Annual Environmental Monitoring Report – Water Management and Monitoring

Mt Piper Power Station Brine Conditioned Fly Ash Co-Placement Project

29 September 2020

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Annual Environmental Monitoring Report – Water Management and Monitoring

Mt Piper Power Station Brine Conditioned Fly Ash Co-Placement Project

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Acronyms and Abbreviations

Name	Description
AEMR	Annual Environmental Monitoring Report
AHD	Australian Height Datum
ANZECC	Australia and New Zealand Environment Conservation Council
ANZG	Australia and New Zealand Governments
BCA	Brine conditioned ash
CCC	Community Consultation Committee
DPIE	NSW Department of Planning, Industry and Environment
EC	Electrical conductivity
EIS	Environmental Impact Statement
EPA	Environmental Protection Authority
EP&A Act	Environmental Planning and Assessment Act 1979
EPL	Environmental Protection Licence
ERM	Environmental Resources Management
ESD	Eastern Stormwater Drain
FHP	Final Holding Pond
GWSDAT	Groundwater Spatiotemporal Data Analysis Tool
ha	Hectares
LCC	Lithgow City Council
LLI	Lendlease Infrastructure
LNAR	Lamberts North Ash Repository
MF	Microfiltration
ML	Mega litre
MPAR	Mt Piper Ash Repository
MPPS	Mt Piper Power Station
NSW	New South Wales
OEMP	Operation Environmental Management Plan
POEO Act	Protection of the Environment Operations Act (NSW) 1997
QAQC	Quality Assurance Quality Control
RL	Relative Level
RO	Reverse Osmosis
SWL	Standing Water Level
SWTP	Springvale Water Treatment Plant
TARPs	Trigger Actions Response Plans
TCR	Thompsons Creek Reservoir
TDS	Total dissolved solids
TSS	Total suspended solids
WAL	Water Access Licence
WCA	Water conditioned ash
WMP	Water Management Plan

1. INTRODUCTION

Environmental Resources Management Australia Pty Ltd (ERM) was engaged by EnergyAustralia NSW Pty Limited (EnergyAustralia) to prepare an Annual Environmental Monitoring Report (AEMR) for the Mt Piper Brine Conditioned Fly Ash Co-Placement Project (the Project). The Project is located at the Mount Piper Power Station (MPPS), 350 Boulder Road, Portland, New South Wales (NSW) (the site). Refer to Figure 1 showing the location of the site.

The Project is operated under the conditions of development consent DA80/10060 (Mt Piper Consent). The Mt Piper Consent was originally granted under the *Environmental Planning and Assessment Act 1979 (NSW)* (EP&A Act) on 1 April 1982 and has since been modified on eight occasions. The Mt Piper Consent, as currently modified, authorises the MPPS and ancillary activities, including the Mt Piper Ash Repository (MPAR).

This report should be read in conjunction with the Statement of Limitations presented in Section 10.

1.1 Project Background

The MPPS is located in the western coalfields of NSW about 18 kilometres northwest of Lithgow. The MPPS is owned and operated by EnergyAustralia. The MPPS is regulated by a number of separate development consents and planning approvals under the EP&A Act, including the Mt Piper Consent. The MPPS is also regulated under the conditions of Environment Protection Licence 13007 (EPL) granted under the *Protection of the Environment Operations Act 1997 (NSW)* (the POEO Act). Table 1 lists the approvals which apply to the Project and form the subject of this AEMR. Appendix A presents a summary of the relevant aspects of this AEMR as required under the Mt Piper Consent and the Water Management and Monitoring Plan approved for the Project dated 28 February 2020 (WMP).

Table 1 Summary of Approvals

Approval/ Licence	Details/Comments
Mt Piper Consent	Granted by Minister for Planning under the EP&A Act as currently modified The WMP was approved under the conditions of the Mt Piper Consent
EPL No. 13007	EPL held by EnergyAustralia for the Mt Piper Power Station, including the Project.

The Project incorporates brine management and storage facilities on the footprint of the MPPS and the ash emplacement area within the former Western Main Open Cut void adjacent to the operational power generation area. The ash placement area is comprised of the MPAR, which is authorised under the Mt Piper Consent, and the separately approved Lamberts North Ash Repository (LNAR). The MPAR and the LNAR are together referred to as the Ash Repositories. However, this AMER is limited to the MPAR which was approved under the Mt Piper Consent.

The separately approved Springvale Water Treatment Project (SWTP) is also located on the MPPS footprint and, in addition to the power station, contributes brine to the MPAR. Key features of the Project area are presented in Figure 2.

The Mt Piper Consent was modified on 3 April 2000 to authorise the co-placement of brine conditioned ash (BCA) in the existing MPAR placement area. This Stage 1 BCA co-placement activity was approved as Modification 4 to the Mt Piper Consent. As required by the conditions imposed as part of Modification 4, an early Water Management Plan was developed and implemented. Due to space limitations in the Stage 1 approval area and to provide for increased brine production due to the upgrade of generating capacity (authorised as Modification 6 to the Mt Piper Consent), a Stage 2 extension to the BCA co-placement area at the MPAR was approved on 23 March 2008 (authorised as Modification 7 to the Mt Piper Consent). A Water Management Plan (*Mt Piper Power Station Brine*

Conditioned Flyash Co-Placement Extension Water Management and Monitoring Plan prepared by Connell Wagner and dated 26 September 2008) was prepared and implemented under the conditions of the Mt Piper Consent for the MPAR. This is referred to in this report as the "Prior WMP."

Following the approval of Modification 8 to the Mt Piper Consent (Condition 43A), the Prior WMP was updated to account for construction and operation of a new 60 ML pond (Settling Pond D) at the MPPS. The current WMP was approved this year and has subsequently been implemented at the site. The WMP includes groundwater and surface water monitoring programs and associated trigger action response plans (TARPs) and contingency measures, together with annual reporting and brine reduction strategies so that effects of the placement of brine conditioned ash on local natural surface waters and groundwater are minimised.

This AEMR has been developed to report on the water monitoring carried out for the Project from July 2019 to June 2020 (the reporting period) in accordance with the conditions of the Mt Piper Consent. Due to the implementation of the WMP part way through the current reporting period, the data for this AEMR has been compiled and reviewed based on the current WMP. However, data obtained and reviewed during the reporting period and any actions taken were considered relative to the WMP that applied at that time.

It is noted that a separate and broader investigation of surface and groundwater conditions in the vicinity of the Ash Repositories, including the Mt Piper Brine in Ash Co-Placement area is currently being completed in line with the contingency measures identified in the WMP (the independent assessment). Once the independent assessment is completed, the WMP will be further updated to reflect the key findings and provide further detail on the contingency measures proposed.

1.1.1 Relationship to other approvals and plans

While the MPAR is approved under the Mt Piper Consent, the LNAR is separately approved by project approval 09_0186 granted under Part 3A of the EP&A Act on 16 February 2012 (LNAR Project Approval). The conditions of the LNAR Project Approval relevantly operate to require:

- implementation of an separately approved Operational Environmental Management Plan. The currently approved plan is the *Lamberts North Ash Placement Project Operation Environmental Management Plan* prepared by CDM Smith and dated May 2013 (LNAR OEMP) which includes a Groundwater Management Plan and a Surface Water Management Plan; and
- the carrying out of groundwater and surface water monitoring programs as specified in the LNAR OEMP. The results of the LNAR monitoring are reported in a separate AEMR prepared in accordance with the conditions of the LNAR Project Approval.

As the LNAR is operated in accordance with the separately approved LNAR OEMP under the conditions of the LNAR Project Approval, this AEMR does not cover water management, monitoring and reporting aspects required under the LNAR OEMP.

In addition, the SWTP was separately approved under development consent number SSD-7592 (SWTP Consent) granted under the EP&A Act in 2017.

This AEMR has been developed in relation to water management and monitoring aspects of the Project in order to satisfy Conditions 44 and 45 of the Mt Piper Consent and relevant reporting requirements of the current WMP. It will be provided to the Secretary, the NSW Environment Protection Authority (EPA), the Water Division within the NSW Department of Planning Industry and Environment (DPIE), WaterNSW, and Lithgow City Council (LCC).

1.2 Objectives

The objectives of the AEMR are to meet the reporting requirements of the Mt Piper Consent and the current WMP for the reporting period.

This includes the requirements of Condition 45 of the Mt Piper Consent which requires that the AEMR include:

- a summary and discussion of all available results and analyses from Water Monitoring Programs contained in the approved WMP;
- a discussion of the aims of the WMP and to what degree these aims have been attained in the context of results and analyses of the water monitoring programs;
- 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, DPIE Water, WaterNSW or LCC.

The WMP provides that the AEMR is to involve the following scope of works:

- Review of surface water and groundwater quality data;
- Review of long-term trends in surface water and groundwater concentrations, with reference to statistical assessment of concentration trends and triggers;
- Assessment of the data to evaluate potential interactions with the Wangcol Creek water quality[1];
- Reporting when the Environmental Goals have not been achieved;
- An interpretation and discussion of routine monitoring results in the context of the aims of the WMP;
- Update on the contingency measures currently being implemented in accordance with the WMP; and
- Preparation of this report in accordance with the WMP and the Mt Piper Consent.

It is noted that other reporting requirements, including provision of water quality data, form part of the EPL annual return reporting process, with the data also published online as required by regulation. The reporting requirements under the EPL will be provided separately to this AEMR.

1.3 Contacts

The contact details for the key personnel responsible for the environmental management of the Project are listed in Table 2.

Table 2 Contact Details

Contact Person	Organisation	Position	Telephone
Mr Ben Eastwood	EnergyAustralia NSW	NSW Environment Leader	(02) 6354 8111

1.4 Scope of Works

In order to meet the objectives of the AEMR, the following works have been implemented:

- Importation of environmental monitoring data provided by EnergyAustralia to the existing ESDAT database for the site;
- Export of summary tables for all available water quality and weather data collected by EnergyAustralia from the monitoring conducted in accordance the WMP;

[1] Note: Wangcol Creek is referred to as "Neubecks Creek" in the WMP and some documents relating to the Project. However, WaterNSW has clarified that the creek is properly called "Wangcol Creek". Accordingly, this AEMR refers to the creek as Wangcol Creek.

- Export of graphs of selected data collected by EnergyAustralia from the monitoring conducted in accordance the WMP;
- Review of surface water (seven locations), groundwater (24 locations) and leak detection (four locations) monitoring data at the Project area for the reporting period;
- Review of changes in water quality data including long-term trends in surface water and groundwater concentrations and water levels;
- Assessment of the groundwater data to evaluate potential interactions with Wangcol Creek water quality;
- Preparation of this AEMR to:
  - present an overview of Project operations, including ash placement activities;
  - present findings of the water quality monitoring, including interpretation and discussion of results, in accordance with the WMP;
  - present outcomes of the statistical assessment of water quality data that exceeded Environmental Goals during the reporting period including a discussion of TARPs where implemented,;
  - provide an update on the contingency measures currently being implemented at the site in accordance with the WMP; and
  - provide a summary of recommended actions to be taken, if any, to mitigate adverse environmental impacts, and to meet the requirements of the relevant government authorities and the WMP.

This AEMR has been developed with consideration of the ongoing independent assessment of groundwater and surface water conditions in the vicinity of both the MPAR and the LNAR (the independent assessment). Refer to Section 7.5 for further details.

2. OPERATIONS SUMMARY

All ash placement operations for MPPS, including those within the Project area, are undertaken by the contracted specialist in ash placement. Lend Lease Infrastructure (LLI) is the current service provider for EnergyAustralia in all aspects of ash and dust management in relation to the Project, which is currently managed under an 'operate and maintain' contract with EnergyAustralia. Refer to Figure 2 for a site layout plan that present key features of the Project area.

2.1 Site Water Discharge

During the reporting period, discharge from LDP01 (now known as LDP12 under the recently revised EPL but referred to as LDP01 in this report for consistency with the WMP) was estimated to be approximately 60 ML.

LDP01 is the discharge point for storm water from the Coal Settling Pond. A data summary for LDP01 is presented in this AEMR as the discharges from LDP01 report to LMP01 and both of these locations are included as monitoring points in the WMP.

Records of flow readings at LMP01 during the reporting period are provided in Appendix B.

2.2 Ash Placement and Geometry

The MPAR is located within the former Western Main open-cut mine void in the eastern area of the MPPS facility. Connell Wagner (2007) noted that, as reported in the 1989 Environmental Impact Statement (EIS), prior to the placement of ash in the mine void, the bottom of the mine void was covered with mine spoil to a minimum level of relative level (RL) 908 metres Australia Height Datum (m AHD) in order to facilitate groundwater flow from the adjacent areas of the unmined Lithgow coal seam aquifer and mine goaf areas surrounding the Western Main open cut mine void.

The MPPS commenced operations in 1993 and since that time water conditioned ash (WCA) has been placed at the MPAR. WCA and BCA have been placed at the MPAR since 2000, with placement of BCA limited to approved areas, as described below. In accordance with the WMP, the conditioning of the ash occurs at the MPPS, and the conditioned ash is then transferred via conveyors or trucks to the MPAR for placement.

The MPAR has approval for the placement of ash up to a RL of 980 m AHD, with the upper surface of the ash to be finished with 1 m of WCA, following the contours of the placement plan approved by the Lithgow City Council in 1990, as replicated in Figure 3. Further, condition 38A of the Mt Piper Consent requires that the placement of BCA brine may only occur between the levels of RL 946 m AHD and RL 980 m AHD in approved BCA placement areas (Stage 1 and Stage 2 approval areas). Refer to Figure 2 and Figure 3 for representation of the approved MPAR placement area and schematic of external batter placement.

With reference to Appendix C and Figure 4, BCA continued to be deposited across Stage 1 and Stage 2 approval areas for the Project over the reporting period. Based on information supplied by EnergyAustralia, a total of 460,942 tonnes of BCA was placed in the MPAR over the reporting period. Refer to Table 3 for a summary of the Project operations for the reporting period, with comparison to the previous reporting period.

Table 3 Operations Summary for the Project

Activity	Previous Reporting Period (2018-2019)	Current Reporting Period (2019-2020)
Ash delivered (T)	564,871	460,942[1]
WCA placed (T)[1]	Not stated	0
BCA placed (T)[1]	Not stated	460,942
Total ash footprint (ha)	71.2[2]	57.45[1]
Area of repository capped (ha)[2]	36.1	42.65

1 Refers to MPAR only
2 Refers to MPAR and LNAR combined

2.3 Brine Composition

Brine from MPPS is derived from the evaporative cooling process in the cooling towers. As water evaporates from the cooling towers, the concentration of salts contained in the circulating water increases, which would eventually impact upon the operation of the cooling system. A portion of the salty water is therefore regularly blown down and replaced with fresh “make up” water.

In addition, the separately approved SWTP also produces brine from the treatment of mine water from dewatering facilities on the Newnes Plateau related to the Springvale Mine and the Angus Place Mine. The separately approved SWTP is integrated with the MPPS water management system and brine from the SWTP is transferred to the MPPS for use in conditioning ash prior to emplacement in the MPAR.

During the reporting period, blowdown water from the cooling towers was transferred to the Mine Water Buffer Pond for treatment by the SWTP or to the EnergyAustralia Reverse Osmosis (RO) brine concentrators and micro filtration (MF) infrastructure. The EnergyAustralia RO and MF system removes salts from the cooling water system, and recycles distillate back into the cooling water cycle. The SWTP brine crystalliser system produces a mixed salt and a dewatered lime salt. Both the EnergyAustralia RO and MF system and the SWTP transfer the brine stream to Brine Waste Pond A and Brine Waste Pond B for temporary storage. This brine is used to condition the fly ash that is placed in approved BCA placement areas.

Monitoring of the brine over time has shown that the concentration of salts in the brine increased between 1999 and 2003-2006 and decreased between 2003-2006 and 2017. The concentration of salts in the brine further decreased between 2017 and 2019-20 as shown in the summary provided in Appendix D. Notable changes in average brine constituents from the period July 2017 to December 2017 to the period July 2019 to June 2020 are listed below:

- chloride concentration in the brine decreased from an average of 10,390 mg/L in 2017 to 7,776 mg/L in the reporting period (26% decrease);
- fluoride concentrations in the brine decreased from an average of average of 64.7 mg/L in 2017 to 55.4 mg/L in the reporting period (15% decrease);
- boron concentrations in the brine increased from an average of 35,800 µg/L in 2017 to 41,500 µg/L in the reporting period (14% increase); and
- manganese concentrations in the brine decreased from an average of 7,210 µg/L in 2017 to 5,170 µg/L in the reporting period (29% decrease).

The changing brine composition may be related to the changed source of water being treated (e.g. with inputs from the SWTP) and also the treatment process at the SWTP. Brine composition data has been used to inform the surface water and groundwater results discussions below.

3. ENVIRONMENTAL SETTING

Details of the environmental site setting are presented in the following sections to provide context to the surface water and groundwater assessments presented below.

3.1 Climate

The climate data below was provided by EnergyAustralia and is sourced from a weather station on site at MPPS. A summary of the climate data is presented in Table 4 and a copy of the data is presented in Appendix E.

Table 4 Local Climate Data for 2019/20

Month	Rainfall Total (mm)	Min. Temperature (°C)	Max. Temperature (°C)
July 2019	8.4	-5.7	17.4
August 2019	18.0	-7.1	19.0
September 2019	51.2	-4.7	24.7
October 2019	9.8	-0.2	29.6
November 2019	14.4	2.1	34.2
December 2019	0.0	5.6	38.7
January 2020	59.0	10.2	39.5
February 2020	120.4	5.9	38.6
March 2020	109.6	5.2	30.7
April 2020	90.0	1.1	24.0
May 2020	14.8	-4.0	19.0
June 2020	17.5	-4.0	16.0
TOTAL/MIN/MAX	513.1	-7.1	39.5

Data from MPPS Weather Station

The total rainfall for the reporting period was 513.1 mm, with the monthly average of 42.8 mm. This is lower than the total reported rainfall of 787 mm for the previous reporting period (ERM, 2019) and is lower than the average annual rainfall between 2012 and 2017, which was reported by Aurecon (2017) to be 756.5 mm/year.

The average monthly rainfall for the current reporting period of 42.8 mm/month is lower than the previous reporting period average monthly rainfall of 65.6 mm/ month and is also lower than the long-term average of 72 mm/month reported by Aurecon (2017).

The 2019-20 monitoring period was characterised by a bushfire season that was unprecendented in its extent and intensity, including the Gospers Mountain fire in the immediate vicinity of the site.

3.2 Regional Geology and Hydrogeology

The site is located on the western margin of the Sydney Basin, and the geology characterised by eastward dipping sedimentary deposits. The sedimentary deposits extend approximately 130 km east towards the coast. Structurally, the western margin of the Sydney Basin is not complex, and no significant faulting or folding structures are present in the region surrounding the site (CDM Smith, 2012).

The site is located at an outcrop of the Illawarra Coal Measures. The Narrabeen Group, comprised of sandstones, overlies the Illawarra Coal Measures in the vicinity of the site, forming the surrounding hillsides. The Illawarra Coal Measures overlie the Shoalhaven Group and host the coal seams that were previously mined out in the vicinity of the site. Some characteristics of these units are listed in Table 5.

Table 5 Local Geological Units

Narrabeen Group	Illawarra Coal Measures	Shoalhaven Group
■ Sandstones, shale and claystone ■ Up to approximately 800 m thick in parts, although generally absent in the immediate vicinity of the Ash Repositories. ■ Deposition in estuarine/alluvial, fluvial, and fluvial-deltaic environments. ■ Unconformably overlies Illawarra Coal Measures (Danis et al., 2011).	■ Interbedded shale, sandstone, conglomerate, and coal. ■ Dips 1 - 2 degrees to the east. ■ Outcrops extensively just east of Portland, exposing the Lidsdale and Lithgow coal seams close to the surface with approximately 15-25 m of sandstone overburden (CDM Smith, 2012). ■ Mined coal seams at and in the vicinity of the site (underground and open cut mining) ■ Upper portions extensively weathered near the site	■ Siltstones, lithic sandstones and conglomerate. ■ Marine sediments. ■ Berry Sandstone/Formation (earlier) & Snapper Point Formation (later). ■ Contains sulfide-bearing material and is acid- generating in places where exposed via rock cuttings (SKM, 2010).

Groundwater beneath the site is present within the Illawarra Coal Measures, with a regional groundwater flow direction generally to the east in the vicinity of the site (see Figure 6a to Figure 6d). The natural stratigraphy of the Illawarra Coal Measures in the vicinity of the site 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.

Prior to the placement of ash in the former mine void (now occupied by the ash repository), the bottom of the mine void was covered with mine spoil to a minimum level of RL 908m AHD. This was to facilitate groundwater flow from the adjacent areas of the unmined Lithgow coal seam aquifer and mine goaf areas surrounding the Western Main open cut mine void. The background groundwater level (water table elevation) prior to the filling of the mine voids and placement of ash was reported to be approximately 910 m AHD.

Groundwater levels beneath the LNAR were expected to rise approximately 2.5 meters once ash placement began due to the expected mass of ash and capping material to be placed and compacted above (CDM Smith, 2013). Historically, groundwater seepage from beneath the MPAR was collected in the Groundwater Collection Basin that was previously located to the east of MPAR (SKM, 2010). In 2012, this basin was filled in with mine spoil and compacted as part of the construction of the adjacent LNAR; the footprint of the former Groundwater Collection Basin is located beneath the LNAR.

The area surrounding the Ash Repositories is characterised by open cut and below ground coal mining. The below ground mined out areas are variably filled in with goaf, or in some areas remain as voids. Former open cut mines remain as ponds, including within the alignment of Wangcol Creek to the north of MPAR, or have been filled in.

Long term groundwater monitoring at the site indicates that the water table occurs variably in the former below ground mined out areas and open cuts and, away from the Ash Repositories, predominantly in the overlying Bunnyong Sandstone. The water table elevation ranges from approximately 903 m AHD to 910 m AHD to the east and north of the Ash Repositories. Perched water is present in the southern part of the MPAR.

3.3 Hydrology

The Project site is within the catchment of Wangcol Creek a tributary of the Coxs River. The site itself sits on the eastern edge of the Great Dividing Range and includes the headwaters of Wangcol Creek. Wangcol Creek is located to the north and northeast of the MPAR, approximately 250 m from the active ash placement area at its closest point. Wangcol Creek flows to the east and southeast and joins the Coxs River approximately 3.2 km east of the site.

Coxs River makes up part of the Warragamba water catchment, the largest of Sydney's five drinking water catchments (WaterNSW, 2018). Historically, Coxs River flow has been affected by three major factors: the construction of the Lyell Dam; regional climatic variations; and land clearing in the upper and central parts of the river (Young et al. 2000). As a result of clearing the land for pastures, Coxs River catchment supports cattle and sheep grazing as its primary land use, however extractive industries such as coal mining are also present. .

Clean water diversion structures divert surface waters around the operational areas of the MPPS where possible. Storm water that falls within the operational area of the MPPS is directed to water management and storage infrastructure for use at the Project site.

4. WATER MONITORING AND MANAGEMENT PLAN

The aim of the WMP is to minimise the effect of the placement of brine conditioned ash on local natural surface waters and groundwater. The WMP addresses water cycle management associated with the Project. It includes a surface water and groundwater water monitoring program, a requirement for an annual environmental report, trigger and response plans (TARPs), contingency measures, and strategies for brine reduction.

The WMP approved under the Mt Piper Consent outlines the following key elements:

- A water cycle management plan describing the management of surface water run off at the ash repository;
- Brine cycle management including brine minimisation strategies and future mine disposal strategies;
- Water cycle management including the newly installed Settling Pond D; and
- Water monitoring program, including surface water and groundwater monitoring, and the environmental goals to be adopted.

4.1 Environmental Goals

The Environmental Goals for groundwater and surface water monitoring in the WMP are consistent with those applied to monitoring of the LNAR as approved in the LNAR OEMP. The Environmental Goals were developed by Aurecon (2009) to account for hardness corrected guideline values and were presented by CDM Smith (2013).

The Environmental Goals utilise the 95% ecosystem protection values, stock watering, irrigation water or drinking water values based on the ANZG (2018) water quality guidelines (formerly ANZECC, 2000), 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 the former groundwater collection basin (for groundwater).

It is noted that, where the Environmental Goals for groundwater are based on the ANZG (2018) water quality guidelines, these guidelines are applicable to receiving waters and not to groundwater. However, they form an appropriate basis for undertaking a conservative initial screening assessment.

The Environmental Goals adopted for this assessment are presented with the surface water and groundwater data in Appendix F and Appendix G respectively.

5. SURFACE WATER ASSESSMENT

5.1 Objective

The objective of the groundwater monitoring program is to identify water quality changes at an early stage so that potential causes can be investigated and, if necessary, effects mitigated. The surface water data is compared between locations and also to the established Environmental Goals to assess changes in water quality and to assess whether the TARPs or contingency measures should be considered and/or implemented.

5.2 Surface Water Monitoring Locations and Frequency

A summary of the surface water monitoring site locations under the WMP is presented on Figure 5 in Table 6.

Table 6 Surface Water Monitoring Locations

Site ID	Position	Location Description	Frequency	No. of Samples
LDP01	Upstream	Monitors the storm water discharge from the coal settling pond. The licenced discharge point under EPL #13007.	Monthly during discharge[1]	42
LMP01	Upstream	Final Holding Pond Weir – this monitoring point is located north-west of the MPAR. This monitoring site is located in an upstream position relative to the Ash Repositories and is the location where flow from the headwaters of Wangcol Creek flow out from the MPPS operational area.	Quarterly	38
NC01	Mid-stream	Located midstream in the monitored area of Wangcol Creek, upstream to the Ash Repositories.	Monthly	5
SW_C	Mid-stream	Located within Wangcol Creek, the monitoring location is located midstream in the monitored area of Wangcol Creek and near groundwater monitoring well D107.	Quarterly	7
SW_E	Mid-stream	Located within Wangcol Creek, downstream of former open cuts "Area D" and "Area E."	Quarterly	8
WX22 / SW_F	Downstream	Located in Wangcol Creek at a stream gauge to the east/down-stream of the Ash Repositories. Also WaterNSW monitoring point 212055.	Monthly	10
SW_G	Downstream	Located within the downstream portion of Wangcol Creek, and downstream of WX22, within a former open cut mine working.	Quarterly	7

Selected field parameters monitored on a weekly basis

Monitoring undertaken by analytical laboratory Nalco Water – Ecolab

It is noted that monitoring locations NC01 and WX22 were not sampled every month during the reporting period due to constraints associated with necessary measures to respond to the COVID-19 pandemic and the bushfires which occurred over summer 2019/20 and restricted access to MPPS.

5.3 Surface Water Monitoring Methodology

Surface water quality monitoring was undertaken by Nalco Water – Ecolab (Nalco) on behalf of EnergyAustralia. It is understood that the sampling methodology applied by Nalco was in accordance with that outlined in the WMP.

5.4 Surface Water Quality Dataset

Surface water samples were obtained by Nalco for either field or laboratory analysis in accordance with the following monitoring and analysis schedule as outlined within the WMP:

- electrical conductivity (EC - µS/cm, field measured);
- pH (field measured);
- Total Dissolved Solids (TDS);
- cations and anions (calcium, chloride, fluoride, potassium, sodium, sulfate);
- alkalinity (total alkalinity, bicarbonate alkalinity, phenolphthalein alkalinity);
- total and dissolved metals (aluminium, arsenic, barium, beryllium, boron, cadmium, chromium, copper, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, selenium, silver, zinc) – field filtered at 0.45 µm;
- non-filterable residue (NFR, turbidity, or Total Suspended Solids – TSS);
- total phosphorus; and
- nitrogen, nitrate, nitrite, total kjeldahl nitrogen (TKN).

It is noted that the trace metals in surface water samples were predominantly reported as unfiltered results with occasional filtered results. Results are presented in Appendix F.

Data Quality Assurance and Quality Control (QA/QC) checks for compliance are performed by EnergyAustralia prior to the publishing of the surface water data on a monthly basis online.

Evidence of the collection of field QC samples (i.e. rinsate, trip blanks or trip spikes) during the field based programs was not provided. Results of laboratory QC measures including laboratory duplicate, triplicate, internal duplicates, method blanks or spike data were also not presented for review during compilation of this AEMR.

5.5 Surface Water Results

The surface water analytical results obtained for the reporting period are presented alongside the Environmental Goals for surface water in Appendix F and Figure 7. Surface water field and analytical results obtained from surface water monitoring locations for the reporting period are presented in Appendix F, and summarised in Figure 7. Trend graphs for selected analytes (chloride, manganese, nickel, sulfate and TDS), considered to be indicators of potential changing conditions resulting from the Project, are provided in Appendix I.

5.5.1 Upstream Monitoring Results

Locations LMP01 and LDP01 are considered to be present upstream conditions relative to the MPAR in the monitored area of Wangcol Creek. It is noted that LDP01 is the licenced discharge point for the MPPS, specifically the coal stockpile area, during high storm water flow events. LDP01 is located at the discharge point of the coal settling pond, which discharges into the final holding pond; therefore, the data obtained from LDP01 is not representative of typical instream conditions.

LMP01 is a sampling location from downstream of the final holding pond weir. The final holding pond holds storm water from the clean water diversions from around the MPPS, and can be closed in the event of an environmental incident to limit the likelihood of adverse impacts to the downstream surface water environment.

LDP01 and LMP01 are located upstream of the MPAR and water quality at these locations is not considered to be influenced by activities at the Ash Repositories. However, other aspects of the Project are located within the catchment upstream of these sampling locations (e.g. brine transfer pipelines and brine waste holding ponds).

During the reporting period, discharge from LDP01 was estimated to be approximately 60 ML. Records of flow readings at LMP01 during the reporting period are provided in Appendix B.

The surface water field and analytical results obtained from sample points LMP01 and LDP01 for the reporting period are presented in Appendix F, and summarised in Figure 7 and Section 5.6.

A brief discussion of results is presented in the following subsections.

5.5.1.1 Field Parameters

Field parameters monitored at LMP01 and LDP01 for the reporting period are summarised as follows:

- pH values (field measured) of surface water samples from LMP01 were 6.78 to 8.86, while laboratory measured values were slightly higher, ranging from 7.4 to 9.1. At LDP01 laboratory measured pH values were 6.5 to 9.7; field measurements were not provided for LDP01. Field-based pH measurements are considered to have a greater reliability and accuracy than lab-based pH measurements of field samples. pH values for samples from LDP01 and LMP01 were outside of the range (more alkaline) of the Environmental Goal in September, October, November, December, January, February and March.
- Field EC values obtained from LMP01 were 363 µS/cm to 1960 µS/cm and were generally consistent with laboratory determined results of 250 µS/cm to 1200 µS/cm. Laboratory EC values from LDP01 were 190 µS/cm to 1300 µS/cm; field measurements were not provided for LDP01. The reported EC values were generally consistent with TDS concentrations (measured monthly until 31 October 2019 before changing to weekly) at LDP01, which were 130 mg/L to 810 mg/L. The TDS values at LMP01 were 14 mg/L to 554 mg/L, which were lower than expected from the field/laboratory EC values. All field/laboratory EC and TDS values were below the Environmental Goals for surface water (2,200 µS/cm and 1,500 mg/L respectively).

  Trend graphs for LMP01 and LDP01 show fluctuations of TDS over time, however the TDS concentrations appear steady and generally within the historical range. LDP01 reported a spikein TDS on 17 February 2020 which is likely attributable to both:

  - a leak which formed in a brine pipeline at MPPS which occurred in February 2020 and resulted in materially less than 433 litres of brine being released to a drain which lead to the final holding pond in Wangcol Creek. While short-term increased concentrations of key parameters associated with the event were identified in surface water at the FHP and at LMP01, this event is unlikely to have resulted in any material environmental harm to Wangcol Creek; and
  - a leak in a brine pipeline, which forms part of the SWTP and is separately operated by a third party, which is understood by EnergyAustralia to have occurred at around the same time.

  It is understood that both events were notified to the EPA and subsequently rectified. Concentrations have since returned to the typical range.

5.5.1.2 Major and Minor Ions

Throughout the reporting period, reported concentrations of major ions for which there are Environmental Goals (chloride, fluoride, and sulfate) at LMP01 and LDP01 were below the relevant Environmental Goals for surface water.

Trend graphs for LMP01 and LDP01 show fluctuations of sulfate and chloride over time however the concentrations appear steady and generally within the historical range. High sulfate and chloride results relative to the historical dataset have been reported intermittently since July 2019, however the concentrations have returned to the more typical range. The spike in concentrations may be attributed to the brine leak events which have been notified to the EPA and rectified.

5.5.1.3 Metals

Throughout the reporting period, chromium, copper, iron, lead and molybdenum were identified on one or more occasions at concentrations above the relevant Environmental Goals for surface water at LMP01 and LDP01 as presented in Appendix F, and summarised in Figure 7 and Table 9.

Silver concentrations were reported below the limit of reporting (of <1 µg/L) for the entire monitoring period at both LMP01 and LDP01; however, the limit of reporting exceeds the Environmental Goal for surface water of 0.05 µg/L. Based on the results of previous monitoring, including concentrations of silver in brine and groundwater, silver is not considered to represent a constituent of concern for monitoring in accordance with the WMP.

Trend graphs for LMP01 and LDP01 show fluctuations of boron, manganese and nickel over time however the concentrations appear steady and generally within the historical range. Spikes have been reported intermittently at the upstream monitoring locations since the end of 2015 (and 2011 for nickel) however the results typically return to near to or below laboratory detection limits.

5.5.2 Midstream Monitoring Results

Locations NC01, SW_C and SW_E are considered to represent midstream conditions relative to the MPAR in the monitored area of Wangcol Creek.

Locations NC01 and SW_C are located north of the MPAR along an area of Wangcol Creek that is not known to have been subject to open cut mining operations. SW_E is located further downstream of NC01 and SW_C, to the east of the MPAR and immediately downstream from an area of Wangcol Creek that was historically subject to open cut mining activities.

The surface water field and analytical results obtained from sample points NC01, SW_C and SW_E, for the reporting period are presented in Appendix F, and summarised in Figure 7 and Section 5.6.

A brief discussion of results is presented in the following subsections.

5.5.2.1 Field Parameters

Field parameters monitored at NC01, SW_C and SW_E for the reporting period are summarised as follows:

- pH (field) values were 6.7 to 7.6 with no results reported outside of the Environmental Goal range for surface water.
- Field EC values reported at SW_C and SW_E ranged from 290 µS/cm to 11,800 µS/cm, and field EC values were generally consistent with laboratory determined TDS results. No electrical conductivity results were recorded at monitoring point NC01 during the reporting period. SW_E reported exceedances of the EC and TDS Environmental Goals for surface water during October, November, and January of the reporting period.

Trend graphs show TDS at NC01 and SW_C has remained low and stable. TDS at SW_E increased markedly from June 2019 to January 2020. March 2020 data indicates a return towards the historical range, though still above the Environmental Goal for surface water. No data has been provided for April to June in the reporting period due to constraints associated with necessary measures to respond to the COVID-19 pandemic.

5.5.2.2 Major and Minor Ions

Throughout the reporting period, major and minor ions including chloride, fluoride, and sulfate were reported at NC01, SW_C and SW_E at concentrations that were typically below the Environmental Goal for surface water.

Concentrations of major and minor ions were generally stable at NC01 and SW_C throughout the reporting period. Consistent with increased TDS and EC values, concentrations of chloride and sulfate in surface water from SW_E reported were higher during October, November and January (noting no samples were analysed during December) compared to previous results from the reporting period.

- Fluoride was reported above the Environmental Goal for surface water at NC01 during September.

Sulfate was was reported above the Environmental Goal for surface water at SW_E during November and January.

Chloride was was reported above the Environmental Goal for surface water at SW_E during January.

Trend graphs for chloride and sulfate are consistent with TDS, and show chloride and sulfate concentrations at NC01 and SW_C have remained low and stable. Concentrations of chloride and sulfate at SW_E increased from June 2019 to January 2020. March 2020 data indicates a return towards the historical range, and below the Environmental Goal for surface water. No data has been provided for April to June in the reporting period due to constraints associated with necessary measures to respond to the COVID-19 pandemic.

5.5.2.3 Metals

Throughout the reporting period boron, chromium, iron, manganese and nickel were identified on one or more occasions at concentrations above the relevant Environmental Goals for surface water at NC01, SW_C and SW_E as presented in Appendix F, and summarised in Figure 7 and Table 9. Consistent with major ion concentrations and TDS and EC values, SW_E accounts for the majority of exceedances from the midstream monitoring locations.

Trend graphs for boron, manganese and nickel are consistent with TDS, and show concentrations of these selected metals at NC01 and SW_C have remained low and stable. Boron, manganese and nickel at SW_E increased markedly from June 2019 to January 2020 with concentrations during this period all exceeding the Environmental Goals for surface water. March 2020 data indicates a return towards the historical range, with boron and manganese below the Environmental Goal for surface water. No data has been provided for April to June in the reporting period due to constraints associated with necessary measures to respond to the COVID-19 pandemic.

5.5.3 Downstream Monitoring Results

Locations WX22 (SW_F) and SW_G are considered to be present downstream conditions relative to the MPAR in the monitored area of Wangcol Creek.

Both WX22 and SW_G are located east of the MPAR along an area of Wangcol Creek that is downstream of and, in the case of SW_G has been subject to, open cut mining operations.

The surface water field and analytical results obtained from sample points WX22 (SW_F) and SW_G for the reporting period are presented in Appendix F, and summarised in Figure 7 and Section 5.6.

A brief discussion of results is presented in the following subsections.

5.5.3.1 Field Parameters

Field parameters monitored at WX22 and SW_G for the reporting period are summarised as follows:

- Field pH values ranged from 6.5 to 7.5, within the Environmental Goal pH range for surface water.
- Field measured EC values ranged from 528 µS/cm to 3040 µS/cm. Field EC values were generally consistent with laboratory determined TDS values. EC and TDS were reported above the Environmental Goal for surface water at both locations during November and January.

Trend graphs for WX22 and SW_G show TDS has fluctuated over time. Concentrations of TDS typically increase during summer months, with TDS exceeding the Environmental Goal for surface water at WX22 during February 2014, February 2018 and January 2020. The spike in TDS concentrations during the summer months is becoming progressively higher, however these results are inherently tied to rain fall events. The trends at SW_G are similar to that described for WX22 however monitoring data at SW_G has only been collected since May 2018. TDS typically returns to concentrations below the Environmental Goal for surface water at the end of each summer period.

5.5.3.2 Major and Minor Ions

Throughout the reporting period, concentrations of cations and anions including chloride, fluoride, and sulfate were reported at WX22 and SW_G at concentrations that were below the relevant Environmental Goals with the exception of sulfate at WX22 during November and January.

Trend graphs for WX22 and SW_G show chloride and sulfate concentrations have fluctuated over time and are consistent with TDS trends. Concentrations of chloride and sulfate typically increase during summer months. As per TDS observations, the summer spike in chloride and sulfate concentrations during the summer months is becoming progressively higher. Sulfate concentrations spikes have exceeded the Environmental Goal for surface water at WX22 during February 2014, February 2018 and January 2020, returning to below the Environmental Goal for surface water at the end of each summer period. Chloride has remained below the Environmental Goal for surface water throughout the historical dataset.

5.5.3.3 Metals

Throughout the reporting period boron, iron, manganese, mercury, nickel and zinc were identified on one or more occasions at concentrations above the Environmental Goal for surface water at WX22 or SW_G as presented in Appendix F, and summarised in Figure 7 and Section 5.6. WX22 accounts for the majority of exceedances from the downstream monitoring locations and the maximum concentrations at WX22 were typically higher than at SW_G.

Trend graphs for WX22 and SW_G show boron, manganese and nickel concentrations have fluctuated over time and are consistent with TDS trends. Concentrations of these selected metals typically increase during summer months, with boron and manganese concentrations reported to exceed the Environmental Goal for surface water during January and February before returning to below the Environmental Goal for surface water during March and June. Concentrations of nickel exceed the Environmental Goal for surface water during all monitoring events samples, though concentrations do increase during the summer period.

5.6 Summary

Copper, iron, lead, molybdenum and pH results were reported to exceed the relevant Environmental Goals for surface water at upstream monitoring locations (LDP01 and LMP01). The concentrations of analytes reported during the period January to March, including the exceedances for chromium, lead and molybdenum are considered likely to have been influenced by the reported brine leak events noted at Section 5.5.1.1 above. This is unlikely to have caused material environmental harm to Wangcol Creek, and the cause of the incident has been rectified.

Results from midstream monitoring locations NC01 and SW_C were typically below the Environmental Goals for surface water, with concentrations of target analytes typically reported within a similar range to the upstream monitoring locations. Concentrations of copper, lead and molybdenum were typically lower than in the upstream locations. A change in surface water quality was apparent based on the results reported at the midstream monitoring location SW_E, at the downstream extent of the area of historical open cut mining disturbance. Based on results from the independent assessment, this is considered likely to be associated with the former open cut pits within Wangcol Creek intersecting groundwater.

SW_E reported results above the Environmental Goals for surface water for analytes including EC, TDS, sulfate, chloride and metals (boron, chromium, copper, iron, manganese and nickel) from October through March of the reporting period. The seasonal period from Spring through to late Summer is typically the time of lowest rainfall in the region. The lower rainfall period, with higher rates of evaporation, results in a greater relative contribution of groundwater inputs to the surface water system, and the connectivity of SW_E with groundwater due to open cut mining has resulted in the elevated results reported compared to surface water monitoring locations further upstream. The trend graphs for SW_E (Appendix I) indicate a sharp increase in concentrations of analytes including boron, chloride, manganese, nickel, sulfate and TDS from October through to January or February. For all analytes except nickel, concentrations subsequently declined to below the relevant Environmental Goals in March. The reported concentrations of metals over the Spring and Summer period in the mid-stream monitoring locations were higher than reported in previous years; however concentrations from March were typically similar to those in previous years.

At the downstream monitoring locations (WX22 and SW_G), concentrations of EC, TDS, sulfate, boron, iron, manganese, mercury, and zinc in surface water exceeded the relevant Environmental Goals at times over the monitoring period; typically between October and January. Nickel concentrations exceeded the Environmental Goal throughout the reporting period. Trend graphs (Appendix I) indicate an increasing trend for increase in concentrations of analytes including boron, chloride, manganese, nickel, sulfate and TDS at WX22 from October to January, before declining towards the end of the reporting period. Concentrations at SW_G were typically lower than at WX22, and analyte concentrations at WX22 were consistently lower than at SW_E, located further upstream. The elevated concentrations of parameters in surface water at downstream monitoring locations are considered to be related to groundwater inputs to Wangcol Creek, particularly during the summer period.

Overall the interaction of groundwater with surface water of Wangcol Creek in midstream and downstream locations, particularly downstream of former open cut areas, is considered to have contributed to the exceedances in Environmental Goals. Groundwater discharge to Wangcol Creek is currently subject to review and management as part of the independent assessment. Mitigation measures that form part of the Mt Piper Groundwater Interception Project are currently being planned for implementation in 2021.

6. GROUNDWATER

6.1 Objective

The objective of the groundwater monitoring program is to identify water quality changes at an early stage so that potential causes can be investigated and, if necessary, effects mitigated. The groundwater data is compared between locations, to historical data, and also to the established Environmental Goals to assess changes in water quality and the extent to which impacts may be related to activities associate with the Project.

6.2 Groundwater Monitoring Locations and Frequency

A summary of the groundwater monitoring locations is presented in Table 7 and Figure 5. The number of groundwater wells monitored by EnergyAustralia increased during the monitoring period as a result of the independent assessment. These additional locations (D100 series) were included in the updated WMP, and results are reported here.

Table 7 Groundwater Monitoring Network

Bore ID	Location Description	Screened Material [1]	Frequency	No. of Samples
Brine waste pond leak detection bores				
MPGM5/D5	Adjacent (downgradient) Brine Waste Pond A	Not known	Quarterly	9
MPGM5/D6	Adjacent (downgradient) Brine Waste Pond B	Not known	Quarterly	8
Within MPAR / mine disturbance area east of MPAR				
B5	Within the MPAR	Fill	Quarterly	2
SW3-D	Within the southeast portion of the MPAR	Fill – clay/silty clay	Quarterly	1
MPGM4/D23	Adjacent (south) of the MPAR	Sandstone	Quarterly	0
MPGM4/D10	East (downgradient) of the MPAR, and adjacent to LN Pond 2.	Fill / mine spoil	Quarterly	9
MPGM4/D11	Within the eastern extent of the MPAR.	Fill beneath the ash	Quarterly	10
MPGM4/D19	East (downgradient) of the Ash Repositories	Fill / mine spoil	Quarterly	11
D113	East (downgradient) of the Ash Repositories. Nested (deeper) with D19	Siltstone	Quarterly	9
Within mine disturbance area – south and southeast of MPAR				
MPGM4/D15	South of the Ash Repositories.	Sandstone and/or shale	Quarterly	11
MPGM4/D16	South of the Ash Repositories.	Sandstone and/or shale	Quarterly	11
MPGM4/D17	South of the Ash Repositories.	Sandstone and/or shale	Quarterly	8
MPGM4/D18	South of the Ash Repositories.	Sandstone and/or shale	Quarterly	9
Adjacent MPAR – downgradient				

Bore ID	Location Description	Screened Material [1]	Frequency	No. of Samples
MPGM4/D1	Northeast (downgradient) of the MPAR.	Mudstone, sandstone and coal	Quarterly	11
MPGM4/D9	Northeast (downgradient) of the MPAR and adjacent to Wangcol Creek	Alluvial deposits	Quarterly	11
D102	Northeast (downgradient) of the MPAR and adjacent to Wangcol Creek. Nested (deeper) with D9.	Siltstone	Quarterly	9
D105	East (downgradient) of the MPAR and adjacent Wangcol Creek.	Coal	Quarterly	9
MPGM4/D8	East (downgradient) of the MPAR and adjacent to the northern side of Wangcol Creek.	Alluvial deposits	Quarterly	11
D104	East (downgradient) of the MPAR and adjacent Wangcol Creek.	Sandstone	Quarterly	9
D103	East (downgradient) of the MPAR and adjacent Wangcol Creek.	Coal and/or siltstone	Quarterly	9
MPGM4/D2	East (downgradient) of the MPAR and adjacent Wangcol Creek.	Not known	Quarterly	10
Background and Adjacent MPAR				
MPGM4/D4	Background groundwater monitoring location, northwest (upgradient) of the MPAR.	Fill	Quarterly	11
MPGM4/D5	Background groundwater monitoring location, northwest (upgradient) of the MPAR.	Mudstone/ Sandstone and coal	Quarterly	9
MPGM4/D3	Background groundwater monitoring location, north (cross gradient) of the MPAR.	Sandstone and/or siltstone	Quarterly	11
D107	North (cross gradient) of MPAR and adjacent Wangcol creek .	Siltstone and/or shale	Quarterly	9
D106	North (cross gradient) of MPAR and adjacent Wangcol creek.	Weathered sandstone and/or Shale	Quarterly	9

Variation between the number of times each location was sampled was due to constraints associated with necessary measures to respond to the COVID-19 pandemic and the bushfires which occurred over summer 2019/20 and restricted access to the MPPS.

6.3 Groundwater Monitoring Methodology

Groundwater quality monitoring was undertaken by Nalco on behalf of EnergyAustralia. It is understood that the sampling methodology applied by Nalco was in accordance with that outlined in the WMP.

6.4 Groundwater Quality Dataset

Nalco collected groundwater samples from the 26 groundwater monitoring bores throughout the reporting period. Samples were obtained for field and laboratory analysis in accordance with the following monitoring and analysis schedule:

- depth to water (to m AHD - prior to purging);

- EC (µS/cm, field measured);
- pH (field measured);
- TDS;
- cations and anions (calcium, chloride, fluoride, potassium, sodium, sulfate);
- alkalinity (total alkalinity, bicarbonate alkalinity, phenolphthalein alkalinity); and
- total and dissolved metals (aluminium, arsenic, barium, beryllium, boron, cadmium, chromium, copper, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, selenium, silver, zinc) – field filtered at 0.45 µm.

The trace metals in groundwater samples were reported as unfiltered samples, except for iron, manganese and vanadium.

Evidence of the collection of field QC samples (i.e. rinsate, trip blanks or trip spikes) during the field based programs was not provided. Results of laboratory QC measures including laboratory duplicate, triplicate, internal duplicates, method blanks or spike data were also not presented for review during compilation of this AEMR.

6.5 Groundwater Results

For the purpose of this discussion, the groundwater data review has considered the groundwater monitoring locations in five monitoring zones:

- Brine waste pond leak detection bores (MPGM5/D5, MPGM5/D6);
- Bores within MPAR / mine disturbance area east of MPAR (B5, SW3-D, MPGM4/D23, MPGM4/D10, MPGM4/D11, MPGM4/D19, D113);
- Bores within mine disturbance area – south and southeast of MPAR (MPGM4/D15, MPGM4/D16, MPGM4/D17, MPGM4/D18);
- Bores adjacent to MPAR – downgradient (MPGM4/D1, MPGM4/D9, D102, D105, MPGM4/D8, D104, D103, MPGM4/D2); and
- Background bores (MPGM4/D4, MPGM4/D5) and bores adjacent to MPAR – to the north (MPGM4/D3, D107, D106).

Trend graphs for selected analytes (chloride, manganese, nickel, sulfate and TDS) that are considered to be indicators of potential changing conditions resulting from Project activities are provided in Appendix J.

6.5.1 Groundwater elevations and inferred flow direction

Hydrographs for each bore have been segregated to present graphs for bores in each monitoring zone described above (Appendix H). The hydrographs show that water levels within each bore generally declined slightly during the first half of the monitoring period, with a recovery of groundwater levels associated with high rainfall events from January onwards through the reporting period. A notable outlier to the relatively stable groundwater elevations reported is Bore D18 which reported fluctuating groundwater levels throughout the monitoring period, with a correlation to rainfall events; these observations are considered to indicate that the construction of this bore may be compromised.

Groundwater elevation contours indicate that regional groundwater flow beneath the MPAR is generally toward the east. The inferred groundwater flow directions have remained relatively consistent throughout the monitoring period, as indicated in the seasonal groundwater flow contours presented in Figures 6a to Figure 6d. Table 8 provides a range of seasonal groundwater elevation data for discrete monitoring zones in relation to the MPAR.

Table 8 Seasonal Groundwater Elevation data

Monitoring Period	Within MPAP/ Mine Disturbance Area east of MPAR (mAHD)	Within Mine Disturbance Area south and southeast of MPAR (mAHD)	Background and Adjacent MPAR (mAHD)	Adjacent to MPAR and Downgradient (mAHD)
Winter 2019	905.93 - 910.14	908.75 - 914.50	909.70 - 917.84	903.5 - 909.70
Spring 2019	907.82 – 910.33	908.35 – 914.30	909.60 - 917.84	903.30 - 909.30
Summer 2020	907.02 – 909.83	907.35 –914.20	909.0[1] - 917.54	902.80 – 908.8
Autumn 2020	907.72 – 909.84	908.25 – 914.3	909.0[2] - 918.24	903.4 - 909.4

1 Data is approximate and extrapolated from contours presented on Figure 6c
2 Data is approximate and extrapolated from contours presented on Figure 6d

6.5.2 Groundwater Quality within MPAR and the Mine Disturbance Area east of MPAR

Data obtained from groundwater bores situated within the MPAR or in the mine disturbance area immediately to the east are summarised below and compared to the Environmental Goals for groundwater. It is noted that bores SW3-D, B5 and D23 are located within this area but due to either access reasons or the bores being dry, only a limited suite of is available for this reporting period. The full set of groundwater monitoring data is presented in Appendix G, and summarised in Figure 8a. Trend graphs showing concentrations vs time for key analytes are provided in Appendix J.

6.5.2.1 Field Parameters

- pH values of groundwater in this area were slightly acidic, ranging from 5.46 to 6.3 throughout the reporting period. pH values remained generally stable, however, were consistently lower than the Environmental Goal range for groundwater of 6.5 to 8.0.
- EC values obtained from field measurements were 916 µS/cm to 45,200 µS/cm with TDS reported at 1,160 mg/L to 9,550 mg/L. Both EC and TDS in this area were consistently above the Environmental Goals for groundwater during the reporting period, with the exception of TDS and EC at D19 during August and EC at SW3-D in November.

  Trend graphs for bores within this area show concentrations of TDS in groundwater have fluctuated over time, with a general increase in concentrations to above the Environmental Goal for groundwater since approximately 2010. The TDS concentrations in groundwater within this area no longer appear to be increasing, although they remain above the Environmental Goal for groundwater.

6.5.2.2 Major and Minor Ions

Throughout the reporting period, major and minor ions, including chloride, fluoride, and sulfate were analysed in groundwater from D10, D11, D113 and D19. Sulfate concentrations generally exceeded the Environmental Goal for groundwater throughout the reporting period across these four bores. Chloride concentrations were above the Environmental Goal for groundwater consistently at bore D11, and intermittently at bores D10, D19 and D113 during the reporting period.

Trend graphs for bores within this area show chloride and sulfate concentrations have fluctuated over time. Consistent with TDS trends, chloride and sulfate concentrations have increased in concentrations since approximately 2010 and no longer appear to be increasing, although they typically remain above the Environmental Goals for groundwater.

6.5.2.3 Metals

Throughout the reporting period arsenic, boron, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, were identified on one or more occasions at concentrations above the Environmental Goal for groundwater from bores D10, D11, D19 and D113. These results are presented in Appendix G, and summarised in Figure 8a. Bores D10 and D11 account for the majority of exceedances.

Trend graphs for bores within this area show boron, manganese and nickel concentrations have fluctuated over time. These selected metals have been reported above the Environmental Goals for groundwater since before 2010, and concentrations remain above the Environmental Goals on a consistent basis. However, concentrations of boron, manganese and nickel appear stable at all locations, and have decreased at bores D10 and D19.

6.5.3 Groundwater Quality within Mine Disturbance Area South and Southeast of MPAR

Data obtained from groundwater bores that are considered to be situated within the Mt Piper Ash Repository and mine spoil general area are summarised below and compared to the groundwater Environmental Goals. Bores in this area include D15 to D18 and are located south to south east of the Mt Piper Ash Repository. The full set of groundwater monitoring data is presented in Appendix G, and summarised in Figure 8b. Trend graphs are provided in Appendix J.

6.5.3.1 Field Parameters

- pH values in this area were 4.92 to 7.0, remaining generally stable, however, consistently lower than the Environmental Goal range for groundwater of 6.5 to 8.0 at all locations with the exception of D18 in November 2019.
- EC values obtained from field measurements were 650 µS/cm to 3,680 µS/cm with laboratory TDS reported at 310 mg/L to 6,010 mg/L. EC and TDS values were consistently above the Environmental Goals for groundwater at bores D15 and D17, however were below the Environmental Goals for groundwater at bores D16 and D18.

Trend graphs for bores within this area show concentrations of TDS in groundwater from bores D15 and D17 have been increasing and have been above the groundwater Environmental Goal since mid-2013. Concentrations of TDS in groundwater at D16 have been increasing since late 2017, although they remain below the Environmental Goals for groundwater. Concentrations of TDS in groundwater at D18 appear stable and remain below the Environmental Goals for groundwater.

6.5.3.2 Major and Minor Ions

- Throughout the reporting period, concentrations of major and minor ions including chloride, fluoride and sulfate were reported for groundwater from bores D15 to D18. Concentrations were generally higher at bore D15 relative to the other locations in this area. Sulfate was reported above the Environmental Goal for groundwater at bores D15 and D17, chloride was reported at bore D15 above the Environmental Goal on one occasion, in August 2019. Fluoride was reported to exceed the Environmental Goal for groundwater at D18 during June 2020.

Trend graphs for bores within this area show concentrations of chloride and sulfate in groundwater are consistent with the TDS observations. Concentrations of chloride and sulfate in groundwater have been increasing at D15 and D17 since mid-2013. Sulfate concentrations at D15 have been consistently above the Environmental Goal for groundwater since monitoring began in 2012, and for D17 since mid-2014. Although concentrations of chloride and sulfate in groundwater at D16 have been increasing since late 2017, the only exceedance of the Environmental Goals for groundwater from this bore occurred for sulfate in April 2019. Concentrations of chloride and sulfate in groundwater at D18 appear stable and remain below the Environmental Goals for groundwater.

6.5.3.3 Metals

Throughout the reporting period arsenic, boron, cadmium, chromium, copper, iron, manganese, lead, mercury, molybdenum, nickel, zinc and selenium were identified on one or more occasions at concentrations above the Environmental Goal in groundwater from bores D15 to D18. Results are presented in Appendix G, and summarised in Figure 8b. Bore D15 accounts for the majority of exceedances in this area.

Trend graphs for bores within this area show that concentrations of boron, manganese and nickel in groundwater are different from the trends for TDS, chloride and sulfate.

Boron concentrations appear have remained relatively stable, fluctuating within a similar concentration range at each specific monitoring bore in this area. The exception is for intermittent spikes in boron concentrations at D15 through the historical dataset, including the anomalous and high result reported above the Environmental Goal for groundwater during August of the reporting period. Concentrations of boron at D15 have returned to the previous range and were below the Environmental Goal for groundwater during all other, and subsequent monitoring events in the monitoring period.

Concentrations of manganese appear relatively stable, although variable, at each location in this area. The highest manganese concentrations were reported for groundwater from D15 and D17 report. These were similar in magnitude and higher that concentrations in groundwater from D16 and D18. However, manganese concentrations at all location in this zone remained below the Environmental Goal for groundwater throughout the historical dataset and throughout the monitoring period.

Concentrations of nickel appear stable, although variable, since at least 2014. Concentrations in groundwater from bore D15 were higher than in groundwater from the other wells in this area and, at D15, have remained above the Environmental Goal since 2017, and typically above the Environmental Goal since monitoring began in 2012. Concentrations of manganese in groundwater from D16, D17 and D18 appear stable since at least 2014 and have remained below the Environmental Goal for groundwater throughout the historical dataset.

6.5.4 Groundwater Quality Upgradient of MPAR (background)

Data obtained from bores MPGM4/D4 and MPGM4/D5 located to the northwest and up hydraulic gradient (background) of the MPAR, are outlined below and compared to the Environmental Goals for groundwater. Bores D4 and D5 are considered to represent background groundwater conditions in the area and, based on their location up hydraulic gradient of MPAR, have not been affected by activities at MPAR. The full set of groundwater monitoring data is presented in Appendix G, and summarised in Figure 8c. Trend graphs are provided in Appendix J.

6.5.4.1 Field Parameters

- pH values for groundwater from MPGM4/D4 and MPGM4/D5 ranged from 3.38 to 6.06; the pH from bore D4 has been consistently acidic, varying from 3.38 to 3.47 during the reporting period. Throughout the reporting period the reported pH was generally stable in groundwater from these bores, and consistently lower than the Environmental Goal range for groundwater of 6.5 to 8.0.
- EC values obtained from field measurements were 770 µS/cm to 1270 µS/cm and remained generally stable throughout the reporting period. TDS values were generally consistent with the field EC. EC and TDS values did not exceed the Environmental Goals for groundwater during the reporting period.

Trend graphs for up gradient (background) bores MPGM4/D4 and MPGM4/D5 show concentrations of TDS in groundwater have been stable and below the Environmental Goal for groundwater through the historical dataset.

6.5.4.2 Major and Minor Ions

Throughout the reporting period, concentrations of major and minor ions, including chloride, fluoride, and sulfate were reported at bores MPGM4/D4 and MPGM4/D5. Concentrations were reported below the relevant Environmental Goals for groundwater at both locations throughout the reporting period.

Trend graphs for up gradient (background) bores MPGM4/D4 and MPGM4/D5 show concentrations of chloride and sulfate are consistent with TDS, and have been stable and below the Environmental Goals for groundwater throughout the historical dataset.

6.5.4.3 Metals

Throughout the reporting period arsenic, iron, lead, manganese and magnesium were identified on one or more occasions at concentrations above the Environmental Goal for groundwater at Bores MPGM4/D4 and MPGM4/D5 as presented in Appendix G, and summarised in Figure 8c. Concentrations of metals were generally higher at D4 when compared to concentrations at bore D5.

Trend graphs for up gradient (background) bores MPGM4/D4 and MPGM4/D5 show concentrations of boron, manganese and nickel are consistent with TDS, and have remained stable and below the Environmental Goal for groundwater throughout the historical dataset. The exception is for boron at MPGM4/D5 for which an anomalous and high concentration was reported in July 2013.

6.5.5 Groundwater Quality Adjacent to MPAR (north)

Groundwater data obtained from groundwater bores MPGM4/D3, D106 and D107 adjacent and to the north of the MPAR are summarised with reference to the Environmental Goals for groundwater below. The full set of groundwater monitoring data is presented in Appendix G, and summarised in Figure 8c. Trend graphs are provided in Appendix J.

6.5.5.1 Field Parameters

- pH values in this area were 5.85 to 6.14, indicating slightly acidic groundwater conditions, and were consistently lower than the Environmental Goal range for groundwater of 6.5 to 8.0 throughout the reporting period.
- EC values obtained from field measurements ranged from 350 µS/cm to 13,850 µS/cm and were generally consistent with laboratory TDS values reported between 168 mg/L and 13,500 mg/L. Field EC and TDS values were consistently above the Environmental Goals for groundwater at D106 and D107, however values in groundwater from bore MPGM4/D3 remained below the Environmental Goals throughout the reporting period.

Trend graphs show the concentrations of TDS in groundwater from bore MPGM4/D3 have been stable and below the Environmental Goal for groundwater throughout the historical dataset. This is consistent with up gradient (background) bores MPGM4/D4 and MPGM4/D5.

Trend graphs for bores D107 and D106 show concentrations of TDS in groundwater have increased and have remained above the Environmental Goal since September 2018 when these bores were first sampled.

6.5.5.2 Major and Minor Ions

Throughout the reporting period, concentrations of major and minor ions, including chloride, fluoride and sulfate, were reported for groundwater from MPGM4/D3, D106 and D107. Concentrations of these ions were generally higher in groundwater from bores D106 and D107 when compared to bore MPGM4/D3. Sulfate and chloride concentrations were consistently (since 2018) above the Environmental Goals for groundwater from bores D106 and D107, while concentrations at bore MPGM4/D3 remained below the Environmental Goals for groundwater. Fluoride concentrations were below the Environmental Goal for groundwater from all bores, however it is noted that the laboratory limit of reporting was raised to above the Environmental Goal for groundwater for the sample collected in June 2020.

Consistent with TDS, trend graphs of chloride and sulfate concentrations in groundwater from bore MPGM4/D3 have been stable and below the Environmental Goals throughout the historical dataset. This is consistent with up gradient (background) bores MPGM4/D4 and MPGM4/D5.

Also consistent with TDS, trend graphs indicate that chloride and sulfate concentrations in groundwater from bores D107 and D106 have been increasing and have remained above the Environmental Goal for groundwater since September 2018 when these bores were first sampled.

6.5.5.3 Metals

Throughout the reporting period boron, chromium, copper, iron, manganese, mercury and nickel were identified on one or more occasions at concentrations above the Environmental Goals in groundwater from bores MPGM4/D3, D106 and D107. Results are presented in Appendix G, and summarised in Figure 8c. Similar to TDS and major and minor ions, concentrations in groundwater from bore MPGM4/D3, located further upstream were generally lower than concentrations from bores D106 and D107. Bores D106 and D107 accounted for the majority of exceedances.

Trend graphs for bores MPGM4/D3, D106 and D107 show concentrations of boron, manganese and nickel are generally consistent with TDS values. Trend graphs for bore MPGM4/D3 show concentrations of these selected metals have been stable and below the Environmental Goals for groundwater through the historical dataset. This is consistent with up gradient (background) bores MPGM4/D4 and MPGM4/D5.

Trend graphs for bore D107 and D106 show concentrations of boron, manganese and nickel in groundwater have been increasing and have been above the Environmental Goals for groundwater since September 2018 when these bores were first sampled.

6.5.6 Groundwater Quality Adjacent to MPAR and Downgradient

Groundwater data obtained from groundwater bores MPGM4/D1, MPGM4/D9, D102, D105, MPGM4/D8, D104, D103, MPGM4/D2 located adjacent to and down hydraulic gradient of the MPAR are summarised with reference to the Environmental Goals for groundwater below. The full set of groundwater monitoring data is presented in Appendix G, and summarised in Figure 8d. Trend graphs are provided in Appendix J.

6.5.6.1 Field Parameters

- pH values in groundwater from these bores ranged from 5.15 to 6.4, indicating slightly acidic groundwater conditions throughout the reporting period. pH levels remained generally stable, however, were consistently lower than the Environmental Goal range for groundwater of 6.5 to 8.0 at all locations throughout the reporting period.
- EC values obtained from field measurements were 222 µS/cm to 10,000 µS/cm. The EC results were comparable to laboratory determined TDS values reported at 118 mg/L to 13,500 mg/L. Over the reporting period, EC and TDS values were consistently above the Groundwater Environmental Goals in groundwater from bores MPGM4/D1, MPGM4/D9, D102, D103 and D105, with intermittent exceedances recorded at bore MPGM4/D2. No exceedances of the EC and TDS Environmental Goals for groundwater were reported for groundwater from bores D104 and MPGM4/D8.

Trend graphs show that, in groundwater from most bores in this area, concentrations of TDS in groundwater have been increasing over time, commencing with MPGM4/D1 and MPGM4/D9 since 2011/2012. TDS concentrations at in groundwater from MPGM4/D1 have consistently been reported above Environmental Goal for groundwater since 2013. TDS concentrations in groundwater from MPGM4/D9 were above or near the Environmental Goal from 2013 to early 2018. In 2018 and 2019

TDS concentrations in groundwater from this bore increased; however, over the reporting period concentrations declined from a maximum value in February 2020 although they remain above the Environmental Goal. Trend graphs for bores D102, D103 and D105 show the concentrations of TDS in groundwater from these bores have remained above the Environmental Goal for groundwater since September 2018 when these bores were first sampled. TDS concentrations in D102 and D105 increased over this period whereas concentrations in D103 fluctuated within the historic range.

Trend graphs for groundwater from bores D104 and MPGM4/D8 show fluctuating although stable TDS concentrations over time; concentrations were below the Environmental Goal throughout the historical dataset.

6.5.6.2 Major and Minor Ions

Throughout the reporting period, concentrations of major and minor ions, including chloride, fluoride and sulfate, were reported in groundwater from bores MPGM4/D1, MPGM4/D2, MPGM4/D8, MPGM4/D9, D102, D103, D104 and D105, with concentrations of chloride and sulfate exceeding the Environmental Goals for groundwater throughout the reporting period.

Concentrations of major and minor ions were generally lower at bores MPGM4/D8 and D104 when compared to concentrations in groundwater from bores MPGM4/D1, MPGM4/D2, MPGM4/D9, D105 and D103.

Sulfate was reported at concentrations above the Environmental Goal in groundwater from bores D102, MPGM4/D9, D103, D105 and MPGM4/D2, except during January and February at bore MPGM4/D2. No exceedances of the sulfate Environmental Goal for groundwater were reported at bores D8 and D104.

Chloride was reported at concentrations that were consistently above the Environmental Goal in groundwater from bores MPGM4/D1, D102 and MPGM4/D9. Chloride concentrations in groundwater from MPGM4/D2 and D103 were above the Environmental Goal at least once over the monitoring period, and no exceedances of the chloride Environmental Goal were reported in groundwater from bores MPGM4/D8, D104 and D105.

Trend graphs for bores within this area show concentrations of chloride and sulfate in groundwater are consistent with TDS and have been increasing over time, commencing with MPGM4/D1 and MPGM4/D9 near the beginning of 2011. Sulfate has consistently been reported at above the Environmental Goals for groundwater at MPGM4/D1 and MPGM4/D9 since early 2013, while chloride has consistently been reported at above the Environmental Goals for groundwater at MPGM4/D1 since early 2015. Like TDS, the chloride concentrations in groundwater from MPGM4/D9 have increased since early 2018, with chloride concentrations above the Environmental Goal since August 2018.

Groundwater from MPGM4/D2 has reported generally increasing, although fluctuating, chloride concentrations over time, with concentrations generally below the Environmental Goal. Similar trends are apparent in sulfate concentrations in groundwater from MPGM4/D2 although sulfate concentrations increased above the Environmental Goal in 2013 and, most recently declined below the Environmental Goal since January 2020.

Trend graphs for bore D103 show the concentration of sulfate has remained stable, above the Environmental Goal since September 2018 when the bore was first sampled. Concentrations of chloride at D103 have declined since monitoring commenced, and have been below the Environmental Goal for groundwater since October 2019.

Sulfate concentrations in groundwater from D105 appear to be stable and consistently above the Environmental Goal for groundwater. Chloride concentrations in groundwater from D105 appear to be stable and consistently below the Environmental Goal for groundwater.

Trend graphs for bores D104 and MPGM4/D8 show fluctuating although stable chloride and sulfate concentrations over time, with concentrations of these analytes consistently reported below the Environmental Goals for groundwater through the historical dataset.

6.5.6.3 Metals

Throughout the reporting period boron, chromium, copper, iron, lead, manganese, mercury, and nickel were identified on one or more occasions at concentrations above the relevant Environmental Goals for groundwater at the bores located downgradient of MPAR. Results are presented in Appendix G, and summarised in Figure 8d. Concentrations of metals were generally lower in groundwater from bores MPGM4/D8 and D104, with concentrations highest in groundwater from bores MPGM4/D1, MPGM4/D9, D102, D103 and D105.

6.5.7 Groundwater Quality Adjacent to Brine Waste Holding Ponds

Groundwater from groundwater bores MPGM5/D5 and MPGM5/D6, adjacent to the Brine Waste Holding Ponds (to the west and upgradient of the MPAR) are summarised with reference to the Environmental Goals for groundwater below. These bores were constructed for the purpose of leak detection from the Brine Waste Holding Ponds. The full set of groundwater monitoring data is presented in Appendix G, and summarised in Figure 8e. Trend graphs are provided in Appendix J.

6.5.7.1 Field Parameters

- pH values in this area were 5.54 to 5.98, indicating slightly acidic groundwater conditions throughout the reporting period. pH values were consistently below the Environmental Goal range for groundwater of 6.5 – 8.0 in groundwater from both MPGM5/D5 and MPGM5/D6 throughout the reporting period.
- EC values obtained from field measurements at MPGM5/D5 were 13,120 µS/cm to 62,300 µS/cm, and this was consistent with laboratory TDS values reported at 12,300 mg/L to 81,700 mg/L. EC values obtained from field measurements at MPGM5/D6 were 1,320 µS/cm to 11,940 µS/cm, also consistent with laboratory TDS values reported at 850 mg/L to 10,500. EC and TDS values consistently exceeded the Environmental Goals for groundwater at bore MPG5/D5 while exceedances of EC and TDS at MPGM5/D6 were reported in October 2019 and November 2019 only. Concentrations in MPGM5/D6 declined from October 2019 to March 2020 to values below the Environmental Goals.

6.5.7.2 Major and Minor Ions

Throughout the reporting period, concentrations of major and minor ions, including chloride, fluoride and sulfate were reported at bores MPGM5/D5 and MPGM5/D6. Typically concentrations were higher in groundwater from bore MPGM5/D5, and concentrations in MPGM5/D6 declined from October 2019 to March 2020.

Fluoride concentrations were reported below the laboratory limit of reporting at both locations; however, the LOR was raised at MPGM5/D5 above the Environmental Goal for groundwater during September and January to March.

Sulfate concentrations were above the Environmental Goal for groundwater at MPGM5/D5 consistently during the reporting period, and at MPGM5/D6 in October and November 2019.

Chloride concentrations were above the Environmental Goal for groundwater at MPGM5/D5 consistently during the reporting period, and at MPGM5/D6 in October.

6.5.7.3 Metals

Throughout the reporting period arsenic, boron, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium and zinc were identified on one or more occasions at concentrations above the relevant Environmental Goals for groundwater at bores MPGM5/D5 and MPGM5/D6. Results are presented in Appendix G, and summarised in Figure 8e. Bore MPGM5/D5 accounts for the majority of exceedances from the leak detection bores, with concentrations generally higher from this location.

6.6 Summary

6.6.1 Background bores – Up gradient Water Quality

Acidic groundwater and concentrations of metals including arsenic, iron, lead and manganese that exceeded the Environmental Goals were identified in groundwater from background bores MPGM4/D4 and MPGM4/D5. As these bores are located in up hydraulic gradient, and away from, the MPAR the conditions reported are not considered to be related to the Project activities. The area surrounding the MPAR has been highly disturbed by historical mining activities, and the low pH in this area has been reported as resulting from oxidation of iron sulfide (Connell Wagner, 2007); the elevated metals are likely associated with this oxidation and acidification mobilising metals into groundwater. Trend graphs presented in Appendix J for key analytes in groundwater including TDS, chloride, sulfate, boron, manganese and nickel show that the concentrations of these analytes have remained relatively stable in this area over the monitoring period of Jan 2010 to June 2020, consistent with them representing background conditions.

6.6.2 Groundwater Quality within MPAR and the Mine Disturbance Area east of MPAR

Elevated EC and TDS values as well as concentrations of chloride and sulfate, and metals including arsenic, boron, cadmium, chromium, copper, lead, nickel, manganese, iron and zinc were identified at concentrations at or above the Environmental Goals in groundwater from bores within the MPAR, and in downgradient areas to the east. pH values in groundwater both within and downgradient of the MPAR were typically below the Environmental Goal for groundwater. The lower pH values are considered to be consistent with background conditions in the area and may result from historical mine disturbance and / or be related to the regional groundwater quality. On this basis, the pH of groundwater will continue to be monitored but is not discussed further.

Concentrations of arsenic, iron, lead and manganese in groundwater from the bores at and downgradient of the MPAR were a similar order of magnitude to those in groundwater from the background monitoring wells (MPGM4/D4 and MPGM4/D5). These concentrations are considered to be related to background groundwater conditions. Iron concentrations were significantly lower in groundwater from bores D19 and D113 compared to background concentrations in groundwater from bores MPGM4/D4 and MPGM4/D5.

The reported TDS, EC, sulfate, chloride, boron, cadmium, chromium, nickel and zinc concentrations in groundwater from bores in this area are considered elevated relative to upgradient locations and also to locations to the south and southeast of the MPAR. Connell Wagner (2007) reported elevated levels of sulfate, boron, nickel, zinc, manganese and iron previously in this area based on pre-placement ash data from bore B904 (operational between 1997 and 2000), which may have been influenced by goaf underground mine workings to the south of this area. However, concentrations of sulfate, chloride, boron, nickel and zinc and potentially cadmium, chromium, and lead indicate a different composition relative to the background bores and pre-placement groundwater data from historical bore B904 (from Aurecon 2017).

In consideration of the brine composition (refer to Appendix D), which also contains elevated concentrations of these constituents, groundwater in this area has been influenced by leaching of BCA higher in the MPAR into the underlying water table. The leaching of constituents from the BCA placement area to the underlying groundwater is currently subject to review and management as part of the independent assessment.

6.6.3 Groundwater Quality within Mine Disturbance Area South and Southeast of MPAR

Concentrations of analytes including sulfate, chloride and metals were typically lower in groundwater from D18 than in the surrounding bores in this area; they were also lower than when compared to background concentrations in groundwater from bores MPGM4/D4 and MPGM4/D5. Based on this information, the integrity of bore D18 may have been compromised, allowing fresh water to enter the borehole from the surface or may be directly connected through mine void or fill to surface water. Groundwater elevations in bore D18 are also more variable than in nearby bores, with more rapid responses to rainfall. Based on this information, water quality in bore D18 is not considered to represent groundwater quality in the area.

Elevated concentrations of iron were consistent in groundwater from bores within this area, and were comparable to those reported in background bores MPGM4/D4 and MPGM4/D5. These iron concentrations, which exceeded the Environmental Goal, are considered to be consistent with background groundwater conditions.

EC, TDS and sulfate concentrations were higher in groundwater from bores D15 and D17 than in the background bores MPGM4/D4 and MPGM4/D5, and exceeded the Environmental Goals for groundwater. Concentrations of nickel and zinc consistently exceeded the Environmental Goals; concentrations of chloride, arsenic, boron, cadmium, chromium, copper, lead, and mercury periodically exceeded the Environmental Goals in groundwater from bore D15 only.

The reported arsenic concentrations in groundwater from D15 are similar to those in groundwater from background bores MPGM4/D4 and MPGM4/D5 and likely are consistent with background conditions. However, TDS, EC, chloride, boron, cadmium, chromium, copper, nickel and zinc concentrations in groundwater from bore D15, and sulfate from both D15 and D17, are considered elevated relative to background groundwater conditions.

Concentrations of target analytes in bore D16 are below the Environmental Goals for groundwater; however trend graphs presented in Appendix J indicate a gradual increases in concentrations of sulfate, chloride and TDS in groundwater from bore D16 since early 2018.

Concentrations of target analytes in groundwater from bore D15 that exceed Environmental Goals are considered to be influenced by activities at the MPAR. Bore D15 appears to be located cross gradient, rather than directly down hydraulic gradient of the MPAR; however, the presence of preferential flow paths associated with former mine workings, and other water management activities are likely to be factors in the apparent distribution of the analytes in groundwater. The leaching of constituents from the BCA placement area to the underlying and adjacent groundwater is currently subject to review and management as part of the independent assessment.

6.6.4 Groundwater Quality Adjacent to MPAR (north)

Groundwater quality at bore D3, which is the furthest up hydraulic gradient of the bores adjacent to MPAR is similar to the background groundwater conditions identified at bores background bores MPGM4/D4 and MPGM4/D5. Iron concentrations were within an order of magnitude of concentrations in the background bores, and the low pH, although slightly higher than in groundwater from the background bores is also comparable.

Concentrations of EC, TDS, chloride, sulfate, boron, iron, manganese and nickel that exceeded the Environmental Goals were reported in groundwater from bores D106 and D107. The iron and manganese concentrations are considered to be related to the background water quality in the area, based on concentrations in groundwater from the background bores background bores MPGM4/D4 and MPGM4/D5, which were a similar order of magnitude.

The EC, TDS, chloride, sulfate, boron and nickel concentrations at D106 and D107 are considered to represent changes to water quality and are not primarily related to background and pre-ash placement conditions. These analytes are present at elevated concentrations in the brine and in groundwater beneath and immediately downgradient of the MPAR, and concentrations of analytes in groundwater from bores D106 and D107 are considered to relate to BCA placement activities at the MPAR. The leaching of constituents from the BCA placement area to underlying and adjacent groundwater is currently subject to review and management as part of the independent assessment.

6.6.5 Groundwater Quality Adjacent to MPAR and Downgradient

Elevated concentrations of iron and irregular reported exceedances of the Environmental Goals for copper were reported in groundwater from bores D8 and D104. These concentrations are considered likely to be related to the background water quality in the area, based on concentrations in groundwater from the background bores background bores MPGM4/D4 and MPGM4/D5, which were a similar order of magnitude.

Concentrations of TDS, EC, sulfate, chloride, boron, iron, nickel and manganese that exceeded the Environmental Goals were reported in groundwater from bores MPGM4/D1, MPGM4/D9, D102, D103, D105 and D2, located down hydraulic gradient of the MPAR. pH values were also typically below the Environmental Goal range for groundwater. The elevated iron and manganese concentrations and the acidic pH values are considered to represent background groundwater conditions in the area.

The concentrations of EC and TDS, chloride, sulfate, copper, nickel and boron that were above the Environmental Goals are considered to represent changes to water quality and are not primarily related to background and pre-ash placement conditions. These analytes are present at elevated concentrations in the brine and in groundwater beneath and immediately downgradient of the MPAR, and concentrations of analytes in groundwater from bores MPGM4/D1, MPGM4/D9, D102, D013, D105 and MPGM4/D2 are considered to relate to BCA placement activities at the MPAR. This is currently subject to review and management as part of the independent assessment.

The intermittent and irregular exceedances of the Environmental Goals for chromium, copper, lead and mercury in groundwater from bores D103, D105 and MPGM4/D2 that occurred during the reporting period are considered outliers that will continue to be monitored via the routine monitoring and reporting process.

6.6.6 Groundwater Quality Adjacent to Brine Waste Holding Ponds

Based on concentrations in groundwater from background bores background bores MPGM4/D4 and MPGM4/D5, the concentrations of arsenic, lead, iron and manganese in groundwater from MPGM5/5 and MPGM5/6 are considered to be consistent with background groundwater conditions in the area.

Concentrations of EC, TDS, chloride, sulfate, fluoride, boron, cadmium, copper, nickel, and zinc in groundwater from MPGM5/D5 and MPGM5/D6 that exceeded the Environmental Goals are considered to be related to a tear identified in the liner at Brine Waste Pond A (based on differences in monitoring carried out on 27 March 2019 and 9 May 2019) which was repaired during the reporting period and notified to the EPA. Concentrations of these analytes in groundwater from MPGM5/6 have since declined to below Environmental Goals. Groundwater elevation and quality at these locations will continue to be monitored.

7. EARLY WARNING ASSESSMENT

In addition to comparing results with the Environmental Goals for surface water and groundwater, an early warning assessment of the groundwater and surface water monitoring data is required as part of the WMP. This assessment includes assessment of concentration trends through time, including statistical analysis where appropriate.

7.1 Trend Assessment Approach

Trends in target analyte concentrations in groundwater and surface water were assessed through a combination of graphical and statistical tools, primarily Groundwater Spatiotemporal Data Analysis Tool (GWSDAT), prepared by Shell Global Solutions (2012) and freely available for use. Trend plots for groundwater (concentrations in groundwater and groundwater elevations vs time) and surface water (concentrations in surface water vs time) were generated for each individual monitoring location where an exceedance of the adopted Environmental Goal was reported during this monitoring period. A time period to include the last two reporting periods was adopted for the statistical assessment. Statistical tools were applied and included the use of the Mann-Kendall method to evaluate trends in target analyte concentrations in groundwater and surface water from each individual monitoring location. Further details of GWSDAT and the data assessment methodology are provided in Appendix K.

7.2 Groundwater Trend Graphs

Trend graphs were created for target analyte concentrations for individual monitoring locations to evaluate temporal trends of solute concentrations. The trend graphs also include adopted Environmental Goals. As discussed in Section 5.5 and Section 6.5, trend graphs for the entire data set are presented for surface water and groundwater in Appendices I and Appendix J respectively.

A descriptions of trends relative to historical concentrations over the last ten years (since 2010) and Environmental Goals is provided in Section 5 (for surface water) and Section 6 (for groundwater).

7.3 Statistical Assessment of Trends

Statistical assessment of trends was completed via GWSDAT using the Mann-Kendall procedure. Trend plots from the statistical assessment are presented in Appendix L, and include data since from the beginning of the 2018/2019 reporting period, and the statistical trend assessment. The p-value presented in these trend plots indicates the level of statistical significance that can be attributed to the trend. A p-value of less than 0.05 relates to a statistical significance of 95%, i.e. if a trend has a p-value of less than 0.05 there is a 95% level of confidence that the data presents an actual trend and not a random distribution of data. The 95% confidence level has been adopted by ERM as an indicator of statistical significance in trends, and trends with these characteristics are shown in green text in the trend plots. Those that are not statistically significant are shown in red text.

Where no p-value is provided on the graphical outputs, a sufficient number of data points were not available to evaluate the significance of trends through the Mann-Kendall test. This output has been included to show concentrations both above and below the laboratory limit of reporting and with respect to the relevant adopted background concentration (where available).

Further details on the Mann-Kendall procedure are presented in the Western Australia Department of Environment's guidance document entitled *Use of Monitored Natural Attenuation for Groundwater Remediation* (2004).

Table 9 presents a summary from the statistical assessment of trends assessed for all locations and analytes reported above the relevant Environmental Goal during the monitoring period.

Table 9 Summary of Statistical Assessment for Target Analytes

Monitoring Location	As	B	Ca	Cl	Cr	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Sulfate	Zn	TDS	EC	pH
Surface Water																		
LDP01	-		-	Down	-	NT	NT	NT	-	-	NT	-	-	-	-	-	-	-
LMP01	-		-	Up	-	Up	NT	NT	-	-	Up	-	-	-	-	-	-	NT
NC01	-		-	Up	-	Up	NT	-	-	-	-	-	-	-	-	-	-	-
Point C	-		-	NT	-	NT	Up	-	-	-	-	-	-	-	-	-	-	-
Point E	-	Up	-	NT	-	NT	NT	-	NT	-	-	NT	-	NT	-	NT	NT	-
WX22	-	Up	-	Up	-	NT	NT	-	NT	-	-	Up	-	Up	NT	Up	Up	NT
Point G	-		-	NT	-	-	NT	-	-	-	-	NT	-	-		NT	NT	-
Groundwater within and downgradient of Mt Piper Ash Repository																		
B5	-	-	-	NT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D23	-	-	-	Up	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D10	-	NT	NT	Down	-	-	NT	NT	Down	-	-	NT	-	NT	Down	NT	NT	NT
D11	-	NT	-	Up	-	-	NT	-	NT	-	-	NT	-	NT	-	NT	NT	Up
D19	NT	Down	-	Down	NT	NT	Down	NT	Down	NT	-	NT	NT	Down	NT	Down	Down	Up
D113	-	NT	-	Down	NT	NT	NT	-	NT	-	-	NT	-	NT	-	NT	NT	NT
Groundwater adjacent to Mt Piper Ash Repository – Southeast																		
D15	Up	NT	NT	Down	NT	Up	NT	NT	-	NT	-	NT	NT	Down	NT	NT	Down	Up
D16	-	-	-	Up	-	-	NT	-	-	-	-		-	Up	-	Up	-	NT
D17	-	-	-	NT	NT	-	NT	-	-	-	-		-	NT	-	NT	NT	NT
D18	-	-	-	NT	-	-	NT	-	-	-	-		-	-	-	-	-	-

Monitoring Location	As	B	Ca	Cl	Cr	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Sulfate	Zn	TDS	EC	pH
Groundwater adjacent to Mt Piper Ash Repository – North and Northeast																		
MPGM4/D4	Down	-	-	NT	-	-	NT	Down	-	-	--		-	-	-	-	-	Up
MPGM4/D5	-	-	-	Up	-	-	NT	-	NT	-	-		-	-	-	-	-	NT
MPGM4/D3	-	-	-	NT	-	-	NT	-	-	NT	--		-	-	-	-	-	NT
D107	-	Up	-	Down	-	-	NT	NT	NT	-	-	NT	-	NT	-	NT	NT	NT
D106	-	NT	-	Down	NT	NT	NT	NT	Down	NT	-	NT	-	NT	-	NT	NT	NT
MPGM4/D1	-	Up	-	Up	-	-	NT	-	Up	-	-	Up	-	Up	-	Up	Up	Down
MPGM4/D9	-	Up	-	Up	-	NT	NT	-	Up	NT	-	Up	-	Up	NT	Up	Up	NT
D102	-	NT	-	NT	NT	-	NT	-	NT	-	-	NT	-	NT	-	NT	NT	NT
Groundwater downgradient of Mt Piper Ash Repository																		
D105	-	NT	-	NT	-	-	NT	-	NT		-	NT	-	NT	-	NT	NT	NT
MPGM4/D8	-	-	-	NT	-	NT	NT	-	-		-		-	-	-	-	-	NT
D103	-	Up	-	NT	NT	-	NT	-	NT		-	NT	-	NT	-	NT	NT	NT
D104	-	-	-	NT	-	NT	NT	-	-		-	-	-	-	-	-	-	NT
MPGM4/D2	-	NT	-	Down	-	Up	NT	Up	NT	NT	-	-	-	-	-	Up	Down	NT
Leak Detection Bores - MPPS																		
MPGM5/D5	NT	NT	NT	Down	-	NT	NT	Up	NT	Up	-	NT	NT	Down	Down	NT	NT	NT
MPGM5/D6	-	NT	NT	NT	-	NT	NT	NT	NT	NT	-	NT	-	NT	-	NT	NT	NT

NT = No statistically significant trend apparent (red text in GWSDAT outputs; Appendix L)

Up = Statistically significant increasing trend (green text in GWSDAT outputs; Appendix L)

Down = Statistically significant decreasing trend (green text in GWSDAT outputs; Appendix L)

- = GWSDAT trend analysis not conducted

7.4 Trend Assessment Summary

A statistically significant increasing trend in copper and molybdenum was reported in surface water from LMP01, and for copper in surface water at NC01. However, these trends may be related to the brine leak event which was reported to EPA, and which was considered unlikely to have resulted in any material environmental harm to Wangcol Creek within the meaning of the POEO Act. Concentrations and trends at LMP01 and NC01 will continue to be monitored and will inform future AEMRs.

Statistically significant increasing trends were reported for boron, chloride, manganese, nickel, sulfate, TDS and EC concentrations in groundwater from bores MPGM4/D9 and MPGM4/D1. As discussed in previous sections these elevated levels are considered to be due to the leaching of these analytes from the BCA placed in the MPAR and subsequent transport of solutes with the regional groundwater. These processes and future management strategies are being further assessed as part of the independent assessment in accordance with contingency measures outlined in the WMP.

Statistically significant increasing trends for boron, nickel, chloride sulfate, EC and TDS were identified in surface water from WX22. The increasing concentration trends in surface water at this location are considered to be related to the migrating solutes in groundwater interaction with surface water in this section of Wangcol Creek.

While a number of statistically significant increasing trends have been reported, as shown in Table 9, concentrations of boron, iron, manganese, chloride, sulfate, TDS and EC in groundwater at D10 and D19 have reported statistically significant decreasing trends. This may indicate that, immediately downgradient of the ash repository, seepage from this part of the MPAR has declined, resulting in declining concentrations in groundwater from these specific bores.

The statistically significant increasing concentrations of boron at D103 will continue to be monitored, along with groundwater conditions at D104, D105 and MPGM4/D8.

Concentrations of chloride, sulfate and TDS in groundwater from D16 were statistically significantly increasing. The presence of preferential flow paths as a result of historical mining disturbance, and other water management activities in the surrounding area are considered to be potential factors contributing to the concentrations trends in groundwater at D16.

7.5 Implementation of Contingency and Mitigation Measures

Where increasing trends have been identified, these have been recognised as triggers for action in accordance with the TARPs. In the case of surface water and groundwater in the vicinity and down hydraulic gradient of the MPAR, the independent assessment is currently being implemented in line with the contingency measures contained in the WMP to assess the extent to which the MPAR may be contributing to previously reported exceedances, and to identify further contingency measures if necessary. The independent assessment includes a separate and broader investigation of surface water and groundwater conditions in the vicinity of the Ash Repositories. Potential short- and long-term management measures are currently being identified and assessed as part of the independent assessment, including the Mt Piper Groundwater Interception Project (refer to Section 7.5.1).

In the case of the increasing trends identified in groundwater from the leak detection bore MPGM5/D5, the increasing concentrations triggered the implementation of contingency measures. These included an investigation of the source of the increased concentrations, during which the ponds were drained and a tear in the primary and secondary liners of the Brine Waste Pond A was identified and subsequently repaired. Further leak testing of the primary and secondary liners was carried out in December 2019 before brine was replaced in Brine Waste Pond A. The EPA was notified of this leak.

The statistically significant increasing trends in groundwater at bore D16 are potentially an early warning that operations at the neighbouring facility, unrelated to MPPS, may be influencing the quality of groundwater in the southern extent of the monitoring area.

7.5.1 Mt Piper Groundwater Interception Project

The Mt Piper Groundwater Interception Project is proposed as a response to the results of the routine monitoring which have indicated that brine conditioned ash (BCA) placement activities are influencing groundwater conditions in the vicinity of the MPAR. The objective of the Mt Piper Groundwater Interception Project is to mitigate groundwater impacts and to improve the water quality in Wangcol Creek, adjacent to the MPAR.

The Mt Piper Groundwater Interception Project proposes to extract water from former mine working within the base of Wangcol Creek and groundwater from the vicinity of Wangcol Creek. The extracted groundwater would then be transferred back to the Ash Repositories for storage prior to being treated in the existing water management infrastructure at the MPPS. In accordance with the WMP, the Mt Piper Groundwater Interception Project has been, and continues to be, subject to discussion with regulatory stakeholders.

EnergyAustralia presented an overview of the Mt Piper Groundwater Interception Project to regulatory stakeholders on 29 April 2020 and 31 July 2020 and further engagement by EnergyAustralia with regulatory stakeholders and the Community Consultation Committee (CCC) is planned.

A Review of Environmental Factors (REF) is currently being developed in support of the approvals required to implement the Mt Piper Groundwater Interception Project. It is currently anticipated that the REF will be on public exhibition prior to the end of 2020 and, pending relevant approvals, the construction of the Mt Piper Groundwater Interception Project will take place during the first half of 2021.

8. CONCLUSIONS

Based on the review of the surface water and groundwater quality data for the Project obtained in accordance with the WMP for the reporting period, it is considered that the objectives of the AEMR have been met and the following conclusions are drawn:

- Concentrations of target analytes in groundwater have been reported above the Environmental Goal for groundwater at monitoring locations within and downgradient of the MPAR. Elevated levels of key analytes including chloride, sulfate, boron and nickel, are considered to be due to the leaching of these analytes from the BCA placed MPAR and subsequent transport of solutes with the regional groundwater. The impacted groundwater is migrating from the vicinity of the MPAR toward the alignment of Wangcol Creek, as indicated by the groundwater quality results reported at D107, D106, MPGM4/D1, MPGM4/D9, D102 and to a lesser extent at D105, D104, D103 and MPGM4/D2.
- Potential interaction of this impacted groundwater with the surface water of Wangcol Creek is indicated by the monitoring results reported at SW_E, WX22 and SW_G, locations that are to the northeast of the MPAR. Concentrations of nickel, chloride, sulfate, EC and TDS at WX22 had statistically significant increasing trends. The interaction between groundwater and surface water at these location is considered to be facilitated by the historical mining operations within the Wangcol Creek alignment. Former open cut pits are present near these monitoring locations and are likely to provide a preferential pathway for groundwater migration to the surface water environment in these areas.
- Although concentrations in groundwater currently remain below the Environmental Goals, D16 has reported increasing concentrations of chloride, sulfate and TDS. The presence of preferential flow paths as a result of historical mining disturbance, and other water management activities in the area may be factors in the trends identified in groundwater from bore D16.
- While a number of increasing trends have been reported, concentrations of boron, iron, manganese, chloride, sulfate, TDS and EC in groundwater at D10 and D19 have reported statistically significant decreasing trends. This may indicate that, immediately downgradient of the ash repository, seepage from this part of the MPAR has declined, resulting in declining concentrations in groundwater from these specific bores.

Results of the groundwater and surface water monitoring program indicate that groundwater quality in the vicinity of the MPAR and the brine waste ponds is influenced by the Project activities. In portions of Wangcol Creek, surface water quality has also been affected, primarily through the flow of groundwater into the creek. This is currently subject to review and management as part of the independent groundwater assessment.

Where increasing trends have been identified, these have been recognised as triggers for action in accordance with the TARPs. In the case of surface water and groundwater in the vicinity and down hydraulic gradient of MPAR, the independent assessment, including assessment of potential mitigation measures continues. The Mt Piper Groundwater Interception Project is currently being progressed as a mitigation measure. The outcomes of the independent assessment will inform future AEMRs for the Project and will be reflected in revisions to the WMP, while groundwater elevation and quality will continue to be monitored.

The statistically significant increasing trends in groundwater at bore D16 indicate that activities up gradient may be influencing the quality of groundwater in the southern extent of the monitoring area.

Due to bore construction appearing to have been compromised or bores repeatedly being dry, it is recommended that monitoring of bores D18, SW3D and D23 be removed from the monitoring program during future revision to the WMP.

9. REFERENCES

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CDM Smith, 2012. Lamberts North Ash Placement Project: Groundwater Modelling Report, prepared for Delta Electricity, 22 November 2012

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ERM 2020b, P0533074 - Brine in Ash Annual Environment Management & Lamberts North Annual Water Quality Assessment - Mt Piper Power Station, prepared for EnergyAustralia NSW Pty Ltd, 20 March 2020

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10. STATEMENT OF LIMITATIONS

This report is based solely on the scope of work described in our proposal P0533074 dated 20/3/20 and confirmed via email on 24/4/20 (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).

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.

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.

This report was prepared between 7 July 2020 and 29 September 2020 and is based on conditions encountered and information reviewed at the time of preparation. The 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.

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 standards of 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.

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:

- did not, nor was able to, make further enquiries to assess the reliability of the information or independently verify information provided by;
- assumes no responsibility or liability for errors in data obtained from,
- the Client, any third parties or external sources (including regulatory agencies).

Although the data that 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.

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:

- the suitability of the site(s) for any purpose or the permissibility of any use;
- the presence, absence or otherwise of any environmental conditions or contaminants at the site(s) or elsewhere; or
- the presence, absence or otherwise of asbestos, asbestos containing materials or any hazardous materials on the site(s).

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 environment works.

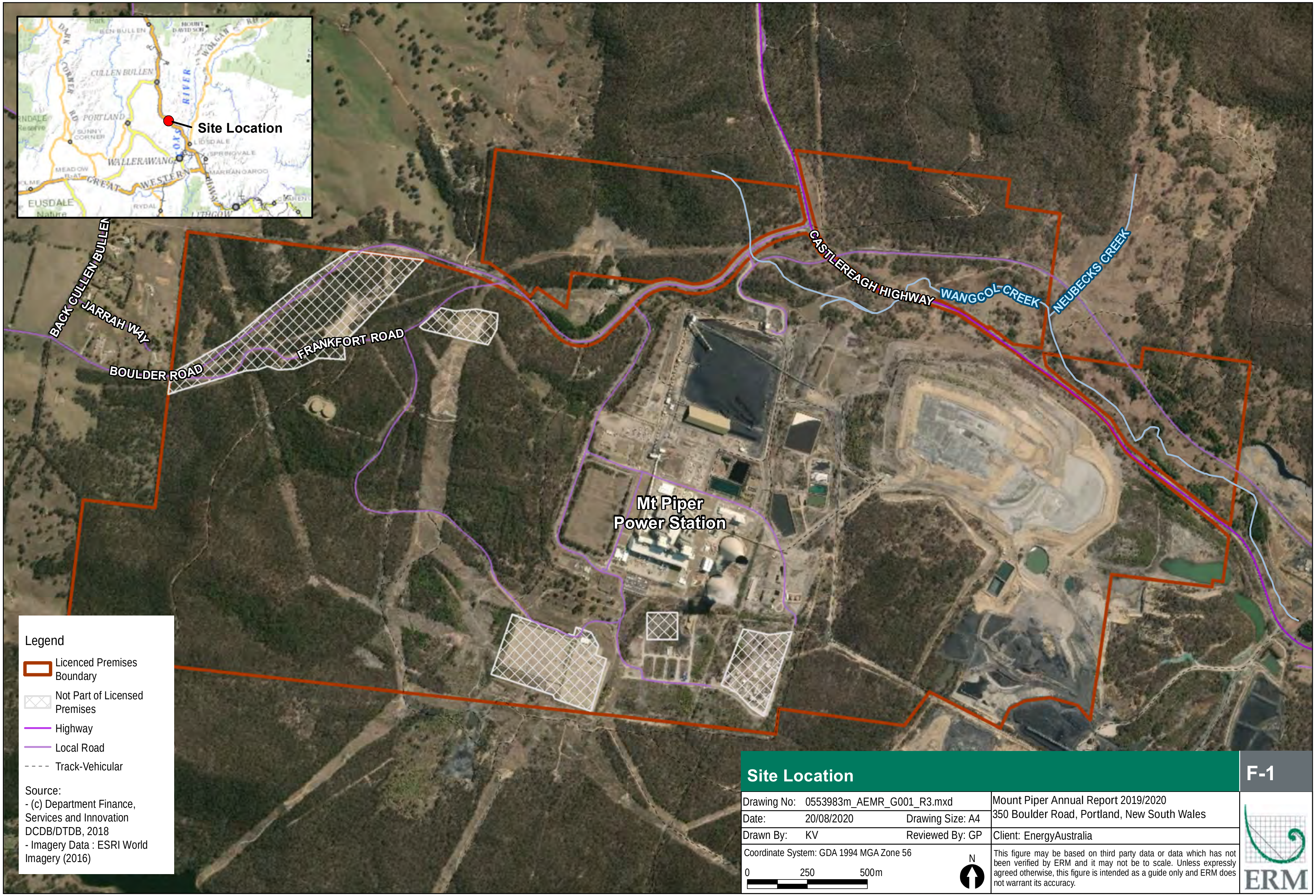
The ongoing use of the site or use of the site for a different purpose may require the management of or remediation of site conditions, such as contamination and other conditions, including but not limited to conditions referred to in this report.

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.

Except to the extent that ERM has agreed otherwise with the Client in the Scope of Work or the Contract, this report:

- has been prepared and is intended only for the exclusive use of the Client;
- must not to be relied upon or used by any other party;
- has not been prepared nor is intended for the purpose of advertising, sales, promoting or endorsing any Client interests including raising investment capital, recommending investment decisions, or other publicity purposes;
- 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
- does not purport to provide, nor should be construed as, legal advice.

FIGURES


Site Location
BACK CULLEN BULLEN
JARRAH WAY
BOULDER ROAD
FRANKFORT ROAD
CASTLEREAGH HIGHWAY
WANGCOL CREEK
NEUBECKS CREEK
Mt Piper
Power Station
Legend
Licenced Premises Boundary
Not Part of Licensed Premises
Highway
Local Road
Track-Vehicular
Source:
- (c) Department Finance, Services and Innovation DCDB/DTDB, 2018
- Imagery Data : ESRI World Imagery (2016)
Site Location
F-1
Drawing No: 0553983m_AEMR_G001_R3.mxd
Date: 20/08/2020
Drawing Size: A4
Drawn By: KV
Reviewed By: GP
Coordinate System: GDA 1994 MGA Zone 56
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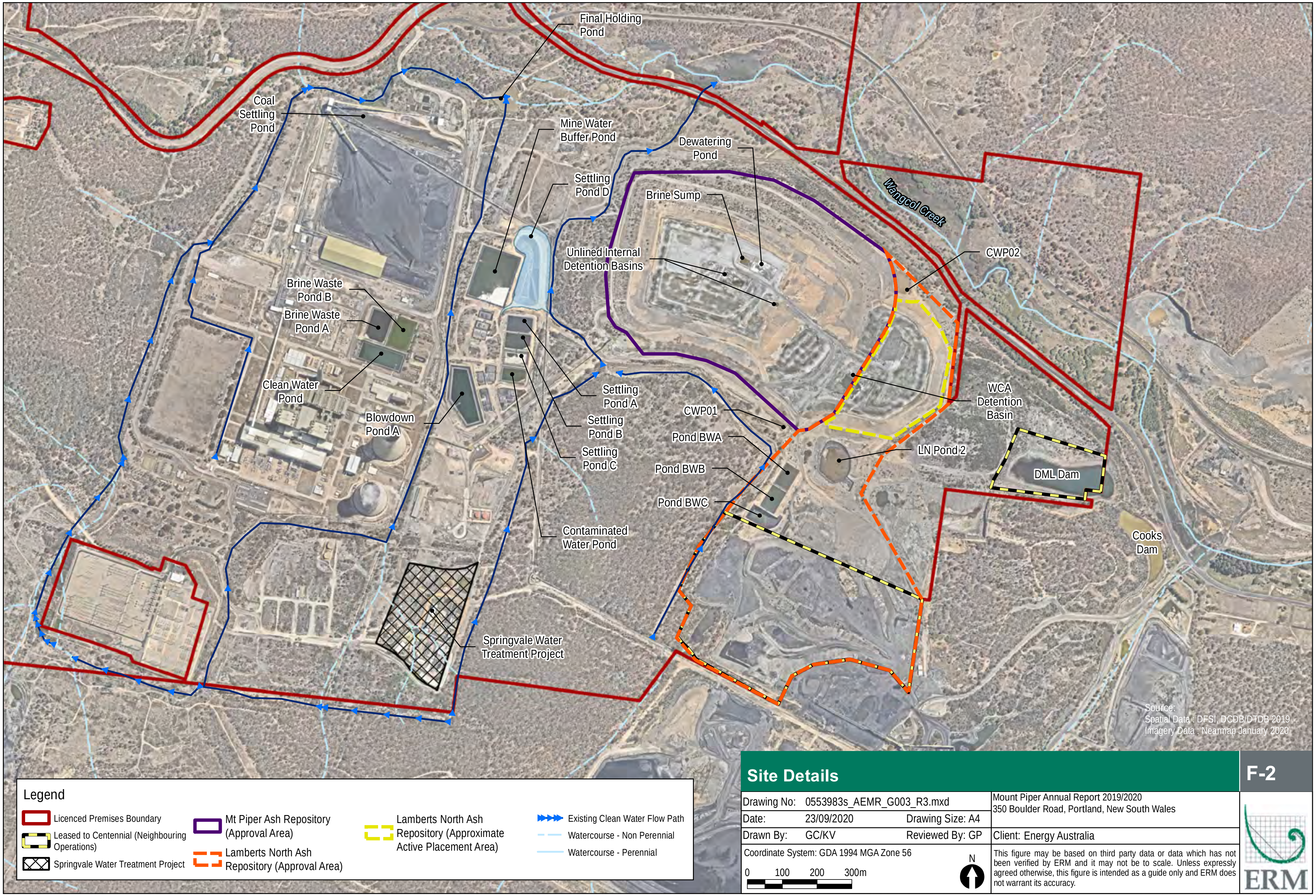
Mount Piper Annual Report 2019/2020
350 Boulder Road, Portland, New South Wales
Client: EnergyAustralia
This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.
ERM



Legend

- Licenced Premises Boundary
- Leased to Centennial (Neighbouring Operations)
- Springvale Water Treatment Project
- Mt Piper Ash Repository (Approval Area)
- Lamberts North Ash Repository (Approval Area)
- Lamberts North Ash Repository (Approximate Active Placement Area)
- Existing Clean Water Flow Path
- Watercourse - Non Perennial
- Watercourse - Perennial

Site Details

F-2

Drawing No:	0553983s_AEMR_G003_R3.mxd		
Date:	23/09/2020	Drawing Size:	A4
Drawn By:	GC/KV	Reviewed By:	GP

Mount Piper Annual Report 2019/2020
350 Boulder Road, Portland, New South Wales

Client: Energy Australia

Coordinate System: GDA 1994 MGA Zone 56

0 100 200 300m

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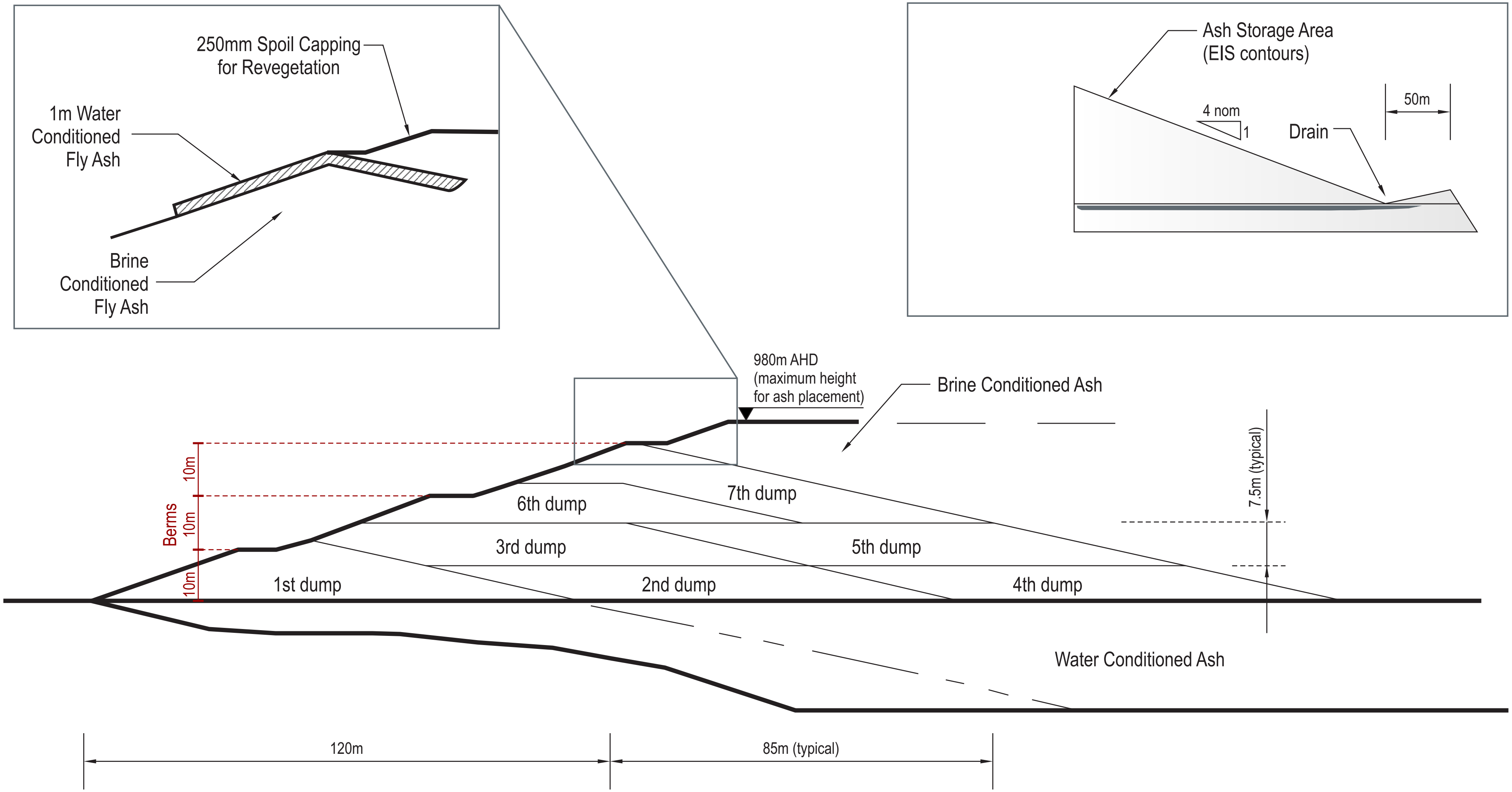
ERM



Notes:

Details shown are diagrammatical only.

Source:

Connell and Wagner, 2008. Mt Piper Power Station Brine Conditioned Flyash Co-placement Extension Water Management and Monitoring Plan. Prepared for Delta Electricity, September 2008.

Schematic of External Batter Placement

F - 3

Drawing No: 0553983m_AEMR_C001_R0.cdr

Date: 14/08/2020 Drawing size: A4

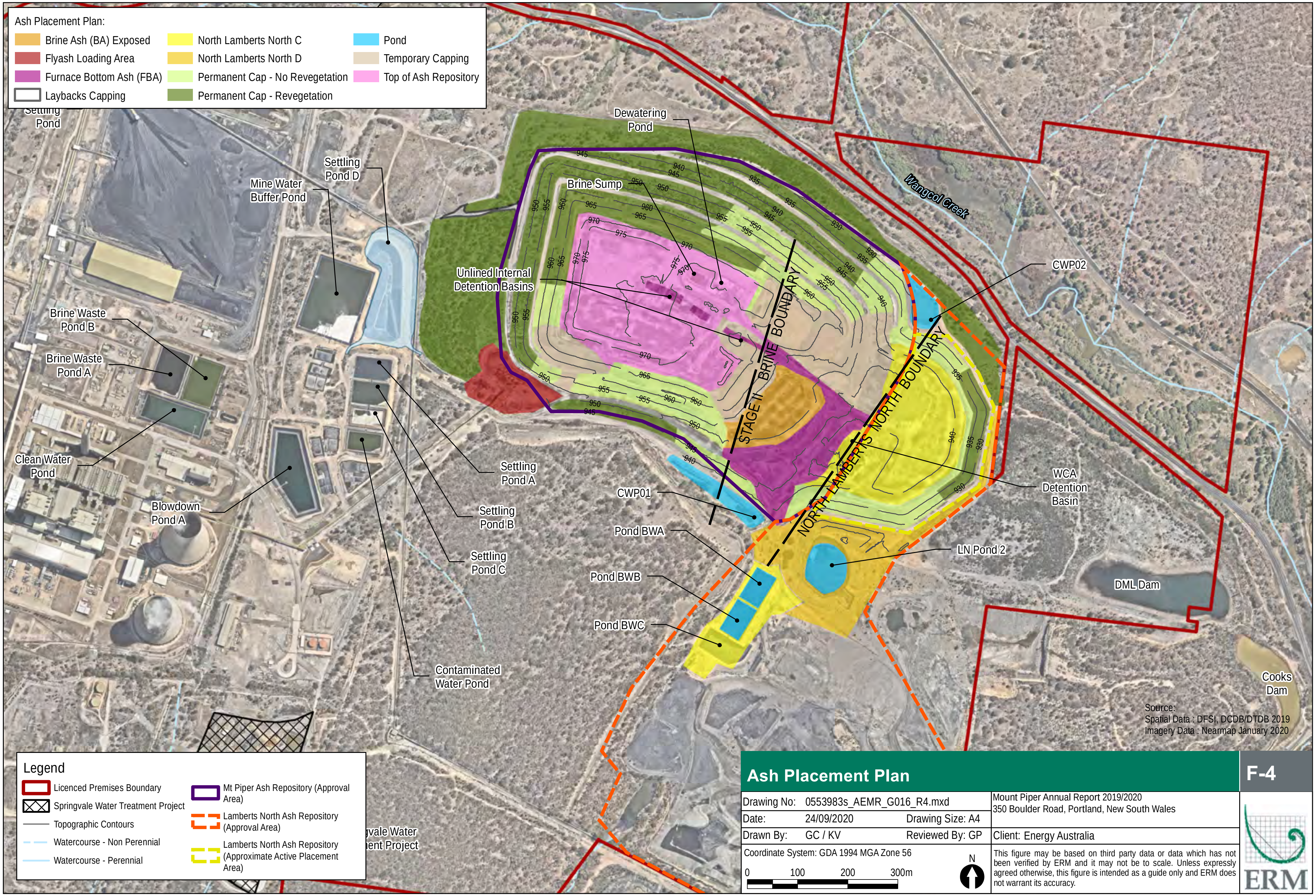
Drawn by: GC/KV Reviewed by: GP

Drawing Not to Scale

Mount Piper Annual Report 2019/2020
350 Boulder Road, Portland, New South Wales

Client: Energy Australia

ERM



Ash Placement Plan:
Brine Ash (BA) Exposed
Flyash Loading Area
Furnace Bottom Ash (FBA)
Laybacks Capping
North Lamberts North C
North Lamberts North D
Permanent Cap - No Revegetation
Permanent Cap - Revegetation
Pond
Temporary Capping
Top of Ash Repository
Settling Pond
Settling Pond D
Mine Water Buffer Pond
Dewatering Pond
Brine Sump
Wangcol Creek
Unlined Internal Detention Basins
Brine Waste Pond B
Brine Waste Pond A
Clean Water Pond
Blowdown Pond A
Settling Pond A
Settling Pond B
Settling Pond C
Contaminated Water Pond
CWP01
CWP02
STAGE II BRINE BOUNDARY
NORTH LAMBERTS NORTH BOUNDARY
WCA Detention Basin
Pond BWA
Pond BWB
Pond BWC
LN Pond 2
DML Dam
Cooks Dam
Source:
Spatial Data : DFSI, DCDB/DTDB 2019
Imagery Data : Nearmap January 2020
Legend
Licenced Premises Boundary
Springvale Water Treatment Project
Topographic Contours
Watercourse - Non Perennial
Watercourse - Perennial
Mt Piper Ash Repository (Approval Area)
Lamberts North Ash Repository (Approval Area)
Lamberts North Ash Repository (Approximate Active Placement Area)
Ash Placement Plan
F-4
Drawing No: 0553983s_AEMR_G016_R4.mxd
Date: 24/09/2020
Drawing Size: A4
Drawn By: GC / KV
Reviewed By: GP
Mount Piper Annual Report 2019/2020
350 Boulder Road, Portland, New South Wales
Client: Energy Australia
Coordinate System: GDA 1994 MGA Zone 56
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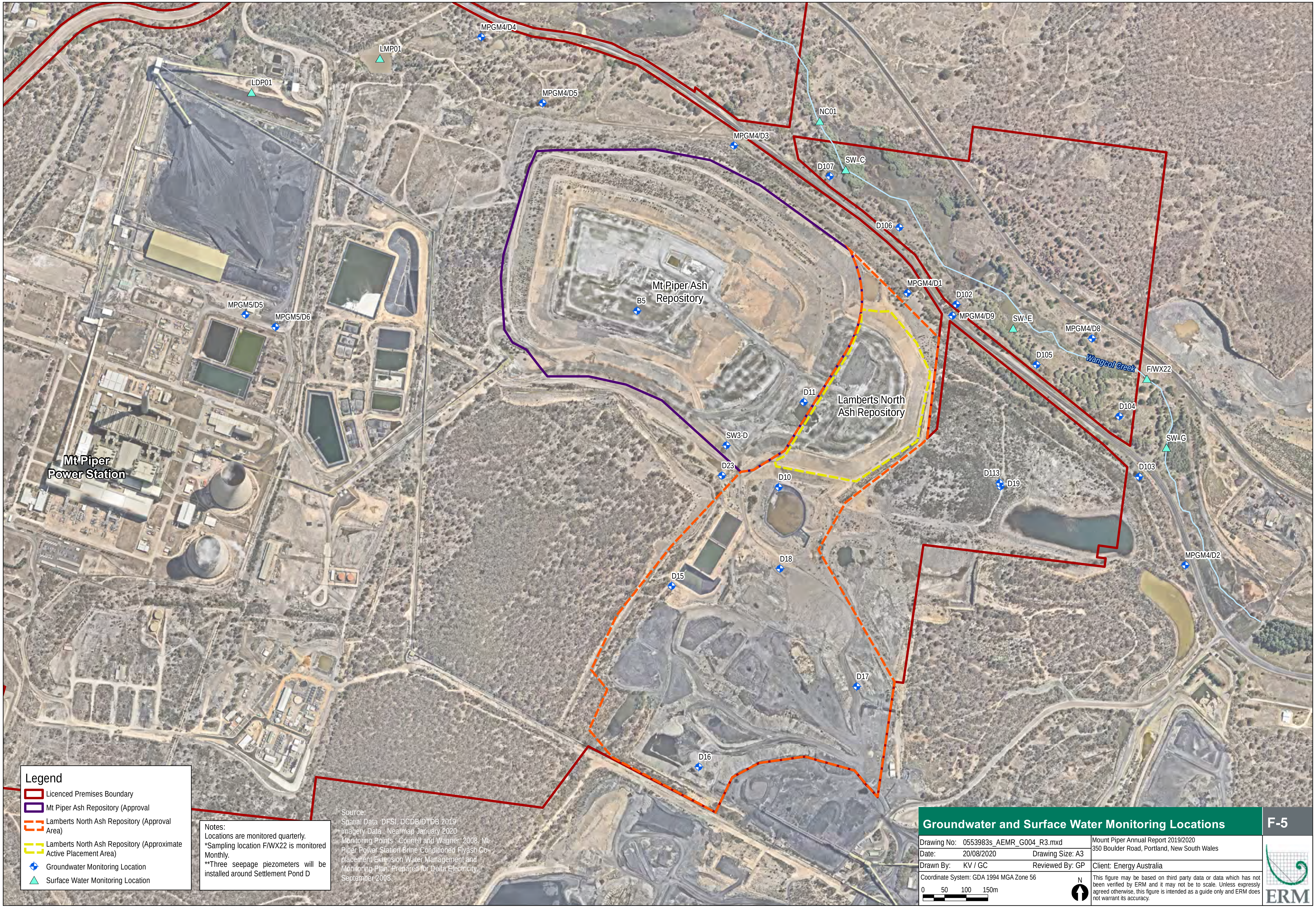

Groundwater and Surface Water Monitoring Locations F-5

Drawing No: 0553983s_AEMR_G004_R3.mxd
Date: 20/08/2020 Drawing Size: A3
Drawn By: KV / GC Reviewed By: GP

Mount Piper Annual Report 2019/2020
350 Boulder Road, Portland, New South Wales

Client: Energy Australia

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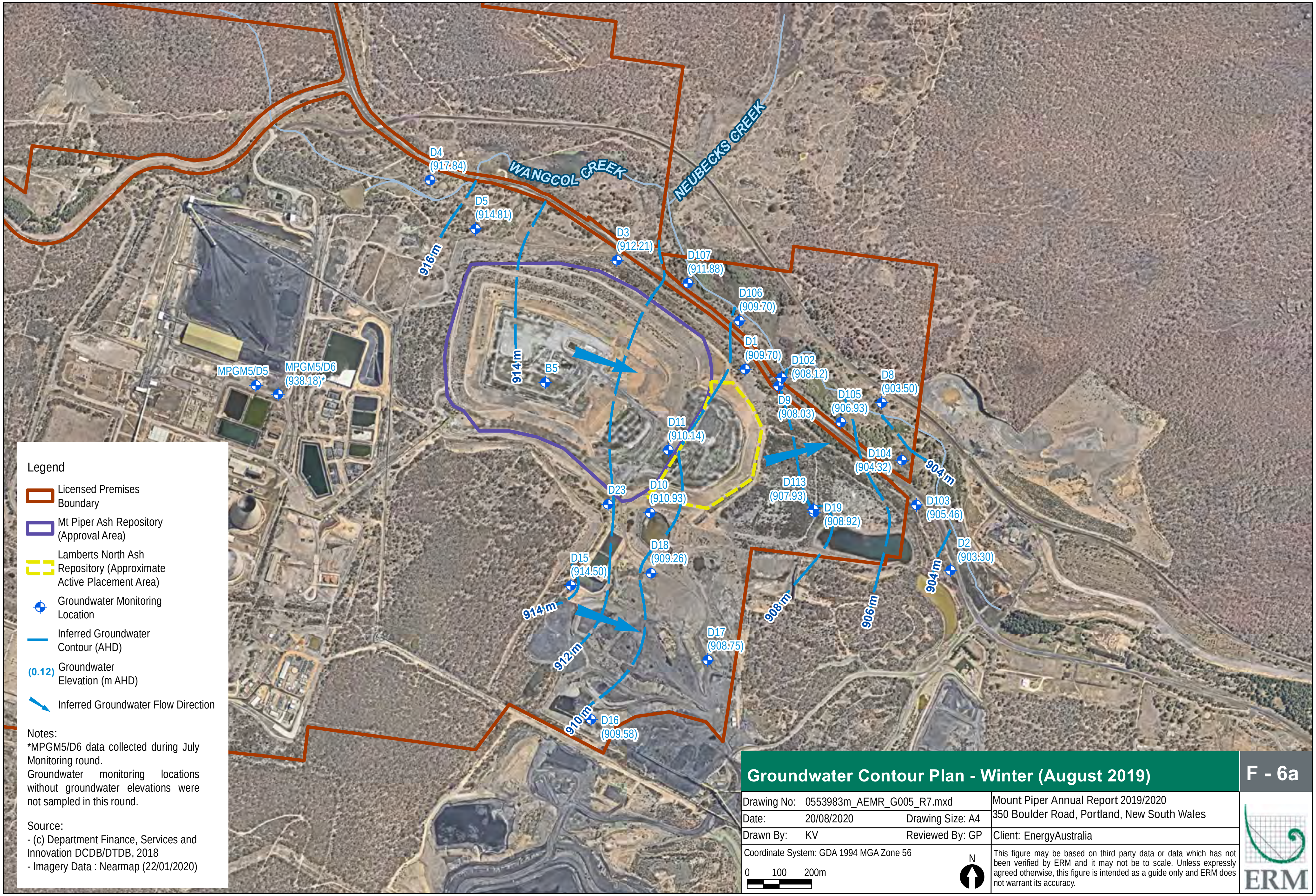

Legend

- Licensed Premises Boundary
- Mt Piper Ash Repository (Approval Area)
- Lamberts North Ash Repository (Approximate Active Placement Area)
- Groundwater Monitoring Location
- Inferred Groundwater Contour (AHD)
- (0.12) Groundwater Elevation (m AHD)
- Inferred Groundwater Flow Direction

Notes:
*MPGM5/D6 data collected during July Monitoring round.
Groundwater monitoring locations without groundwater elevations were not sampled in this round.

Source:
- (c) Department Finance, Services and Innovation DCDB/DTDB, 2018
- Imagery Data : Nearmap (22/01/2020)

Groundwater Contour Plan - Winter (August 2019)

F - 6a

Drawing No:	0553983m_AEMR_G005_R7.mxd		Mount Piper Annual Report 2019/2020 350 Boulder Road, Portland, New South Wales
Date:	20/08/2020	Drawing Size: A4	
Drawn By:	KV	Reviewed By: GP	Client: EnergyAustralia

Coordinate System: GDA 1994 MGA Zone 56

0 100 200m

N

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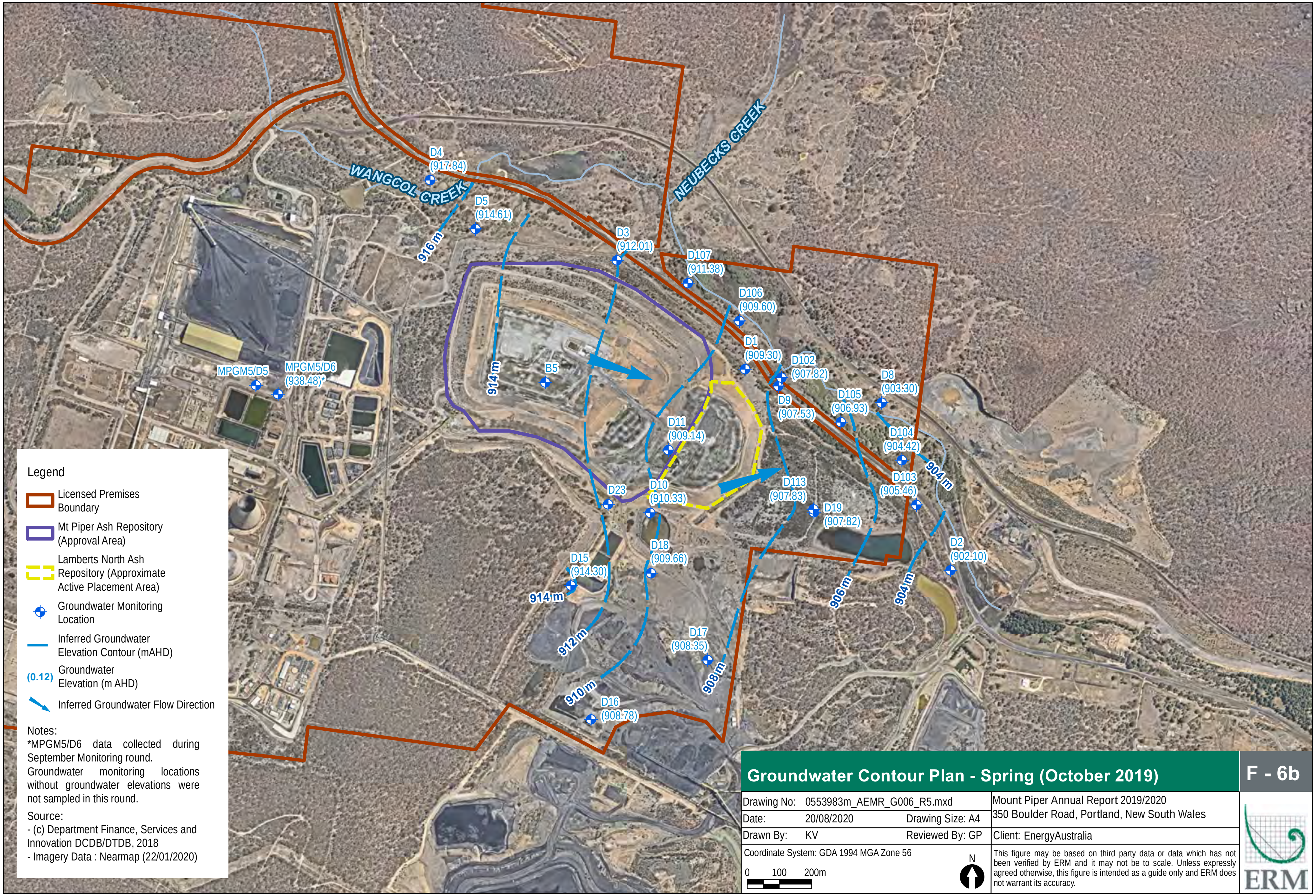
ERM



Legend

- Licensed Premises Boundary
- Mt Piper Ash Repository (Approval Area)
- Lamberts North Ash Repository (Approximate Active Placement Area)
- Groundwater Monitoring Location
- Inferred Groundwater Elevation Contour (mAHD)
- (0.12) Groundwater Elevation (m AHD)
- Inferred Groundwater Flow Direction

Notes:
*MPGM5/D6 data collected during September Monitoring round.
Groundwater monitoring locations without groundwater elevations were not sampled in this round.

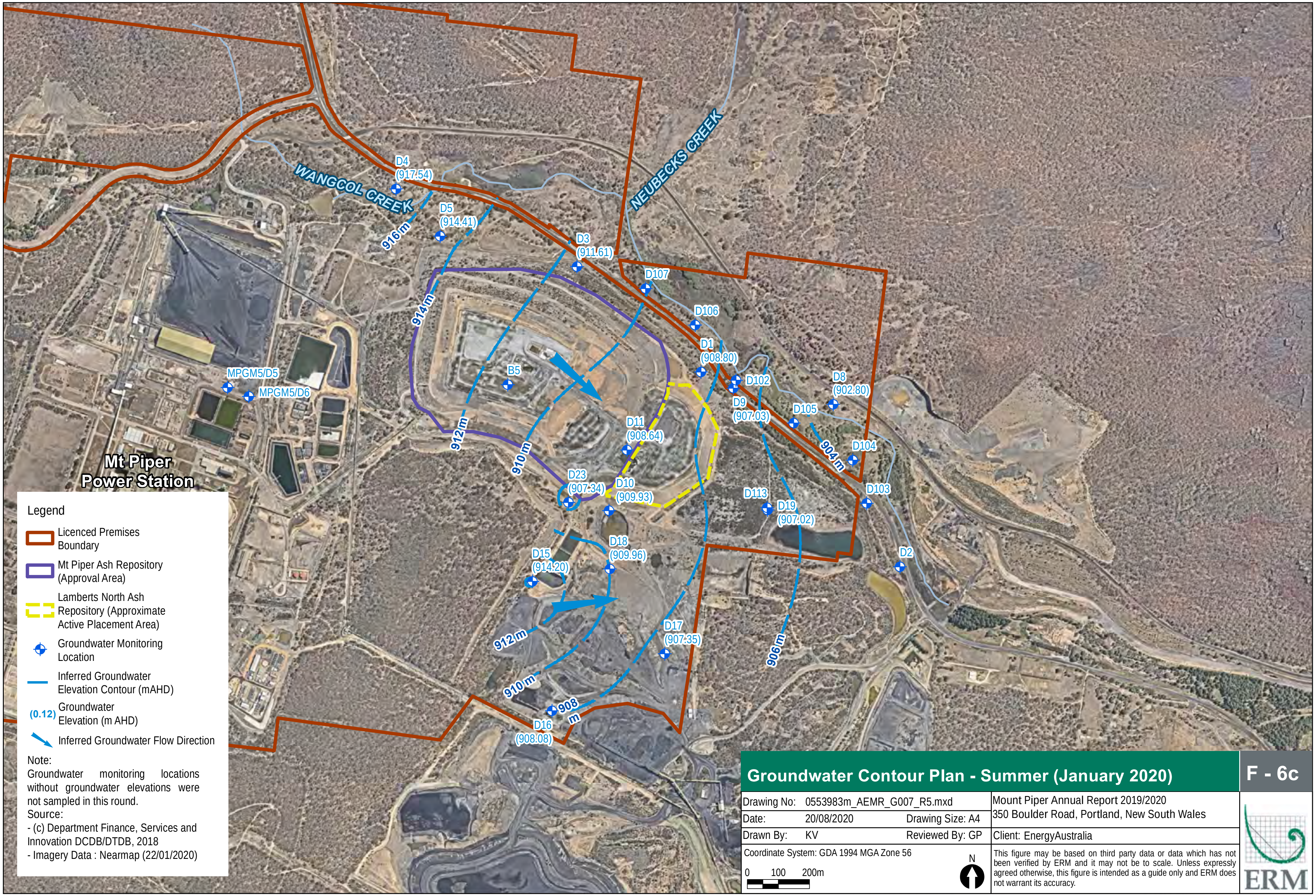
Source:
- (c) Department Finance, Services and Innovation DCDB/DTDB, 2018
- Imagery Data : Nearmap (22/01/2020)

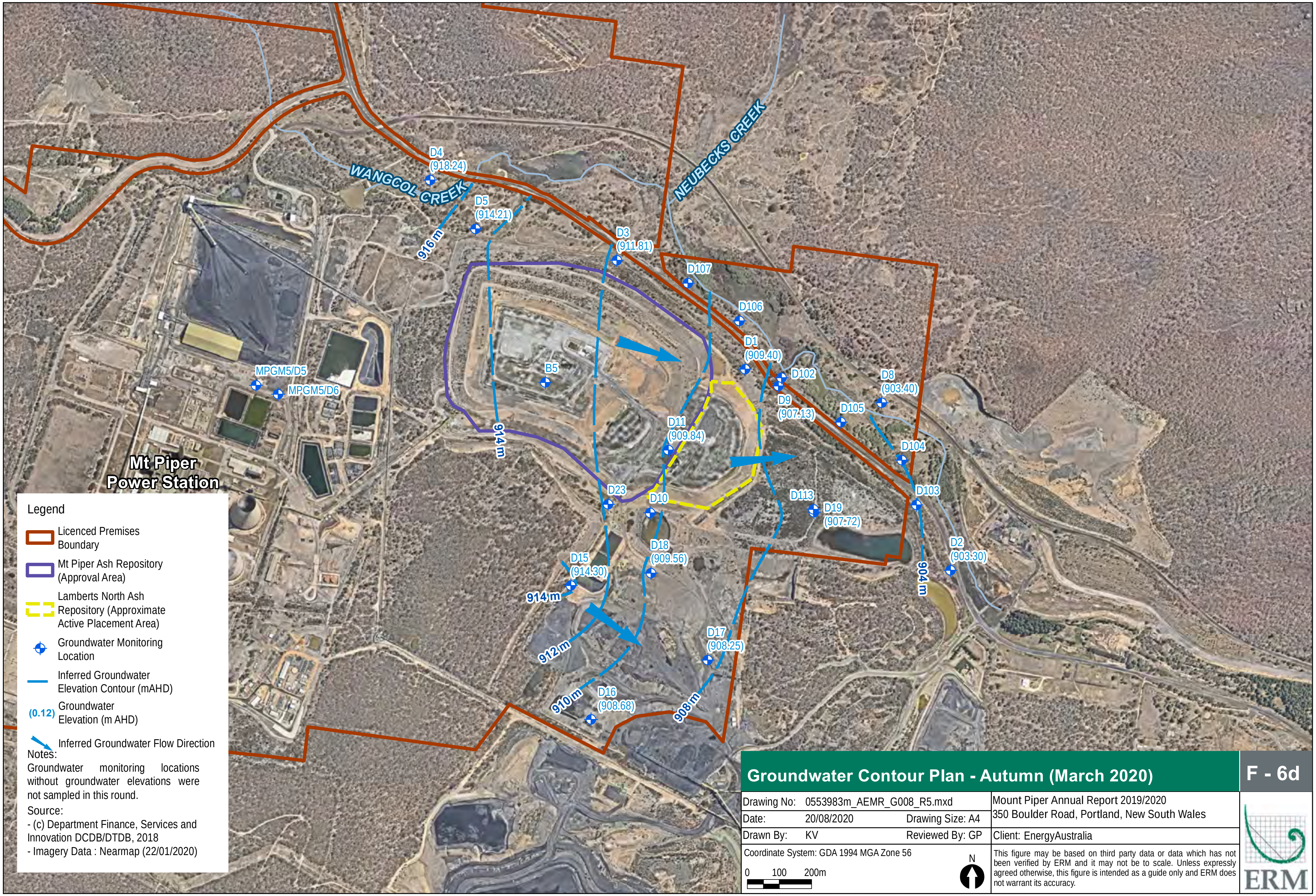
Groundwater Contour Plan - Spring (October 2019)

F - 6b

Drawing No: 0553983m_AEMR_G006_R5.mxd	Mount Piper Annual Report 2019/2020
Date: 20/08/2020 Drawing Size: A4	350 Boulder Road, Portland, New South Wales
Drawn By: KV Reviewed By: GP	Client: EnergyAustralia
Coordinate System: GDA 1994 MGA Zone 56 0 100 200m N	This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

ERM

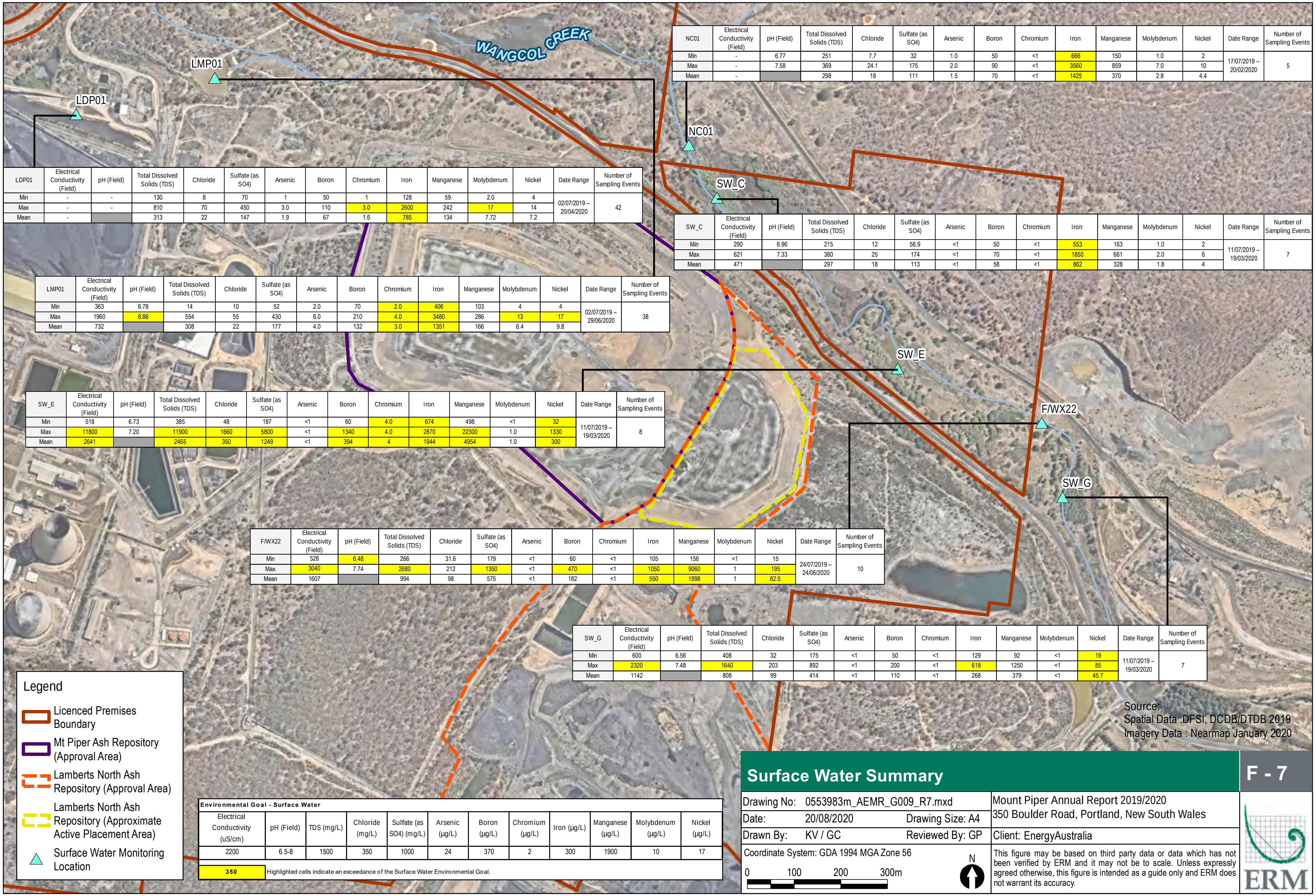

WANGCOL CREEK
NEUBECKS CREEK
Mt Piper Power Station
D4 (917.54)
D5 (914.41)
D3 (911.61)
D107
D106
D1 (908.80)
D102
D9 (907.03)
D8 (902.80)
D105
D104
D103
D2
B5
MPGM5/D5
MPGM5/D6
D11 (908.64)
D23 (907.34)
D10 (909.93)
D113
D19 (907.02)
D18 (909.96)
D15 (914.20)
D17 (907.35)
D16 (908.08)
916 m
914 m
912 m
910 m
908 m
906 m
904 m
Legend
Licenced Premises Boundary
Mt Piper Ash Repository (Approval Area)
Lamberts North Ash Repository (Approximate Active Placement Area)
Groundwater Monitoring Location
Inferred Groundwater Elevation Contour (mAHD)
(0.12) Groundwater Elevation (m AHD)
Inferred Groundwater Flow Direction
Note:
Groundwater monitoring locations without groundwater elevations were not sampled in this round.
Source:
- (c) Department Finance, Services and Innovation DCDB/DTDB, 2018
- Imagery Data : Nearmap (22/01/2020)
Groundwater Contour Plan - Summer (January 2020)
F - 6c
Drawing No: 0553983m_AEMR_G007_R5.mxd
Date: 20/08/2020
Drawing Size: A4
Drawn By: KV
Reviewed By: GP
Mount Piper Annual Report 2019/2020
350 Boulder Road, Portland, New South Wales
Client: EnergyAustralia
Coordinate System: GDA 1994 MGA Zone 56
0 100 200m
N
This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.
ERM



Groundwater Contour Plan - Autumn (March 2020)

F - 6d

Drawing No: 0553983m_AEMR_G008_R5.mxd		Mount Piper Annual Report 2019/2020 350 Boulder Road, Portland, New South Wales	ERM
Date: 20/08/2020	Drawing Size: A4		
Drawn By: KV	Reviewed By: GP	Client: EnergyAustralia	
Coordinate System: GDA 1994 MGA Zone 56		This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.	



NC01	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	-	6.77	251	7.7	32	1.0	50	<1	666	150	1.0	2	17/07/2019 – 20/02/2020	5
Max	-	7.58	369	24.1	175	2.0	90	<1	3560	859	7.0	10		
Mean	-		298	18	111	1.5	70	<1	1425	370	2.8	4.4		

LDP01	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	-	-	130	8	70	1	50	1	128	59	2.0	4	02/07/2019 – 20/04/2020	42
Max	-	-	810	70	450	3.0	110	3.0	2600	242	17	14		
Mean	-		313	22	147	1.9	67	1.6	785	134	7.72	7.2		

SW_C	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	290	6.96	215	12	56.9	<1	50	<1	553	163	1.0	2	11/07/2019 – 19/03/2020	7
Max	621	7.33	380	25	174	<1	70	<1	1850	661	2.0	6		
Mean	471		297	18	113	<1	58	<1	862	328	1.8	4		

LMP01	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	363	6.78	14	10	52	2.0	70	2.0	406	103	4	4	02/07/2019 – 29/06/2020	38
Max	1960	8.86	554	55	430	6.0	210	4.0	3480	286	13	17		
Mean	732		308	22	177	4.0	132	3.0	1351	166	6.4	9.8		

SW_E	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	518	6.73	385	48	187	<1	60	4.0	674	498	<1	32	11/07/2019 – 19/03/2020	8
Max	11800	7.20	11900	1660	5800	<1	1340	4.0	2870	22300	1.0	1330		
Mean	2641		2465	350	1249	<1	394	4	1944	4954	1.0	300		

F/WX22	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	528	6.48	266	31.6	179	<1	60	<1	105	156	<1	15	24/07/2019 – 24/06/2020	10
Max	3040	7.74	2680	212	1350	<1	470	<1	1050	9060	1	195		
Mean	1607		994	98	575	<1	182	<1	550	1998	1	82.5		

SW_G	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	600	6.56	408	32	175	<1	50	<1	129	92	<1	19	11/07/2019 – 19/03/2020	7
Max	2320	7.48	1640	203	892	<1	200	<1	618	1250	<1	85		
Mean	1142		808	99	414	<1	110	<1	268	379	<1	45.7		

Environmental Goal - Surface Water

Electrical Conductivity (uS/cm)	pH (Field)	TDS (mg/L)	Chloride (mg/L)	Sulfate (as SO4) (mg/L)	Arsenic (µg/L)	Boron (µg/L)	Chromium (µg/L)	Iron (µg/L)	Manganese (µg/L)	Molybdenum (µg/L)	Nickel (µg/L)
2200	6.5-8	1500	350	1000	24	370	2	300	1900	10	17

350 Highlighted cells indicate an exceedance of the Surface Water Environmental Goal.

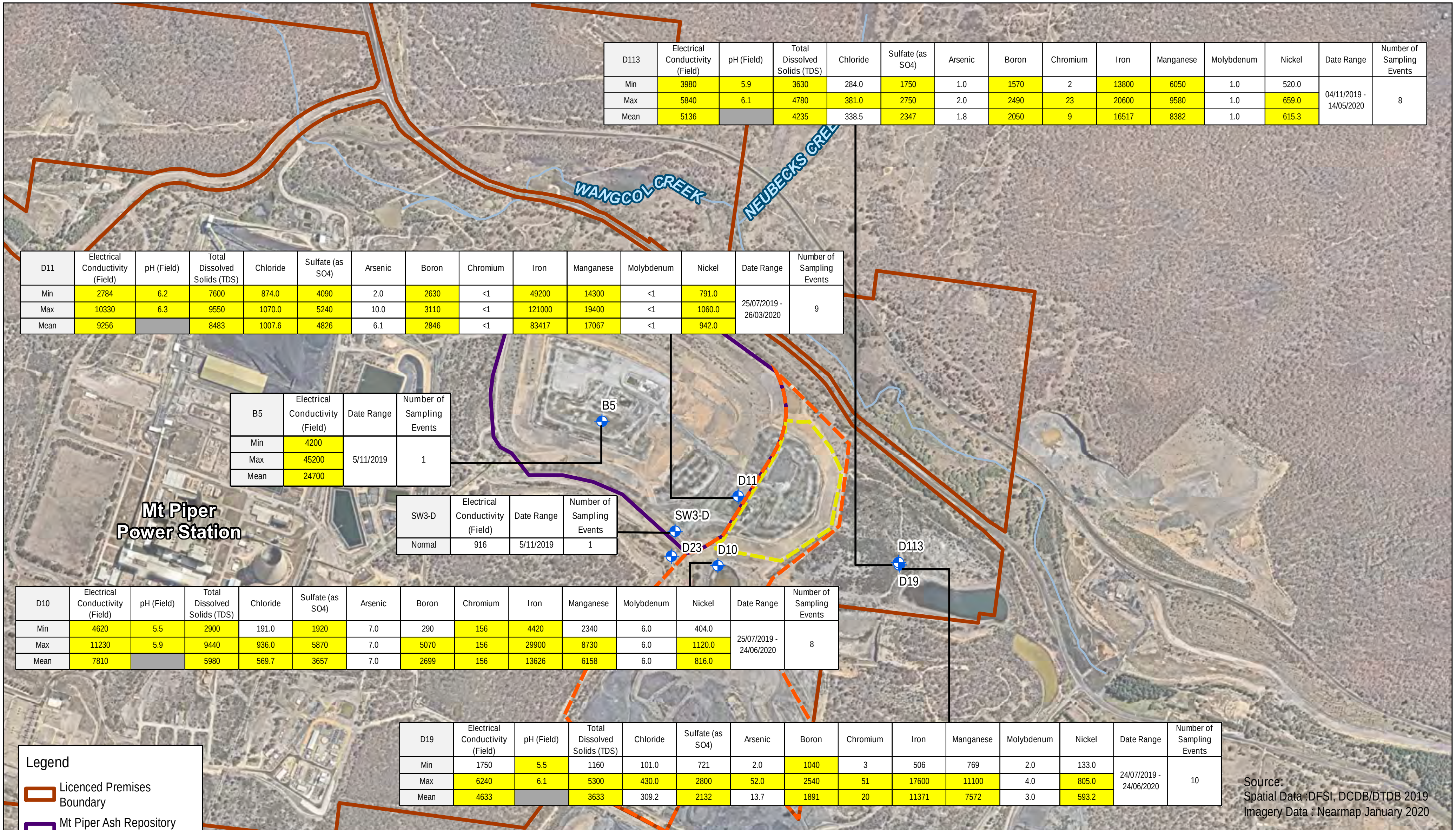
Surface Water Summary

F - 7

Drawing No: 0553983m_AEMR_G009_R7.mxd
Date: 20/08/2020 Drawing Size: A4
Drawn By: KV / GC Reviewed By: GP
Coordinate System: GDA 1994 MGA Zone 56

Mount Piper Annual Report 2019/2020
350 Boulder Road, Portland, New South Wales
Client: EnergyAustralia

ERM



D113	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	3980	5.9	3630	284.0	1750	1.0	1570	2	13800	6050	1.0	520.0	04/11/2019 - 14/05/2020	8
Max	5840	6.1	4780	381.0	2750	2.0	2490	23	20600	9580	1.0	659.0		
Mean	5136		4235	338.5	2347	1.8	2050	9	16517	8382	1.0	615.3		

D11	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	2784	6.2	7600	874.0	4090	2.0	2630	<1	49200	14300	<1	791.0	25/07/2019 - 26/03/2020	9
Max	10330	6.3	9550	1070.0	5240	10.0	3110	<1	121000	19400	<1	1060.0		
Mean	9256		8483	1007.6	4826	6.1	2846	<1	83417	17067	<1	942.0		

B5	Electrical Conductivity (Field)	Date Range	Number of Sampling Events
Min	4200	5/11/2019	1
Max	45200		
Mean	24700		

SW3-D	Electrical Conductivity (Field)	Date Range	Number of Sampling Events
Normal	916	5/11/2019	1

D10	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	4620	5.5	2900	191.0	1920	7.0	290	156	4420	2340	6.0	404.0	25/07/2019 - 24/06/2020	8
Max	11230	5.9	9440	936.0	5870	7.0	5070	156	29900	8730	6.0	1120.0		
Mean	7810		5980	569.7	3657	7.0	2699	156	13626	6158	6.0	816.0		

D19	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	1750	5.5	1160	101.0	721	2.0	1040	3	506	769	2.0	133.0	24/07/2019 - 24/06/2020	10
Max	6240	6.1	5300	430.0	2800	52.0	2540	51	17600	11100	4.0	805.0		
Mean	4633		3633	309.2	2132	13.7	1891	20	11371	7572	3.0	593.2		

Legend
- Licenced Premises Boundary
- Mt Piper Ash Repository (Approval Area)
- Lamberts North Ash Repository (Approval Area)
- Lamberts North Ash Repository (Approximate Active Placement Area)
- Groundwater Monitoring Location

Environmental Goal - Groundwater

Electrical Conductivity (µS/cm)	pH (Field)	TDS (mg/L)	Chloride (mg/L)	Sulfate (as SO4) (mg/L)	Arsenic (µg/L)	Boron (µg/L)	Chromium (µg/L)	Iron (µg/L)	Manganese (µg/L)	Molybdenum (µg/L)	Nickel (µg/L)
2600	6.5-8	2000	350	1000	24	370	5	664	5704	10	550.9

350 — Highlighted cells indicate an exceedance of the Groundwater Environmental Goal

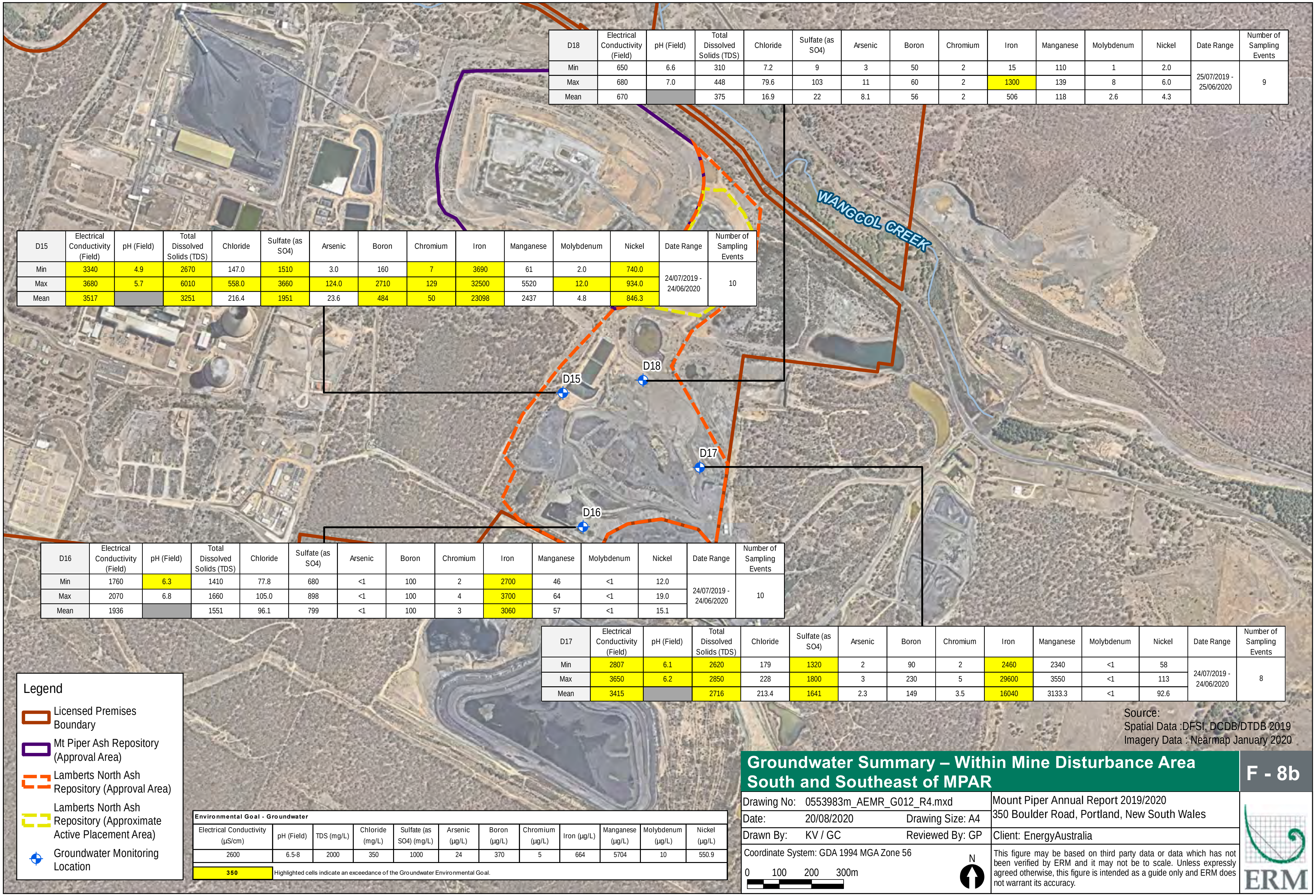
Groundwater Summary – Within MPAR / Mine Disturbance Area East of MPAR

F - 8a

Drawing No: 0553983m_AEMR_G011_R4.mxd
Date: 20/08/2020 Drawing Size: A4
Drawn By: KV / GC Reviewed By: GP
Coordinate System: GDA 1994 MGA Zone 56
0 100 200 300m
N

Mount Piper Annual Report 2019/2020
350 Boulder Road, Portland, New South Wales
Client: EnergyAustralia

ERM



D18	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	650	6.6	310	7.2	9	3	50	2	15	110	1	2.0	25/07/2019 - 25/06/2020	9
Max	680	7.0	448	79.6	103	11	60	2	1300	139	8	6.0		
Mean	670		375	16.9	22	8.1	56	2	506	118	2.6	4.3		

D15	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	3340	4.9	2670	147.0	1510	3.0	160	7	3690	61	2.0	740.0	24/07/2019 - 24/06/2020	10
Max	3680	5.7	6010	558.0	3660	124.0	2710	129	32500	5520	12.0	934.0		
Mean	3517		3251	216.4	1951	23.6	484	50	23098	2437	4.8	846.3		

D16	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	1760	6.3	1410	77.8	680	<1	100	2	2700	46	<1	12.0	24/07/2019 - 24/06/2020	10
Max	2070	6.8	1660	105.0	898	<1	100	4	3700	64	<1	19.0		
Mean	1936		1551	96.1	799	<1	100	3	3060	57	<1	15.1		

D17	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	2807	6.1	2620	179	1320	2	90	2	2460	2340	<1	58	24/07/2019 - 24/06/2020	8
Max	3650	6.2	2850	228	1800	3	230	5	29600	3550	<1	113		
Mean	3415		2716	213.4	1641	2.3	149	3.5	16040	3133.3	<1	92.6		

Environmental Goal - Groundwater

Electrical Conductivity (µS/cm)	pH (Field)	TDS (mg/L)	Chloride (mg/L)	Sulfate (as SO4) (mg/L)	Arsenic (µg/L)	Boron (µg/L)	Chromium (µg/L)	Iron (µg/L)	Manganese (µg/L)	Molybdenum (µg/L)	Nickel (µg/L)
2600	6.5-8	2000	350	1000	24	370	5	664	5704	10	550.9

350 — Highlighted cells indicate an exceedance of the Groundwater Environmental Goal.

Groundwater Summary – Within Mine Disturbance Area South and Southeast of MPAR

F - 8b

Drawing No: 0553983m_AEMR_G012_R4.mxd
Date: 20/08/2020 Drawing Size: A4
Drawn By: KV / GC Reviewed By: GP
Coordinate System: GDA 1994 MGA Zone 56
0 100 200 300m
N

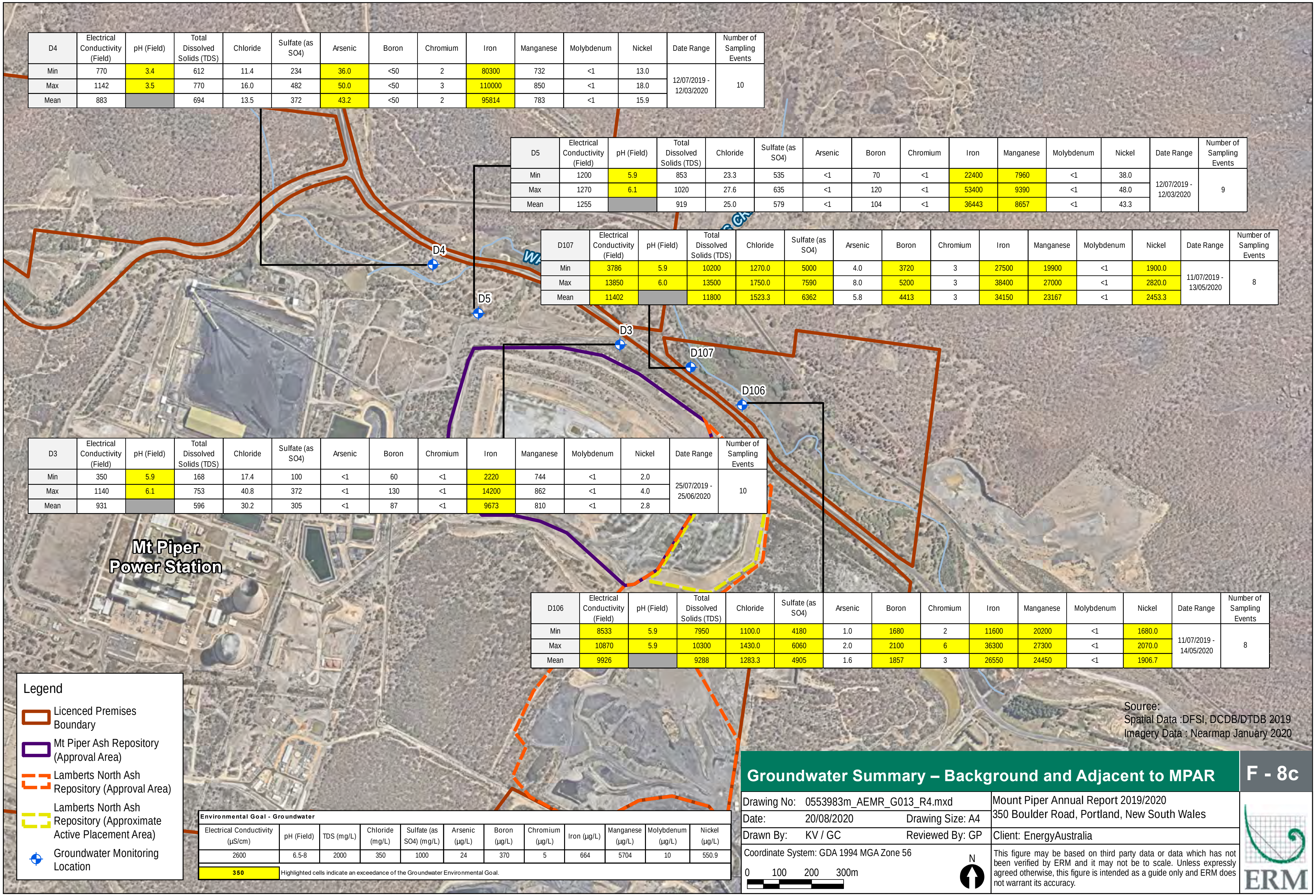
Mount Piper Annual Report 2019/2020
350 Boulder Road, Portland, New South Wales
Client: EnergyAustralia

This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

ERM

Groundwater Summary – Background and Adjacent to MPAR

F - 8c



D4	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	770	3.4	612	11.4	234	36.0	<50	2	80300	732	<1	13.0	12/07/2019 - 12/03/2020	10
Max	1142	3.5	770	16.0	482	50.0	<50	3	110000	850	<1	18.0		
Mean	883		694	13.5	372	43.2	<50	2	95814	783	<1	15.9		

D5	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	1200	5.9	853	23.3	535	<1	70	<1	22400	7960	<1	38.0	12/07/2019 - 12/03/2020	9
Max	1270	6.1	1020	27.6	635	<1	120	<1	53400	9390	<1	48.0		
Mean	1255		919	25.0	579	<1	104	<1	36443	8657	<1	43.3		

D107	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	3786	5.9	10200	1270.0	5000	4.0	3720	3	27500	19900	<1	1900.0	11/07/2019 - 13/05/2020	8
Max	13850	6.0	13500	1750.0	7590	8.0	5200	3	38400	27000	<1	2820.0		
Mean	11402		11800	1523.3	6362	5.8	4413	3	34150	23167	<1	2453.3		

D3	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	350	5.9	168	17.4	100	<1	60	<1	2220	744	<1	2.0	25/07/2019 - 25/06/2020	10
Max	1140	6.1	753	40.8	372	<1	130	<1	14200	862	<1	4.0		
Mean	931		596	30.2	305	<1	87	<1	9673	810	<1	2.8		

D106	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	8533	5.9	7950	1100.0	4180	1.0	1680	2	11600	20200	<1	1680.0	11/07/2019 - 14/05/2020	8
Max	10870	5.9	10300	1430.0	6060	2.0	2100	6	36300	27300	<1	2070.0		
Mean	9926		9288	1283.3	4905	1.6	1857	3	26550	24450	<1	1906.7		

Environmental Goal - Groundwater

Electrical Conductivity (µS/cm)	pH (Field)	TDS (mg/L)	Chloride (mg/L)	Sulfate (as SO4) (mg/L)	Arsenic (µg/L)	Boron (µg/L)	Chromium (µg/L)	Iron (µg/L)	Manganese (µg/L)	Molybdenum (µg/L)	Nickel (µg/L)
2600	6.5-8	2000	350	1000	24	370	5	664	5704	10	550.9

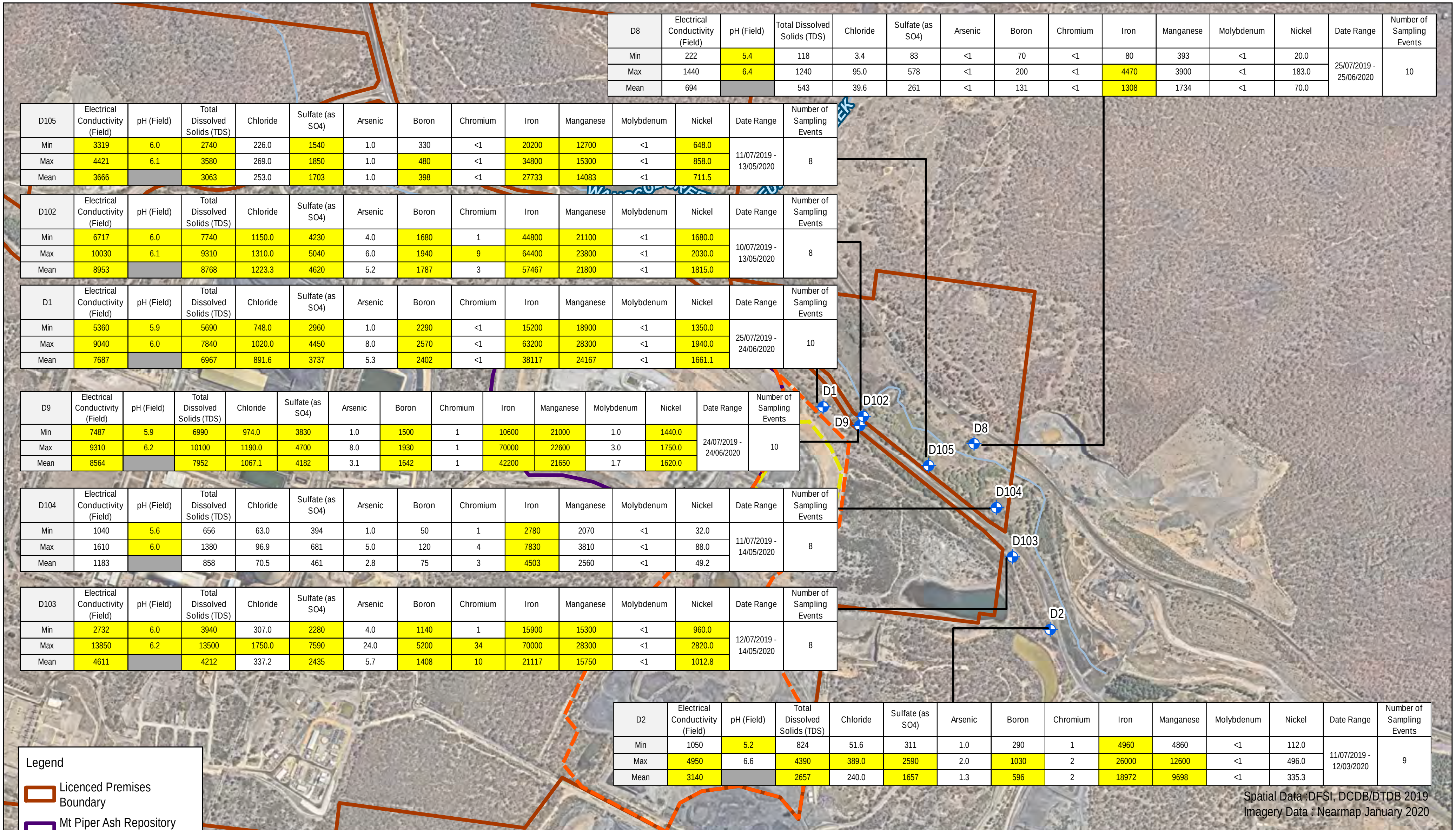
350 — Highlighted cells indicate an exceedance of the Groundwater Environmental Goal.

Drawing No: 0553983m_AEMR_G013_R4.mxd
Date: 20/08/2020 Drawing Size: A4
Drawn By: KV / GC Reviewed By: GP
Coordinate System: GDA 1994 MGA Zone 56
0 100 200 300m
N

Mount Piper Annual Report 2019/2020
350 Boulder Road, Portland, New South Wales
Client: EnergyAustralia

This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

ERM



D8	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	222	5.4	118	3.4	83	<1	70	<1	80	393	<1	20.0		
Max	1440	6.4	1240	95.0	578	<1	200	<1	4470	3900	<1	183.0	25/07/2019 - 25/06/2020	10
Mean	694		543	39.6	261	<1	131	<1	1308	1734	<1	70.0		

D105	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	3319	6.0	2740	226.0	1540	1.0	330	<1	20200	12700	<1	648.0		
Max	4421	6.1	3580	269.0	1850	1.0	480	<1	34800	15300	<1	858.0	11/07/2019 - 13/05/2020	8
Mean	3666		3063	253.0	1703	1.0	398	<1	27733	14083	<1	711.5		

D102	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	6717	6.0	7740	1150.0	4230	4.0	1680	1	44800	21100	<1	1680.0		
Max	10030	6.1	9310	1310.0	5040	6.0	1940	9	64400	23800	<1	2030.0	10/07/2019 - 13/05/2020	8
Mean	8953		8768	1223.3	4620	5.2	1787	3	57467	21800	<1	1815.0		

D1	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	5360	5.9	5690	748.0	2960	1.0	2290	<1	15200	18900	<1	1350.0		
Max	9040	6.0	7840	1020.0	4450	8.0	2570	<1	63200	28300	<1	1940.0	25/07/2019 - 24/06/2020	10
Mean	7687		6967	891.6	3737	5.3	2402	<1	38117	24167	<1	1661.1		

D9	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	7487	5.9	6990	974.0	3830	1.0	1500	1	10600	21000	1.0	1440.0		
Max	9310	6.2	10100	1190.0	4700	8.0	1930	1	70000	22600	3.0	1750.0	24/07/2019 - 24/06/2020	10
Mean	8564		7952	1067.1	4182	3.1	1642	1	42200	21650	1.7	1620.0		

D104	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	1040	5.6	656	63.0	394	1.0	50	1	2780	2070	<1	32.0		
Max	1610	6.0	1380	96.9	681	5.0	120	4	7830	3810	<1	88.0	11/07/2019 - 14/05/2020	8
Mean	1183		858	70.5	461	2.8	75	3	4503	2560	<1	49.2		

D103	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	2732	6.0	3940	307.0	2280	4.0	1140	1	15900	15300	<1	960.0		
Max	13850	6.2	13500	1750.0	7590	24.0	5200	34	70000	28300	<1	2820.0	12/07/2019 - 14/05/2020	8
Mean	4611		4212	337.2	2435	5.7	1408	10	21117	15750	<1	1012.8		

D2	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	1050	5.2	824	51.6	311	1.0	290	1	4960	4860	<1	112.0		
Max	4950	6.6	4390	389.0	2590	2.0	1030	2	26000	12600	<1	496.0	11/07/2019 - 12/03/2020	9
Mean	3140		2657	240.0	1657	1.3	596	2	18972	9698	<1	335.3		

Spatial Data :DFSI, DCDB/DTDB 2019
Imagery Data : Nearmap January 2020

Legend

- Licenced Premises Boundary
- Mt Piper Ash Repository (Approval Area)
- Lamberts North Ash Repository (Approval Area)
- Lamberts North Ash Repository (Approximate Active Placement Area)
- Groundwater Monitoring Location

Environmental Goal - Groundwater

Electrical Conductivity (µS/cm)	pH (Field)	TDS (mg/L)	Chloride (mg/L)	Sulfate (as SO4) (mg/L)	Arsenic (µg/L)	Boron (µg/L)	Chromium (µg/L)	Iron (µg/L)	Manganese (µg/L)	Molybdenum (µg/L)	Nickel (µg/L)
2600	6.5-8	2000	350	1000	24	370	5	664	5704	10	550.9

350 Highlighted cells indicate an exceedance of the Groundwater Environmental Goal.

Groundwater Summary – Adjacent to MPAR and Downgradient

F - 8d

Drawing No: 0553983m_AEMR_G014_R4.mxd
Date: 20/08/2020 Drawing Size: A4
Drawn By: KV / GC Reviewed By: GP
Coordinate System: GDA 1994 MGA Zone 56

0 100 200 300m

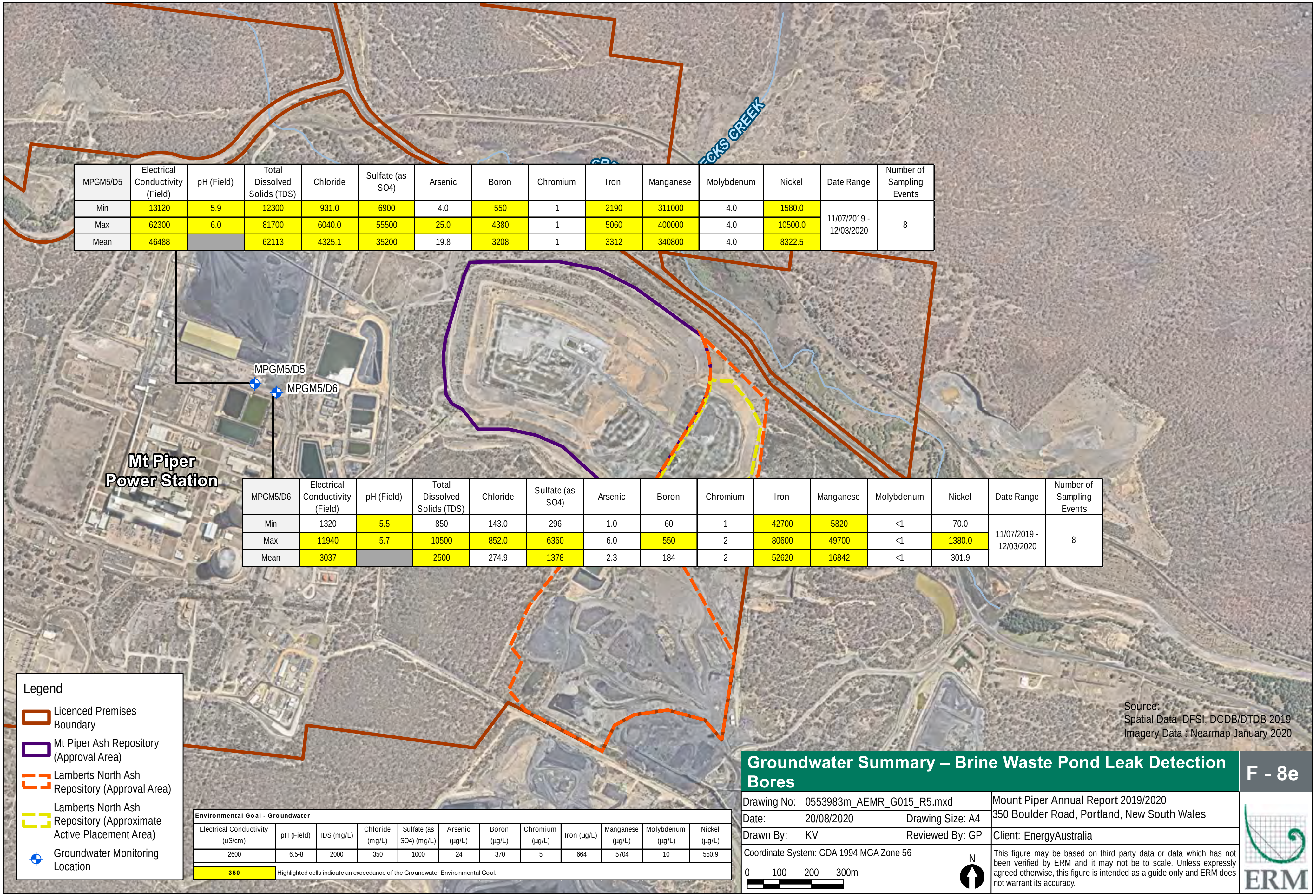
N

Mount Piper Annual Report 2019/2020
350 Boulder Road, Portland, New South Wales

Client: EnergyAustralia

This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

ERM



MPGM5/D5	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	13120	5.9	12300	931.0	6900	4.0	550	1	2190	311000	4.0	1580.0	11/07/2019 - 12/03/2020	8
Max	62300	6.0	81700	6040.0	55500	25.0	4380	1	5060	400000	4.0	10500.0		
Mean	46488		62113	4325.1	35200	19.8	3208	1	3312	340800	4.0	8322.5		

MPGM5/D6	Electrical Conductivity (Field)	pH (Field)	Total Dissolved Solids (TDS)	Chloride	Sulfate (as SO4)	Arsenic	Boron	Chromium	Iron	Manganese	Molybdenum	Nickel	Date Range	Number of Sampling Events
Min	1320	5.5	850	143.0	296	1.0	60	1	42700	5820	<1	70.0	11/07/2019 - 12/03/2020	8
Max	11940	5.7	10500	852.0	6360	6.0	550	2	80600	49700	<1	1380.0		
Mean	3037		2500	274.9	1378	2.3	184	2	52620	16842	<1	301.9		

Legend
- Licenced Premises Boundary
- Mt Piper Ash Repository (Approval Area)
- Lamberts North Ash Repository (Approval Area)
- Lamberts North Ash Repository (Approximate Active Placement Area)
- Groundwater Monitoring Location

Environmental Goal - Groundwater

Electrical Conductivity (uS/cm)	pH (Field)	TDS (mg/L)	Chloride (mg/L)	Sulfate (as SO4) (mg/L)	Arsenic (µg/L)	Boron (µg/L)	Chromium (µg/L)	Iron (µg/L)	Manganese (µg/L)	Molybdenum (µg/L)	Nickel (µg/L)
2600	6.5-8	2000	350	1000	24	370	5	664	5704	10	550.9

350 — Highlighted cells indicate an exceedance of the Groundwater Environmental Goal.

Source:
Spatial Data :DFSI, DCDB/DTDB 2019
Imagery Data : Nearmap January 2020

Groundwater Summary – Brine Waste Pond Leak Detection Bores

F - 8e

Drawing No: 0553983m_AEMR_G015_R5.mxd
Date: 20/08/2020 Drawing Size: A4
Drawn By: KV Reviewed By: GP
Coordinate System: GDA 1994 MGA Zone 56
0 100 200 300m
N

Mount Piper Annual Report 2019/2020
350 Boulder Road, Portland, New South Wales
Client: EnergyAustralia

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ERM

APPENDIX A MT PIPER CONSENT REQUIREMENTS

Project Approval Document	Consent requirements	How addressed by this AEMR
Mt Piper Consent	38 A Notwithstanding the provisions of Condition No. 38, the brine and ash co-placement area may be extended and shall be undertaken generally in accordance with the Statement of Environmental Effects: Mount Piper Power Station Extension of Brine Conditioned Ash Placement Area, prepared by Connell Wagner Pty Ltd and dated June 2007. This includes: (i) The extended area must lie within the existing ash placement area; (ii) Co-placement activities in the proposed extended area must use existing facilities and methods; (iii) The placement of brine conditioned ash may only occur between the levels of RL 946 metres (the end-point of the water conditioned ash layer) and RL 980 metres.	Refer to Appendix C and Section 2 of this report.
	38 B The groundwater and surface water monitoring programs required by Condition No. 40 and 41 apply to the extension of the brine and ash co-placement area, permitted by Condition 38 A.	Refer to relevant conditions below.
	38 C The Applicant must update the Water Management Plan (WMP) required by Condition No. 43, and obtain the approval of the Secretary for the update, prior to undertaking any works permitted by Condition No. 38 A. In determining whether to grant approval, the Secretary must consult with the BCD, WaterNSW, DPIE Water, and Council.	Condition is met by the WMP dated 28/2/20, as outlined in Section 1 and Section 4 to Section 8 of this report.
	40. The Applicant shall, at least one month prior to the first placement of brine-conditioned flyash, consult with the EPA, DPIE Water and WaterNSW to establish the requirements for Water Monitoring Programs for groundwater and surface water. The Water Monitoring Programs shall: (i) be based on the monitoring programs presented in the Statement of Environmental Effects for this modification; (ii) include water quality testing at a minimum frequency of every three months; (iii) be at the expense of the Applicant.	Condition is met by the WMP dated 28/2/20, as outlined in Section 1 and Section 4 to Section 8 of this report.
	41. The Applicant shall expand the groundwater and surface water monitoring programs, including, if so required, the establishment of additional groundwater monitoring bores and surface water sampling points, in accordance with any reasonable requirements of the EPA, DPIE Water or WaterNSW.	Condition is met by the WMP dated 28/2/20, as outlined in Section 1 and Section 4 to Section 8 of this report.

Project Approval Document	Consent requirements	How addressed by this AEMR
	43. At least one month prior to the placement of brine-conditioned flyash, or within such further period as the Secretary may agree, the Applicant shall prepare and submit for the approval of the EPA, WaterNSW, DPIE Water, Council, and the Secretary, a Water Management Plan (WMP) which shall include, but not be limited to: (a) Details of the monitoring programs for surface water and groundwater required under conditions 40 and 41. (b) Details of measures to be employed to control surface water run-off from the site. (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. (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.	Condition is met by the WMP dated 28/2/20, as outlined in Section 1 and Section 4 to Section 8 of this report.
	43A. The Applicant must update the Water Management Plan required by Condition 43 to the satisfaction of the Secretary, prior to commissioning the storage pond associated with Modification 8. The Applicant must implement the approved Water Management Plan.	Condition is met by the WMP dated 28/2/20, as outlined in Section 1,and Section 4 to Section 8 of this report.
	44. The Applicant shall provide to the Secretary, EPA, DPIE Water, WaterNSW and Council, an Environmental Monitoring Report (EMR) on a yearly basis, with the first EMR to be submitted no later than six months after the first placement of brine-conditioned flyash onsite. The Applicant shall agree to Council making the Environmental Monitoring Reports available on request for public inspection.	Condition is met by the development of this report in its entirety.
	45. The Environmental Monitoring Report shall include, but not be limited to: (a) a summary and discussion of all available results and analyses from Water Monitoring Programs; (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 Programs; (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, DPIE Water, WaterNSW or Council.	Refer to Section 4 to Section 8, along with Appendix B to Appendix L of this report.

Project Approval Document	Consent requirements	How addressed by this AEMR
The WMP	Section 5.1 – Environmental Goals The results of all surface water and groundwater monitoring are intended to be assessed relative to the Environmental Goals	Refer to Section 5 (surface water) and Section 6 (groundwater), along with Appendix F to Appendix J of this report.
	Section 5.2 – Early Warning Assessment In addition to comparing results with the Environmental Goals for surface water and groundwater an early warning assessment will be conducted. This assessment will include a review of concentration trends through time at each location, including statistical assessment.	Refer to Section 7, along with Appendix H to Appendix J of this report.
	Section 6.1 – Monitoring Locations	Refer to Section 5.2 and Section 6.2 of this report.
	Section 6.2 – Monitoring Frequency	Refer to Section 5.2 and Section 6.2 of this report. Monitoring was generally undertaken within the required timeframes, and where these time frames have not been met, sufficient data is available from adjacent monitoring locations to inform the objectives of the AEMR.
	Section 6.3 – Monitoring Method	Refer to Section 5.3 and Section 6.3 of this report.
	Section 6.4 – Monitoring Parameters	Refer to Section 5.4 and Section 6.4 of this report.
	Section 6.5 – Data Management and Assessment The monitoring data is compared with the existing historical dataset for an assessment of trends related to potential influence of the brine management and BCA placement activities on surface water and groundwater.	Refer to Section 6.5, Section 5.6, Section 6.5, Section 6.6 and Section 7 of this report.
	Section 6.6 – Reporting Requirements The reporting requirements of the WMP form the objectives of this AEMR.	Refer to Section 1.2, Section 5 to Section 8 of this report. The objectives of this report are considered to have been met.

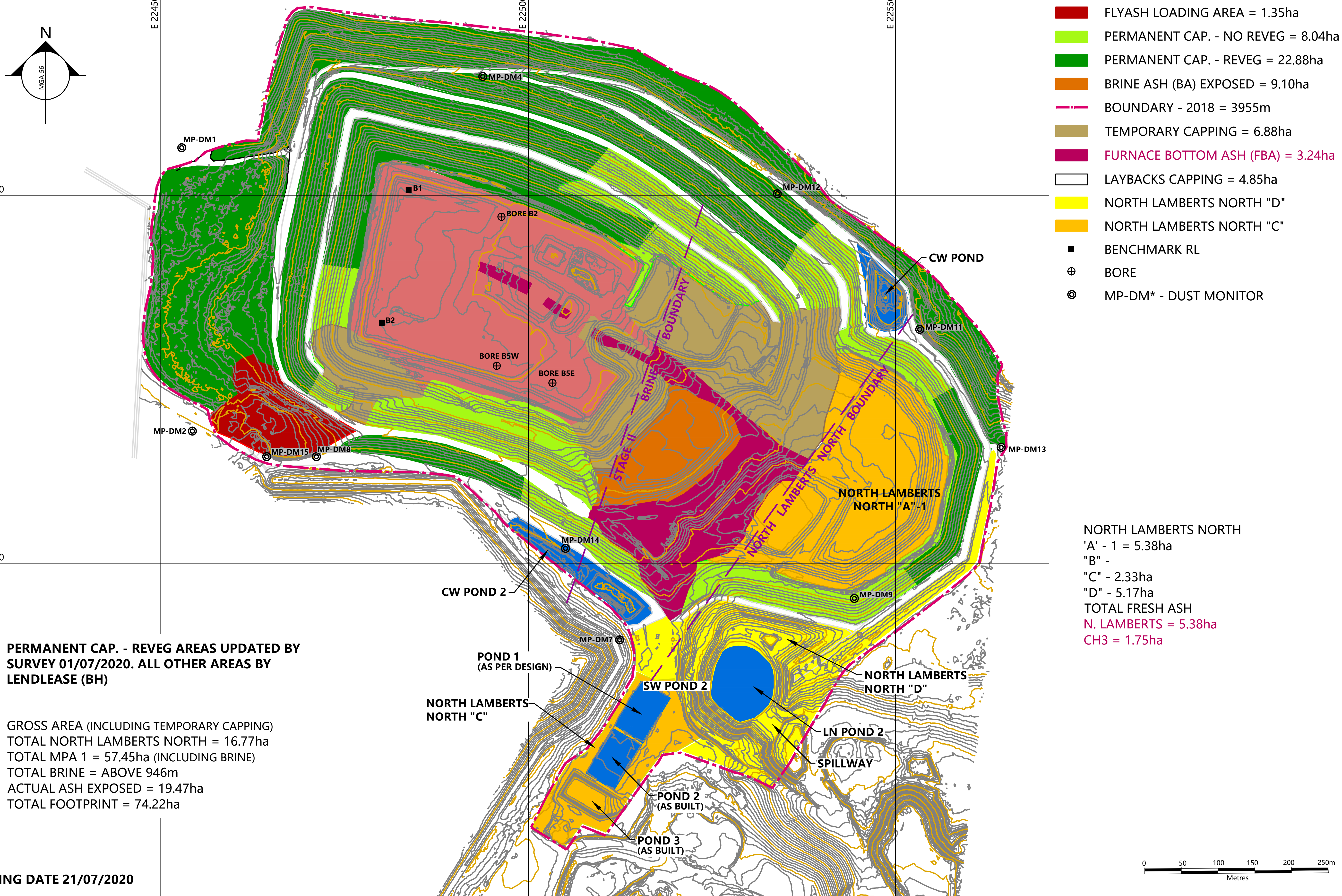
Project Approval Document	Consent requirements	How addressed by this AEMR
	Section 7.1 – Performance Criteria The key aim of TARPs is the mitigation and control of impacts, ideally through early detection. Therefore, TARPs for groundwater and surface water quality are based on the Environmental Goals for the monitoring program. In addition, long-term trends in surface and groundwater concentrations are assessed using the routine monitoring data and with reference to a statistical assessment of water quality data. Should concentrations at a given location indicate a statistically significant increasing concentration trend in groundwater or surface water, or exceed the relevant Environmental Goal, the triggers are considered to have been exceeded and actions are to be implemented.	Refer to Section 7.5 of this report.
	Section 7.2 – Incident Response An impact to groundwater or surface water is considered to be present when concentrations of a monitoring parameter are recorded above the Environmental Goals. In the event of an impact to groundwater or surface water that is considered to be potentially associated with brine management and/or handling/placement of BCA at MPAR, the WMP outlines an incident response procedure. It is noted that the EPL 13007 outlines separate incident response requirements. The reporting requirements of the EPL will be provided to the regulators separately to this AEMR.	Refer to Section 7.5 of this report.
	Section 7.3 – Contingency Measures Should routine monitoring data suggest that further changes in water quality are being caused by brine management (e.g. brine waste ponds) or other BCA placement and related activities at the MPPS, the WMP outlines contingency items that may be implemented.	Refer to Section 7.5 of this report. Once the independent assessment is completed, the WMP will be updated to reflect the key findings and further contingency measures proposed.

APPENDIX B LDP01 STORM WATER FLOW VOLUME DATA

Mt Piper Power Station - LDP01 stormwater flow volumes

Date	Kilolitres/ day	Start Pump (hh.mm)	Cease Pumping (hh.mm)
10/03/2020	3000	11.30	18.00
11/03/2020	3000	7.00	18.00
12/03/2020	3000	7.00	18.00
20/03/2020	3000	11.30	18.00
21/03/2020	3000	7.00	14.00
7/04/2020	3000	11.30	0.00
8/04/2020	4000	0.01	17.00
9/04/2020	4000	7.00	17.00
12/04/2020	3000	10.00	17.00
13/04/2020	3000	7.00	15.00
4/05/2020	4000	11.30	24.00
5/05/2020	5000	7.00	24.00
6/05/2020	3000	7.00	18.00
7/05/2020	2000	7.00	14.00
29/07/2020	3000	11	23.59
30/07/2020	4000	12.01	23.59
31/07/2020	4000	12.01	23.59
1/08/2020	3000	12.01	11

APPENDIX C ASH REPOSITORY SURVEY



NORTH LAMBERTS NORTH
'A' - 1 = 5.38ha
"B" -
"C" - 2.33ha
"D" - 5.17ha
TOTAL FRESH ASH
N. LAMBERTS = 5.38ha
CH3 = 1.75ha

PERMANENT CAP. - REVEG AREAS UPDATED BY SURVEY 01/07/2020. ALL OTHER AREAS BY LENDLEASE (BH)

GROSS AREA (INCLUDING TEMPORARY CAPPING)
TOTAL NORTH LAMBERTS NORTH = 16.77ha
TOTAL MPA 1 = 57.45ha (INCLUDING BRINE)
TOTAL BRINE = ABOVE 946m
ACTUAL ASH EXPOSED = 19.47ha
TOTAL FOOTPRINT = 74.22ha

DRAWING DATE 21/07/2020

NOTES:	No.	AMENDMENT	DATE	DRAWN	CHECK'D	AUTH'D
AREAS BY LENDLEASE						

Disclaimer:
CEH Survey Pty. Ltd. do not guarantee the accuracy or completeness of this plan and are not liable for any loss or damage which the user may suffer resulting from the use of this plan.

CEH SURVEY
CONSULTING LAND, ENGINEERING AND MINING SURVEYORS

SCALE: 1 : 5000 (A3)

CLIENT: LEND LEASE SERVICES PTY LTD

LOCALITY: MOUNT PIPER

LGA: LITHGOW

PLAN: **LEND LEASE SERVICES PTY LTD**
MOUNT PIPER ASH EMPLACEMENT
SURVEY: FEBRUARY 2020

SURVEYOR:	DRAWN:	DATE:	PLAN No.
T.H./B.N./L.B.	G.M./D.M.	21-07-2020	MPA0220 (As surveyed)

CEH Job No. - 3/841

PLAN No. MPA0220 AS SURVEY

APPENDIX D BRINE COMPOSITION DATA

APPENDIX D BRINE COMPOSITION

Brine Composition Average Data

Parameter	Values from 1999 SEE Average[b]	2003 – 2006 Average[b]	July 2017 - Dec 2017 Average[a]	July 2019 – June 2020 Average[c]
		mg/L		
pH	7.9	8.1	7.9	9.3
Cond (us/cm)	63,664	127,982	88,556	61,320
TDS	116,650	137,170	118,500	64,257
Alk (CaCO3)	1,360	1,346	976	14,735
Cl	19,864	23,889	10,390	7,776
SO4	49,670	66,767	67,378	28,302
Na	25,678	30,103	37,400	23,475
K	4,258	7,362	3,460	1,721
Ca	645	606	780	696
Mg	5,480	9,010	4,010	1,540
		ug/L		
As	409^^^	143	438	522
Ag	1.4^^	<50	10	<1
Ba	272*	30	1,000	6.43
Be	17^	5.8	-	<10
B	73,560*	115,000	35,800	41,500
Cd	19+	42	5.3	2.3
Cr ***	49+	<50	1,050	50
Cu	7,858*	7,197	12,400	5,991
F	21,178*	125,656	64,650	55,404
Fe	833*	-	1,580	151
Hg	1.35^^	-	0.04	0.11
Mn	17,530*	34,000	7,210	5,170
Mo	2,600^^	-	-	2,625
Ni	4,187*	4,017	3,880	348
Pb	6^^	-	10	<10
Se	245*	-	130	115
Zn	2,020*	-	1,050	2,180

a. Brine composition data provided by EnergyAustralia on 01 August 2018;
b. Connell Wagner (2007). Statement of Environmental Effects, Mount Piper Power Station, Extension of Brine Conditions Ash Placement Area. Prepared by Environmental Services, Pacific Power International for Delta Electricity, 21 June 2007.
c. data based on Nalco monitoring point reference 1050, EA BC Waste Pond
Notations relate to Average Trace element values, from 1999 Statement of Environmental Effects including:
* mostly 10 – 15 analyses (sources Hodgson, 1999) – AWT, 1996
** EPA (1999a) ^ one analysis ^^ 3 analyses ^^^ 5 analyses + 6 analyses
*** Total chromium reported (CrVI <25ug/l)

APPENDIX E SITE WEATHER DATA

Month	Jul-19			Aug-19			Sep-19			Oct-19			Nov-19			Dec-19		
Measurement	Min	Max	Rain	Min	Max	Rain	Min	Max	Rain	Min	Max	Rain	Min	Max	Rain	Min	Max	Rain
Date	°C	°C	mm	°C	°C	mm	°C	°C	mm	°C	°C	mm	°C	°C	mm	°C	°C	mm
1	-4.6	16	0	-3.8	14.3	0.2	-2.4	17.4	0.2	3.8	19.5	0.0	6.1	28.9	0.0	5.6	22.2	0.0
2	-3.4	17.4	0	-2.5	14.4	0.0	1.2	16.8	0.0	1.2	22.1	0.0	9.9	28.1	0.0	6.5	12.2	0.0
3	-5.7	13.4	0	-3.2	16.3	0.0	2.9	21.1	0.0	3.0	24.1	0.0	13.5	22.8	9.6	6.5	21.0	0.0
4	7.1	12	0.8	-6.3	16.5	0.0	1.4	21.2	0.0	6.2	25.6	0.0	8.5	20.2	3.2	11.4	23.3	0.0
5	7.5	12.7	1.8	-3.2	16.4	0.2	2.6	22.3	0.0	9.3	19.0	0.4	4.6	17.4	0.0	11.4	27.0	0.0
6	4.5	13.2	0.2	-7.0	15.6	0.0	1.9	24.7	3.8	10.0	28.9	0.0	2.4	22.9	0.0	9.7	27.0	0.0
7	5	14.8	0.0	-4.3	14.8	0.0	3.0	7.3	1.6	8.9	26.3	0.0	11.8	22.0	0.0	10.8	27.4	0.0
8	5	11.4	2.6	-0.8	11.6	0.4	2.8	9.7	0.6	4.1	15.8	1.0	6.1	21.2	1.0	8.4	27.3	0.0
9	-0.5	11.5	0.2	2.0	7.5	1.8	1.5	8.5	0.6	-0.2	17.0	0.2	3.9	13.3	0.2	9.6	32.3	0.0
10	-1.5	8.6	0.2	0.0	4.3	3.8	-4.7	14.0	0.0	0.6	16.6	0.0	5.3	19.5	0.0	10.7	36.0	0.0
11	5.1	10.5	0.0	0.3	3.2	6.8	-4.3	18.1	0.0	5.8	12.6	2.8	2.7	24.7	0.0	11.6	32.7	0.0
12	5.9	9.5	0.0	-2.4	11.1	0.2	-3.4	18.7	0.0	5.9	12.5	1.0	6.9	27.8	0.0	13.4	29.1	0.0
13	1.7	7.7	1.6	-4.2	10.8	0.0	-1.9	21.5	0.0	2.1	17.0	0.0	6.2	18.6	0.0	11.6	27.1	0.0
14	0.2	6.7	0.0	-7.1	13.7	0.2	2.2	20.4	0.0	7.2	23.4	0.0	5.4	23.6	0.0	NA	15.4	0.0
15	3.3	8.7	0.2	-5.8	13.0	0.0	-0.9	23.4	0.0	4.9	26.6	0.0	6.0	25.0	0.0	NA	NA	0.0
16	3.6	10.8	0.0	-4.4	16.3	0.0	3.2	23.1	0.0	5.3	26.6	0.0	4.2	24.3	0.0	NA	30.9	0.0
17	2.2	10.5	0.0	-0.1	16.5	0.0	0.7	9.0	33.2	6.6	18.0	0.0	6.2	23.7	0.0	10.5	28.1	0.0
18	-1.6	11.2	0.0	-2.0	19.0	0.0	4.7	11.0	0.8	2.9	21.2	0.0	7.9	25.1	0.0	8.2	33.1	0.0
19	-3	11.8	0.0	0.7	6.4	0.0	9.1	18.4	0.6	1.3	20.3	0.0	6.9	30.4	0.0	13.9	36.4	0.0
20	-5.4	15.8	0.0	0.6	10.6	0.0	10.5	20.2	0.0	0.2	19.7	0.0	8.7	29.5	0.0	12.3	32.8	0.0
21	-0.6	14.9	0.0	5.1	10.7	0.0	9.2	20.9	3.8	0.3	23.4	0.0	6.7	34.2	0.0	12.6	38.7	0.0
22	1.1	16.9	0.0	0.3	11.3	0.0	3.0	17.8	5.8	2.9	26.7	0.0	16.8	32.9	0.0	11.7	22.8	0.0
23	-1	14.5	0.0	-5.9	15.0	0.0	0.0	13.3	0.2	4.0	27.1	0.0	14.7	32.0	0.0	11.9	26.2	0.0
24	-1.9	11.6	0.0	-4.4	16.5	0.0	-2.8	15.2	0.0	5.2	28.1	0.0	13.1	23.0	0.4	10.9	27.7	0.0
25	-5	15	0.0	0.2	18.1	0.0	-2.1	18.5	0.0	8.6	28.1	0.0	11.4	27.9	0.0	13.6	26.6	0.0
26	-2.8	13.3	0.0	4.3	15.2	0.0	2.9	18.1	0.0	9.8	21.9	4.2	7.4	26.5	0.0	9.8	31.0	0.0
27	-2.3	14.4	0.0	5.3	14.8	0.0	-0.5	18.9	0.0	0.2	20.9	0.0	2.1	25.4	0.0	10.8	32.4	0.0
28	-2.8	13.4	0.0	-0.4	14.5	0.2	0.5	17.9	0.0	0.8	22.4	0.0	5.5	29.9	0.0	11.0	34.7	0.0
29	-3.6	14.6	0.4	-0.9	9.9	3.6	-1.1	18.6	0.0	4.0	27.1	0.0	10.3	30.0	0.0	14.5	35.8	0.0
30	0.8	9.5	0.2	3.7	8.1	0.6	0.5	16.5	0.0	7.7	26.9	0.2	9.2	26.1	0.0	13.6	35.9	0.0
31	-0.9	12.2	0.2	0.0	11.9	0.0				8.6	29.6	0.0				16.3	35.8	0.0
Min	-5.7	6.7	0	-7.0999999	3.20000005	0	-4.6999998	7.30000019	0	-0.2	12.5	0	2.0999999	13.3000002	0	5.5999999	12.1999998	0
Max	7.5	17.4	2.60000004	5.30000019	19	6.80000012	10.5	24.7000008	33.2000007	10	29.6000042	4.20000006	16.7999992	34.2000008	9.60000019	16.2999992	38.7000008	0
Average	0.21	12.40		-1.49	12.85		1.32	17.42		4.55	22.42		7.68	25.23		11.03	28.96	
Total			8.40			18.00			51.20			9.80			14.40			0.00

Month	Jan-20			Feb-20			Mar-20			Apr-20			May-20			Jun-20		
Measurement	Min	Max	Rain	Min	Max	Rain	Min	Max	Rain	Min	Max	Rain	Min	Max	Rain	Min	Max	Rain
Date	°C	°C	mm	°C	°C	mm	°C	°C	mm	°C	°C	mm	°C	°C	mm	°C	°C	mm
1	13.8	35.9	0.0	21.2	38.6	0	11.5	28.2	0	10.8	22.6	0	3	6	2.4	0	13	1.1
2	16.0	33.1	17.2	19.8	36.7	8	11.9	30.7	0	12.9	17.1	9	4	8	1.4	2	5	0.1
3	16.8	36.6	0.0	14.1	26.6	1.2	14.8	17.1	7.4	13.3	16.9	11	0	13	0	-2	11	0
4	18.1	38.4	0.0	10.8	21.4	0	14.7	18.4	6.6	8.9	16.7	26	-2	15	0.1	-1	13	0.1
5	12.8	34.6	0.0	12.4	24	0	15.4	17	42.4	7.6	15.3	0	3	16	0	-3	14	0.1
6	12.7	25.0	0.0	13.9	17.4	12	14.5	23	1.2	5.1	14.4	0	1	17	0.1	-4	12	0
7	16.4	30.9	3.6	14.4	18.8	4.2	12.3	20.1	0	6.3	14.1	0	2	16	0.1	-3	12	0.1
8	15.3	34.2	0.8	15	18.5	8.8	11.8	18.9	0.2	9.3	13.8	0	5	19	0.1	2	13	0
9	16.2	23.4	0.0	14.4	17.8	31.6	11.9	17.7	0.6	10.9	14.4	0	5	18	0	6	12	0
10	17.0	35.9	0.0	13.5	24.8	16.8	8.9	19.7	0	8.8	15.1	5	0	10	0	7	15	0.1
11	13.6	29.3	0.0	13.4	25.5	6	8	20.7	0	6.6	16.8	0	-4	13	0	2	15	0
12	11.6	19.8	0.6	15.2	25.5	3.8	10.5	20.4	0.2	2.8	19.2	0	-3	14	0	5	13	0.1
13	12.6	25.0	0.0	16.7	23.5	1.8	5.2	23.6	0	1.8	19.5	0	0	11	0.1	8	16	0
14	14.5	28.0	0.0	13.8	26.1	0.2	8.1	14.3	10.4	2.3	22.5	0	-2	12	0	5	11	7.3
15	11.0	28.9	0.0	12.9	28.7	0.6	7.7	16.4	0	5.9	24	0	0	14	0	0	13	0.1
16	15.1	23.4	8.8	16.3	21.8	0	9.5	14.9	1.2	10.1	21.7	0	4	14	0.2	3	13	0
17	15.0	18.4	0.4	14.8	19.7	1.4	9.6	19.5	0.6	7.1	18	0	1	15	0	0	13	0
18	14.4	19.5	2.0	13.1	28.4	19.2	8.3	24	0	3.4	18.5	0	3	14	0.1	6	14	0
19	14.4	19.3	23.6	9.9	18.5	0	7.5	28.7	0	1.4	17.7	0	6	16	0.1	0	15	0
20	12.9	28.4	0.2	7.4	25.1	0	12.8	27.8	0	4.4	17.3	0	6	14	2.5	2	13	0.1
21	10.2	26.8	0.0	13.9	22.8	0	5.9	25.6	0	6.9	18.8	0	3	14	4.8	4	12	7.4
22	10.3	31.9	0.0	13.9	19.4	0	11.7	24.2	0	3.9	18	0	2	9	0.4	3	7	0.5
23	12.4	33.7	0.2	14	18	0.2	10.9	18.3	0	1.1	19.4	0	5	9	1.7	3	7	0.1
24	18.9	28.8	1.6	11.8	24.2	1.6	12.1	20.7	0	5.8	20.3	0	3	13	0.1	3	9	0
25	18.4	25.9	0.0	12.2	26	0.2	9.9	20.2	26.2	2.8	20.5	0	1	12	0	3	8	0
26	16.7	32.7	0.0	11.1	24.5	2.8	10.3	14.3	1.4	5.7	19.5	0	8	12	0.5	-3	12	0
27	NA	33.1	0.0	8.5	25.2	0	8.6	15.4	0.6	3.6	18.8	0	5	14	0	1	10	0
28	NA	NA	0.0	5.9	27	0	7.9	17.9	0	12.9	18.3	0	1	15	0	3	11	0.3
29	NA	NA	0.0	9	25	0	13.2	21.6	0.2	11.8	20	25	0	3	0.1	0	12	0
30	NA	36.1	0.0				10.4	18.1	10.2	4	13.6	14	0	0	0	1	13	0
31	15.9	39.5	0.0				8.8	23.3	0.2				0	0	0			

Min	10.1999998	18.3999996	0	5.9	17.4	0	5.2	14.3	0	1.1	13.6	0	-4	0	0	-4	5	0
Max	18.8999996	39.5	23.6000005	21.2	38.6	31.6	15.4	30.7	42.4	13.3	24	26	8	19	4.8	8	16	7.4
Average	14.56	29.53		13.22	24.12		10.47	20.67		6.61	18.09		1.94	12.13		1.77	11.90	
Total			59.00			120.40			109.60			90.00			14.80			17.50

APPENDIX F TABULATED SURFACE WATER DATA

LocCode	Sampled_Date-Time	Aluminium	Arsenic	Arsenic (Filtered)	Barium	Barium (Filtered)	Beryllium	Beryllium (Filtered)	Boron	Boron (Filtered)	Cadmium	Cadmium (Filtered)	Chromium	Chromium (Filtered)	Copper	Copper (Filtered)	Iron	Iron (Filtered)	Lead	Lead (Filtered)	Magnesium	Magnesium (Filtered)	Manganese	Manganese (Filtered)	Mercury	Mercury (Filtered)	Molybdenum	Molybdenum (Filtered)	Nickel	Nickel (Filtered)	Selenium	Selenium (Filtered)	Silver	Silver (Filtered)	Strontium	Strontium (Filtered)	Vanadium	Vanadium (Filtered)	Zinc	Zinc (Filtered)
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L
Environmental Goals - Surface Water			24	24	700	700	100	100	370	370	0.85	0.85	2	2	3.5	3.5	300	300	5	5			1900	1900	0.06	0.06	10	10	17	17	5	5	0.05	0.05					116	116
Up-Stream Monitoring Locations																																								
LDP01	2/07/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LDP01	9/07/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LDP01	16/07/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LDP01	22/07/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LDP01	29/07/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LDP01	6/08/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LDP01	12/08/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LDP01	20/08/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LDP01	27/08/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LDP01	3/09/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LDP01	9/09/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LDP01	17/09/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LDP01	24/09/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LDP01	1/10/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LDP01	9/10/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LDP01	15/10/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LDP01	22/10/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LDP01	29/10/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LDP01	31/10/2019	440	1	-	25	-	<1	-	60	-	<0.1	-	<1	-	<100	-	300	-	<1	-	10.3	-	154	-	<0.04	-	7	-	5	-	0.6	-	<1	-	0.082	-	<10	-	18	-
LDP01	5/11/2019	660	2	-	26	-	<1	-	<50	-	<0.1	-	1	-	<100	-	500	-	2	-	10.1	-	148	-	<0.04	-	6	-	6	-	0.9	-	<1	-	0.076	-	<10	-	31	-
LDP01	12/11/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.82	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LDP01	19/11/2019	240	1	1	27	-	<1	-	50	<50	<0.1	-	<1	-	10	7	202	58	<1	-	9.84	-	224	85	<0.04	-	8	-	5	4	0.8	-	<1	-	0.082	-	<10	<10	15	<5
LDP01	26/11/2019	790	2	1	25	-	<1	-	60	60	<0.1	-	1	-	12	8	654	100	1	-	8.18	-	143	92	<0.04	-	7	-	6	4	0.8	-	<1	-	0.056	-	<10	<10	26	8
LDP01	3/12/2019	390	2	1	25	-	<1	-	<50	50	0.1	-	<1	-	10	6	683	87	<1	-	9.3	-	175	125	<0.04	-	8	-	5	4	0.8	-	<1	-	0.068	-	<10	<10	18	<5
LDP01	10/12/2019	490	3	1	28	28	<1	<1	<50	<50	<0.1	<0.1	<1	<1	8	5	456	119	<1	<1	7.77	7.77	242	188	<0.04	<0.04	8	8	6	4	0.8	0.8	<1	<1	0.008	0.01	<10	<10	16	<5
LDP01	18/12/2019	200	1	1	29	-	<1	-	60	70	<0.1	-	<1	-	5	6	413	61	<1	-	10.4	-	152	95	<0.04	-	11	-	4	4	0.6	-	<1	-	0.085	-	<10	<10	8	<5
LDP01	31/12/2019	170	2	1	33	-	<1	-	70	60	<0.1	-	<1	-	8	8	178	16	<1	-	11.3	-	125	<1	<0.04	-	17	-	6	4	0.6	-	<1	-	0.096	-	<10	<10	12	8
LDP01	7/01/2020	130	2	1	34	-	<1	-	70	130	<0.1	-	<1	-	5	4	156	16	<1	-	10.8	-	77	2	<0.04	-	10	-	4	4	0.7	-	<1	-	0.097	-	<10	<10	8	8
LDP01	14/01/2020	110	1	1	31	-	<1	-	90	80	<0.1	-	<1	-	4	2	128	10	<1	-	10.5	-	59	<1	<0.04	-	12	-	5	4	0.7	-	<1	-	0.094	-	<10	<10	<5	<5
LDP01	21/01/2020	1180	2	1	29	-	<1	-	90	90	0.1	-	2	-	12	5	1240	86	2	-	8.03	-	104	<1	<0.04	-	6	-	7	4	0.6	-	<1	-	0.067	-	<10	<10	44	7
LDP01	29/01/2020	1850	3	<1	42	-	<1	-	60	60	0.1	-	2	-	14	4	2600	60	5	-	8.02	-	138	<1	<0.04	-	7	-	10	3	0.9	-	<1	-	0.067	-	<10	<10	44	<5
LDP01	4/02/2020	620	2	<1	27	-	<1	-	50	50	<0.1	-	1	-	8	4	704	52	1	-	8.4	-	64	<1	<0.04	-	12	-	5	3	0.7	-	<1	-	0.072	-	<10	<10	20	7
LDP01	11/02/2020	2790	3	<1	39	-	<1	-	50	50	0.2	-	3	-	12	3	2070	149	6	-	8.99	-	176	76	<0.04	-	3	-	14	13	0.4	-	<1	-	0.061	-	<10	<10	78	18
LDP01	17/02/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LDP01	2/03/2020	840	3	2	-	24	-	<1	-	90	-	0.1	-	<1	-	5	-	156	-	2	-	10.6	-	8	<0.04	-	-	27	-	7	-	0.8	-	<1	0.067	-	<10	<10	22	<5
LDP01	9/03/2020	-	-	<1	-	19	<1	-	<50	<50	<0.1	-	1	-	8	4	866	135	1	-	6.34	-	68	6	-	<0.04	4	-	8	4	0.4	-	<1	-	0.044	-	<10	<10	30	15
LDP01	16/03/2020	550	<1	<1	19	-	<1	-	50	<50	0.1	-	<1	-	4	<1	706	54	<1	-	7.32	-	110	<1	<0.04	-	5	-	9	5	1.9	-	-	-	0.048	-	<10	<10	34	6
LDP01	23/03/2020	210	1	<1	<20	-	<1	-	110	110	0.1	-	<1	-	-	3	-	<51	-	<1	-	9.66	-	7	<0.04	-	-	8	-	6	-	1.5	-	<1	-	<0.058	-	<10	-	11
LDP01	30/03/2020	-	-	1	-	<40	-	<1	-	70	-	0.2	-	4	-	4	-	73	-	7	7.93	-	166	<1	-	<0.04	6	-	14	4	<1	-	<1	-	0.074	-	<10	<10	75	9
LDP01	6/04/2020	1560	<2	<1	22	-	<1	-	70	70	<0.1	-	2	-	10	5	1490	163	3	-	5.5	-	86	<2	-	<0.04	2	-	10	5	<0.4	-	<1	-	0.037	-	<10	<10	<41	16
LDP01	14/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LDP01	20/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	**110**	**1**	**1**	**19**	**19**	**0**	**0**	**50**	**50**	**0.1**	**0.1**	**1**	**4**	**4**	**2**	**128**	**10**	**1**	**2**	**5.5**	**7.77**	**59**	**2**	**0**	**0**	**2**	**8**	**4**	**3**	**0.4**	**0.8**	**0**	**0**	**0.008**	**0.01**	**0**	**0**	**8**	**6**
	Max	**2790**	**3**	**2**	**42**	**28**	**0**	**0**	**110**	**130**	**0.2**	**0.2**	**3**	**4**	**14**	**8**	**2600**	**163**	**6**	**7**	**11.3**	**10.6**	**242**	**188**	**0**	**0**	**17**	**27**	**14**	**13**	**1.9**	**1.5**	**0**	**0**	**0.097**	**0.01**	**0**	**0**	**78**	**18**
	Mean	**734.4**	**1.9**	**1.1**	**28.8**	**23.7**	**-**	**-**	**67.1**	**74.3**	**0.1**	**0.2**	**1.6**	**4.0**	**8.7**	**4.9**	**785.1**	**82.1**	**2.6**	**4.5**	**8.9**	**9.3**	**133.9**	**68.4**	**-**	**-**	**7.7**	**14.3**	**7.2**	**4.8**	**0.8**	**1.0**	**-**	**-**	**0.1**	**0.0**	**-**	**-**	**29.4**	**10.3**
LMP01	2/07/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	9/07/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	16/07/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	18/07/2019	140	<1	-	53	-	<1	-	210	-	<0.1	-	<1	-	33	25	506	152	<1	-	20.2	-	286	260	<0.04	-	4	-	13	-	0.4	-	<1	-	0.175	-	<10	<10	63	55
LMP01	22/07/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	29/07/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	6/08/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	12/08/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	20/08/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	22/08/2019	250	<1	-	30	-	<1	-	190	-	<0.1	-	<1	-	20	10	406	91	<1	-	13.9	-	112	23	<0.04	-	5	-	6	-	0.5	-	<1	-	0.106	-	<10	<10	28	14
LMP01	27/08/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

		Aluminium	Arsenic	Arsenic (Filtered)	Barium	Barium (Filtered)	Beryllium	Beryllium (Filtered)	Boron	Boron (Filtered)	Cadmium	Cadmium (Filtered)	Chromium	Chromium (Filtered)	Copper	Copper (Filtered)	Iron	Iron (Filtered)	Lead	Lead (Filtered)	Magnesium	Magnesium (Filtered)	Manganese	Manganese (Filtered)	Mercury	Mercury (Filtered)	Molybdenum	Molybdenum (Filtered)	Nickel	Nickel (Filtered)	Selenium	Selenium (Filtered)	Silver	Silver (Filtered)	Strontium	Strontium (Filtered)	Vanadium	Vanadium (Filtered)	Zinc	Zinc (Filtered)
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L
Environmental Goals - Surface Water			24	24	700	700	100	100	370	370	0.85	0.85	2	2	3.5	3.5	300	300	5	5			1900	1900	0.06	0.06	10	10	17	17	5	5	0.05	0.05					116	116
LMP01	3/09/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	9/09/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	17/09/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	19/09/2019	1360	2	-	29	-	<1	-	70	-	<0.1	-	2	-	16	6	1830	110	3	-	8.82	-	121	22	<0.04	-	4	-	9	-	0.7	-	<1	-	0.068	-	<10	<10	56	14
LMP01	24/09/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	1/10/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	9/10/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	15/10/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	22/10/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	24/10/2019	420	<1	-	26	-	<1	-	110	-	<0.1	-	<1	-	11	-	533	-	1	-	11.6	-	103	-	<0.04	-	6	-	4	-	0.5	-	<1	-	0.085	-	<10	-	22	-
LMP01	29/10/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	20/02/2020	3110	6	-	42	-	<1	-	80	-	0.2	-	4	-	16	6	3480	212	8	-	9.48	-	208	33	<0.04	-	13	-	17	-	0.9	-	<1	-	0.067	-	<10	<10	79	8
LMP01	24/02/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	2/03/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	9/03/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	16/03/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	23/03/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	30/03/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	20/04/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	11/05/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	18/05/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	25/05/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	1/06/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	9/06/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	15/06/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	22/06/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LMP01	29/06/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	**140**	**2**	**0**	**26**	**0**	**0**	**0**	**70**	**0**	**0.2**	**0**	**2**	**0**	**11**	**6**	**406**	**91**	**1**	**0**	**8.82**	**0**	**103**	**22**	**0**	**0**	**4**	**0**	**4**	**0**	**0.4**	**0**	**0**	**0**	**0.067**	**0**	**0**	**0**	**22**	**8**
	Max	**3110**	**6**	**0**	**53**	**0**	**0**	**0**	**210**	**0**	**0.2**	**0**	**4**	**0**	**33**	**25**	**3480**	**212**	**8**	**0**	**20.2**	**0**	**286**	**260**	**0**	**0**	**13**	**0**	**17**	**0**	**0.9**	**0**	**0**	**0**	**0.175**	**0**	**0**	**0**	**79**	**55**
	Mean	**1056.0**	**4.0**	**-**	**36.0**	**-**	**-**	**-**	**132.0**	**-**	**0.2**	**-**	**3.0**	**-**	**19.2**	**11.8**	**1351.0**	**141.3**	**4.0**	**-**	**12.8**	**-**	**166.0**	**84.5**	**-**	**-**	**6.4**	**-**	**9.8**	**-**	**0.6**	**-**	**-**	**-**	**0.1**	**-**	**-**	**-**	**49.6**	**22.8**
Mid-Stream Monitoring Locations																																								
NC01	17/07/2019	60	<1	-	30	-	<1	-	50	-	<0.1	-	<1	-	5	2	788	365	<1	-	13.1	-	219	196	<0.04	-	2	-	3	-	<0.2	-	<1	-	0.09	-	<10	<10	7	<5
NC01	22/08/2019	40	<1	-	32	-	<1	-	80	-	<0.1	-	<1	-	2	<1	666	125	<1	-	14.9	-	150	103	<0.04	-	2	-	2	-	<0.2	-	<1	-	0.102	-	<10	<10	<5	<5
NC01	19/09/2019	660	1	-	25	-	<1	-	70	-	<0.1	-	<1	-	5	2	1070	154	2	-	10.2	-	198	59	<0.04	-	2	-	4	-	0.3	-	<1	-	0.067	-	<10	<10	14	5
NC01	23/10/2019	70	<1	-	51	-	<1	-	60	-	<0.1	-	<1	-	<1	-	1040	-	<1	-	10.6	-	859	-	<0.04	-	1	-	3	-	0.2	-	<1	-	0.089	-	<10	-	74	-
NC01	20/02/2020	1660	2	-	43	-	<1	-	90	-	<0.1	-	<1	-	4	1	3560	238	2	-	11.6	-	425	248	<0.04	-	7	-	10	-	0.6	-	<1	-	0.078	-	<10	<10	46	11
	Min	**40**	**1**	**0**	**25**	**0**	**0**	**0**	**50**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**666**	**125**	**2**	**0**	**10.2**	**0**	**150**	**59**	**0**	**0**	**1**	**0**	**2**	**0**	**0.2**	**0**	**0**	**0**	**0.067**	**0**	**0**	**0**	**7**	**5**
	Max	**1660**	**2**	**0**	**51**	**0**	**0**	**0**	**90**	**0**	**0**	**0**	**0**	**0**	**5**	**2**	**3560**	**365**	**2**	**0**	**14.9**	**0**	**859**	**248**	**0**	**0**	**7**	**0**	**10**	**0**	**0.6**	**0**	**0**	**0**	**0.102**	**0**	**0**	**0**	**74**	**11**
	Mean	**498.0**	**1.5**	**-**	**36.2**	**-**	**-**	**-**	**70.0**	**-**	**-**	**-**	**-**	**-**	**4.0**	**1.7**	**1424.8**	**220.5**	**2.0**	**-**	**12.1**	**-**	**370.2**	**151.5**	**-**	**-**	**2.8**	**-**	**4.4**	**-**	**0.4**	**-**	**-**	**-**	**0.1**	**-**	**-**	**-**	**35.3**	**8.0**
C	11/07/2019	40	<1	-	26	-	-	-	60	-	<0.1	-	<1	-	3	-	553	-	<1	-	13.4	-	163	-	<0.04	-	2	-	3	-	<0.2	-	<1	-	-	-	-	-	<5	-
C	14/08/2019	50	<1	-	29	-	-	-	50	-	<0.1	-	<1	-	8	-	584	-	<1	-	16.2	-	188	-	<0.04	-	2	-	5	-	0.2	-	<1	-	-	-	-	-	11	-
C	11/09/2019	70	<1	-	33	-	-	-	70	-	<0.1	-	<1	-	3	-	647	-	<1	-	14.3	-	222	-	<0.04	-	2	-	4	-	<0.2	-	<1	-	-	-	-	-	6	-
C	16/10/2019	390	<1	-	33	-	-	-	60	-	<0.1	-	<1	-	<1	-	651	-	<1	-	12.4	-	388	-	<0.04	-	<1	-	2	-	<0.2	-	<1	-	-	-	-	-	<5	-
C	13/11/2019	610	<1	<1	42	32	-	-	50	<50	<0.1	<0.1	<1	<1	<1	<1	887	119	<1	<1	12.5	11	661	400	<0.04	-	1	2	2	2	0.2	<0.2	<1	<1	-	-	-	-	<5	<5
C	12/02/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	19/03/2020	160	<1	<1	27	24	-	-	60	60	<0.1	<0.1	<1	<1	<1	<1	1850	939	<1	<1	9.58	9.3	344	321	<0.04	-	2	2	6	4	0.4	0.3	<1	<1	-	-	-	-	8	<5
	Min	**40**	**0**	**0**	**26**	**24**	**0**	**0**	**50**	**60**	**0**	**0**	**0**	**0**	**3**	**0**	**553**	**119**	**0**	**0**	**9.58**	**9.3**	**163**	**321**	**0**	**0**	**1**	**2**	**2**	**2**	**0.2**	**0.3**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**0**
	Max	**610**	**0**	**0**	**42**	**32**	**0**	**0**	**70**	**60**	**0**	**0**	**0**	**0**	**8**	**0**	**1850**	**939**	**0**	**0**	**16.2**	**11**	**661**	**400**	**0**	**0**	**2**	**2**	**6**	**4**	**0.4**	**0.3**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**0**
	Mean	**220.0**	**-**	**-**	**31.7**	**28.0**	**-**	**-**	**58.3**	**60.0**	**-**	**-**	**-**	**-**	**4.7**	**-**	**862.0**	**529.0**	**-**	**-**	**13.1**	**10.2**	**327.7**	**360.5**	**-**	**-**	**1.8**	**2.0**	**3.7**	**3.0**	**0.3**	**0.3**	**-**	**-**	**-**	**-**	**-**	**-**	**8.3**	**-**
E	11/07/2019	<10	<1	-	21	-	-	-	<50	-	<0.1	-	<1	-	<1	-	674	-	<1	-	25.4	-	498	-	<0.04	-	<1	-	20	-	<0.2	-	<1	-	-	-	-	-	<5	-
E	14/08/2019	<10	<1	-	24	-	-	-	<50	-	<0.1	-	<1	-	<1	-	2790	-	<1	-	31	-	717	-	<0.04	-	<1	-	44	-	<0.2	-	<1	-	-	-	-	-	<5	-
E	11/09/2019	20	<1	-	26	-	-	-	60	-	<0.1	-	<1	-	<1	-	1550	-	<1	-	35.4	-	1060	-	<0.04	-	<1	-	64	-	<0.2	-	<1	-	-	-	-	-	23	-
E	16/10/2019	80	<1	-	34	-	-	-	210	-	<0.1	-	<1	-	4	-	2870	-	<1	-	106	-	3890	-	<0.04	-	1	-	243	-	<0.2	-	<1	-	-	-	-	-	34	-
E	13/11/2019	20	<1	<1	31	29	-	-	260	260	<0.1	<0.1	<1	<1	<1	<1	2770	699	<1	<1	148	124	5330	5090	<0.04	-	<1	<1	337	328	<0.2	<0.2	<1	<1	-	-	-	-	14	14
E	15/01/2020	30	<1	<1	35	35	-	-	1340	1340	<0.1	<0.1	<1	<1	<1	<1	<2	<2	<1	<1	632	632	22,300	22,300	<0.04	-	<1	<1	1330	1330	0.4	<0.2	<1	<1	-	-	-	-	7	7
E	12/02/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E	19/03/2020	40	<1	<1	22	20	-	-	100	100	<0.1	<0.1	4	<1	<1	<1	1010	344	<1	<1	27.9	26.2	881	817	<0.04	-	<1	<1	52	48	0.3	0.2	<1	<1	-	-	-	-	6	<5

		Aluminium	Arsenic	Arsenic (Filtered)	Barium	Barium (Filtered)	Beryllium	Beryllium (Filtered)	Boron	Boron (Filtered)	Cadmium	Cadmium (Filtered)	Chromium	Chromium (Filtered)	Copper	Copper (Filtered)	Iron	Iron (Filtered)
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Environmental Goals - Surface Water			24	24	700	700	100	100	370	370	0.85	0.85	2	2	3.5	3.5	300	300
	Min	**20**	**0**	**0**	**21**	**20**	**0**	**0**	**60**	**100**	**0**	**0**	**4**	**0**	**4**	**0**	**674**	**344**
	Max	**80**	**0**	**0**	**35**	**35**	**0**	**0**	**1340**	**1340**	**0**	**0**	**4**	**0**	**4**	**0**	**2870**	**699**
	Mean	**38.0**	**-**	**-**	**27.6**	**28.0**	**-**	**-**	**394.0**	**566.7**	**-**	**-**	**4.0**	**-**	**4.0**	**-**	**1944.0**	**521.5**
Downstream Monitoring Locations																		
WX22	24/07/2019	<10	<1	-	34	-	-	-	80	-	<0.1	-	<1	-	<1	<1	168	95
WX22	28/08/2019	<10	<1	-	50	-	-	-	110	-	<0.1	-	<1	-	<1	<1	105	87
WX22	25/09/2019	30	<1	-	20	-	-	-	90	-	<0.1	-	<1	-	3	<1	179	95
WX22	30/10/2019	30	<1	-	81	-	-	-	240	-	<0.1	-	<1	-	<1	-	674	-
WX22	6/11/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WX22	27/11/2019	80	<1	-	57	-	-	-	390	-	<0.1	-	<1	-	<1	<1	809	95
WX22	22/01/2020	130	<1	<1	31	31	-	-	470	-	<0.1	<0.1	<1	<1	1	1	648	80
WX22	26/02/2020	20	<1	-	36	-	-	-	130	-	<0.1	-	<1	-	<1	<1	1000	596
WX22	25/03/2020	<10	<1	-	<27	-	-	-	70	-	<0.1	-	<1	-	<1	<1	1050	<550
WX22	24/06/2020	130	<1	-	14	-	-	-	60	-	<0.1	-	<1	-	<1	<1	319	85
	Min	**20**	**0**	**0**	**14**	**31**	**0**	**0**	**60**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**105**	**80**
	Max	**130**	**0**	**0**	**81**	**31**	**0**	**0**	**470**	**0**	**0**	**0**	**0**	**0**	**3**	**1**	**1050**	**596**
	Mean	**70.0**	**-**	**-**	**40.4**	**31.0**	**-**	**-**	**182.2**	**-**	**-**	**-**	**-**	**-**	**2.0**	**1.0**	**550.2**	**161.9**
G	11/07/2019	<10	<1	-	25	-	-	-	<50	-	<0.1	-	<1	-	<1	-	171	-
G	14/08/2019	<10	<1	-	28	-	-	-	50	-	<0.1	-	<1	-	<1	-	196	-
G	11/09/2019	<10	<1	-	52	-	-	-	100	-	<0.1	-	<1	-	<1	-	129	-
G	16/10/2019	30	<1	-	46	-	-	-	120	-	<0.1	-	<1	-	<1	-	198	-
G	13/11/2019	20	<1	<1	72	69	-	-	200	190	<0.1	<0.1	<1	<1	<1	<1	295	84
G	12/02/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
G	19/03/2020	20	<1	<1	20	20	-	-	80	80	<0.1	<0.1	<1	<1	<1	<1	618	264
	Min	**20**	**0**	**0**	**20**	**20**	**0**	**0**	**50**	**80**	**0**	**0**	**0**	**0**	**0**	**0**	**129**	**84**
	Max	**30**	**0**	**0**	**72**	**69**	**0**	**0**	**200**	**190**	**0**	**0**	**0**	**0**	**0**	**0**	**618**	**264**
	Mean	**23.3**	**-**	**-**	**40.5**	**44.5**	**-**	**-**	**110.0**	**135.0**	**-**	**-**	**-**	**-**	**-**	**-**	**267.8**	**174.0**
		31	31	15	31	15	9	9	31	14	31	15	31	15	31	22	31	22
		26	9	9	30	15	9	9	29	13	9	9	10	9	15	10	30	20
		<10	0	0	14	20	0	0	<50	0	0	0	0	0	<1	0	<2	<2
		20	ND	ND	14	20	ND	ND	50	60	ND	ND	4	ND	1	1	105	80
		610	<1	<1	81	35	0	0	1340	1340	<0.1	<0.1	4	<1	8	1	2870	939
		610	ND	ND	81	35	ND	ND	1340	1340	ND	ND	4	ND	8	1	2870	939
		103	0.39	0.25	33	29	0	0	216	306	0.039	0.025	0.91	0.25	2.1	0.5	1040	341
		40	0.5	0.25	31	31	0	0	70	60	0.05	0.025	0.5	0.25	0.5	0.5	674	218.4285714
		157	0.21	0.26	16	4.8	0	0	327	483	0.021	0.026	1.3	0.26	2.1	0.32	854	298
		0	0	0	0	0	0	0	6	3	0	0	4	0	7	0	26	11
		0	0	0	0	0	0	0	6	3	0	0	4	0	7	0	26	10

		Lead	Lead (Filtered)	Magnesium	Magnesium (Filtered)	Manganese	Manganese (Filtered)	Mercury	Mercury (Filtered)	Molybdenum	Molybdenum (Filtered)	Nickel	Nickel (Filtered)	Selenium	Selenium (Filtered)	Silver	Silver (Filtered)	Strontium	Strontium (Filtered)	Vanadium	Vanadium (Filtered)	Zinc	Zinc (Filtered)
		µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L
Environmental Goals - Surface Water		5	5			1900	1900	0.06	0.06	10	10	17	17	5	5	0.05	0.05					116	116
	Min	**0**	**0**	**25.4**	**26.2**	**498**	**817**	**0**	**0**	**1**	**0**	**20**	**48**	**0.3**	**0.2**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**7**
	Max	**0**	**0**	**632**	**632**	**22300**	**22300**	**0**	**0**	**1**	**0**	**1330**	**1330**	**0.4**	**0.2**	**0**	**0**	**0**	**0**	**0**	**0**	**34**	**14**
	Mean	**-**	**-**	**143.7**	**260.7**	**4953.7**	**9402.3**	**-**	**-**	**1.0**	**-**	**298.6**	**568.7**	**0.4**	**0.2**	**-**	**-**	**-**	**-**	**-**	**-**	**16.8**	**10.5**
Downstream Monitoring Locations																							
WX22	24/07/2019	<1	-	38	-	249	238	<0.04	-	<1	-	28	-	<0.2	-	<1	-	0.198	-	<10	<10	<5	5
WX22	28/08/2019	<1	-	52.3	-	198	192	<0.04	-	<1	-	46	-	<0.2	-	<1	-	0.295	-	<10	<10	6	<5
WX22	25/09/2019	<1	-	27.1	-	176	177	<0.04	-	<1	-	22	-	<0.2	-	<1	-	0.154	-	<10	<10	11	6
WX22	30/10/2019	<1	-	95.2	-	1430	-	0.14	-	<1	-	112	-	<0.2	-	<1	-	0.549	-	<10	-	43	-
WX22	6/11/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WX22	27/11/2019	<1	-	138	-	1680	1580	<0.04	-	<1	-	122	-	<0.2	-	<1	-	0.745	-	<10	<10	46	44
WX22	22/01/2020	<1	<1	166	166	9060	8620	<0.04	-	<1	<1	195	195	0.4	0.4	<1	<1	0.896	0.9	<10	<10	142	133
WX22	26/02/2020	<1	-	27.4	-	3260	3040	<0.04	-	<1	-	120	-	<0.2	-	<1	-	0.194	-	<10	<10	114	112
WX22	25/03/2020	<1	-	<23.8	-	1770	1660	<0.04	-	<1	-	<53	-	<0.2	-	<1	-	0.134	-	<10	<10	<16	<14
WX22	24/06/2020	<1	-	17.1	-	156	151	<0.04	-	1	-	15	-	<0.2	-	<1	-	0.097	-	<10	<10	10	<5
	Min	**0**	**0**	**17.1**	**166**	**156**	**151**	**0.14**	**0**	**1**	**0**	**15**	**195**	**0.4**	**0.4**	**0**	**0**	**0.097**	**0.9**	**0**	**0**	**6**	**5**
	Max	**0**	**0**	**166**	**166**	**9060**	**8620**	**0.14**	**0**	**1**	**0**	**195**	**195**	**0.4**	**0.4**	**0**	**0**	**0.896**	**0.9**	**0**	**0**	**142**	**133**
	Mean	**-**	**-**	**70.1**	**166.0**	**1997.7**	**1957.3**	**0.1**	**-**	**1.0**	**-**	**82.5**	**195.0**	**0.4**	**0.4**	**-**	**-**	**0.4**	**0.9**	**-**	**-**	**53.1**	**60.0**
G	11/07/2019	<1	-	28.3	-	110	-	<0.04	-	<1	-	19	-	<0.2	-	<1	-	-	-	-	-	<5	-
G	14/08/2019	<1	-	36.2	-	92	-	<0.04	-	<1	-	26	-	<0.2	-	<1	-	-	-	-	-	8	-
G	11/09/2019	<1	-	57.4	-	174	-	<0.04	-	<1	-	51	-	<0.2	-	<1	-	-	-	-	-	5	-
G	16/10/2019	<1	-	61.3	-	349	-	<0.04	-	<1	-	50	-	<0.2	-	<1	-	-	-	-	-	13	-
G	13/11/2019	<1	<1	113	112	301	253	<0.04	-	<1	<1	85	84	<0.2	<0.2	<1	<1	-	-	-	-	10	10
G	12/02/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
G	19/03/2020	<1	<1	18.7	18.2	1250	1180	<0.04	-	<1	<1	43	40	0.2	<0.2	<1	<1	-	-	-	-	16	14
	Min	**0**	**0**	**18.7**	**18.2**	**92**	**253**	**0**	**0**	**0**	**0**	**19**	**40**	**0.2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**10**
	Max	**0**	**0**	**113**	**112**	**1250**	**1180**	**0**	**0**	**0**	**0**	**85**	**84**	**0.2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**16**	**14**
	Mean	**-**	**-**	**52.5**	**65.1**	**379.3**	**716.5**	**-**	**-**	**-**	**-**	**45.7**	**62.0**	**0.2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**10.4**	**12.0**
		31	15	31	15	31	22	31	10	31	15	31	15	31	15	31	15	18	10	18	17	31	22
		9	9	30	15	31	22	10	10	16	11	30	15	15	12	9	9	18	10	9	9	24	16
		0	0	9.58	9.3	156	151	0	0	<1	0	2	2	<0.2	<0.2	0	0	0	0	0	0	<5	0
		ND	ND	9.58	9.3	156	151	0.14	ND	1	2	2	2	0.2	0.2	ND	ND	0.097	0.9	ND	ND	6	5
		<1	<1	632	632	22300	22300	0.14	0	2	2	1330	1330	0.4	0.4	<1	<1	0.896	0.9	<10	<10	142	133
		ND	ND	632	632	22300	22300	0.14	ND	2	2	1330	1330	0.4	0.4	ND	ND	0.896	0.9	ND	ND	142	133
		0.39	0.25	89	161	3056	4042	0.034	0	0.95	0.92	153	297	0.21	0.26	0.39	0.25	0.29	0.45	3	2.9	25	27
		0.5	0.25	27.4	124	661	817	0.02	0	1	0.5	28	195	0.1	0.3	0.5	0.25	0.174	0.45	5	5	8.333	7
		0.21	0.26	154	208	5670	6614	0.044	0	0.56	0.91	327	448	0.13	0.11	0.21	0.26	0.31	0.48	2.5	2.6	38	44
		0	0	0	0	9	8	4	0	0	0	20	10	0	0	22	6	0	0	0	0	2	2
		0	0	0	0	9	8	4	0	0	0	19	10	0	0	0	0	0	0	0	0	2	2

LocCode	Sampled_Date-Time	Bicarbonate Alkalinity (as CaCO3)	Bicarbonate Alkalinity (as CaCO3) (Filtered)	Total Alkalinity (as CaCO3)	Total Alkalinity (as CaCO3) (Filtered)	Chloride	Chloride (Filtered)	Chlorine (Free Residual) (Filtered)	Fluoride	Fluoride (Filtered)	Calcium	Calcium (Filtered)	Calcium (CaCO3)	Calcium (CaCO3) (Filtered)	Organic Carbon (C)	Organic Carbon (C) (Filtered)	Phenolphthalein Alkalinity (CaCO3)	Phenolphthalein Alkalinity (CaCO3) (Filtered)	Potassium	Potassium (Filtered)	Total Phosphate (PO4)	Total Phosphate (PO4) (Filtered)	Sodium	Sodium (Filtered)	Total Hardness (CaCO3)	Total Hardness (CaCO3) (Filtered)	Phosphorus	Phosphorus (Filtered)	Silica (Total)	Silica (Total) (Filtered)	Silica, Molybdate Reactive (Dissolved)	Silica, Molybdate Reactive (Dissolved) (Filtered)	Sulfate (as SO4)	Sulfate (as SO4) (Filtered)	Nitrate (as N)	Nitrate (as N) (Filtered)	Nitrite (as N)	Nitrite (as N) (Filtered)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Environmental Goals - Surface Water						350	350		1.5	1.5																							1000	1000				
Up-Stream Monitoring Locations																																						
LDP01	2/07/2019	-	-	69	-	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2400	-	150	-	-	-	-	-
LDP01	9/07/2019	-	-	-	-	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	140	-	-	-	-	-
LDP01	16/07/2019	-	-	-	-	54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	450	-	-	-	-	-
LDP01	22/07/2019	-	-	-	-	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	220	-	-	-	-	-
LDP01	29/07/2019	-	-	-	-	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	180	-	-	-	-	-
LDP01	6/08/2019	-	-	88	-	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2200	-	230	-	-	-	-	-
LDP01	12/08/2019	-	-	-	-	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	220	-	-	-	-	-
LDP01	20/08/2019	-	-	-	-	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	-	-	-	-	-
LDP01	27/08/2019	-	-	-	-	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	260	-	-	-	-	-
LDP01	3/09/2019	-	-	98	-	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2000	-	220	-	-	-	-	-
LDP01	9/09/2019	-	-	-	-	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	190	-	-	-	-	-
LDP01	17/09/2019	-	-	-	-	58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	110	-	-	-	-	-
LDP01	24/09/2019	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	75	-	-	-	-	-
LDP01	1/10/2019	-	-	84	-	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3000	-	78	-	-	-	-	-
LDP01	9/10/2019	-	-	-	-	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	69.6	-	-	-	-	-
LDP01	15/10/2019	-	-	-	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-	-	-	-
LDP01	22/10/2019	-	-	-	-	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	-	-	-
LDP01	29/10/2019	-	-	-	-	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	77	-	-	-	-	-
LDP01	31/10/2019	140	-	140	-	12	-	-	0.4	-	24.2	-	100	-	6	-	<10	-	6.07	-	<0.1	-	53.9	-	420	-	0.03	-	2900	-	2200	-	86	-	0.06	-	<0.01	-
LDP01	5/11/2019	130	-	127 - 130	-	17	-	-	0.3	-	23.4	-	60	-	5	-	<10	-	6.71	-	0.25	-	56.5	-	200	-	0.08	-	4800	-	2400	-	97	-	0.13	-	<0.01	-
LDP01	12/11/2019	1000	-	1000	-	14	-	-	0.4	-	24.3	-	60	-	-	-	<10	-	6.11	-	-	-	59.3	-	160	-	-	-	-	-	1400	-	130	-	-	-	-	-
LDP01	19/11/2019	140	-	140	-	16	-	-	0.3	-	21.2	-	54	-	5	5	<10	-	5.17	-	<0.1	<0.1	56.1	-	140	-	<0.01	<0.01	2800	-	2100	-	120	-	0.09	-	<0.01	-
LDP01	26/11/2019	110	110	110	110	14	-	-	0.3	-	19.2	-	48	-	3	4	<10	<10	4.93	-	0.24	0.11	49.4	-	100	-	0.08	0.04	4900	-	2300	2300	79	79	0.13	-	<0.01	-
LDP01	3/12/2019	110	110	120	120	14	-	-	0.4	-	22.5	-	110	-	6	5	<10	<10	5.54	-	0.14	0.12	51.3	-	120	-	0.04	0.04	3800	-	2500	2500	99	99	0.1	-	<0.01	-
LDP01	10/12/2019	170	170	170	170	16	16	-	0.4	0.4	20.3	20.3	60	60	8	8	<10	<10	4.83	4.83	0.1	<0.1	52.1	52.1	120	120	0.03	<0.01	3300	3300	2400	2400	98	98	0.07	0.07	0.01	0.01
LDP01	18/12/2019	140	140	140	140	13	-	-	0.4	-	24.9	-	60	-	6	6	<10	<10	5.55	-	<0.1	<0.1	58.1	-	120	-	0.02	0.02	2600	-	2300	2300	93	93	0.07	-	<0.01	-
LDP01	31/12/2019	160	160	160	160	14	-	-	0.4	-	27.8	-	68	-	5	6	<10	<10	6.36	-	<0.1	<0.1	65.8	-	130	-	0.02	<0.01	2800	-	2300	2300	98	98	0.03	-	<0.01	-
LDP01	7/01/2020	170	170	170	170	14	-	-	0.4	-	26	-	68	-	6	6	<10	<10	6.64	-	<0.1	<0.1	71.6	-	170	-	0.02	<0.01	2000	-	1800	1800	98	98	0.11	-	<0.01	-
LDP01	14/01/2020	170	-	180	-	13	-	-	0.4	-	26.5	-	66	-	6	6	<10	-	6.89	-	<0.1	<0.1	67.7	-	120	-	0.03	<0.01	1800	-	1800	1800	86	86	0.02	-	<0.01	-
LDP01	21/01/2020	130	130	130	130	8	-	-	0.4	-	21.7	-	52	-	6	8	<10	<10	6.27	-	0.2	0.1	45.1	-	85	-	0.07	0.03	5900	-	2700	2700	74	74	0.09	-	<0.01	-
LDP01	29/01/2020	110	110	110	110	9	-	-	0.4	-	24.3	-	58	-	7	8	<10	<10	5.67	-	0.24	<0.1	39.9	-	100	-	0.08	0.02	4800	-	2400	2400	91	91	0.16	-	0.01	-
LDP01	4/02/2020	140	140	140	140	8	-	-	0.4	-	25.4	-	56	-	7	7	<10	<10	4.82	-	0.24	<0.1	44.4	-	100	-	0.08	0.02	2600	-	1000	1000	74	74	0.08	-	0.01	-
LDP01	11/02/2020	43	-	43	-	<5	-	-	0.2	-	20.2	-	50	-	6	-	<10	-	6.18	-	<0.1	<0.1	14.6	-	100	-	<0.1	<0.1	14,600	-	5800	5800	92	92	0.34	-	<0.01	-
LDP01	17/02/2020	120	-	230	-	70	-	-	0.5	-	-	-	60	-	-	-	53	-	-	-	-	-	-	-	120	-	-	-	-	-	5900	-	360	-	-	-	-	-
LDP01	2/03/2020	130	-	200	-	60	-	-	0.4	-	-	22.3	52	-	6	7	33	-	-	11.8	3.4	0.14	-	178	100	-	1.11	0.05	-	6700	5100	-	280	-	0.03	-	0.03	-
LDP01	9/03/2020	63	-	-	63	-	12	0.1	-	<0.2	16.2	-	-	-	-	7	-	<10	4.95	-	-	<0.1	27.5	-	-	70	-	0.03	7200	-	-	5900	-	74	-	0.15	-	<0.01
LDP01	16/03/2020	-	75	75	-	16	-	-	-	0.2	17.9	-	44	-	5	4	-	<10	5.2	-	<0.1	<0.1	49	-	90	-	<0.01	0.02	5500	-	-	4700	-	110	0.12	-	<0.01	-
LDP01	23/03/2020	<87	-	87	-	12	-	-	-	0.2	<22.3	-	50	-	3	<3	<10	-	-	6.12	0.12	<0.1	-	62.1	<90	-	<0.04	0.02	-	<5200	4900	-	130	-	<0.01	-	<0.01	-
LDP01	30/03/2020	<76	-	76	-	-	10	-	-	0.2	-	21	-	-	4	<5	<10	-	4.93	-	<0.46	<0.1	<38.8	-	-	84	0.15	0.03	6100	-	5500	-	96	-	-	<0.16	-	<0.01
LDP01	6/04/2020	-	57	-	57	-	<10	<0.1	-	<0.2	13.7	-	-	-	-	<8	-	<10	4.57	-	-	<0.1	<19.2	-	-	<54	-	0.01	8200	-	-	10,000	-	64	-	0.16	0.02	-
LDP01	14/04/2020	-	48	-	<48	<14	-	<0.1	-	<0.2	-	-	50	-	-	-	-	<10	-	-	-	-	-	-	100	-	-	48	-	-	5000	-	170	-	-	-	-	-
LDP01	20/04/2020	75	-	<75	-	14	-	-	-	0.2	-	-	60	-	-	-	<10	-	-	-	-	-	-	-	120	-	-	-	-	-	5300	-	200	-	-	-	-	-
	Min	**43**	**48**	**43**	**57**	**8**	**10**	**0.1**	**0.2**	**0.2**	**13.7**	**20.3**	**44**	**60**	**3**	**4**	**33**	**0**	**4.57**	**4.83**	**0.1**	**0.1**	**14.6**	**52.1**	**85**	**70**	**0.02**	**0.01**	**1800**	**3300**	**1000**	**1000**	**69.6**	**64**	**0.02**	**0.07**	**0.01**	**0.01**
	Max	**1000**	**170**	**1000**	**170**	**70**	**16**	**0.1**	**0.5**	**0.4**	**27.8**	**22.3**	**110**	**60**	**8**	**8**	**53**	**0**	**6.89**	**11.8**	**3.4**	**0.14**	**71.6**	**178**	**420**	**120**	**1.11**	**48**	**14600**	**6700**	**5900**	**10000**	**450**	**110**	**0.34**	**0.16**	**0.03**	**0.01**
	Mean	**171.1**	**118.3**	**163.5**	**124.5**	**22.0**	**12.7**	**0.1**	**0.4**	**0.2**	**22.2**	**21.2**	**61.2**	**60.0**	**5.6**	**6.2**	**43.0**	**-**	**5.7**	**7.6**	**0.5**	**0.1**	**50.7**	**97.4**	**135.8**	**91.3**	**0.1**	**3.7**	**4811.1**	**5000.0**	**3068.0**	**3421.4**	**147.5**	**87.9**	**0.1**	**0.1**	**0.0**	**0.0**
LMP01	2/07/2019	-	-	-	-	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	-	-	-
LMP01	9/07/2019	-	-	-	-	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	150	-	-	-	-	-
LMP01	16/07/2019	-	-	-	-	51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	430	-	-	-	-	-
LMP01	18/07/2019	71	-	71	-	40.5	-	-	0.13	-	39.2	-	-	-	-	-	<1	-	10.6	-	-	-	151	-	-	-	0.03	-	-	-	-	-	340	-	0.1	-	<0.01	-
LMP01	22/07/2019	-	-	-	-	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	230	-	-	-	-	-
LMP01	29/07/2019	-	-	-	-	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	190	-	-	-	-	-
LMP01	6/08/2019	-	-	-	-	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	230	-	-	-	-	-
LMP01	12/08/2019	-	-	-	-	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	210	-	-	-	-	-
LMP01	20/08/2019	-	-	-	-	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	210	-	-	-	-	-
LMP01	22/08/2019	78	-	78	-	23.3	-	-	0.288	-	27.3	-	-	-	-	-	<1	-	7.66	-	-	-	83.6	-	-	-	<0.01	-	-	-	-	-	189	-	0.14	-	<0.01	-
LMP01	27/08/2019	-	-	-	-	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	230	-	-	-	-	-

		Bicarbonate Alkalinity (as CaCO3)	Bicarbonate Alkalinity (as CaCO3) (Filtered)	Total Alkalinity (as CaCO3)	Total Alkalinity (as CaCO3) (Filtered)	Chloride	Chloride (Filtered)	Chlorine (Free Residual) (Filtered)	Fluoride	Fluoride (Filtered)	Calcium	Calcium (Filtered)	Calcium (CaCO3)	Calcium (CaCO3) (Filtered)	Organic Carbon (C)	Organic Carbon (C) (Filtered)	Phenolphthalein Alkalinity (CaCO3)	Phenolphthalein Alkalinity (CaCO3) (Filtered)	Potassium	Potassium (Filtered)	Total Phosphate (PO4)	Total Phosphate (PO4) (Filtered)	Sodium	Sodium (Filtered)	Total Hardness (CaCO3)	Total Hardness (CaCO3) (Filtered)	Phosphorus	Phosphorus (Filtered)	Silica (Total)	Silica (Total) (Filtered)	Silica, Molybdate Reactive (Dissolved)	Silica, Molybdate Reactive (Dissolved) (Filtered)	Sulfate (as SO4)	Sulfate (as SO4) (Filtered)	Nitrate (as N)	Nitrate (as N) (Filtered)	Nitrite (as N)	Nitrite (as N) (Filtered)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Environmental Goals - Surface Water						350	350		1.5	1.5																							1000	1000				
LMP01	3/09/2019	-	-	-	-	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	210	-	-	-	-	-
LMP01	9/09/2019	-	-	-	-	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	-	-	-	-	-
LMP01	17/09/2019	-	-	-	-	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	110	-	-	-	-	-
LMP01	19/09/2019	61	-	61	-	12.9	-	-	<1	-	22.4	-	-	-	-	-	<1	-	5.65	-	-	-	39.3	-	-	-	0.06	-	-	-	-	-	88	-	0.19	-	<0.01	-
LMP01	24/09/2019	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-
LMP01	1/10/2019	-	-	-	-	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-	-
LMP01	9/10/2019	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70.1	-	-	-	-	-
LMP01	15/10/2019	-	-	-	-	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	97	-	-	-	-	-
LMP01	22/10/2019	-	-	-	-	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	110	-	-	-	-	-
LMP01	24/10/2019	99	-	99	-	11.9	-	-	0.138	-	25.3	-	-	-	-	-	<1	-	5.96	-	-	-	45.6	-	-	-	<0.02	-	-	-	-	-	73.8	-	0.1	-	<0.01	-
LMP01	29/10/2019	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	89	-	-	-	-	-
LMP01	20/02/2020	98	-	98	-	24.2	-	-	0.301	-	22.8	-	-	-	-	-	<1	-	9.93	-	-	-	99.8	-	-	-	0.12	-	-	-	-	-	138	-	0.26	-	0.03	-
LMP01	24/02/2020	-	-	-	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	210	-	-	-	-	-
LMP01	2/03/2020	-	-	-	-	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	250	-	-	-	-	-
LMP01	9/03/2020	-	-	-	-	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	230	-	-	-	-	-
LMP01	16/03/2020	-	-	-	-	16	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	110	-	-	-	-
LMP01	23/03/2020	-	-	-	-	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	120	-	-	-	-	-
LMP01	30/03/2020	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	110	-	-	-	-	-
LMP01	20/04/2020	-	-	-	-	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	210	-	-	-	-	-
LMP01	11/05/2020	-	-	-	-	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	210	-	-	-	-	-
LMP01	18/05/2020	-	-	-	-	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	260	-	-	-	-	-
LMP01	25/05/2020	-	-	-	-	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	270	-	-	-	-	-
LMP01	1/06/2020	-	-	-	-	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	260	-	-	-	-	-
LMP01	9/06/2020	-	-	-	-	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	230	-	-	-	-	-
LMP01	15/06/2020	-	-	-	-	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	140	-	-	-	-	-
LMP01	22/06/2020	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	83	-	-	-	-	-
LMP01	29/06/2020	-	-	-	-	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	95	-	-	-	-	-
	Min	**61**	**0**	**61**	**0**	**10**	**16**	**0**	**0.13**	**0**	**22.4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5.65**	**0**	**0**	**0**	**39.3**	**0**	**0**	**0**	**0.03**	**0**	**0**	**0**	**0**	**0**	**52**	**110**	**0.1**	**0**	**0.03**	**0**
	Max	**99**	**0**	**99**	**0**	**55**	**16**	**0**	**0.301**	**0**	**39.2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10.6**	**0**	**0**	**0**	**151**	**0**	**0**	**0**	**0.12**	**0**	**0**	**0**	**0**	**0**	**430**	**110**	**0.26**	**0**	**0.03**	**0**
	Mean	**81.4**	**-**	**81.4**	**-**	**21.9**	**16.0**	**-**	**0.2**	**-**	**27.4**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**8.0**	**-**	**-**	**-**	**83.9**	**-**	**-**	**-**	**0.1**	**-**	**-**	**-**	**-**	**-**	**176.6**	**110.0**	**0.2**	**-**	**0.0**	**-**
Mid-Stream Monitoring Locations																																						
NC01	17/07/2019	72	-	72	-	19.8	-	-	0.143	-	25.6	-	-	-	-	-	<1	-	5.76	-	-	-	53.3	-	-	-	<0.01	-	-	-	-	-	122	-	0.02	-	<0.01	-
NC01	22/08/2019	81	-	81	-	24.1	-	-	0.22	-	29.1	-	-	-	-	-	<1	-	6.37	-	-	-	72.7	-	-	-	<0.01	-	-	-	-	-	175	-	<0.01	-	<0.01	-
NC01	19/09/2019	62	-	62	-	14.3	-	-	1.56	-	23	-	-	-	-	-	<1	-	6.04	-	-	-	38.6	-	-	-	0.05	-	-	-	-	-	83.9	-	0.07	-	<0.01	-
NC01	23/10/2019	114	-	114	-	7.72	-	-	0.223	-	24.4	-	-	-	-	-	<1	-	7.04	-	-	-	37.7	-	-	-	<0.01	-	-	-	-	-	32.2	-	<0.01	-	<0.01	-
NC01	20/02/2020	98	-	98	-	22.8	-	-	<0.05	-	30	-	-	-	-	-	<1	-	9.08	-	-	-	86	-	-	-	0.12	-	-	-	-	-	140	-	0.02	-	0.01	-
	Min	**62**	**0**	**62**	**0**	**7.72**	**0**	**0**	**0.143**	**0**	**23**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5.76**	**0**	**0**	**0**	**37.7**	**0**	**0**	**0**	**0.05**	**0**	**0**	**0**	**0**	**0**	**32.2**	**0**	**0.02**	**0**	**0.01**	**0**
	Max	**114**	**0**	**114**	**0**	**24.1**	**0**	**0**	**1.56**	**0**	**30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9.08**	**0**	**0**	**0**	**86**	**0**	**0**	**0**	**0.12**	**0**	**0**	**0**	**0**	**0**	**175**	**0**	**0.07**	**0**	**0.01**	**0**
	Mean	**85.4**	**-**	**85.4**	**-**	**17.7**	**-**	**-**	**0.5**	**-**	**26.4**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**6.9**	**-**	**-**	**-**	**57.7**	**-**	**-**	**-**	**0.1**	**-**	**-**	**-**	**-**	**-**	**110.6**	**-**	**0.0**	**-**	**0.0**	**-**
C	11/07/2019	79	-	79	-	20.4	-	-	0.155	-	-	-	-	-	-	-	<1	-	6.31	-	-	-	57.8	-	-	-	<0.01	-	-	-	-	-	117	-	0.05	-	<0.01	-
C	14/08/2019	81	-	81	-	24.4	-	-	0.211	-	-	-	-	-	-	-	<1	-	8.18	-	-	-	82.9	-	-	-	<0.01	-	-	-	-	-	174	-	0.05	-	<0.01	-
C	11/09/2019	112	-	112	-	25.4	-	-	0.209	-	-	-	-	-	-	-	<1	-	7.48	-	-	-	73.7	-	-	-	0.01	-	-	-	-	-	171	-	<0.01	-	<0.01	-
C	16/10/2019	136	-	136	-	14	-	-	0.179	-	-	-	-	-	-	-	<1	-	6.26	-	-	-	43.3	-	-	-	0.02	-	-	-	-	-	62.1	-	0.03	-	<0.01	-
C	13/11/2019	167	-	167	-	14.8	-	-	0.224	-	-	-	-	-	-	-	<1	-	7.05	6.36	-	-	51.4	46.2	-	-	0.01	-	-	-	-	-	56.9	-	<0.01	-	<0.01	-
C	12/02/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	19/03/2020	75	-	75	-	11.8	-	-	0.123	-	-	-	-	-	-	-	<1	-	5.27	5.05	-	-	50.9	49.4	-	-	<0.01	-	-	-	-	-	97	-	<0.01	-	<0.01	-
	Min	**75**	**0**	**75**	**0**	**11.8**	**0**	**0**	**0.123**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5.27**	**5.05**	**0**	**0**	**43.3**	**46.2**	**0**	**0**	**0.01**	**0**	**0**	**0**	**0**	**0**	**56.9**	**0**	**0.03**	**0**	**0**	**0**
	Max	**167**	**0**	**167**	**0**	**25.4**	**0**	**0**	**0.224**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8.18**	**6.36**	**0**	**0**	**82.9**	**49.4**	**0**	**0**	**0.02**	**0**	**0**	**0**	**0**	**0**	**174**	**0**	**0.05**	**0**	**0**	**0**
	Mean	**108.3**	**-**	**108.3**	**-**	**18.5**	**-**	**-**	**0.2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**6.8**	**5.7**	**-**	**-**	**60.0**	**47.8**	**-**	**-**	**0.0**	**-**	**-**	**-**	**-**	**-**	**113.0**	**-**	**0.0**	**-**	**-**	**-**
E	11/07/2019	83	-	83	-	48.2	-	-	0.116	-	-	-	-	-	-	-	<1	-	5.57	-	-	-	61.9	-	-	-	<0.01	-	-	-	-	-	187	-	<0.01	-	<0.01	-
E	14/08/2019	87	-	87	-	53.9	-	-	0.116	-	-	-	-	-	-	-	<1	-	6.99	-	-	-	83.2	-	-	-	<0.01	-	-	-	-	-	237	-	<0.01	-	<0.01	-
E	11/09/2019	84	-	84	-	75.2	-	-	0.11	-	-	-	-	-	-	-	<1	-	6.8	-	-	-	99	-	-	-	<0.01	-	-	-	-	-	309	-	0.04	-	<0.01	-
E	16/10/2019	88	-	88	-	222	-	-	<0.1	-	-	-	-	-	-	-	<1	-	15.6	-	-	-	285	-	-	-	<0.01	-	-	-	-	-	771	-	0.05	-	<0.01	-
E	13/11/2019	105	-	105	-	344	-	-	0.117	-	-	-	-	-	-	-	<1	-	20.9	17.8	-	-	348	296	-	-	<0.01	-	-	-	-	-	1200	-	<0.01	-	<0.01	-
E	15/01/2020	86	-	86	-	1660	-	-	<1	-	-	-	-	-	-	-	<1	-	93.6	93.6	-	-	1550	1550	-	-	0.04	-	-	-	-	-	5800	-	<0.01	-	<0.01	-
E	12/02/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E	19/03/2020	71	-	71	-	49.9	-	-	<0.1	-	-	-	-	-	-	-	<1	-	7.86	7.18	-	-	85	79.6	-	-	0.06	-	-	-	-	-	240	-	0.02	-	<0.01	-

		Bicarbonate Alkalinity (as CaCO3)	Bicarbonate Alkalinity (as CaCO3) (Filtered)	Total Alkalinity (as CaCO3)	Total Alkalinity (as CaCO3) (Filtered)	Chloride	Chloride (Filtered)	Chlorine (Free Residual) (Filtered)	Fluoride	Fluoride (Filtered)	Calcium	Calcium (Filtered)	Calcium (CaCO3)	Calcium (CaCO3) (Filtered)	Organic Carbon (C)	Organic Carbon (C) (Filtered)	Phenolphthalein Alkalinity (CaCO3)	Phenolphthalein Alkalinity (CaCO3) (Filtered)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Environmental Goals - Surface Water						350	350		1.5	1.5								
	Min	**71**	**0**	**71**	**0**	**48.2**	**0**	**0**	**0.11**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Max	**105**	**0**	**105**	**0**	**1660**	**0**	**0**	**0.117**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Mean	**86.3**	**-**	**86.3**	**-**	**350.5**	**-**	**-**	**0.1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Downstream Monitoring Locations																		
WX22	24/07/2019	76	-	76	-	67	-	-	<0.1	-	55.3	-	-	-	-	-	<1	-
WX22	28/08/2019	68	-	68	-	95.5	-	-	1.1	-	76.6	-	-	-	-	-	<1	-
WX22	25/09/2019	80	-	80	-	47.6	-	-	0.142	-	41.4	-	-	-	-	-	<1	-
WX22	30/10/2019	82	-	82	-	155	-	-	<0.1	-	144	-	-	-	-	-	<1	-
WX22	6/11/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WX22	27/11/2019	35	-	35	-	191	-	-	<0.1	-	163	-	-	-	-	-	<1	-
WX22	22/01/2020	31	31	31	31	212	212	-	<0.5	<0.5	242	242	-	-	-	-	<1	<1
WX22	26/02/2020	23	-	23	-	38.8	-	-	<0.1	-	51.4	-	-	-	-	-	<1	-
WX22	25/03/2020	56	-	56	-	42.9	-	-	<0.1	-	<39	-	-	-	-	-	<1	-
WX22	24/06/2020	59	-	59	-	31.6	-	-	0.13	-	27.5	-	-	-	-	-	<1	-
	Min	**23**	**31**	**23**	**31**	**31.6**	**212**	**0**	**0.13**	**0**	**27.5**	**242**	**0**	**0**	**0**	**0**	**0**	**0**
	Max	**82**	**31**	**82**	**31**	**212**	**212**	**0**	**1.1**	**0**	**242**	**242**	**0**	**0**	**0**	**0**	**0**	**0**
	Mean	**56.7**	**31.0**	**56.7**	**31.0**	**97.9**	**212.0**	**-**	**0.5**	**-**	**100.2**	**242.0**	**-**	**-**	**-**	**-**	**-**	**-**
G	11/07/2019	79	-	79	-	52.2	-	-	0.103	-	-	-	-	-	-	-	<1	-
G	14/08/2019	72	-	72	-	68.2	-	-	0.119	-	-	-	-	-	-	-	<1	-
G	11/09/2019	79	-	79	-	123	-	-	0.102	-	-	-	-	-	-	-	<1	-
G	16/10/2019	91	-	91	-	113	-	-	0.11	-	-	-	-	-	-	-	<1	-
G	13/11/2019	112	-	112	-	203	-	-	0.119	-	-	-	-	-	-	-	<1	-
G	12/02/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
G	19/03/2020	52	-	52	-	32	-	-	<0.1	-	-	-	-	-	-	-	<1	-
	Min	**52**	**0**	**52**	**0**	**32**	**0**	**0**	**0.102**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Max	**112**	**0**	**112**	**0**	**203**	**0**	**0**	**0.119**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Mean	**80.8**	**-**	**80.8**	**-**	**98.6**	**-**	**-**	**0.1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
		31	10	31	10	31	10	9	31	10	18	10	9	9	9	9	31	10
		31	10	31	10	31	10	9	22	9	17	10	9	9	9	9	9	9
		23	0	23	0	11.8	0	0	<0.1	0	0	0	0	0	0	0	0	0
		23	31	23	31	11.8	212	ND	0.11	ND	27.5	242	ND	ND	ND	ND	ND	ND
		167	31	167	31	1660	212	0	1.1	<0.5	242	242	0	0	0	0	<1	<1
		167	31	167	31	1660	212	ND	1.1	ND	242	242	ND	ND	ND	ND	ND	ND
		82	16	82	16	190	106	0	0.21	0.036	74	121	0	0	0	0	0.39	0.071
		81	15.5	81	15.5	48.2	106	0	0.123	0	46.4	121	0	0	0	0	0.5	0
		34	17	34	17	403	113	0	0.26	0.094	82	129	0	0	0	0	0.21	0.19
		0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0

		Potassium	Potassium (Filtered)	Total Phosphate (PO4)	Total Phosphate (PO4) (Filtered)	Sodium	Sodium (Filtered)	Total Hardness (CaCO3)	Total Hardness (CaCO3) (Filtered)	Phosphorus	Phosphorus (Filtered)	Silica (Total)	Silica (Total) (Filtered)	Silica, Molybdate Reactive (Dissolved)	Silica, Molybdate Reactive (Dissolved) (Filtered)	Sulfate (as SO4)	Sulfate (as SO4) (Filtered)	Nitrate (as N)	Nitrate (as N) (Filtered)	Nitrite (as N)	Nitrite (as N) (Filtered)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Environmental Goals - Surface Water																1000	1000				
	Min	**5.57**	**7.18**	**0**	**0**	**61.9**	**79.6**	**0**	**0**	**0.04**	**0**	**0**	**0**	**0**	**0**	**187**	**0**	**0.02**	**0**	**0**	**0**
	Max	**93.6**	**93.6**	**0**	**0**	**1550**	**1550**	**0**	**0**	**0.06**	**0**	**0**	**0**	**0**	**0**	**5800**	**0**	**0.05**	**0**	**0**	**0**
	Mean	**22.5**	**39.5**	**-**	**-**	**358.9**	**641.9**	**-**	**-**	**0.1**	**-**	**-**	**-**	**-**	**-**	**1249.1**	**-**	**0.0**	**-**	**-**	**-**
Downstream Monitoring Locations																					
WX22	24/07/2019	6.86	-	-	-	80.2	-	-	-	<0.01	-	-	-	-	-	264	-	0.02	-	<0.01	-
WX22	28/08/2019	10	-	-	-	107	-	-	-	<0.01	-	-	-	-	-	429	-	<0.01	-	<0.01	-
WX22	25/09/2019	7.24	-	-	-	65.2	-	-	-	<0.01	-	-	-	-	-	203	-	0.02	-	<0.01	-
WX22	30/10/2019	13.6	-	-	-	187	-	-	-	<0.01	-	-	-	-	-	711	-	<0.01	-	<0.01	-
WX22	6/11/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WX22	27/11/2019	13.7	-	-	-	266	-	-	-	<0.01	-	-	-	-	-	1150	-	<0.01	-	<0.01	-
WX22	22/01/2020	22.5	22.5	-	-	264	264	-	-	0.05		-	-	-	-	1350	1350	0.03	0.03	<0.01	<0.01
WX22	26/02/2020	8.87	-	-	-	71.2	-	-	-	<0.01	-	-	-	-	-	317	-	<0.01	-	<0.01	-
WX22	25/03/2020	<8.07	-	-	-	<72	-	-	-	<0.01	-	-	-	-	-	<215	-	<0.01	-	<0.01	-
WX22	24/06/2020	6.04	-	-	-	53.5	-	-	-	<0.01	-	-	-	-	-	179	-	0.01	-	<0.01	-
	Min	**6.04**	**22.5**	**0**	**0**	**53.5**	**264**	**0**	**0**	**0.05**	**0**	**0**	**0**	**0**	**0**	**179**	**1350**	**0.01**	**0.03**	**0**	**0**
	Max	**22.5**	**22.5**	**0**	**0**	**266**	**264**	**0**	**0**	**0.05**	**0**	**0**	**0**	**0**	**0**	**1350**	**1350**	**0.03**	**0.03**	**0**	**0**
	Mean	**11.1**	**22.5**	**-**	**-**	**136.8**	**264.0**	**-**	**-**	**0.1**	**-**	**-**	**-**	**-**	**-**	**575.4**	**1350.0**	**0.0**	**0.0**	**-**	**-**
G	11/07/2019	5.65	-	-	-	61.4	-	-	-	<0.01	-	-	-	-	-	208	-	<0.01	-	<0.01	-
G	14/08/2019	7.34	-	-	-	83.9	-	-	-	<0.01	-	-	-	-	-	256	-	<0.01	-	<0.01	-
G	11/09/2019	8.77	-	-	-	130	-	-	-	0.01	-	-	-	-	-	493	-	<0.01	-	<0.01	-
G	16/10/2019	11.4	-	-	-	138	-	-	-	0.02	-	-	-	-	-	460	-	0.04	-	<0.01	-
G	13/11/2019	15.5	15.4	-	-	198	197	-	-	<0.01	-	-	-	-	-	892	-	<0.01	-	<0.01	-
G	12/02/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
G	19/03/2020	6.88	6.68	-	-	62.4	60.7	-	-	0.01	-	-	-	-	-	175	-	0.02	-	<0.01	-
	Min	**5.65**	**6.68**	**0**	**0**	**61.4**	**60.7**	**0**	**0**	**0.01**	**0**	**0**	**0**	**0**	**0**	**175**	**0**	**0.02**	**0**	**0**	**0**
	Max	**15.5**	**15.4**	**0**	**0**	**198**	**197**	**0**	**0**	**0.02**	**0**	**0**	**0**	**0**	**0**	**892**	**0**	**0.04**	**0**	**0**	**0**
	Mean	**9.3**	**11.0**	**-**	**-**	**112.3**	**128.9**	**-**	**-**	**0.0**	**-**	**-**	**-**	**-**	**-**	**414.0**	**-**	**0.0**	**-**	**-**	**-**
		31	15	9	9	31	15	9	9	31	9	9	9	9	9	31	10	31	10	31	10
		30	15	9	9	30	15	9	9	15	9	9	9	9	9	30	10	19	10	9	9
		5.27	5.05	0	0	43.3	46.2	0	0	<0.01	0	0	0	0	0	56.9	0	<0.01	0	0	0
		5.27	5.05	ND	ND	43.3	46.2	ND	ND	0.01	ND	ND	ND	ND	ND	56.9	1350	0.01	0.03	ND	ND
		93.6	93.6	0	0	1550	1550	0	0	0.06	0	0	0	0	0	5800	1350	0.05	0.03	<0.01	<0.01
		93.6	93.6	ND	ND	1550	1550	ND	ND	0.06	ND	ND	ND	ND	ND	5800	1350	0.05	0.03	ND	ND
		15	25	0	0	213	366	0	0	0.02	0	0	0	0	0	768	675	0.022	0.015	0.0039	7E-04
		7.48	17.8	0	0	82.9	264	0	0	0.005	0	0	0	0	0	237	675	0.02	0.015	0.005	0
		22	30	0	0	369	507	0	0	0.02	0	0	0	0	0	1406	722	0.017	0.016	0.0021	0.002
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	4	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	4	0	0	0	0

LocCode	Sampled_Date-Time	Nitrite + Nitrate (as N)	Nitrite + Nitrate (as N) (Filtered)	Nitrogen (N) - Kjeldahl	Nitrogen (N) - Kjeldahl (Filtered)	Nitrogen (N)	Nitrogen (N) (Filtered)	Ammonia (NH3-N)	Ammonia (NH3-N) (Filtered)	Total Suspended Solids (TSS)	Total Dissolved Solids (TDS)	Electrical Conductivity (Lab)	pH (Lab)	Turbidity	Electrical Conductivity (Field)	Dissolved Oxygen (Field)	Temperature (Field)	pH (Field)	Oil & Grease	Oil & Grease (Filtered)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	pH units	NTU	uS/cm	mg/L	oC	pH units	mg/L	mg/L
Environmental Goals - Surface Water											1500	2200	6.5-8		2200			6.5-8		
Up-Stream Monitoring Locations																				
LDP01	2/07/2019	-	-	-	-	-	-	-	-	14	314	500	7.6	-	-	-	-	-	-	-
LDP01	9/07/2019	-	-	-	-	-	-	-	-	14	-	520	7.9	-	-	-	-	-	-	-
LDP01	16/07/2019	-	-	-	-	-	-	-	-	14	-	1300	7.8	-	-	-	-	-	-	-
LDP01	22/07/2019	-	-	-	-	-	-	-	-	9	-	660	7.7	-	-	-	-	-	-	-
LDP01	29/07/2019	-	-	-	-	-	-	-	-	5	-	580	6.7	-	-	-	-	-	-	-
LDP01	6/08/2019	-	-	-	-	-	-	-	-	10	478	660	7.7	-	-	-	-	-	-	-
LDP01	12/08/2019	-	-	-	-	-	-	-	-	52	-	680	7.9	-	-	-	-	-	-	-
LDP01	20/08/2019	-	-	-	-	-	-	-	-	12	-	600	7.9	-	-	-	-	-	-	-
LDP01	27/08/2019	-	-	-	-	-	-	-	-	12	-	650	8	-	-	-	-	-	-	-
LDP01	3/09/2019	-	-	-	-	-	-	-	-	14	460	670	8	-	-	-	-	-	-	-
LDP01	9/09/2019	-	-	-	-	-	-	-	-	20	-	640	8.3	-	-	-	-	-	-	-
LDP01	17/09/2019	-	-	-	-	-	-	-	-	260	-	420	7.6	-	-	-	-	-	-	-
LDP01	24/09/2019	-	-	-	-	-	-	-	-	52	-	300	7.9	-	-	-	-	-	-	-
LDP01	1/10/2019	-	-	-	-	-	-	-	-	30	217	360	7.8	-	-	-	-	-	-	-
LDP01	9/10/2019	-	-	-	-	-	-	-	-	16	-	360	7.9	-	-	-	-	-	-	-
LDP01	15/10/2019	-	-	-	-	-	-	-	-	20	-	430	8	-	-	-	-	-	-	-
LDP01	22/10/2019	-	-	-	-	-	-	-	-	12	-	410	8	-	-	-	-	-	-	-
LDP01	29/10/2019	-	-	-	-	-	-	-	-	10	-	380	8.3	-	-	-	-	-	-	-
LDP01	31/10/2019	0.06	-	0.8	-	0.9	-	0.43	-	10	280	450	8.3	-	-	-	-	-	<5	-
LDP01	5/11/2019	0.13	-	0.9	-	1	-	0.32	-	25	248	420	7.9	-	-	-	-	-	<5	-
LDP01	12/11/2019	-	-	-	-	-	-	-	-	11	230	450	8.2	-	-	-	-	-	-	-
LDP01	19/11/2019	0.09	-	0.4	-	0.5	-	0.18	-	11	360	460	7.6	-	-	-	-	-	6	-
LDP01	26/11/2019	0.13	0.13	0.8	0.8	0.9	0.9	0.21	0.21	16	180	370	8.2	55	-	-	-	-	<5	<5
LDP01	3/12/2019	0.1	0.1	0.6	0.6	0.7	0.7	0.2	0.2	8	280	420	8.4	35	-	-	-	-	<5	<5
LDP01	10/12/2019	0.08	0.08	0.6	0.6	0.7	0.7	0.23	0.23	9	280	450	8.1	30	-	-	-	-	<5	<5
LDP01	18/12/2019	0.07	0.07	0.5	0.5	0.6	0.6	0.09	0.09	4	220	480	8.3	15	-	-	-	-	<5	<5
LDP01	31/12/2019	0.03	0.03	0.7	0.7	0.7	0.7	0.1	0.1	5	350	520	9.3	13	-	-	-	-	<5	<5
LDP01	7/01/2020	0.11	0.11	0.4	0.4	0.5	0.5	0.03	0.03	10	310	520	8.5	16	-	-	-	-	<5	<5
LDP01	14/01/2020	0.02	0.02	0.4	0.4	0.4	0.4	<0.01	<0.01	6	320	540	8.4	9.9	-	-	-	-	<5	<5
LDP01	21/01/2020	0.09	0.09	0.7	0.7	0.8	0.8	0.06	0.06	54	220	330	8	110	-	-	-	-	<5	<5
LDP01	29/01/2020	0.17	0.17	0.8	0.8	1	1	0.08	0.08	110	370	340	7.2	200	-	-	-	-	<5	<5
LDP01	4/02/2020	0.09	0.09	0.8	0.8	0.9	0.9	0.03	0.03	42	180	350	8.5	70	-	-	-	-	<5	<5
LDP01	11/02/2020	0.34	0.34	<1	<1	<1	<1	<0.01	<0.01	130	190	230	7.6	190	-	-	-	-	5	5
LDP01	17/02/2020	-	-	-	-	-	-	-	-	23	810	1300	9.7	85	-	-	-	-	-	-
LDP01	2/03/2020	0.06	-	1.9	-	2	-	0.13	-	7	610	950	9.2	70	-	-	-	-	<5	-
LDP01	9/03/2020	0.15	-	0.6	-	0.8	-	0.02	-	11	130	250	7.6	55	-	-	-	-	<5	-
LDP01	16/03/2020	-	0.12	-	0.2	-	0.3	-	0.04	28	<270	370	6.5	55	-	-	-	-	-	<5
LDP01	23/03/2020	0.01	-	0.5	-	<0.5	-	0.02	-	13	320	460	6.6	17	-	-	-	-	<5	-
LDP01	30/03/2020	<0.16	-	0.8	-	1	-	0.05	-	150	260	350	7.8	180	-	-	-	-	<5	-
LDP01	6/04/2020	-	<0.18	0.7	-	-	0.9	0.04	-	67	190	190	7.6	<150	-	-	-	-	-	<5
LDP01	14/04/2020	-	-	-	-	-	-	-	-	11	290	460	7.2	20	-	-	-	-	-	-
LDP01	20/04/2020	-	-	-	-	-	-	-	-	<7	360	550	7.9	11	-	-	-	-	-	-
	Min	**0.01**	**0.02**	**0.4**	**0.2**	**0.4**	**0.3**	**0.02**	**0.03**	**4**	**130**	**190**	**6.5**	**9.9**	**0**	**0**	**0**	**0**	**5**	**5**
	Max	**0.34**	**0.34**	**1.9**	**0.8**	**2**	**1**	**0.43**	**0.23**	**260**	**810**	**1300**	**9.7**	**200**	**0**	**0**	**0**	**0**	**6**	**5**
	Mean	**0.1**	**0.1**	**0.7**	**0.6**	**0.8**	**0.7**	**0.1**	**0.1**	**32.6**	**313.2**	**507.9**	**-**	**65.1**	**-**	**-**	**-**	**-**	**5.5**	**5.0**
LMP01	2/07/2019	-	-	-	-	-	-	-	-	9	-	500	7.7	-	-	-	-	-	-	-
LMP01	9/07/2019	-	-	-	-	-	-	-	-	9	-	520	8	-	-	-	-	-	-	-
LMP01	16/07/2019	-	-	-	-	-	-	-	-	8	-	1200	7.7	-	-	-	-	-	-	-
LMP01	18/07/2019	0.1	-	0.8	-	0.9	-	0.2	-	7	554	-	-	8.9	980	12.4	-	6.78	-	-
LMP01	22/07/2019	-	-	-	-	-	-	-	-	8	-	670	7.9	-	-	-	-	-	-	-
LMP01	29/07/2019	-	-	-	-	-	-	-	-	2	-	590	7.9	-	-	-	-	-	-	-
LMP01	6/08/2019	-	-	-	-	-	-	-	-	11	-	700	7.8	-	-	-	-	-	-	-
LMP01	12/08/2019	-	-	-	-	-	-	-	-	22	-	640	8	-	-	-	-	-	-	-
LMP01	20/08/2019	-	-	-	-	-	-	-	-	10	-	620	8	-	-	-	-	-	-	-
LMP01	22/08/2019	0.14	-	0.4	-	0.5	-	0.1	-	6	293	-	-	21.9	624	8.7	-	7.46	-	-
LMP01	27/08/2019	-	-	-	-	-	-	-	-	8	-	650	7.8	-	-	-	-	-	-	-

		Nitrite + Nitrate (as N)	Nitrite + Nitrate (as N) (Filtered)	Nitrogen (N) - Kjeldahl	Nitrogen (N) - Kjeldahl (Filtered)	Nitrogen (N)	Nitrogen (N) (Filtered)	Ammonia (NH3-N)	Ammonia (NH3-N) (Filtered)	Total Suspended Solids (TSS)	Total Dissolved Solids (TDS)	Electrical Conductivity (Lab)	pH (Lab)	Turbidity	Electrical Conductivity (Field)	Dissolved Oxygen (Field)	Temperature (Field)	pH (Field)	Oil & Grease	Oil & Grease (Filtered)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	pH units	NTU	uS/cm	mg/L	oC	pH units	mg/L	mg/L
Environmental Goals - Surface Water											1500	2200	6.5-8		2200			6.5-8		
LMP01	3/09/2019	-	-	-	-	-	-	-	-	6	-	640	8.1	-	-	-	-	-	-	-
LMP01	9/09/2019	-	-	-	-	-	-	-	-	9	-	640	8.1	-	-	-	-	-	-	-
LMP01	17/09/2019	-	-	-	-	-	-	-	-	170	-	480	8.1	-	-	-	-	-	-	-
LMP01	19/09/2019	0.19	-	0.5	-	0.7	-	<0.1	-	64	276	-	-	151	363	11.6	-	7.25	-	-
LMP01	24/09/2019	-	-	-	-	-	-	-	-	27	-	300	7.9	-	-	-	-	-	-	-
LMP01	1/10/2019	-	-	-	-	-	-	-	-	19	-	350	8	-	-	-	-	-	-	-
LMP01	9/10/2019	-	-	-	-	-	-	-	-	14	-	360	7.7	-	-	-	-	-	-	-
LMP01	15/10/2019	-	-	-	-	-	-	-	-	13	-	420	7.9	-	-	-	-	-	-	-
LMP01	22/10/2019	-	-	-	-	-	-	-	-	11	-	420	7.9	-	-	-	-	-	-	-
LMP01	24/10/2019	0.1	-	0.3	-	0.4	-	<0.1	-	16	266	-	-	30.8	425	8.9	-	7.18	-	-
LMP01	29/10/2019	-	-	-	-	-	-	-	-	17	-	400	8.1	-	-	-	-	-	-	-
LMP01	20/02/2020	0.29	-	0.6	-	0.9	-	<0.1	-	96	446	-	-	289	590	7.9	-	8.86	-	-
LMP01	24/02/2020	-	-	-	-	-	-	-	-	95	-	750	9.1	-	490	-	-	-	-	-
LMP01	2/03/2020	-	-	-	-	-	-	-	-	37	-	930	8.9	-	607	-	-	-	-	-
LMP01	9/03/2020	-	-	-	-	-	-	-	-	28	-	250	7.6	-	378	-	-	-	-	-
LMP01	16/03/2020	-	-	-	-	-	-	-	-	24	-	380	7.7	-	424	-	-	-	-	-
LMP01	23/03/2020	-	-	-	-	-	-	-	-	11	-	450	8.3	-	559	-	-	-	-	-
LMP01	30/03/2020	-	-	-	-	-	-	-	-	120	-	330	7.9	-		-	-	-	-	-
LMP01	20/04/2020	-	-	-	-	-	-	-	-	7	14	540	7.4	-	880	-	-	-	-	-
LMP01	11/05/2020	-	-	-	-	-	-	-	-	2	-	540	7.7	-	1240	-	-	-	-	-
LMP01	18/05/2020	-	-	-	-	-	-	-	-	2	-	660	8.1	-	730	-	-	-	-	-
LMP01	25/05/2020	-	-	-	-	-	-	-	-	15	-	630	7.5	-	1960	-	-	-	-	-
LMP01	1/06/2020	-	-	-	-	-	-	-	-	6	-	690	8.1	-	-	-	-	-	-	-
LMP01	9/06/2020	-	-	-	-	-	-	-	-	5	-	640	8.1	-	-	-	-	-	-	-
LMP01	15/06/2020	-	-	-	-	-	-	-	-	80	-	400	8	-	-	-	-	-	-	-
LMP01	22/06/2020	-	-	-	-	-	-	-	-	38	-	270	8	-	-	-	-	-	-	-
LMP01	29/06/2020	-	-	-	-	-	-	-	-	8	-	330	7.9	-	-	-	-	-	-	-
	Min	**0.1**	**0**	**0.3**	**0**	**0.4**	**0**	**0.1**	**0**	**2**	**14**	**250**	**7.4**	**8.9**	**363**	**7.9**	**0**	**6.78**	**0**	**0**
	Max	**0.29**	**0**	**0.8**	**0**	**0.9**	**0**	**0.2**	**0**	**170**	**554**	**1200**	**9.1**	**289**	**1960**	**12.4**	**0**	**8.86**	**0**	**0**
	Mean	**0.2**	**-**	**0.5**	**-**	**0.7**	**-**	**0.2**	**-**	**27.4**	**308.2**	**542.1**	**-**	**100.3**	**732.1**	**9.9**	**-**	**-**	**-**	**-**
Mid-Stream Monitoring Locations																				
NC01	17/07/2019	0.02	-	0.3	-	0.3	-	-	-	-	252	-	-	6.4	-	10.3	-	7.58	-	-
NC01	22/08/2019	<0.01	-	0.2	-	0.2	-	-	-	-	369	-	-	6.6	-	10.1	-	6.77	-	-
NC01	19/09/2019	0.07	-	0.5	-	0.6	-	-	-	-	251	-	-	57.2	-	9.9	-	7.04	-	-
NC01	23/10/2019	<0.01	-	0.6	-	0.6	-	-	-	-	256	-	-	13.2	-	4.4	-	7.04	-	-
NC01	20/02/2020	0.03	-	1.1	-	1.1	-	-	-	-	363	-	-	124	-	6.1	-	6.88	-	-
	Min	**0.02**	**0**	**0.2**	**0**	**0.2**	**0**	**0**	**0**	**0**	**251**	**0**	**0**	**6.4**	**0**	**4.4**	**0**	**6.77**	**0**	**0**
	Max	**0.07**	**0**	**1.1**	**0**	**1.1**	**0**	**0**	**0**	**0**	**369**	**0**	**0**	**124**	**0**	**10.3**	**0**	**7.58**	**0**	**0**
	Mean	**0.0**	**-**	**0.5**	**-**	**0.6**	**-**	**-**	**-**	**-**	**298.2**	**-**	**-**	**41.5**	**-**	**8.2**	**-**	**-**	**-**	**-**
C	11/07/2019	-	-	0.3	-	0.4	-	-	-	-	296	-	-	4.8	499	12.5	-	6.96	-	-
C	14/08/2019	-	-	0.3	-	0.4	-	-	-	-	380	-	-	7.2	621	13.8	-	7.31	-	-
C	11/09/2019	-	-	0.3	-	0.3	-	-	-	-	370	-	-	7.1	612	9.8	-	7.33	-	-
C	16/10/2019	-	-	0.2	-	0.2	-	-	-	-	252	-	-	18	424	5.6	-	7.04	-	-
C	13/11/2019	-	-	0.2	-	0.2	-	-	-	-	266	-	-	22.1	453	5	-	7	-	-
C	12/02/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	290	6.4	-	6.98	-	-
C	19/03/2020	-	-	0.3	-	0.3	-	-	-	-	215	-	-	19.5	400	5.9	-	-	-	-
	Min	**0**	**0**	**0.2**	**0**	**0.2**	**0**	**0**	**0**	**0**	**215**	**0**	**0**	**4.8**	**290**	**5**	**0**	**6.96**	**0**	**0**
	Max	**0**	**0**	**0.3**	**0**	**0.4**	**0**	**0**	**0**	**0**	**380**	**0**	**0**	**22.1**	**621**	**13.8**	**0**	**7.33**	**0**	**0**
	Mean	**-**	**-**	**0.3**	**-**	**0.3**	**-**	**-**	**-**	**-**	**296.5**	**-**	**-**	**13.1**	**471.3**	**8.4**	**-**	**-**	**-**	**-**
E	11/07/2019	-	-	0.2	-	0.2	-	-	-	-	385	-	-	3.9	670	12.8	-	7.2	-	-
E	14/08/2019	-	-	0.2	-	0.2	-	-	-	-	492	-	-	11.5	819	15.9	-	7.05	-	-
E	11/09/2019	-	-	0.2	-	0.2	-	-	-	-	607	-	-	15	980	13.1	-	7.15	-	-
E	16/10/2019	-	-	0.2	-	0.2	-	-	-	-	1650	-	-	37.5	2390	8	-	6.73	-	-
E	13/11/2019	-	-	0.2	-	0.2	-	-	-	-	1660	-	-	31.9	3150	8.9	-	6.85	-	-
E	15/01/2020	-	-	0.5	-	0.5	-	-	-	-	11,900	-	-	5.4	11,800	5.7	-	7.03	-	-
E	12/02/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	518	8.8	-	7.05	-	-
E	19/03/2020	-	-	0.3	-	0.3	-	-	-	-	564	-	-	11.4	800	7.8	-	6.92	-	-

		Nitrite + Nitrate (as N)	Nitrite + Nitrate (as N) (Filtered)	Nitrogen (N) - Kjeldahl	Nitrogen (N) - Kjeldahl (Filtered)	Nitrogen (N)	Nitrogen (N) (Filtered)	Ammonia (NH3-N)	Ammonia (NH3-N) (Filtered)	Total Suspended Solids (TSS)	Total Dissolved Solids (TDS)	Electrical Conductivity (Lab)	pH (Lab)	Turbidity	Electrical Conductivity (Field)	Dissolved Oxygen (Field)	Temperature (Field)	pH (Field)	Oil & Grease	Oil & Grease (Filtered)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	pH units	NTU	uS/cm	mg/L	oC	pH units	mg/L	mg/L
Environmental Goals - Surface Water											1500	2200	6.5-8		2200			6.5-8		
	Min	**0**	**0**	**0.2**	**0**	**0.2**	**0**	**0**	**0**	**0**	**385**	**0**	**0**	**3.9**	**518**	**5.7**	**0**	**6.73**	**0**	**0**
	Max	**0**	**0**	**0.5**	**0**	**0.5**	**0**	**0**	**0**	**0**	**11900**	**0**	**0**	**37.5**	**11800**	**15.9**	**0**	**7.2**	**0**	**0**
	Mean	**-**	**-**	**0.3**	**-**	**0.3**	**-**	**-**	**-**	**-**	**2465.4**	**-**	**-**	**16.7**	**2640.9**	**10.1**	**-**	**7.0**	**-**	**-**
Downstream Monitoring Locations																				
WX22	24/07/2019	0.02	-	0.2	-	0.2	-	-	-	-	534	-	-	1.3	-	13.4	4.5	7.74	-	-
WX22	28/08/2019	<0.01	-	0.2	-	0.2	-	-	-	-	805	-	-	1.7	-	12.9	6.8	6.97	-	-
WX22	25/09/2019	0.02	-	0.1	-	0.1	-	-	-	-	487	-	-	1.3	-	12.3	8.6	7.34	-	-
WX22	30/10/2019	<0.01	-	0.2	-	0.2	-	-	-	-	1390	-	-	5.1	-	8.4	15.3	6.55	-	-
WX22	6/11/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	1886	-	-	-	-	-
WX22	27/11/2019	<0.01	-	0.3	-	0.3	-	-	-	-	1610	-	-	6.7	2610	9.5	16.9	6.88	-	-
WX22	22/01/2020	0.03	0.03	1.6	1.6	1.6	1.6	-	-	-	2680	-	-	8	3040	7.5	19.6	7.07	-	-
WX22	26/02/2020	<0.01	-	0.2	-	0.2	-	-	-	-	652	-	-	5.2	850	8.8	17.5	6.48	-	-
WX22	25/03/2020	<0.01	-	0.3	-	<0.3	-	-	-	-	518	-	-	4.4	730	8.7	15.3	7.03	-	-
WX22	24/06/2020	0.01	-	0.1	-	0.1	-	-	-	-	266	-	-	4.1	528	13.2	6.3	7.24	-	-
	Min	**0.01**	**0.03**	**0.1**	**1.6**	**0.1**	**1.6**	**0**	**0**	**0**	**266**	**0**	**0**	**1.3**	**528**	**7.5**	**4.5**	**6.48**	**0**	**0**
	Max	**0.03**	**0.03**	**1.6**	**1.6**	**1.6**	**1.6**	**0**	**0**	**0**	**2680**	**0**	**0**	**8**	**3040**	**13.4**	**19.6**	**7.74**	**0**	**0**
	Mean	**0.0**	**0.0**	**0.4**	**1.6**	**0.4**	**1.6**	**-**	**-**	**-**	**993.6**	**-**	**-**	**4.2**	**1607.3**	**10.5**	**12.3**	**-**	**-**	**-**
G	11/07/2019	-	-	0.1	-	0.1	-	-	-	-	450	-	-	1.3	698	12.2	-	7.26	-	-
G	14/08/2019	-	-	0.3	-	0.3	-	-	-	-	564	-	-	0.9	900	15	-	7.3	-	-
G	11/09/2019	-	-	0.2	-	0.2	-	-	-	-	892	-	-	1	1420	12.8	-	7.23	-	-
G	16/10/2019	-	-	<0.1	-	<0.1	-	-	-	-	895	-	-	2.5	1450	10.1	-	7.25	-	-
G	13/11/2019	-	-	0.2	-	0.2	-	-	-	-	1640	-	-	2.7	2320	9.5	-	7.48	-	-
G	12/02/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	600	7.8	-	6.56	-	-
G	19/03/2020	-	-	0.2	-	0.2	-	-	-	-	408	-	-	3.6	606	9.8	-	7.05	-	-
	Min	**0**	**0**	**0.1**	**0**	**0.1**	**0**	**0**	**0**	**0**	**408**	**0**	**0**	**0.9**	**600**	**7.8**	**0**	**6.56**	**0**	**0**
	Max	**0**	**0**	**0.3**	**0**	**0.3**	**0**	**0**	**0**	**0**	**1640**	**0**	**0**	**3.6**	**2320**	**15**	**0**	**7.48**	**0**	**0**
	Mean	**-**	**-**	**0.2**	**-**	**0.2**	**-**	**-**	**-**	**-**	**808.2**	**-**	**-**	**2.0**	**1142.0**	**11.0**	**-**	**-**	**-**	**-**

		18	10	31	10	31	10	9	9	9	31	11	9	31	30	33	18	33	9	9
		13	10	31	10	30	10	9	9	9	31	11	9	31	30	33	18	33	9	9
		0	0	0.1	0	0.1	0	0	0	0	215	0	0	1.3	290	5	0	6.48	0	0
		0.01	0.03	0.1	1.6	0.1	1.6	ND	ND	ND	215	ND	ND	1.3	290	5	4.5	6.48	ND	ND
		0.03	0.03	1.6	1.6	1.6	1.6	0	0	0	11900	0	0	37.5	11800	15.9	19.6	7.74	0	0
		0.03	0.03	1.6	1.6	1.6	1.6	ND	ND	ND	11900	ND	ND	37.5	11800	15.9	19.6	7.74	ND	ND
		0.01	0.015	0.33	0.8	0.34	0.8	0	0	0	1534	0	0	11	1853	9.9	9.2	7	0	0
		0.005	0.015	0.2	0.8	0.2	0.8	0	0	0	518	0	0	7.1	700	8.9	7.7	7.03	0	0
		0.01	0.016	0.35	0.86	0.35	0.86	0	0	0	2862	0	0	10	2858	3.2	7.4	0.3	0	0
		0	0	0	0	0	0	0	0	0	8	0	6	0	8	0	0	2	0	0
		0	0	0	0	0	0	0	0	0	8	0	6	0	8	0	0	2	0	0

APPENDIX G TABULATED GROUNDWATER DATA

				Field Parameters				Major Anions and Cations												Metals																																	
				Electrical Conductivity (Field)	pH (Field)	Temperature (Field)	Total Dissolved Solids (TDS)	Calcium	Calcium (Filtered)	Chloride	Potassium	Potassium (Filtered)	Sodium	Sodium (Filtered)	Sulfate (as SO4)	Fluoride	Total Alkalinity (as CaCO3)	Total Alkalinity (as CaCO3) (Filtered)	Phenolphthalein Alkalinity (CaCO3)	Aluminium	Arsenic	Arsenic (Filtered)	Barium	Barium (Filtered)	Boron	Boron (Filtered)	Cadmium	Cadmium (Filtered)	Chromium	Chromium (Filtered)	Copper	Copper (Filtered)	Iron	Iron (Filtered)	Lead	Lead (Filtered)	Manganese	Manganese (Filtered)	Magnesium	Magnesium (Filtered)	Mercury	Molybdenum	Molybdenum (Filtered)	Nickel	Nickel (Filtered)	Selenium	Selenium (Filtered)	Silver	Silver (Filtered)	Vanadium	Vanadium (Filtered)	Zinc	Zinc (Filtered)
				uS/cm	pH units	oC	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
ANZECC (2000) or Local Guidelines - Groundwater				2600	6.5-8		2000			350					1000	1.5					24	24	700	700	370	370	2	2	5	5	5	5	664	664	5	5	5704	5704			0.06	10	10	550.9	550.9	5	5	0.05	0.05			908	908
Upgradient - Background Bores			
LocCode	**Field_ID**	**Sampled_Date**	**Sample_Type**
D4	9 Groundwater Bore MPGM4	12/07/2019	Normal	900	3.38	-	770	15.2	-	11.7	8.54	-	20.2	-	408	<0.1	<1	-	-	14,100	46	-	13	-	<50	-	0.6	-	2	-	3	-	105,000	105,000	19	-	778	778	9.33	-	<0.04	<1	-	18	-	0.2	-	<1	-	10	10	198	-
D4	9 Groundwater Bore MPGM4	7/08/2019	Normal	860	3.39	-	719	17.2	-	13.8	9.08	-	20.3	-	341	<0.1	<1	-	-	13,400	50	-	13	-	<50	-	0.5	-	3	-	1	-	90,700	90,700	22	-	762	762	10	-	<0.04	<1	-	16	-	0.2	-	<1	-	<10	<10	170	-
D4	9 Groundwater Bore MPGM4	5/09/2019	Normal	860	3.39	-	718	16.4	-	11.4	8.29	-	19.2	-	391	<0.1	<1	-	-	13,000	41	-	11	-	<50	-	0.6	-	2	-	<1	-	100,000	100,000	18	-	732	732	9.42	-	<0.04	<1	-	17	-	<0.2	-	<1	-	<10	<10	168	-
D4	9 Groundwater Bore MPGM4	3/10/2019	Normal	860	3.41	-	743	15.4	-	12.5	8.25	-	18.4	-	413	<0.1	<1	-	-	14,700	42	-	12	-	<50	-	0.6	-	2	-	<1	-	110,000	-	18	-	775	-	9.23	-	<0.04	<1	-	18	-	<0.2	-	<1	-	<10	-	188	-
D4	9 Groundwater Bore MPGM4	5/11/2019	Normal	1142	-	15.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	9 Groundwater Bore MPGM4	5/11/2019	Normal	1064	-	13.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	9 Groundwater Bore MPGM4	7/11/2019	Normal	820	3.43	-	612	17.1	-	15.5	8.45	-	20.1	-	398	<0.1	<1	-	-	11,800	36	-	12	-	<50	-	0.4	-	2	-	<1	-	80,300	-	17	-	767	-	8.98	-	<0.04	<1	-	15	-	<0.2	-	<1	-	<10	-	150	-
D4	9 Groundwater Bore MPGM4	12/12/2019	Normal	820	3.45	-	716	16.7	-	14.5	8.26	-	18.9	-	372	0.062	<1	<1	-	12,800	42	-	13	-	<50	-	0.5	-	2	-	<1	-	95,400	-	16	-	815	-	9.69	-	<0.04	<1	-	15	-	<0.2	-	<1	-	<10	<10	147	-
D4	9 Groundwater Bore MPGM4	16/01/2020	Normal	810	3.47	-	624	17.8	-	16	7.81	-	20	-	482	0.12	<1	-	-	13,500	44	-	13	-	<50	-	0.5	-	2	-	<1	-	89,300	89,300	18	-	850	850	8.94	-	<0.04	<1	-	16	-	0.2	-	<1	-	<10	<10	158	-
D4	9 Groundwater Bore MPGM4	12/02/2020	Normal	810	3.47	-	696	16.6	-	13.2	9.65	-	22.9	-	308	0.075	<1	-	-	12,500	41	-	12	-	<50	-	0.5	-	2	-	1	-	-	87,800	17	-	-	778	10	-	<0.04	<1	-	15	-	<0.2	-	<1	-	<10	<10	151	-
D4	9 Groundwater Bore MPGM4	12/03/2020	Normal	770	3.46	-	650	17.1	-	12.8	8.03	-	19.8	-	234	<0.1	<1	-	-	10,900	47	-	12	-	<50	-	0.4	-	2	-	<1	-	-	71,700	18	-	-	745	8.99	-	<0.04	<1	-	13	-	<0.2	-	<1	-	<10	<10	125	-
			Min	**770**	**3.38**	**13.9**	**612**	**15.2**	**0**	**11.4**	**7.81**	**0**	**18.4**	**0**	**234**	**0.062**	**0**	**0**	**0**	**10900**	**36**	**0**	**11**	**0**	**0**	**0**	**0.4**	**0**	**2**	**0**	**1**	**0**	**80300**	**71700**	**16**	**0**	**732**	**732**	**8.94**	**0**	**0**	**0**	**0**	**13**	**0**	**0.2**	**0**	**0**	**0**	**10**	**10**	**125**	**0**
			Max	**1142**	**3.47**	**15.4**	**770**	**17.8**	**0**	**16**	**9.65**	**0**	**22.9**	**0**	**482**	**0.12**	**0**	**0**	**0**	**14700**	**50**	**0**	**13**	**0**	**0**	**0**	**0.6**	**0**	**3**	**0**	**3**	**0**	**110000**	**105000**	**22**	**0**	**850**	**850**	**10**	**0**	**0**	**0**	**0**	**18**	**0**	**0.2**	**0**	**0**	**0**	**10**	**10**	**198**	**0**
			mean	**883.3**	**-**	**14.7**	**694.2**	**16.6**	**-**	**13.5**	**8.5**	**-**	**20.0**	**-**	**371.9**	**0.1**	**-**	**-**	**-**	**12966.7**	**43.2**	**-**	**12.3**	**-**	**-**	**-**	**0.5**	**-**	**2.1**	**-**	**1.7**	**-**	**95814.3**	**90750.0**	**18.1**	**-**	**782.7**	**774.2**	**9.4**	**-**	**-**	**-**	**-**	**15.9**	**-**	**0.2**	**-**	**-**	**-**	**10.0**	**10.0**	**161.7**	**-**
D5	10 Groundwater Bore MPGM4	12/07/2019	Normal	1270	5.89	-	949	101	-	24.4	9.03	-	31.6	-	596	<0.1	77	-	-	30	<1	-	17	-	70	-	<0.1	-	<1	-	<1	-	35,500	35,500	<1	-	7960	7960	74.2	-	<0.04	<1	-	48	-	<0.2	-	<1	-	<10	<10	16	-
D5	10 Groundwater Bore MPGM4	7/08/2019	Normal	1200	5.92	-	903	102	-	23.3	10.2	-	31.6	-	537	<1	87	-	-	30	<1	-	17	-	100	-	<0.1	-	<1	-	<1	-	53,400	53,400	<1	-	8770	8770	71.9	-	<0.04	<1	-	38	-	0.4	-	<1	-	<10	<10	18	-
D5	10 Groundwater Bore MPGM4	5/09/2019	Normal	1250	5.93	-	906	101	-	24.2	8.99	-	29.6	-	566	0.121	90	-	-	20	<1	-	20	-	80	-	<0.1	-	<1	-	<1	-	50,300	50,300	<1	-	8460	8460	70.8	-	<0.04	<1	-	42	-	0.2	-	<1	-	<10	<10	16	-
D5	10 Groundwater Bore MPGM4	3/10/2019	Normal	1270	5.97	-	872	101	-	23.7	9.15	-	27.1	-	592	<0.1	60	-	-	20	<1	-	18	-	120	-	<0.1	-	<1	-	<1	-	30,800	-	<1	-	8890	-	73.9	-	<0.04	<1	-	45	-	<0.2	-	<1	-	<10	-	12	-
D5	10 Groundwater Bore MPGM4	7/11/2019	Normal	1260	5.92	-	853	109	-	27.6	10.4	-	32.8	-	635	0.149	93	-	-	30	<1	-	17	-	120	-	<0.1	-	<1	-	<1	-	30,300	-	<1	-	7990	-	71.7	-	<0.04	<1	-	42	-	<0.2	-	<1	-	<10	-	17	-
D5	10 Groundwater Bore MPGM4	12/12/2019	Normal	1270	5.92	-	926	102	-	25.1	9.73	-	28.8	-	592	0.16	64	-	-	30	<1	-	19	-	110	-	<0.1	-	<1	-	<1	-	22,400	-	<1	-	9390	-	73.6	-	<0.04	<1	-	41	-	<0.2	-	<1	-	<10	<10	16	-
D5	10 Groundwater Bore MPGM4	16/01/2020	Normal	1260	6.01	-	902	108	-	25.9	10	-	32.1	-	589	0.177	84	-	-	30	<1	-	18	-	120	-	<0.1	-	<1	-	<1	-	32,400	32,400	<1	-	9140	9140	68.5	-	<0.04	<1	-	47	-	0.3	-	<1	-	<10	<10	21	-
D5	10 Groundwater Bore MPGM4	12/02/2020	Normal	1250	6.06	-	938	96.7	-	25.7	11.9	-	33	-	535	<0.1	51	-	-	20	<1	-	17	-	110	-	<0.1	-	<1	-	<1	-	-	27,500	<1	-	-	7890	71.4	-	<0.04	<1	-	41	-	<0.2	-	<1	-	<10	<10	16	-
D5	10 Groundwater Bore MPGM4	12/03/2020	Normal	1260	5.96	-	1020	107	-	24.8	10.6	-	33.1	-	567	<0.1	108	-	-	30	<1	-	16	-	110	-	<0.1	-	<1	-	<1	-	-	50,500	<1	-	-	8100	69.6	-	<0.04	<1	-	46	-	0.3	-	<1	-	<10	<10	13	-
			Min	**1200**	**5.89**	**0**	**853**	**96.7**	**0**	**23.3**	**8.99**	**0**	**27.1**	**0**	**535**	**0.121**	**51**	**0**	**0**	**20**	**0**	**0**	**16**	**0**	**70**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**22400**	**27500**	**0**	**0**	**7960**	**7890**	**68.5**	**0**	**0**	**0**	**0**	**38**	**0**	**0.2**	**0**	**0**	**0**	**0**	**0**	**12**	**0**
			Max	**1270**	**6.06**	**0**	**1020**	**109**	**0**	**27.6**	**11.9**	**0**	**33.1**	**0**	**635**	**0.177**	**108**	**0**	**0**	**30**	**0**	**0**	**20**	**0**	**120**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**53400**	**53400**	**0**	**0**	**9390**	**9140**	**74.2**	**0**	**0**	**0**	**0**	**48**	**0**	**0.4**	**0**	**0**	**0**	**0**	**0**	**21**	**0**
			mean	**1254.4**	**-**	**-**	**918.8**	**103.1**	**-**	**25.0**	**10.0**	**-**	**31.1**	**-**	**578.8**	**0.2**	**79.3**	**-**	**-**	**26.7**	**-**	**-**	**17.7**	**-**	**104.4**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**36442.9**	**41600.0**	**-**	**-**	**8657.1**	**8386.7**	**71.7**	**-**	**-**	**-**	**-**	**43.3**	**-**	**0.3**	**-**	**-**	**-**	**-**	**-**	**16.1**	**-**
Within Ash Repository / Mine Spoil			
LocCode	**Field_ID**	**Sampled_Date**	**Sample_Type**
B5	B5	5/11/2019	Normal	45,200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5	B5	5/11/2019	Normal	4200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			Min	**4200**
			Max	**45200**
			mean	**24700.0**
SW3-D	SW3-D	5/11/2019	Normal	916	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D10	15 Groundwater Bore MPGM4	25/07/2019	Normal	5920	5.55	-	4440	223	-	430	107	-	1150	-	2900	<0.5	66	-	-	130	<1	-	16	-	1640	-	2.4	-	<1	-	<1	-	19,400	19,400	2	-	4040	4040	181	-	<0.04	<1	-	599	-	1.2	-	<1	-	<10	<10	847	-
D10	15 Groundwater Bore MPGM4	29/08/2019	Normal	7480	5.57	-	2900	252	-	191	46.1	-	459	-	1920	<0.01	10	-	-	1830	7	-	25	-	290	-	0.6	-	156	-	11	-	29,900	29,900	9	-	2340	2340	112	-	<0.04	6	-	994	-	0.6	-	<1	-	<10	<10	1690	-
D10	15 Groundwater Bore MPGM4	31/10/2019	Normal	10,580	5.56	-	8050	315	-	899	232	-	1870	-	5380	<1	89	-	-	80	<1	-	35	-	5030	-	6.8	-	<1	-	<1	-	6290	-	7	-	8530	-	336	-	<0.04	<1	-	1120	-	2.4	-	<1	-	<10	-	1080	-
D10	15 Groundwater Bore MPGM4	28/11/2019	Normal	11,230	5.6	-	9440	373	-	936	224	-	2060	-	5870	<0.5	80	-	-	90	<1	-	19	-	5070	-	6.9	-	<1	-	<1	-	4420	-	5	-	8730	-	402	-	<0.04	<1	-	1110	-	2.9	-	<1	-	<10	<10	986	-
D10	15 Groundwater Bore MPGM4	23/01/2020	Normal	10,290	5.61	-	8840	315	-	843	278	-	1720	-	4870	<1	89	-	-	70	<1	-	14	-	4290	-	5.1	-	<1	-	<1	-	8120	8120	6	-	7150	7150	344	-	<0.04	<1	-	976	-	1.6	-	<1	-	<10	<10	881	-
D10	15 Groundwater Bore MPGM4	27/02/2020	Normal	5910	5.54	-	4750	173	-	386	112	-	993	-	2520	<1	64	-	-	50	<1	-	14	-	1630	-	1.9	-	<1	-	<1	-	-	13,500	1	-	-	3510	155	-	<0.04	<1	-	509	-	0.5	-	<1	-	<10	<10	731	-
D10	15 Groundwater Bore MPGM4	24/06/2020	Normal	4620	5.85	-	3440	136	-	303	72.2	-	685	-	2140	0.336	105	-	-	20	<1	-	16	-	940	-	1	-	<1	-	<1	-	-	12,700	9	-	-	2600	98.1	-	<0.04	<1	-	404	-	0.6	-	<1	-	<10	<10	583	-
D10	D10	5/11/2019	Normal	4963	-	17.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D10	D10	5/11/2019	Normal	9299	-	17.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			Min	**4620**	**5.54**	**17.4**	**2900**	**136**	**0**	**191**	**46.1**	**0**	**459**	**0**	**1920**	**0.336**	**10**	**0**	**0**	**20**	**7**	**0**	**14**	**0**	**290**	**0**	**0.6**	**0**	**156**	**0**	**11**	**0**	**4420**	**8120**	**1**	**0**	**2340**	**2340**	**98.1**	**0**	**0**	**6**	**0**	**404**	**0**	**0.5**	**0**	**0**	**0**	**0**	**0**	**583**	**0**
			Max	**11230**	**5.85**	**17.4**	**9440**	**373**	**0**	**936**	**278**	**0**	**2060**	**0**	**5870**	**0.336**	**105**	**0**	**0**	**1830**	**7**	**0**	**35**	**0**	**5070**	**0**	**6.9**	**0**	**156**	**0**	**11**	**0**	**29900**	**29900**	**9**	**0**	**8730**	**7150**	**402**	**0**	**0**	**6**	**0**	**1120**	**0**	**2.9**	**0**	**0**	**0**	**0**	**0**	**1690**	**0**
			mean	**7810.2**	**-**	**17.4**	**5980.0**	**255.3**	**-**	**569.7**	**153.0**	**-**	**1276.7**	**-**	**3657.1**	**0.3**	**71.9**	**-**	**-**	**324.3**	**7.0**	**-**	**19.9**	**-**	**2698.6**	**-**	**3.5**	**-**	**156.0**	**-**	**11.0**	**-**	**13626.0**	**16724.0**	**5.6**	**-**	**6158.0**	**3928.0**	**232.6**	**-**	**-**	**6.0**	**-**	**816.0**	**-**	**1.4**	**-**	**-**	**-**	**-**	**-**	**971.1**	**-**
D11	16 Groundwater Bore MPGM4	25/07/2019	Normal	10,140	6.26	-	7660	616	-	1060	116	-	1630	-	5110	<0.5	136	-	-	<10	10	-	19	-	2990	-	<0.1	-	<1	-	<1	-	117,000	117,000	<1	-	18,400	18,400	453	-	<0.04	<1	-	990	-	<0.2	-	<1	-	<10	<10	129	-
D11	16 Groundwater Bore MPGM4	29/08/2019	Normal	9970	6.23	-	8300	565	-	1060	115	-	1510	-	5140	0.072	136	-	-	<10	7	-	37	-	3090	-	<0.1	-	<1	-	<1	-	91,500	91,500	<1	-	17,400	17,400	428	-	<0.04	<1	-	982	-	<0.2	-	<1	-	<10	<10	114	-
D11	16 Groundwater Bore MPGM4	26/09/2019	Normal	10,330	6.2	-	9260	603	-	1070	102	-	1680	-	5040	<0.5	161	-	-	<10	10	-	19	-	2640	-	<0.1	-	<1	-	<1	-	121,000	121,000	<1	-	19,400	19,400	458	-	<0.04	<1	-	1060	-	0.2	-	<1	-	<10	<10	100	-
D11	16 Groundwater Bore MPGM4	31/10/2019	Normal	9900	6.25	-	7600	513	-	1060	130	-	1640	-	5240	<1	195	-	-	<10	3	-	35	-	2870	-	<0.1	-	<1	-	<1	-	49,200	-	<1	-	16,400	-	416	-	<0.04	<1	-	992	-	0.3	-	<1	-	<10	-	78	-
D11	16 Groundwater Bore MPGM4	28/11/2019	Normal	9860	6.28	-	7740	574	-	984	108	-	1540	-	4740	<0.5	86	-	-	20	6	-	40	-	2740	-	<0.1	-	<1	-	<1	-	71,600	-	<1	-	16,500	-	419	-	<0.04	<1	-	947	-	<0.2	-	<1	-	<10	<10	66	-
D11	16 Groundwater Bore MPGM4	23/01/2020	Normal	9320	6.29	-	8580	479	-	874	116	-	1160	-	4090	<1	171	-	-	<10	3	-	55	-	2630	-	<0.1	-	<1	-	<1	-	50,200	50,200	<1	-	14,300	14,300	358	-	<0.04	<1	-	791	-	0.3	-	<1	-	<10	<10	13	-
D11	16 Groundwater Bore MPGM4	27/02/2020	Normal	9950	6.23	-	9550	672	-	971	124	-	1840	-	4650	<1	145	-	-	<10	2	-	26	-	2700	-	<0.1	-	<1	-	<1	-	-	21,800	<1	-	-	18,700	499	-	<0.04	<1	-	849	-	<0.2	-	<1	-	<10	<10	42	-
D11	16 Groundwater Bore MPGM4	26/03/2020	Normal	10,210	6.3	-	9170	568	-	982	113	-	1620	-	4600	<1	161	-	-	30	8	-	18	-	3110	-	<0.1	-	<1	-	<1	-	-	110,000	<1	-	-	16,200	433	-	<0.04	<1	-	925	-	0.2	-	<1	-	<10	<10	97	-
D11	D11	5/11/2019	Normal	2784	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D11	D11	5/11/2019	Normal	10,100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			Min	**2784**	**6.2**	**0**	**7600**	**479**	**0**	**874**	**102**	**0**	**1160**	**0**	**4090**	**0.072**	**86**	**0**	**0**	**20**	**2**	**0**	**18**	**0**	**2630**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**49200**	**21800**	**0**	**0**	**14300**	**14300**	**358**	**0**	**0**	**0**	**0**	**791**	**0**	**0.2**	**0**	**0**	**0**	**0**	**0**	**13**	**0**
			Max	**10330**	**6.3**	**0**	**9550**	**672**	**0**	**1070**	**130**	**0**	**1840**	**0**	**5240**	**0.072**	**195**	**0**	**0**	**30**	**10**	**0**	**55**	**0**	**3110**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**121000**	**121000**	**0**	**0**	**19400**	**19400**	**499**	**0**	**0**	**0**	**0**	**1060**	**0**	**0.3**	**0**	**0**	**0**	**0**	**0**	**129**	**0**
			mean	**9256.4**	**-**	**-**	**8482.5**	**573.8**	**-**	**1007.6**	**115.5**	**-**	**1577.5**	**-**	**4826.3**	**0.1**	**148.9**	**-**	**-**	**25.0**	**6.1**	**-**	**31.1**	**-**	**2846.3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**83416.7**	**85250.0**	**-**	**-**	**17066.7**	**17400.0**	**433.0**	**-**	**-**	**-**	**-**	**942.0**	**-**	**0.3**	**-**	**-**	**-**	**-**	**-**	**79.9**	**-**
D19	224 Groundwater Bore MPGM4	24/07/2019	Normal	5420	5.93	-	4380	234	-	377	94.3	-	938	-	2600	<0.5	130	-	-	570	4	-	15	-	2070	-	0.2	-	8	-	<1	-	16,900	16,900	7	-	9450	9450	208	-	<0.04	<1	-	653	-	0.3	-	<1	-	<10	<10	342	-
D19	224 Groundwater Bore MPGM4	28/08/2019	Normal	1750	5.46	-	1160	64.2	-	101	29.4	-	227	-	721	<0.1	25	-	-	80	<1	-	15	-	1040	-	0.2	-	5	-	<1	-	506	506	2	-	769	769	47.6	-	<0.04	<1	-	133	-	3.7	-	<1	-	<10	<10	227	-
D19	224 Groundwater Bore MPGM4	25/09/2019	Normal	3490	5.59	-	2520	158	-	228	46.1	-	571	-	1590	<0.5	53	-	-	60	<1	-	13	-	1320	-	0.3	-	3	-	<1	-	1320	1320	1	-	3880	3880	125	-	0.42	<1	-	375	-	3.8	-	<1	-	<10	<10	329	-
D19	224 Groundwater Bore MPGM4	30/10/2019	Normal	4750	5.92	-	3480	236	-	316	68.5	-	761	-	2290	<0.5	125	-	-	320	2	-	17	-	1930	-	0.1	-	3	-	3	-	17,600	-	15	-	9930	-	197	-	<0.04	<1	-	726	-	0.6	-	<1	-	<10	-	258	-
D19	224 Groundwater Bore MPGM4	27/11/2019	Normal	5190	6.12	-	3300	229	-	337	66.8	-	832	-	2420	<1	117	-	-	1550	20	-	52	-	1970	-	0.2	-	51	-	10	-	15,300	-	69	-	10,300	-	201	-	<0.04	3	-	737	-	1.2	-	<1	-	<10	<10	397	-
D19	224 Groundwater Bore MPGM4	22/01/2020	Normal	5550	5.97	-	4630	261	-	358	84.9	-	715	-	2370	<1	118	-	-	710	9	-	25	-	2060	-	0.2	-	14	-	7	-	16,600	16,600	47	-	11,100	11,100	226	-	<0.04	<1	-	805	-	1.4	-	<1	-	<10	<10	330	-
D19	224 Groundwater Bore MPGM4	26/02/2020	Normal	6240	6.05	-	5300	237	-	430	98.1	-	941	-	2800	<1	116	-	-	480	7	-	22	-	2540	-	0.2	-	46	-	3	-	-	14,200	21	-	-	11,000	209	-	<0.04	2	-	715	-	0.6	-	<1	-	<10	<10	361	-
D19	224 Groundwater Bore MPGM4	26/03/2020	Normal	5250	6.14	-	4480	192	-	341	93.1	-	827	-	2210	<0.5	146	-	-	6430	52	-	206	-	2310	-	0.7	-	26	-	54	-	-	16,500	202	-	-	7680	172	-	0.06	4	-	711	-	6	-	<1	-	40	<10	813	-
D19	224 Groundwater Bore MPGM4	24/06/2020	Normal	4480	6.04	-	3450	153	-	295	81.6	-	628	-	2190	0.179	151	-	-	70	2	-	13	-	1780	-	0.2	-	<1	-	1	-	-	15,700	4	-	-	5980	132	-	<0.04	<1	-	484	-	0.5	-	<1	-	<10	<10	259	-
D19	D19	4/11/2019	Normal	4554	-	16.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D19	D19	4/11/2019	Normal	4292	-	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			Min	**1750**	**5.46**	**16.9**	**1160**	**64.2**	**0**	**101**	**29.4**	**0**	**227**	**0**	**721**	**0.179**	**25**	**0**	**0**	**60**	**2**	**0**	**13**	**0**	**1040**	**0**	**0.1**	**0**	**3**	**0**	**1**	**0**	**506**	**506**	**1**	**0**	**769**	**769**	**47.6**	**0**	**0.06**	**2**	**0**	**133**	**0**	**0.3**	**0**	**0**	**0**	**40**	**0**	**227**	**0**
			Max	**6240**	**6.14**	**17**	**5300**	**261**	**0**	**430**	**98.1**	**0**	**941**	**0**	**2800**	**0.179**	**151**	**0**	**0**	**6430**	**52**	**0**	**206**	**0**	**2540**	**0**	**0.7**	**0**	**51**	**0**	**54**	**0**	**17600**	**16900**	**202**	**0**	**11100**	**11100**	**226**	**0**	**0.42**	**4**	**0**	**805**	**0**	**6**	**0**	**0**	**0**	**40**	**0**	**813**	**0**
			mean	**4633.3**	**-**	**17.0**	**3633.3**	**196.0**	**-**	**309.2**	**73.6**	**-**	**715.6**	**-**	**2132.3**	**0.2**	**109.0**	**-**	**-**	**1141.1**	**13.7**	**-**	**42.0**	**-**	**1891.1**	**-**	**0.3**	**-**	**19.5**	**-**	**13.0**	**-**	**11371.0**	**11675.1**	**40.9**	**-**	**7571.5**	**7122.7**	**168.6**	**-**	**0.2**	**3.0**	**-**	**593.2**	**-**	**2.0**	**-**	**-**	**-**	**40.0**	**-**	**368.4**	**-**
D113	D113	4/11/2019	Normal	4412	-	16.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D113	D113	4/11/2019	Normal	3980	-	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D113	Groundwater Bore	12/07/2019	Normal	5470	5.87	-	4500	228	-	379	92.4	-	945	-	2750	<0.5	125	-	<1	-	2	-	16	-	1900	-	0.3	-	11	-	5	-	13,800	-	4	-	9150	-	199	-	<0.04	<1	-	620	-	<0.2	-	<1	-	-	-	398	-
D113	Groundwater Bore	15/08/2019	Normal	5420	6.1	-	4430	229	-	285	85.5	-	926	-	1750	<1	125	-	<1	-	2	-	12	-	1570	-	0.2	-	9	-	2	-	20,600	-	2	-	8550	-	189	-	<0.04	<1	-	612	-	<0.2	-	<1	-	-	-	358	-
D113	Groundwater Bore	11/09/2019	Normal	5380	5.96	-	4300	220	-	381	87.5	-	876	-	2680	<0.5	141	-	<1	-	2	-	13	-	2170	-	0.1	-	2	-	<1	-	16,800	-	2	-	9350	-	189	-	<0.04	<1	-	645	-	<0.2	-	<1	-	-	-	355	-
D113	Groundwater Bore	16/10/2019	Normal	5460	5.93	-	3770	240	-	324	94.1	-	870	-	2340	<0.5	134	-	<1	-	2	-	12	-	2490	-	0.2	-	23	-	<1	-	16,800	-	1	-	9580	-	205	-	<0.04	1	-	659	-	0.2	-	<1	-	-	-	369	-
D113	Groundwater Bore	13/11/2019	Normal	5840	5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D113	Groundwater Bore	18/03/2020	Normal	5550	5.92	-	4780	220	210	378	117	113	948	910	2560	<0.5	137	-	<1	-	1	<1	12	11	2310	2350	0.2	0.2	7	<1	<1	<1	16,800	14,200	2	1	7610	7420	184	176	<0.04	<1	<1	636	614	0.3	<0.2	<1	<1	-	-	378	366
D113	Groundwater Bore	14/05/2020	Normal	4710	5.93	-	3630	145	145	284	89.8	84.4	732	667	2000	<0.5	166	-	<1	-	2	1	13	10	1860	1720	0.2	0.2	3	<1	<1	<1	14,300	13,500	2	<1	6050	5710	132	132	<0.04	<1	<1	520	476	<0.2	<0.2	<1	<1	-	-	323	266
			Min	**3980**	**5.87**	**16.8**	**3630**	**145**	**145**	**284**	**85.5**	**84.4**	**732**	**667**	**1750**	**0**	**125**	**0**	**0**	**0**	**1**	**1**	**12**	**10**	**1570**	**1720**	**0.1**	**0.2**	**2**	**0**	**2**	**0**	**13800**	**13500**	**1**	**1**	**6050**	**5710**	**132**	**132**	**0**	**1**	**0**	**520**	**476**	**0.2**	**0**	**0**	**0**	**0**	**0**	**323**	**266**
			Max	**5840**	**6.1**	**17**	**4780**	**240**	**210**	**381**	**117**	**113**	**948**	**910**	**2750**	**0**	**166**	**0**	**0**	**0**	**2**	**1**	**16**	**11**	**2490**	**2350**	**0.3**	**0.2**	**23**	**0**	**5**	**0**	**20600**	**14200**	**4**	**1**	**9580**	**7420**	**205**	**176**	**0**	**1**	**0**	**659**	**614**	**0.3**	**0**	**0**	**0**	**0**	**0**	**398**	**366**
			mean	**5135.8**	**-**	**16.9**	**4235.0**	**213.7**	**177.5**	**338.5**	**94.4**	**98.7**	**882.8**	**788.5**	**2346.7**	**-**	**138.0**	**-**	**-**	**-**	**1.8**	**1.0**	**13.0**	**10.5**	**2050.0**	**2035.0**	**0.2**	**0.2**	**9.2**	**-**	**3.5**	**-**	**16516.7**	**13850.0**	**2.2**	**1.0**	**8381.7**	**6565.0**	**183.0**	**154.0**	**-**	**1.0**	**-**	**615.3**	**545.0**	**0.3**	**-**	**-**	**-**	**-**	**-**	**363.5**	**316.0**

				Electrical Conductivity (Field)	pH (Field)	Temperature (Field)	Total Dissolved Solids (TDS)	Calcium	Calcium (Filtered)	Chloride	Potassium	Potassium (Filtered)	Sodium	Sodium (Filtered)	Sulfate (as SO4)	Fluoride	Total Alkalinity (as CaCO3)	Total Alkalinity (as CaCO3) (Filtered)	Phenolphthalein Alkalinity (CaCO3)	Aluminium	Arsenic	Arsenic (Filtered)	Barium	Barium (Filtered)	Boron	Boron (Filtered)	Cadmium	Cadmium (Filtered)	Chromium	Chromium (Filtered)	Copper	Copper (Filtered)	Iron	Iron (Filtered)	Lead	Lead (Filtered)	Manganese	Manganese (Filtered)	Magnesium	Magnesium (Filtered)	Mercury	Molybdenum	Molybdenum (Filtered)	Nickel	Nickel (Filtered)	Selenium	Selenium (Filtered)	Silver	Silver (Filtered)	Vanadium	Vanadium (Filtered)	Zinc	Zinc (Filtered)
				Field Parameters				Major Anions and Cations												Metals																																	
				uS/cm	pH units	oC	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
ANZECC (2000) or Local Guidelines - Groundwater				2600	6.5-8		2000			350					1000	1.5					24	24	700	700	370	370	2	2	5	5	5	5	664	664	5	5	5704	5704			0.06	10	10	550.9	550.9	5	5	0.05	0.05			908	908
Upgradient - Background Bores																																																					
LocCode	**Field_ID**	**Sampled_Date**	**Sample_Type**																																																		
D4	9 Groundwater Bore MPGM4	12/07/2019	Normal	900	3.38	-	770	15.2	-	11.7	8.54	-	20.2	-	408	<0.1	<1	-	-	14,100	46	-	13	-	<50	-	0.6	-	2	-	3	-	105,000	105,000	19	-	778	778	9.33	-	<0.04	<1	-	18	-	0.2	-	<1	-	10	10	198	-
D4	9 Groundwater Bore MPGM4	7/08/2019	Normal	860	3.39	-	719	17.2	-	13.8	9.08	-	20.3	-	341	<0.1	<1	-	-	13,400	50	-	13	-	<50	-	0.5	-	3	-	1	-	90,700	90,700	22	-	762	762	10	-	<0.04	<1	-	16	-	0.2	-	<1	-	<10	<10	170	-
D4	9 Groundwater Bore MPGM4	5/09/2019	Normal	860	3.39	-	718	16.4	-	11.4	8.29	-	19.2	-	391	<0.1	<1	-	-	13,000	41	-	11	-	<50	-	0.6	-	2	-	<1	-	100,000	100,000	18	-	732	732	9.42	-	<0.04	<1	-	17	-	<0.2	-	<1	-	<10	<10	168	-
D4	9 Groundwater Bore MPGM4	3/10/2019	Normal	860	3.41	-	743	15.4	-	12.5	8.25	-	18.4	-	413	<0.1	<1	-	-	14,700	42	-	12	-	<50	-	0.6	-	2	-	<1	-	110,000	-	18	-	775	-	9.23	-	<0.04	<1	-	18	-	<0.2	-	<1	-	<10	-	188	-
D4	9 Groundwater Bore MPGM4	5/11/2019	Normal	1142	-	15.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	9 Groundwater Bore MPGM4	5/11/2019	Normal	1064	-	13.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	9 Groundwater Bore MPGM4	7/11/2019	Normal	820	3.43	-	612	17.1	-	15.5	8.45	-	20.1	-	398	<0.1	<1	-	-	11,800	36	-	12	-	<50	-	0.4	-	2	-	<1	-	80,300	-	17	-	767	-	8.98	-	<0.04	<1	-	15	-	<0.2	-	<1	-	<10	-	150	-
D4	9 Groundwater Bore MPGM4	12/12/2019	Normal	820	3.45	-	716	16.7	-	14.5	8.26	-	18.9	-	372	0.062	<1	<1	-	12,800	42	-	13	-	<50	-	0.5	-	2	-	<1	-	95,400	-	16	-	815	-	9.69	-	<0.04	<1	-	15	-	<0.2	-	<1	-	<10	<10	147	-
D4	9 Groundwater Bore MPGM4	16/01/2020	Normal	810	3.47	-	624	17.8	-	16	7.81	-	20	-	482	0.12	<1	-	-	13,500	44	-	13	-	<50	-	0.5	-	2	-	<1	-	89,300	89,300	18	-	850	850	8.94	-	<0.04	<1	-	16	-	0.2	-	<1	-	<10	<10	158	-
D4	9 Groundwater Bore MPGM4	12/02/2020	Normal	810	3.47	-	696	16.6	-	13.2	9.65	-	22.9	-	308	0.075	<1	-	-	12,500	41	-	12	-	<50	-	0.5	-	2	-	1	-	-	87,800	17	-	-	778	10	-	<0.04	<1	-	15	-	<0.2	-	<1	-	<10	<10	151	-
D4	9 Groundwater Bore MPGM4	12/03/2020	Normal	770	3.46	-	650	17.1	-	12.8	8.03	-	19.8	-	234	<0.1	<1	-	-	10,900	47	-	12	-	<50	-	0.4	-	2	-	<1	-	-	71,700	18	-	-	745	8.99	-	<0.04	<1	-	13	-	<0.2	-	<1	-	<10	<10	125	-
			Min	770	3.38	13.9	612	15.2	0	11.4	7.81	0	18.4	0	234	0.062	0	0	0	10900	36	0	11	0	0	0	0.4	0	2	0	1	0	80300	71700	16	0	732	732	8.94	0	0	0	0	13	0	0.2	0	0	0	10	10	125	0
			Max	1142	3.47	15.4	770	17.8	0	16	9.65	0	22.9	0	482	0.12	0	0	0	14700	50	0	13	0	0	0	0.6	0	3	0	3	0	110000	105000	22	0	850	850	10	0	0	0	0	18	0	0.2	0	0	0	10	10	198	0
			mean	883.3	-	14.7	694.2	16.6	-	13.5	8.5	-	20.0	-	371.9	0.1	-	-	-	12966.7	43.2	-	12.3	-	-	-	0.5	-	2.1	-	1.7	-	95814.3	90750.0	18.1	-	782.7	774.2	9.4	-	-	-	-	15.9	-	0.2	-	-	-	10.0	10.0	161.7	-
D5	10 Groundwater Bore MPGM4	12/07/2019	Normal	1270	5.89	-	949	101	-	24.4	9.03	-	31.6	-	596	<0.1	77	-	-	30	<1	-	17	-	70	-	<0.1	-	<1	-	<1	-	35,500	35,500	<1	-	7960	7960	74.2	-	<0.04	<1	-	48	-	<0.2	-	<1	-	<10	<10	16	-
D5	10 Groundwater Bore MPGM4	7/08/2019	Normal	1200	5.92	-	903	102	-	23.3	10.2	-	31.6	-	537	<1	87	-	-	30	<1	-	17	-	100	-	<0.1	-	<1	-	<1	-	53,400	53,400	<1	-	8770	8770	71.9	-	<0.04	<1	-	38	-	0.4	-	<1	-	<10	<10	18	-
D5	10 Groundwater Bore MPGM4	5/09/2019	Normal	1250	5.93	-	906	101	-	24.2	8.99	-	29.6	-	566	0.121	90	-	-	20	<1	-	20	-	80	-	<0.1	-	<1	-	<1	-	50,300	50,300	<1	-	8460	8460	70.8	-	<0.04	<1	-	42	-	0.2	-	<1	-	<10	<10	16	-
D5	10 Groundwater Bore MPGM4	3/10/2019	Normal	1270	5.97	-	872	101	-	23.7	9.15	-	27.1	-	592	<0.1	60	-	-	20	<1	-	18	-	120	-	<0.1	-	<1	-	<1	-	30,800	-	<1	-	8890	-	73.9	-	<0.04	<1	-	45	-	<0.2	-	<1	-	<10	-	12	-
D5	10 Groundwater Bore MPGM4	7/11/2019	Normal	1260	5.92	-	853	109	-	27.6	10.4	-	32.8	-	635	0.149	93	-	-	30	<1	-	17	-	120	-	<0.1	-	<1	-	<1	-	30,300	-	<1	-	7990	-	71.7	-	<0.04	<1	-	42	-	<0.2	-	<1	-	<10	-	17	-
D5	10 Groundwater Bore MPGM4	12/12/2019	Normal	1270	5.92	-	926	102	-	25.1	9.73	-	28.8	-	592	0.16	64	-	-	30	<1	-	19	-	110	-	<0.1	-	<1	-	<1	-	22,400	-	<1	-	9390	-	73.6	-	<0.04	<1	-	41	-	<0.2	-	<1	-	<10	<10	16	-
D5	10 Groundwater Bore MPGM4	16/01/2020	Normal	1260	6.01	-	902	108	-	25.9	10	-	32.1	-	589	0.177	84	-	-	30	<1	-	18	-	120	-	<0.1	-	<1	-	<1	-	32,400	32,400	<1	-	9140	9140	68.5	-	<0.04	<1	-	47	-	0.3	-	<1	-	<10	<10	21	-
D5	10 Groundwater Bore MPGM4	12/02/2020	Normal	1250	6.06	-	938	96.7	-	25.7	11.9	-	33	-	535	<0.1	51	-	-	20	<1	-	17	-	110	-	<0.1	-	<1	-	<1	-	-	27,500	<1	-	-	7890	71.4	-	<0.04	<1	-	41	-	<0.2	-	<1	-	<10	<10	16	-
D5	10 Groundwater Bore MPGM4	12/03/2020	Normal	1260	5.96	-	1020	107	-	24.8	10.6	-	33.1	-	567	<0.1	108	-	-	30	<1	-	16	-	110	-	<0.1	-	<1	-	<1	-	-	50,500	<1	-	-	8100	69.6	-	<0.04	<1	-	46	-	0.3	-	<1	-	<10	<10	13	-
			Min	1200	5.89	0	853	96.7	0	23.3	8.99	0	27.1	0	535	0.121	51	0	0	20	0	0	16	0	70	0	0	0	0	0	0	0	22400	27500	0	0	7960	7890	68.5	0	0	0	0	38	0	0.2	0	0	0	0	0	12	0
			Max	1270	6.06	0	1020	109	0	27.6	11.9	0	33.1	0	635	0.177	108	0	0	30	0	0	20	0	120	0	0	0	0	0	0	0	53400	53400	0	0	9390	9140	74.2	0	0	0	0	48	0	0.4	0	0	0	0	0	21	0
			mean	1254.4	-	-	918.8	103.1	-	25.0	10.0	-	31.1	-	578.8	0.2	79.3	-	-	26.7	-	-	17.7	-	104.4	-	-	-	-	-	-	-	36442.9	41600.0	-	-	8657.1	8386.7	71.7	-	-	-	-	43.3	-	0.3	-	-	-	-	-	16.1	-
Within Ash Repository / Mine Spoil																																																					
LocCode	**Field_ID**	**Sampled_Date**	**Sample_Type**																																																		
Within Mine Spoil - South wells																																																					
LocCode	**Field_ID**	**Sampled_Date**	**Sample_Type**																																																		
D15	220 Groundwater Bore MPGM4	24/07/2019	Normal	3620	4.92	-	2760	258	-	204	43.1	-	554	-	1900	<0.5	12	-	-	980	3	-	17	-	190	-	0.4	-	13	-	2	-	3690	3690	6	-	61	61	116	-	<0.04	<1	-	885	-	0.5	-	<1	-	<10	<10	1550	-
D15	220 Groundwater Bore MPGM4	28/08/2019	Normal	3680	4.94	-	6010	262	-	558	140	-	1290	-	3660	0.214	50	-	-	80	<1	-	17	-	2710	-	3.8	-	<1	-	<1	-	15,600	15,600	4	-	5520	5520	240	-	<0.04	<1	-	761	-	1.2	-	<1	-	<10	<10	966	-
D15	220 Groundwater Bore MPGM4	25/09/2019	Normal	3630	4.97	-	2860	252	-	191	38.1	-	541	-	1840	<0.5	20	-	-	720	4	-	16	-	160	-	0.5	-	10	-	3	-	32,500	32,500	5	-	2520	2520	111	-	0.06	<1	-	890	-	0.3	-	<1	-	<10	<10	1600	-
D15	220 Groundwater Bore MPGM4	30/10/2019	Normal	3640	4.93	-	2730	243	-	187	38.6	-	476	-	1840	<0.5	12	-	-	860	5	-	20	-	210	-	0.5	-	52	-	6	-	29,300	-	6	-	2240	-	103	-	0.07	2	-	934	-	0.5	-	<1	-	<10	-	1610	-
D15	D15	4/11/2019	Normal	3357	-	16.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D15	D15	4/11/2019	Normal	3385	-	16.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D15	220 Groundwater Bore MPGM4	27/11/2019	Normal	3600	5.5	-	2790	242	-	177	36.7	-	516	-	1830	<0.5	8	-	-	1330	6	-	18	-	200	-	0.5	-	129	-	7	-	30,000	-	7	-	2160	-	107	-	<0.04	5	-	934	-	0.4	-	<1	-	<10	<10	1560	-
D15	220 Groundwater Bore MPGM4	22/01/2020	Normal	3530	4.94	-	3460	249	-	166	48.6	-	426	-	1600	<0.5	<1	-	-	4050	37	-	50	-	210	-	0.9	-	34	-	102	-	27,500	27,500	61	-	2120	2120	110	-	0.14	3	-	853	-	12.6	-	<1	-	10	<10	1710	-
D15	220 Groundwater Bore MPGM4	26/02/2020	Normal	3530	5.1	-	3040	223	-	166	43.5	-	423	-	1680	<0.5	4	-	-	16,600	124	-	139	-	260	-	1.4	-	106	-	191	-	-	11,300	119	-	-	2240	102	-	0.09	12	-	821	-	12.4	-	<1	-	50	<10	1810	-
D15	220 Groundwater Bore MPGM4	26/03/2020	Normal	3380	5.68	-	2940	252	-	147	46.4	-	466	-	1510	<0.5	16	-	-	530	4	-	27	-	220	-	0.7	-	7	-	4	-	-	29,200	9	-	-	2040	113	-	<0.04	<1	-	740	-	1.1	-	<1	-	<10	<10	1350	-
D15	220 Groundwater Bore MPGM4	24/06/2020	Normal	3340	5.15	-	2670	233	-	152	40.8	-	378	-	1700	<0.5	23	-	-	880	6	-	15	-	200	-	0.4	-	52	-	8	-	-	26,600	6	-	-	2010	102	-	<0.04	2	-	799	-	0.9	-	<1	-	<10	<10	1350	-
			min	3340	4.92	16.5	2670	223	0	147	36.7	0	378	0	1510	0.214	4	0	0	80	3	0	15	0	160	0	0.4	0	7	0	2	0	3690	3690	4	0	61	61	102	0	0.06	2	0	740	0	0.3	0	0	0	10	0	966	0
			max	3680	5.68	16.5	6010	262	0	558	140	0	1290	0	3660	0.214	50	0	0	16600	124	0	139	0	2710	0	3.8	0	129	0	191	0	32500	32500	119	0	5520	5520	240	0	0.14	12	0	934	0	12.6	0	0	0	50	0	1810	0
			mean	3517.5	-	16.5	3251.1	246.0	-	216.4	52.9	-	563.3	-	1951.1	0.2	18.1	-	-	2892.2	23.6	-	35.4	-	484.4	-	1.0	-	50.4	-	40.4	-	23098.3	20912.9	24.8	-	2436.8	2358.7	122.7	-	0.1	4.8	-	846.3	-	3.3	-	-	-	30.0	-	1500.7	-
D16	221 Groundwater Bore MPGM4	24/07/2019	Normal	1970	6.37	-	1460	296	-	104	31.7	-	34.4	-	842	0.132	175	-	-	<10	<1	-	12	-	<50	-	<0.1	-	4	-	<1	-	2850	2850	<1	-	64	64	105	-	<0.04	<1	-	17	-	<0.2	-	<1	-	<10	<10	<5	-
D16	221 Groundwater Bore MPGM4	28/08/2019	Normal	1980	6.29	-	1540	308	-	103	31.6	-	38.4	-	831	0.166	176	-	-	<10	<1	-	11	-	100	-	<0.1	-	<1	-	<1	-	3630	3630	<1	-	61	61	104	-	<0.04	<1	-	16	-	<0.2	-	<1	-	<10	<10	<5	-
D16	221 Groundwater Bore MPGM4	25/09/2019	Normal	2010	6.31	-	1590	262	-	104	26.8	-	31.2	-	846	0.171	177	-	-	30	<1	-	9	-	<50	-	<0.1	-	<1	-	<1	-	3010	3010	<1	-	62	62	96.7	-	<0.04	<1	-	16	-	<0.2	-	<1	-	<10	<10	<5	-
D16	221 Groundwater Bore MPGM4	30/10/2019	Normal	1960	6.35	-	1560	276	-	93.1	26.5	-	30.8	-	773	<0.1	212	-	-	<10	<1	-	10	-	<50	-	<0.1	-	<1	-	<1	-	3700	-	<1	-	55	-	92.1	-	<0.04	<1	-	15	-	<0.2	-	<1	-	<10	-	<5	-
D16	D16	4/11/2019	Normal	1810	-	16.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D16	D16	4/11/2019	Normal	2023	-	15.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D16	221 Groundwater Bore MPGM4	27/11/2019	Normal	1870	6.82	-	1410	269	-	89.4	26.1	-	26.2	-	775	<0.1	210	-	-	<10	<1	-	10	-	<50	-	<0.1	-	<1	-	<1	-	2740	-	<1	-	57	-	93.7	-	<0.04	<1	-	12	-	<0.2	-	<1	-	<10	<10	<5	-
D16	221 Groundwater Bore MPGM4	22/01/2020	Normal	1760	6.43	-	1560	258	-	77.8	30.3	-	41.4	-	680	0.218	216	-	-	<10	<1	-	8	-	<50	-	<0.1	-	<1	-	<1	-	2700	2700	<1	-	46	46	88.8	-	<0.04	<1	-	12	-	<0.2	-	<1	-	<10	<10	14	-
D16	221 Groundwater Bore MPGM4	26/02/2020	Normal	1900	6.36	-	1570	256	-	93	25.6	-	33.4	-	768	<0.2	189	-	-	20	<1	-	10	-	<50	-	<0.1	-	4	-	<1	-	2790	2790	<1	-	57	57	89.3	-	<0.04	<1	-	13	-	<0.2	-	<1	-	<10	<10	<5	-
D16	221 Groundwater Bore MPGM4	25/03/2020	Normal	1940	6.36	-	1660	289	-	96	30.8	-	41.7	-	775	<0.2	208	-	-	<10	<1	-	14	-	<50	-	<0.1	-	2	-	<1	-	-	3060	<1	-	-	62	101	-	<0.04	<1	-	16	-	<0.2	-	<1	-	<10	<10	<5	-
D16	221 Groundwater Bore MPGM4	24/06/2020	Normal	2070	6.46	-	1610	286	-	105	28.6	-	40	-	898	0.193	202	-	-	<10	<1	-	10	-	<50	-	<0.1	-	2	-	<1	-	-	3540	<1	-	-	65	98.9	-	<0.04	<1	-	19	-	<0.2	-	<1	-	<10	<10	7	-
			min	1760	6.29	15.9	1410	256	0	77.8	25.6	0	26.2	0	680	0.132	175	0	0	20	0	0	8	0	100	0	0	0	2	0	0	0	2700	2700	0	0	46	46	88.8	0	0	0	0	12	0	0	0	0	0	0	0	7	0
			max	2070	6.82	16.7	1660	308	0	105	31.7	0	41.7	0	898	0.218	216	0	0	30	0	0	14	0	100	0	0	0	4	0	0	0	3700	3630	0	0	64	65	105	0	0	0	0	19	0	0	0	0	0	0	0	14	0
			mean	1935.7	-	16.3	1551.1	277.8	-	96.1	28.7	-	35.3	-	798.7	0.2	196.1	-	-	25.0	-	-	10.4	-	100.0	-	-	-	3.0	-	-	-	3060.0	3082.9	-	-	57.4	59.6	96.6	-	-	-	-	15.1	-	-	-	-	-	-	-	10.5	-
D17	222 Groundwater Bore MPGM4	24/07/2019	Normal	3650	6.17	-	2820	266	-	226	24.5	-	462	-	1730	<0.1	110	-	-	80	3	-	15	-	90	-	<0.1	-	3	-	<1	-	29,000	29,000	<1	-	3360	3360	165	-	<0.04	<1	-	106	-	<0.2	-	<1	-	<10	<10	80	-
D17	222 Groundwater Bore MPGM4	28/08/2019	Normal	3610	6.16	-	2720	269	-	218	28.5	-	385	-	1740	<0.5	98	-	-	310	3	-	19	-	110	-	<0.1	-	4	-	<1	-	10,300	10,300	<1	-	3260	3260	160	-	<0.04	<1	-	113	-	<0.2	-	<1	-	<10	<10	88	-
D17	222 Groundwater Bore MPGM4	25/09/2019	Normal	3540	6.13	-	2700	270	-	216	22.4	-	445	-	1620	<0.5	116	-	-	10	2	-	16	-	100	-	<0.1	-	<1	-	<1	-	29,600	29,600	<1	-	3550	3550	159	-	<0.04	<1	-	98	-	<0.2	-	<1	-	<10	<10	83	-
D17	222 Groundwater Bore MPGM4	30/10/2019	Normal	3580	6.09	-	2680	260	-	208	23.9	-	400	-	1580	<0.5	117	-	-	<10	<1	-	13	-	230	-	<0.1	-	<1	-	<1	-	2460	-	<1	-	3090	-	150	-	<0.04	<1	-	98	-	<0.2	-	<1	-	<10	-	63	-
D17	D17	4/11/2019	Normal	2807	-	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D17	222 Groundwater Bore MPGM4	27/11/2019	Normal	3570	6.16	-	2850	253	-	219	21.2	-	437	-	1700	<0.5	90	-	-	160	2	-	15	-	190	-	<0.1	-	5	-	<1	-	16,400	-	<1	-	3200	-	155	-	<0.04	<1	-	102	-	<0.2	-	<1	-	<10	<10	76	-
D17	222 Groundwater Bore MPGM4	22/01/2020	Normal	3080	6.1	-	2620	240	-	179	24.5	-	270	-	1320	<0.5	113	-	-	390	2	-	22	-	220	-	<0.1	-	2	-	<1	-	8480	8480	<1	-	2340	2340	132	-	<0.04	<1	-	58	-	<0.2	-	<1	-	<10	<10	41	-
D17	222 Groundwater Bore MPGM4	24/06/2020	Normal	3480	6.15	-	2620	259	-	228	25.3	-	318	-	1800	0.105	130	-	-	<10	2	-	13	-	100	-	<0.1	-	<1	-	<1	-	-	28,700	<1	-	-	3000	153	-	<0.04	<1	-	73	-	<0.2	-	<1	-	<10	<10	71	-
			min	2807	6.09	19	2620	240	0	179	21.2	0	270	0	1320	0.105	90	0	0	10	2	0	13	0	90	0	0	0	2	0	0	0	2460	8480	0	0	2340	2340	132	0	0	0	0	58	0	0	0	0	0	0	0	41	0
			max	3650	6.17	19	2850	270	0	228	28.5	0	462	0	1800	0.105	130	0	0	390	3	0	22	0	230	0	0	0	5	0	0	0	29600	29600	0	0	3550	3550	165	0	0	0	0	113	0	0	0	0	0	0	0	88	0
			mean	3414.6	-	19.0	2715.7	259.6	-	213.4	24.3	-	388.1	-	1641.4	0.1	110.6	-	-	190.0	2.3	-	16.1	-	148.6	-	-	-	3.5	-	-	-	16040.0	21216.0	-	-	3133.3	3102.0	153.4	-	-	-	-	92.6	-	-	-	-	-	-	-	71.7	-
D18	223 Groundwater Bore MPGM4	25/07/2019	Normal	680	6.7	-	352	82.2	-	10.2	19.3	-	18.7	-	16.4	0.401	307	-	-	100	4	-	645	-	60	-	<0.1	-	<1	-	<1	-	28	28	<1	-	139	139	32.3	-	<0.04	<1	-	2	-	<0.2	-	<1	-	<10	<10	27	-
D18	223 Groundwater Bore MPGM4	29/08/2019	Normal	650	6.66	-	375	80.7	-	7.17	19.1	-	16.6	-	10	0.425	313	-	-	20	7	-	685	-	60	-	<0.1	-	<1	-	<1	-	15	15	2	-	112	112	29.9	-	<0.04	1	-	4	-	<0.2	-	<1	-	<10	<10	24	-
D18	223 Groundwater Bore MPGM4	26/09/2019	Normal	660	6.64	-	391	82.2	-	7.7	18.5	-	15	-	9.73	0.408	315	-	-	30	9	-	695	-	<50	-	<0.1	-	<1	-	<1	-	988	988	<1	-	110	110	31	-	<0.04	1	-	3	-	<0.2	-	<1	-	<10	<10	23	-
D18	223 Groundwater Bore MPGM4	31/10/2019	Normal	680	6.63	-	356	83.9	-	8.06	17.2	-	16.5	-	11.9	0.328	369	-	-	50	11	-	667	-	60	-	<0.1	-	<1	-	<1	-	1300	-	<1	-	114	-	28.7	-	<0.04	<1	-	4	-	<0.2	-	<1	-	<10	-	24	-
D18	223 Groundwater Bore MPGM4	28/11/2019	Normal	680	6.7	-	352	81.3	-	7.92	16.4	-	14.2	-	9.38	0.254	349	-	-	30	10	-	688	-	60	-	<0.1	-	<1	-	1	-	500	-	<1	-	111	-	31	-	<0.04	<1	-	6	-	<0.2	-	<1	-	<10	<10	19	-
D18	223 Groundwater Bore MPGM4	23/01/2020	Normal	680	6.76	-	448	83.7	-	8.41	18.7	-	20.8	-	12.1	0.354	351	-	-	20	3	-	629	-	60	-	<0.1	-	<1	-	<1	-	206	206	<1	-	124	124	31.4	-	<0.04	<1	-	6	-	<0.2	-	<1	-	<10	<10	40	-
D18	223 Groundwater Bore MPGM4	27/02/2020	Normal	660	6.72	-	386	77.1	-	7.53	16.2	-	14	-	9.75	<0.1	353	-	-	40	9	-	668	-	50	-	<0.1	-	<1	-	<1	-	-	999	<1	-	-	82	28.8	-	<0.04	2	-	4	-	<0.2	-	<1	-	<10	<10	15	-
D18	223 Groundwater Bore MPGM4	26/03/2020	Normal	680	7	-	406	80.4	-	15.8	19.2	-	17	-	13.2	0.364	377	-	-	240	11	-	638	-	50	-	0.2	-	2	-	2	-	-	555	2	-	-	138	30.8	-	<0.04	1	-	5	-	<0.2	-	<1	-	<10	<10	50	-
D18	223 Groundwater Bore MPGM4	25/06/2020	Normal	660	6.67	-	310	73.2	-	79.6	16.2	-	14.4	-	103	4.63	362	-	-	50	9	-	552	-	50	-	<0.1	-	<1	-	1	-	-	539	<1	-	-	114	26.9	-	<0.04	8	-	5	-	0.2	-	<1	-	<10	<10	28	-
			min	650	6.63	0	310	73.2	0	7.17	16.2	0	14	0	9.38	0.254	307	0	0	20	3	0	552	0	50	0	0.2	0	2	0	1	0	15	15	2	0	110	82	26.9	0	0	1	0	2	0	0.2	0	0	0	0	0	15	0
			max	680	7	0	448	83.9	0	79.6	19.3	0	20.8	0	103	4.63	377	0	0	240	11	0	695	0	60	0	0.2	0	2	0	2	0	1300	999	2	0	139	139	32.3	0	0	8	0	6	0	0.2	0	0	0	0	0	50	0
			mean	670.0	-	-	375.1	80.5	-	16.9	17.9	-	16.4	-	21.7	0.9	344.0	-	-	64.4	8.1	-	651.9	-	56.3	-	0.2	-	2.0	-	1.3	-	506.2	475.7	2.0	-	118.3	117.0	30.1	-	-	2.6	-	4.3	-	0.2	-	-	-	-	-	27.8	-
Background / adjacent MPAR																																																					
D3	8 Groundwater Bore MPGM4	25/07/2019	Normal	980	5.99	-	597	93.1	-	28.8	11.6	-	44	-	357	<0.1	105	-	-	20	<1	-	24	-	70	-	<0.1	-	<1	-	<1	-	14,200	14,200	<1	-	852	852	55.2	-	<0.04	<1	-	2	-	<0.2	-	<1	-	<10	<10	<5	-
D3	8 Groundwater Bore MPGM4	29/08/2019	Normal	1010	6.05	-	634	92.5	-	29.1	11.8	-	39.8	-	372	<0.1	108	-	-	<10	<1	-	23	-	80	-	<0.1	-	<1	-	<1	-	11,500	11,500	<1	-	862	862	50.4	-	<0.04	<1	-	2	-	<0.2	-	<1	-	<10	<10	<5	-
D3	8 Groundwater Bore MPGM4	26/09/2019	Normal	940	6.04	-	578	82.8	-	30.5	9.75	-	38.6	-	319	<0.1	104	-	-	20	<1	-	29	-	<50	-	<0.1	-	<1	-	1	-	12,000	12,000	<1	-	744	744	49.4	-	<0.04	<1	-	3	-	<0.2	-	<1	-	<10	<10	8	-
D3	8 Groundwater Bore MPGM4	31/10/2019	Normal	960	6.05	-	634	97.5	-	28.5	11	-	39.4	-	330	<0.1	125	-	-	20	<1	-	24	-	100	-	<0.1	-	<1	-	<1	-	7820	-	<1	-	793	-	49.7	-	<0.04	<1	-	2	-	<0.2	-	<1	-	<10	-	<5	-
D3	D3	5/11/2019	Normal	957	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D3	D3	5/11/2019	Normal	1140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D3	8 Groundwater Bore MPGM4	28/11/2019	Normal	1070	6.12	-	623	94.2	-	35.8	9.22	-	42.8	-	347	<1	123	-	-	110	<1	-	27	-	80	-	<0.1	-	<1	-	<1	-	10,300	-	<1	-	855	-	57	-	<0.04	<1	-	4	-	<0.2	-	<1	-	<10	<10	7	-
D3	8 Groundwater Bore MPGM4	23/01/2020	Normal	980	6.14	-	753	94.4	-	40.8	13	-	60.5	-	294	<0.1	145	-	-	<10	<1	-	28	-	130	-	<0.1	-	<1	-	<1	-	2220	2220	<1	-	752	752	54	-	0.09	<1	-	4	-	<0.2	-	<1	-	<10	<10	<5	-
D3	8 Groundwater Bore MPGM4	27/02/2020	Normal	980	6.09	-	702	84	-	33.1	9.45	-	36.6	-	334	<0.1	117	-	-	60	<1	-	25	-	60	-	<0.1	-	<1	-	<1	-	-	1710	<1	-	-	782	47.8	-	<0.04	<1	-	2	-	<0.2	-	<1	-	<10	<10	<5	-
D3	8 Groundwater Bore MPGM4	25/03/2020	Normal	870	5.95	-	674	76.4	-	28.2	9.76	-	36.5	-	294	<0.1	95	-	-	80	<1	-	33	-	<50	-	<0.1	-	<1	-	<1	-	-	5220	<1	-	-	777	43.9	-	<0.04	<1	-	3	-	<0.2	-	<1	-	<10	<10	7	-
D3	8 Groundwater Bore MPGM4	25/06/2020	Normal	350	5.87	-	168	23.6	-	17.4	3.8	-	21.1	-	99.9	0.039	46	-	-	40	<1	-	33	-	<50	-	<0.1	-	<1	-	<1	-	-	690	<1	-	-	110	14.4	-	<0.04	<1	-	3	-	<0.2	-	<1	-	<10	<10	<5	-
			Min	350	5.87	0	168	23.6	0	17.4	3.8	0	21.1	0	99.9	0.039	46	0	0	20	0	0	23	0	60	0	0	0	0	0	1	0	2220	690	0	0	744	110	14.4	0	0.09	0	0	2	0	0	0	0	0	0	0	7	0
			Max	1140	6.14	0	753	97.5	0	40.8	13	0	60.5	0	372	0.039	145	0	0	110	0	0	33	0	130	0	0	0	0	0	1	0	14200	14200	0	0	862	862	57	0	0.09	0	0	4	0	0	0	0	0	0	0	8	0
			mean	930.6	-	-	595.9	82.1	-	30.2	9.9	-	39.9	-	305.2	0.0	107.6	-	-	50.0	-	-	27.3	-	86.7	-	-	-	-	-	1.0	-	9673.3	6791.4	-	-	809.7	697.0	46.9	-	0.1	-	-	2.8	-	-	-	-	-	-	-	7.3	-
D107	Groundwater Bore	11/07/2019	Normal	13,550	5.86	-	12,000	578	-	1750	160	-	2150	-	7590	<0.5	132	-	<1	-	5	-	25	-	4290	-	0.7	-	<1	-	<1	-	38,400	-	4	-	27,000	-	703	-	<0.04	<1	-	2660	-	0.2	-	<1	-	-	-	447	-
D107	Groundwater Bore	14/08/2019	Normal	13,300	5.9	-	12,200	551	-	1580	185	-	2150	-	6600	<0.5	157	-	<1	-	5	-	22	-	3720	-	0.7	-	<1	-	<1	-	27,500	-	5	-	24,200	-	668	-	<0.04	<1	-	2560	-	0.3	-	<1	-	-	-	433	-
D107	Groundwater Bore	11/09/2019	Normal	12,370	5.94	-	11,000	489	-	1570	167	-	1930	-	6480	<0.5	155	-	<1	-	7	-	22	-	4380	-	0.7	-	<1	-	<1	-	37,400	-	5	-	23,700	-	604	-	<0.04	<1	-	2400	-	0.3	-	<1	-	-	-	423	-
D107	Groundwater Bore	16/10/2019	Normal	10,980	5.95	-	10,200	456	-	1270	158	-	1760	-	5000	<0.5	153	-	<1	-	6	-	19	-	4380	-	0.5	-	<1	-	<1	-	30,900	-	4	-	19,900	-	557	-	<0.04	<1	-	1900	-	0.3	-	<1	-	-	-	343	-
D107	D107	5/11/2019	Normal	3786	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D107	D107	5/11/2019	Normal	11,600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D107	Groundwater Bore	13/11/2019	Normal	10,490	5.95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D107	Groundwater Bore	19/03/2020	Normal	12,690	5.92	-	11,900	484	471	1500	253	241	2160	2070	6080	<1	184	-	<1	-	4	3	22	20	4510	4570	0.6	0.6	<1	<1	<1	<1	33,700	29,900	4	3	20,500	20,200	662	630	<0.04	<1	<1	2380	2360	0.5	0.3	<1	<1	-	-	360	348
D107	Groundwater Bore	13/05/2020	Normal	13,850	5.91	-	13,500	550	531	1470	244	221	2460	2300	6420	<2	200	-	<1	-	8	5	25	24	5200	4550	0.7	0.7	3	1	<1	<1	37,000	36,800	7	5	23,700	23,000	786	700	<0.04	<1	<1	2820	2680	0.4	0.3	<1	<1	-	-	453	427
			Min	3786	5.86	0	10200	456	471	1270	158	221	1760	2070	5000	0	132	0	0	0	4	3	19	20	3720	4550	0.5	0.6	3	1	0	0	27,500	29,900	4	3	19,900	20,200	557	630	0	0	0	1,900	2,360	0.2	0.3	0	0	0	0	343	348
			Max	13850	5.95	0	13500	578	531	1750	253	241	2460	2300	7590	0	200	0	0	0	8	5	25	24	5200	4570	0.7	0.7	3	1	0	0	38,400	36,800	7	5	27,000	23,000	786	700	0	0	0	2,820	2,680	0.5	0.3	0	0	0	0	453	427
			mean	11401.8	-	-	11800.0	518.0	501.0	1523.3	194.5	231.0	2101.7	2185.0	6361.7	-	163.5	-	-	-	5.8	4.0	22.5	22.0	4413.3	4560.0	0.7	0.7	3.0	1.0	-	-	34150.0	33350.0	4.8	4.0	23166.7	21600.0	663.3	665.0	-	-	-	2453.3	2520.0	0.3	0.3	-	-	-	-	409.8	387.5
D106	Groundwater Bore	11/07/2019	Normal	10,760	5.89	-	9560	713	-	1380	60.5	-	1440	-	6060	<0.5	128	-	<1	-	<1	-	31	-	1930	-	<0.1	-	<1	-	<1	-	16,800	-	1	-	27,300	-	637	-	<0.04	<1	-	1980	-	<0.2	-	<1	-	-	-	264	-
D106	Groundwater Bore	14/08/2019	Normal	10,870	5.94	-	9990	691	-	1340	62.6	-	1500	-	5240	<0.5	136	-	<1	-	2	-	39	-	1880	-	0.1	-	4	-	6	-	31,700	-	6	-	26,300	-	650	-	0.04	<1	-	2060	-	0.4	-	<1	-	-	-	284	-
D106	Groundwater Bore	11/09/2019	Normal	10,790	5.92	-	10,300	666	-	1430	66.4	-	1430	-	4180	<0.5	137	-	<1	-	2	-	32	-	1680	-	<0.1	-	2	-	<1	-	32,000	-	1	-	26,800	-	598	-	<0.04	<1	-	2070	-	0.2	-	<1	-	-	-	279	-
D106	Groundwater Bore	16/10/2019	Normal	10,540	5.9	-	8310	652	-	1270	67.6	-	1410	-	4820	<0.5	146	-	<1	-	2	-	59	-	1840	-	0.2	-	3	-	2	-	36,300	-	5	-	23,800	-	638	-	0.08	<1	-	1780	-	0.3	-	<1	-	-	-	264	-
D106	D106	5/11/2019	Normal	8533	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D106	D106	5/11/2019	Normal	8562	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D106	Groundwater Bore	13/11/2019	Normal	10,260	5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D106	Groundwater Bore	18/03/2020	Normal	10,060	5.85	-	9620	577	562	1180	91.5	89.8	1410	1380	4590	<1	179	-	<1	-	1	<1	31	24	2100	2080	<0.1	<0.1	2	<1	<1	<1	30,900	22,400	2	<1	22,300	21,400	594	577	<0.04	<1	<1	1870	1810	0.4	<0.2	<1	<1	-	-	227	213
D106	Groundwater Bore	14/05/2020	Normal	8960	5.93	-	7950	510	504	1100	71	71	1170	1140	4540	<1	151	-	<1	-	1	<1	66	59	1710	1630	0.2	0.2	6	<1	3	<1	11,600	9400	<1	<1	20,200	19,200	491	484	0.07	<1	<1	1680	1600	0.4	0.3	<1	<1	-	-	232	214
			Min	8533	5.85	0	7950	510	504	1100	60.5	71	1170	1140	4180	0	128	0	0	0	1	0	31	24	1,680	1,630	0.1	0.2	2	0	2	0	11,600	9,400	1	0	20,200	19,200	491	484	0.04	0	0	1,680	1,600	0.2	0.3	0	0	0	0	227	213
			Max	10870	5.94	0	10300	713	562	1430	91.5	89.8	1500	1380	6060	0	179	0	0	0	2	0	66	59	2,100	2,080	0.2	0.2	6	0	6	0	36,300	22,400	6	0	27,300	21,400	650	577	0.08	0	0	2,070	1,810	0.4	0.3	0	0	0	0	284	214
			mean	9926.1	-	-	9288.3	634.8	533.0	1283.3	69.9	80.4	1393.3	1260.0	4905.0	-	146.2	-	-	-	1.6	-	43.0	41.5	1856.7	1855.0	0.2	0.2	3.4	-	3.7	-	26550.0	15900.0	3.0	-	24450.0	20300.0	601.3	530.5	0.1	-	-	1906.7	1705.0	0.3	0.3	-	-	-	-	258.3	213.5

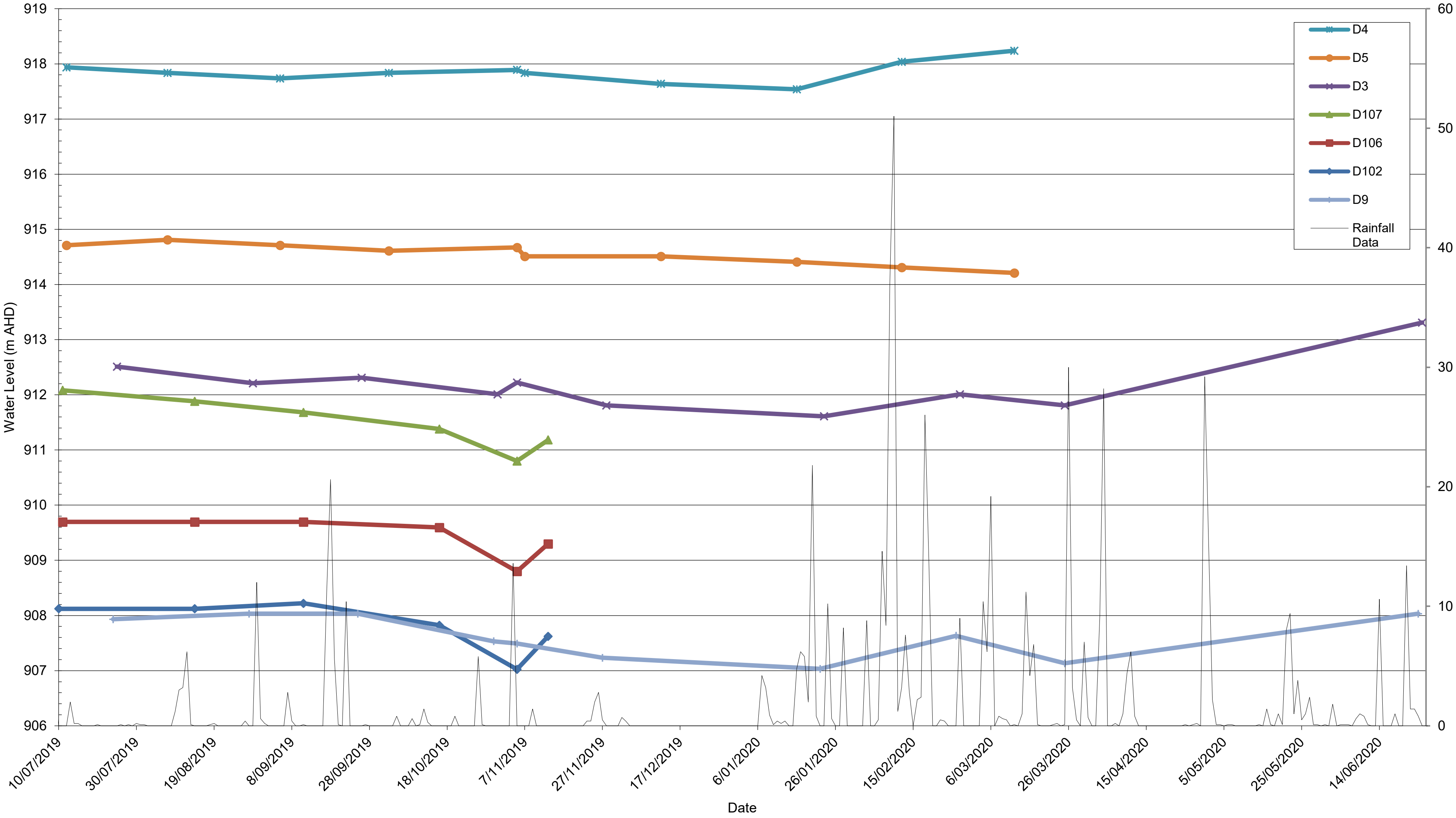
				Field Parameters				Major Anions and Cations									
				Electrical Conductivity (Field)	pH (Field)	Temperature (Field)	Total Dissolved Solids (TDS)	Calcium	Calcium (Filtered)	Chloride	Potassium	Potassium (Filtered)	Sodium	Sodium (Filtered)	Sulfate (as SO4)	Fluoride	Total Alkalinity (as CaCO3)
				uS/cm	pH units	oC	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
ANZECC (2000) or Local Guidelines - Groundwater				2600	6.5-8		2000			350					1000	1.5	
Upgradient - Background Bores																	
LocCode	**Field_ID**	**Sampled_Date**	**Sample_Type**														
D4	9 Groundwater Bore MPGM4	12/07/2019	Normal	900	3.38	-	770	15.2	-	11.7	8.54	-	20.2	-	408	<0.1	<1
D4	9 Groundwater Bore MPGM4	7/08/2019	Normal	860	3.39	-	719	17.2	-	13.8	9.08	-	20.3	-	341	<0.1	<1
D4	9 Groundwater Bore MPGM4	5/09/2019	Normal	860	3.39	-	718	16.4	-	11.4	8.29	-	19.2	-	391	<0.1	<1
D4	9 Groundwater Bore MPGM4	3/10/2019	Normal	860	3.41	-	743	15.4	-	12.5	8.25	-	18.4	-	413	<0.1	<1
D4	9 Groundwater Bore MPGM4	5/11/2019	Normal	1142	-	15.4	-	-	-	-	-	-	-	-	-	-	-
D4	9 Groundwater Bore MPGM4	5/11/2019	Normal	1064	-	13.9	-	-	-	-	-	-	-	-	-	-	-
D4	9 Groundwater Bore MPGM4	7/11/2019	Normal	820	3.43	-	612	17.1	-	15.5	8.45	-	20.1	-	398	<0.1	<1
D4	9 Groundwater Bore MPGM4	12/12/2019	Normal	820	3.45	-	716	16.7	-	14.5	8.26	-	18.9	-	372	0.062	<1
D4	9 Groundwater Bore MPGM4	16/01/2020	Normal	810	3.47	-	624	17.8	-	16	7.81	-	20	-	482	0.12	<1
D4	9 Groundwater Bore MPGM4	12/02/2020	Normal	810	3.47	-	696	16.6	-	13.2	9.65	-	22.9	-	308	0.075	<1
D4	9 Groundwater Bore MPGM4	12/03/2020	Normal	770	3.46	-	650	17.1	-	12.8	8.03	-	19.8	-	234	<0.1	<1
			Min	**770**	**3.38**	**13.9**	**612**	**15.2**	**0**	**11.4**	**7.81**	**0**	**18.4**	**0**	**234**	**0.062**	**0**
			Max	**1142**	**3.47**	**15.4**	**770**	**17.8**	**0**	**16**	**9.65**	**0**	**22.9**	**0**	**482**	**0.12**	**0**
			mean	**883.3**	**-**	**14.7**	**694.2**	**16.6**	**-**	**13.5**	**8.5**	**-**	**20.0**	**-**	**371.9**	**0.1**	**-**
D5	10 Groundwater Bore MPGM4	12/07/2019	Normal	1270	5.89	-	949	101	-	24.4	9.03	-	31.6	-	596	<0.1	77
D5	10 Groundwater Bore MPGM4	7/08/2019	Normal	1200	5.92	-	903	102	-	23.3	10.2	-	31.6	-	537	<1	87
D5	10 Groundwater Bore MPGM4	5/09/2019	Normal	1250	5.93	-	906	101	-	24.2	8.99	-	29.6	-	566	0.121	90
D5	10 Groundwater Bore MPGM4	3/10/2019	Normal	1270	5.97	-	872	101	-	23.7	9.15	-	27.1	-	592	<0.1	60
D5	10 Groundwater Bore MPGM4	7/11/2019	Normal	1260	5.92	-	853	109	-	27.6	10.4	-	32.8	-	635	0.149	93
D5	10 Groundwater Bore MPGM4	12/12/2019	Normal	1270	5.92	-	926	102	-	25.1	9.73	-	28.8	-	592	0.16	64
D5	10 Groundwater Bore MPGM4	16/01/2020	Normal	1260	6.01	-	902	108	-	25.9	10	-	32.1	-	589	0.177	84
D5	10 Groundwater Bore MPGM4	12/02/2020	Normal	1250	6.06	-	938	96.7	-	25.7	11.9	-	33	-	535	<0.1	51
D5	10 Groundwater Bore MPGM4	12/03/2020	Normal	1260	5.96	-	1020	107	-	24.8	10.6	-	33.1	-	567	<0.1	108
			Min	**1200**	**5.89**	**0**	**853**	**96.7**	**0**	**23.3**	**8.99**	**0**	**27.1**	**0**	**535**	**0.121**	**51**
			Max	**1270**	**6.06**	**0**	**1020**	**109**	**0**	**27.6**	**11.9**	**0**	**33.1**	**0**	**635**	**0.177**	**108**
			mean	**1254.4**	**-**	**-**	**918.8**	**103.1**	**-**	**25.0**	**10.0**	**-**	**31.1**	**-**	**578.8**	**0.2**	**79.3**
Within Ash Repository / Mine Spoil																	
LocCode	**Field_ID**	**Sampled_Date**	**Sample_Type**														
Bores Downgradientof MPAR																	
LocCode	**Field_ID**	**Sampled_Date-Time**	**Sample_Type**														
LocCode	**Field_ID**	**Sampled_Date-Time**	**Sample_Type**														
D1	6 Groundwater Bore MPGM4	25/07/2019	Normal	8240	5.92	-	6720	621	-	981	60.9	-	1030	-	4030	<0.5	158
D1	6 Groundwater Bore MPGM4	29/08/2019	Normal	8570	5.92	-	7490	597	-	1010	84.1	-	1020	-	4330	0.471	150
D1	6 Groundwater Bore MPGM4	26/09/2019	Normal	8650	5.91	-	7550	611	-	973	60.6	-	1150	-	4110	<0.1	175
D1	6 Groundwater Bore MPGM4	30/10/2019	Normal	8300	5.92	-	6410	570	-	929	77.4	-	1180	-	3770	<0.5	175
D1	D1	5/11/2019	Normal	5360	-	-	-	-	-	-	-	-	-	-	-	-	-
D1	D1	5/11/2019	Normal	6700	-	-	-	-	-	-	-	-	-	-	-	-	-
D1	6 Groundwater Bore MPGM4	27/11/2019	Normal	7530	5.95	-	5690	521	-	828	51.8	-	939	-	3570	<0.5	114
D1	6 Groundwater Bore MPGM4	22/01/2020	Normal	7240	5.92	-	6530	432	-	748	67.4	-	770	-	3110	<1	138
D1	6 Groundwater Bore MPGM4	26/02/2020	Normal	7470	5.9	-	7600	472	-	783	64.2	-	894	-	3300	<1	150
D1	6 Groundwater Bore MPGM4	25/03/2020	Normal	7460	5.9	-	6870	483	-	752	70.6	-	900	-	2960	<1	199
D1	6 Groundwater Bore MPGM4	24/06/2020	Normal	9040	5.93	-	7840	601	-	1020	93.6	-	1090	-	4450	<1	154
			Min	**5360**	**5.9**	**0**	**5690**	**432**	**0**	**748**	**51.8**	**0**	**770**	**0**	**2960**	**0.471**	**114**
			Max	**9040**	**5.95**	**0**	**7840**	**621**	**0**	**1020**	**93.6**	**0**	**1180**	**0**	**4450**	**0.471**	**199**
			mean	**7687.3**	**-**	**-**	**6966.7**	**545.3**	**-**	**891.6**	**70.1**	**-**	**997.0**	**-**	**3736.7**	**0.5**	**157.0**
D102	Groundwater Bore	10/07/2019	Normal	9410	6.01	-	8260	757	-	1210	56.4	-	1140	-	4740	<0.5	82
D102	Groundwater Bore	14/08/2019	Normal	9510	6.12	-	8730	740	-	1190	59.5	-	1180	-	4530	<0.5	98
D102	D102	5/11/2019	Normal	6808	-	-	-	-	-	-	-	-	-	-	-	-	-
D102	D102	5/11/2019	Normal	6717	-	-	-	-	-	-	-	-	-	-	-	-	-
D102	Groundwater Bore	11/09/2019	Normal	9600	6.09	-	9310	723	-	1310	64.7	-	1160	-	4820	<0.5	91
D102	Groundwater Bore	16/10/2019	Normal	9600	6.07	-	7740	748	-	1150	68	-	1150	-	4230	<0.5	105
D102	Groundwater Bore	13/11/2019	Normal	9370	6.08	-	-	-	-	-	-	-	-	-	-	-	-
D102	Groundwater Bore	18/03/2020	Normal	9530	6.08	-	9300	720	684	1170	87.9	84.2	1180	1130	4360	<1	143
D102	Groundwater Bore	13/05/2020	Normal	10,030	6.08	-	9270	770	721	1310	81.4	76.4	1310	1260	5040	<1	152
			Min	**6717**	**6.01**	**0**	**7740**	**720**	**684**	**1150**	**56.4**	**76.4**	**1140**	**1130**	**4230**	**0**	**82**
			Max	**10030**	**6.12**	**0**	**9310**	**770**	**721**	**1310**	**87.9**	**84.2**	**1310**	**1260**	**5040**	**0**	**152**
			mean	**8952.8**	**6.1**	**-**	**8768.3**	**743.0**	**702.5**	**1223.3**	**69.7**	**80.3**	**1186.7**	**1195.0**	**4620.0**	**-**	**111.8**
D9	14 Groundwater Bore MPGM4	24/07/2019	Normal	8420	6.15	-	6990	712	-	1110	52.2	-	990	-	4390	<0.5	134
D9	14 Groundwater Bore MPGM4	28/08/2019	Normal	8580	5.99	-	7770	688	-	1060	71.4	-	970	-	4020	<0.5	84
D9	14 Groundwater Bore MPGM4	25/09/2019	Normal	8040	5.97	-	7180	658	-	974	44.4	-	944	-	3830	<0.5	140
D9	14 Groundwater Bore MPGM4	30/10/2019	Normal	8650	5.94	-	7090	616	-	1010	58.2	-	1060	-	3960	<0.5	138
D9	D9	5/11/2019	Normal	7487	-	-	-	-	-	-	-	-	-	-	-	-	-
D9	D9	5/11/2019	Normal	7498	-	-	-	-	-	-	-	-	-	-	-	-	-
D9	14 Groundwater Bore MPGM4	27/11/2019	Normal	9210	5.97	-	7320	715	-	1100	51.2	-	1120	-	4380	0.05	96
D9	14 Groundwater Bore MPGM4	22/01/2020	Normal	9310	6	-	8770	612	-	1070	71.4	-	1010	-	4280	<1	120
D9	14 Groundwater Bore MPGM4	26/02/2020	Normal	9070	6.03	-	10,100	655	-	1070	60.8	-	1030	-	4210	<1	133
D9	14 Groundwater Bore MPGM4	25/03/2020	Normal	8840	6.16	-	8230	686	-	1020	70.3	-	1060	-	3870	<1	153
D9	14 Groundwater Bore MPGM4	24/06/2020	Normal	9100	6.14	-	8120	730	-	1190	74.6	-	1040	-	4700	0.214	142
			Min	**7487**	**5.94**	**0**	**6990**	**612**	**0**	**974**	**44.4**	**0**	**944**	**0**	**3830**	**0.05**	**84**
			Max	**9310**	**6.16**	**0**	**10100**	**730**	**0**	**1190**	**74.6**	**0**	**1120**	**0**	**4700**	**0.214**	**153**
			mean	**8564.1**	**-**	**-**	**7952.2**	**674.7**	**-**	**1067.1**	**61.6**	**-**	**1024.9**	**-**	**4182.2**	**0.1**	**126.7**
D105	Groundwater Bore	11/07/2019	Normal	3530	6.02	-	2740	225	-	265	20.3	-	355	-	1780	<0.5	131
D105	Groundwater Bore	14/08/2019	Normal	3460	6.06	-	2900	234	-	236	18.7	-	337	-	1540	<0.5	120
D105	Groundwater Bore	11/09/2019	Normal	3480	6.02	-	2780	220	-	260	21	-	333	-	1740	<0.5	114
D105	Groundwater Bore	16/10/2019	Normal	3550	6.02	-	2950	230	-	226	21.9	-	303	-	1540	<0.5	123
D105	D105	5/11/2019	Normal	3319	-	-	-	-	-	-	-	-	-	-	-	-	-
D105	D105	5/11/2019	Normal	4421	-	-	-	-	-	-	-	-	-	-	-	-	-
D105	Groundwater Bore	13/11/2019	Normal	3560	6.05	-	-	-	-	-	-	-	-	-	-	-	-
D105	Groundwater Bore	18/03/2020	Normal	3810	6.05	-	3580	270	257	269	27.3	25.9	331	315	1770	<0.5	143
D105	Groundwater Bore	13/05/2020	Normal	3860	6.07	-	3430	251	243	262	25.9	25.6	315	310	1850	<0.5	162
			Min	**3319**	**6.02**	**0**	**2740**	**220**	**243**	**226**	**18.7**	**25.6**	**303**	**310**	**1540**	**0**	**114**
			Max	**4421**	**6.07**	**0**	**3580**	**270**	**257**	**269**	**27.3**	**25.9**	**355**	**315**	**1850**	**0**	**162**
			mean	**3665.6**	**-**	**-**	**3063.3**	**238.3**	**250.0**	**253.0**	**22.5**	**25.8**	**329.0**	**312.5**	**1703.3**	**-**	**132.2**
D8	13 Groundwater Bore MPGM4	25/07/2019	Normal	990	5.74	-	723	58	-	65.4	6.91	-	81.9	-	373	<0.1	28
D8	13 Groundwater Bore MPGM4	29/08/2019	Normal	970	5.72	-	664	59.2	-	61.6	8.22	-	76.5	-	375	0.065	25
D8	13 Groundwater Bore MPGM4	26/09/2019	Normal	448	5.66	-	314	27.3	-	20.1	3.52	-	28.4	-	154	<0.1	17
D8	13 Groundwater Bore MPGM4	31/10/2019	Normal	628	5.74	-	460	43.7	-	33.6	5.47	-	45.4	-	218	<0.05	23
D8	D8	5/11/2019	Normal	622	-	-	-	-	-	-	-	-	-	-	-	-	-
D8	D8	5/11/2019	Normal	625	-	-	-	-	-	-	-	-	-	-	-	-	-
D8	13 Groundwater Bore MPGM4	28/11/2019	Normal	609	5.74	-	440	36.5	-	28.3	3.84	-	38	-	206	<1	15
D8	13 Groundwater Bore MPGM4	23/01/2020	Normal	1440	5.43	-	1240	112	-	95	10.9	-	110	-	578	<0.2	16
D8	13 Groundwater Bore MPGM4	27/02/2020	Normal	541	5.49	-	444	33	-	25.4	4.06	-	31.1	-	195	<0.05	11
D8	13 Groundwater Bore MPGM4	26/03/2020	Normal	535	6.4	-	482	33.2	-	23.2	4.95	-	30.2	-	168	<0.05	15
D8	13 Groundwater Bore MPGM4	25/06/2020	Normal	222	5.73	-	118	16	-	3.4	2.23	-	6.04	-	82.6	0.022	12
			Min	**222**	**5.43**	**0**	**118**	**16**	**0**	**3.4**	**2.23**	**0**	**6.04**	**0**	**82.6**	**0.022**	**11**
			Max	**1440**	**6.4**	**0**	**1240**	**112**	**0**	**95**	**10.9**	**0**	**110**	**0**	**578**	**0.065**	**28**
			mean	**693.6**	**-**	**-**	**542.8**	**46.5**	**-**	**39.6**	**5.6**	**-**	**49.7**	**-**	**261.1**	**0.0**	**18.0**
D104	Groundwater Bore	11/07/2019	Normal	1040	5.68	-	656	74.4	-	64.2	7.76	-	63.6	-	394	<0.1	43
D104	Groundwater Bore	15/08/2019	Normal	1070	5.65	-	773	75.5	-	66.2	8.28	-	62.5	-	395	<0.1	35
D104	Groundwater Bore	12/09/2019	Normal	1070	5.62	-	714	73.5	-	65.4	8.01	-	61.5	-	420	<1	39
D104	Groundwater Bore	17/10/2019	Normal	1100	5.56	-	718	79.2	-	67.1	8.63	-	70.8	-	402	<0.05	38
D104	D104	5/11/2019	Normal	1213	-	-	-	-	-	-	-	-	-	-	-	-	-
D104	D104	5/11/2019	Normal	1193	-	-	-	-	-	-	-	-	-	-	-	-	-
D104	Groundwater Bore	14/11/2019	Normal	1130	5.57	-	-	-	-	-	-	-	-	-	-	-	-
D104	Groundwater Bore	19/03/2020	Normal	1610	5.63	-	1380	123	120	96.9	11.7	11.6	112	110	681	<0.2	45
D104	Groundwater Bore	14/05/2020	Normal	1220	5.95	-	908	73	64.8	63	8.29	7.38	104	94.8	475	<0.1	67
			Min	**1040**	**5.56**	**0**	**656**	**73**	**64.8**	**63**	**7.76**	**7.38**	**61.5**	**94.8**	**394**	**0**	**35**
			Max	**1610**	**5.95**	**0**	**1380**	**123**	**120**	**96.9**	**11.7**	**11.6**	**112**	**110**	**681**	**0**	**67**
			mean	**1182.9**	**-**	**-**	**858.2**	**83.1**	**92.4**	**70.5**	**8.8**	**9.5**	**79.1**	**102.4**	**461.2**	**-**	**44.5**
D103	Groundwater Bore	12/07/2019	Normal	5000	6.02	-	4240	295	-	370	30.4	-	648	-	2540	<0.5	129
D103	Groundwater Bore	15/08/2019	Normal	4930	6.07	-	4250	297	-	333	31.6	-	649	-	2420	<0.1	124
D103	Groundwater Bore	11/09/2019	Normal	4880	6.07	-	4000	276	-	360	33.4	-	631	-	2600	<0.5	128
D103	Groundwater Bore	16/10/2019	Normal	4930	6.07	-	3940	283	-	321	36	-	602	-	2280	<0.5	126
D103	D103	4/11/2019	Normal	4354	-	15.7	-	-	-	-	-	-	-	-	-	-	-
D103	D103	4/11/2019	Normal	2732	-	16.1	-	-	-	-	-	-	-	-	-	-	-
D103	Groundwater Bore	13/11/2019	Normal	4920	6.04	-	-	-	-	-	-	-	-	-	-	-	-
D103	Groundwater Bore	18/03/2020	Normal	4900	6.04	-	4480	288	276	332	41.2	39.4	623	596	2360	<0.5	145
D103	Groundwater Bore	14/05/2020	Normal	4850	6.14	-	4360	248	237	307	34.6	33	602	574	2410	<0.5	160

				Major Anions and Cations		Metals																																	
				Total Alkalinity (as CaCO3) (Filtered)	Phenolphthalein Alkalinity (CaCO3)	Aluminium	Arsenic	Arsenic (Filtered)	Barium	Barium (Filtered)	Boron	Boron (Filtered)	Cadmium	Cadmium (Filtered)	Chromium	Chromium (Filtered)	Copper	Copper (Filtered)	Iron	Iron (Filtered)	Lead	Lead (Filtered)	Manganese	Manganese (Filtered)	Magnesium	Magnesium (Filtered)	Mercury	Molybdenum	Molybdenum (Filtered)	Nickel	Nickel (Filtered)	Selenium	Selenium (Filtered)	Silver	Silver (Filtered)	Vanadium	Vanadium (Filtered)	Zinc	Zinc (Filtered)
				mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
ANZECC (2000) or Local Guidelines - Groundwater							24	24	700	700	370	370	2	2	5	5	5	5	664	664	5	5	5704	5704			0.06	10	10	550.9	550.9	5	5	0.05	0.05			908	908
Upgradient - Background Bores																																							
LocCode	**Field_ID**	**Sampled_Date**	**Sample_Type**																																				
D4	9 Groundwater Bore MPGM4	12/07/2019	Normal	-	-	14,100	46	-	13	-	<50	-	0.6	-	2	-	3	-	105,000	105,000	19	-	778	778	9.33	-	<0.04	<1	-	18	-	0.2	-	<1	-	10	10	198	-
D4	9 Groundwater Bore MPGM4	7/08/2019	Normal	-	-	13,400	50	-	13	-	<50	-	0.5	-	3	-	1	-	90,700	90,700	22	-	762	762	10	-	<0.04	<1	-	16	-	0.2	-	<1	-	<10	<10	170	-
D4	9 Groundwater Bore MPGM4	5/09/2019	Normal	-	-	13,000	41	-	11	-	<50	-	0.6	-	2	-	<1	-	100,000	100,000	18	-	732	732	9.42	-	<0.04	<1	-	17	-	<0.2	-	<1	-	<10	<10	168	-
D4	9 Groundwater Bore MPGM4	3/10/2019	Normal	-	-	14,700	42	-	12	-	<50	-	0.6	-	2	-	<1	-	110,000	-	18	-	775	-	9.23	-	<0.04	<1	-	18	-	<0.2	-	<1	-	<10	-	188	-
D4	9 Groundwater Bore MPGM4	5/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	9 Groundwater Bore MPGM4	5/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	9 Groundwater Bore MPGM4	7/11/2019	Normal	-	-	11,800	36	-	12	-	<50	-	0.4	-	2	-	<1	-	80,300	-	17	-	767	-	8.98	-	<0.04	<1	-	15	-	<0.2	-	<1	-	<10	-	150	-
D4	9 Groundwater Bore MPGM4	12/12/2019	Normal	<1	-	12,800	42	-	13	-	<50	-	0.5	-	2	-	<1	-	95,400	-	16	-	815	-	9.69	-	<0.04	<1	-	15	-	<0.2	-	<1	-	<10	<10	147	-
D4	9 Groundwater Bore MPGM4	16/01/2020	Normal	-	-	13,500	44	-	13	-	<50	-	0.5	-	2	-	<1	-	89,300	89,300	18	-	850	850	8.94	-	<0.04	<1	-	16	-	0.2	-	<1	-	<10	<10	158	-
D4	9 Groundwater Bore MPGM4	12/02/2020	Normal	-	-	12,500	41	-	12	-	<50	-	0.5	-	2	-	1	-	-	87,800	17	-	-	778	10	-	<0.04	<1	-	15	-	<0.2	-	<1	-	<10	<10	151	-
D4	9 Groundwater Bore MPGM4	12/03/2020	Normal	-	-	10,900	47	-	12	-	<50	-	0.4	-	2	-	<1	-	-	71,700	18	-	-	745	8.99	-	<0.04	<1	-	13	-	<0.2	-	<1	-	<10	<10	125	-
			Min	**0**	**0**	**10900**	**36**	**0**	**11**	**0**	**0**	**0**	**0.4**	**0**	**2**	**0**	**1**	**0**	**80300**	**71700**	**16**	**0**	**732**	**732**	**8.94**	**0**	**0**	**0**	**0**	**13**	**0**	**0.2**	**0**	**0**	**0**	**10**	**10**	**125**	**0**
			Max	**0**	**0**	**14700**	**50**	**0**	**13**	**0**	**0**	**0**	**0.6**	**0**	**3**	**0**	**3**	**0**	**110000**	**105000**	**22**	**0**	**850**	**850**	**10**	**0**	**0**	**0**	**0**	**18**	**0**	**0.2**	**0**	**0**	**0**	**10**	**10**	**198**	**0**
			mean	**-**	**-**	**12966.7**	**43.2**	**-**	**12.3**	**-**	**-**	**-**	**0.5**	**-**	**2.1**	**-**	**1.7**	**-**	**95814.3**	**90750.0**	**18.1**	**-**	**782.7**	**774.2**	**9.4**	**-**	**-**	**-**	**-**	**15.9**	**-**	**0.2**	**-**	**-**	**-**	**10.0**	**10.0**	**161.7**	**-**
D5	10 Groundwater Bore MPGM4	12/07/2019	Normal	-	-	30	<1	-	17	-	70	-	<0.1	-	<1	-	<1	-	35,500	35,500	<1	-	7960	7960	74.2	-	<0.04	<1	-	48	-	<0.2	-	<1	-	<10	<10	16	-
D5	10 Groundwater Bore MPGM4	7/08/2019	Normal	-	-	30	<1	-	17	-	100	-	<0.1	-	<1	-	<1	-	53,400	53,400	<1	-	8770	8770	71.9	-	<0.04	<1	-	38	-	0.4	-	<1	-	<10	<10	18	-
D5	10 Groundwater Bore MPGM4	5/09/2019	Normal	-	-	20	<1	-	20	-	80	-	<0.1	-	<1	-	<1	-	50,300	50,300	<1	-	8460	8460	70.8	-	<0.04	<1	-	42	-	0.2	-	<1	-	<10	<10	16	-
D5	10 Groundwater Bore MPGM4	3/10/2019	Normal	-	-	20	<1	-	18	-	120	-	<0.1	-	<1	-	<1	-	30,800	-	<1	-	8890	-	73.9	-	<0.04	<1	-	45	-	<0.2	-	<1	-	<10	-	12	-
D5	10 Groundwater Bore MPGM4	7/11/2019	Normal	-	-	30	<1	-	17	-	120	-	<0.1	-	<1	-	<1	-	30,300	-	<1	-	7990	-	71.7	-	<0.04	<1	-	42	-	<0.2	-	<1	-	<10	-	17	-
D5	10 Groundwater Bore MPGM4	12/12/2019	Normal	-	-	30	<1	-	19	-	110	-	<0.1	-	<1	-	<1	-	22,400	-	<1	-	9390	-	73.6	-	<0.04	<1	-	41	-	<0.2	-	<1	-	<10	<10	16	-
D5	10 Groundwater Bore MPGM4	16/01/2020	Normal	-	-	30	<1	-	18	-	120	-	<0.1	-	<1	-	<1	-	32,400	32,400	<1	-	9140	9140	68.5	-	<0.04	<1	-	47	-	0.3	-	<1	-	<10	<10	21	-
D5	10 Groundwater Bore MPGM4	12/02/2020	Normal	-	-	20	<1	-	17	-	110	-	<0.1	-	<1	-	<1	-	-	27,500	<1	-	-	7890	71.4	-	<0.04	<1	-	41	-	<0.2	-	<1	-	<10	<10	16	-
D5	10 Groundwater Bore MPGM4	12/03/2020	Normal	-	-	30	<1	-	16	-	110	-	<0.1	-	<1	-	<1	-	-	50,500	<1	-	-	8100	69.6	-	<0.04	<1	-	46	-	0.3	-	<1	-	<10	<10	13	-
			Min	**0**	**0**	**20**	**0**	**0**	**16**	**0**	**70**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**22400**	**27500**	**0**	**0**	**7960**	**7890**	**68.5**	**0**	**0**	**0**	**0**	**38**	**0**	**0.2**	**0**	**0**	**0**	**0**	**0**	**12**	**0**
			Max	**0**	**0**	**30**	**0**	**0**	**20**	**0**	**120**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**53400**	**53400**	**0**	**0**	**9390**	**9140**	**74.2**	**0**	**0**	**0**	**0**	**48**	**0**	**0.4**	**0**	**0**	**0**	**0**	**0**	**21**	**0**
			mean	**-**	**-**	**26.7**	**-**	**-**	**17.7**	**-**	**104.4**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**36442.9**	**41600.0**	**-**	**-**	**8657.1**	**8386.7**	**71.7**	**-**	**-**	**-**	**-**	**43.3**	**-**	**0.3**	**-**	**-**	**-**	**-**	**-**	**16.1**	**-**
Within Ash Repository / Mine Spoil																																							
LocCode	**Field_ID**	**Sampled_Date**	**Sample_Type**																																				
Bores Downgradientof MPAR																																							
LocCode	**Field_ID**	**Sampled_Date-Time**	**Sample_Type**																																				
LocCode	**Field_ID**	**Sampled_Date-Time**	**Sample_Type**																																				
D1	6 Groundwater Bore MPGM4	25/07/2019	Normal	-	-	70	7	-	40	-	2330	-	<0.1	-	<1	-	<1	-	59,300	59,300	<1	-	26,000	26,000	493	-	<0.04	<1	-	1780	-	0.3	-	<1	-	<10	<10	172	-
D1	6 Groundwater Bore MPGM4	29/08/2019	Normal	-	-	50	5	-	37	-	2570	-	<0.1	-	<1	-	1	-	39,900	39,900	<1	-	26,600	26,600	498	-	<0.04	<1	-	1940	-	<0.2	-	<1	-	<10	<10	173	-
D1	6 Groundwater Bore MPGM4	26/09/2019	Normal	-	-	50	8	-	35	-	2360	-	<0.1	-	<1	-	<1	-	63,200	63,200	<1	-	28,300	28,300	506	-	<0.04	<1	-	1940	-	0.2	-	<1	-	<10	<10	176	-
D1	6 Groundwater Bore MPGM4	30/10/2019	Normal	-	-	70	5	-	32	-	2520	-	<0.1	-	<1	-	<1	-	24,000	-	<1	-	23,900	-	477	-	0.24	<1	-	1810	-	0.2	-	<1	-	<10	-	153	-
D1	D1	5/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1	D1	5/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1	6 Groundwater Bore MPGM4	27/11/2019	Normal	-	-	50	4	-	30	-	2320	-	<0.1	-	<1	-	<1	-	27,100	-	<1	-	21,300	-	415	-	<0.04	<1	-	1480	-	<0.2	-	<1	-	<10	<10	112	-
D1	6 Groundwater Bore MPGM4	22/01/2020	Normal	138	-	<10	1	-	25	-	2290	-	<0.1	-	<1	-	<1	-	15,200	15,200	<1	-	18,900	18,900	363	-	<0.04	<1	-	1370	-	<0.2	-	<1	-	<10	<10	85	-
D1	6 Groundwater Bore MPGM4	26/02/2020	Normal	-	-	40	4	-	27	-	2330	-	<0.1	-	<1	-	<1	-	-	11,400	<1	-	-	22,800	388	-	<0.04	<1	-	1350	-	<0.2	-	<1	-	<10	<10	112	-
D1	6 Groundwater Bore MPGM4	25/03/2020	Normal	-	-	60	6	-	27	-	2340	-	<0.1	-	<1	-	<1	-	-	48,700	<1	-	-	20,000	396	-	<0.04	<1	-	1420	-	<0.2	-	<1	-	<10	<10	138	-
D1	6 Groundwater Bore MPGM4	24/06/2020	Normal	-	-	60	8	-	32	-	2560	-	<0.1	-	<1	-	<1	-	-	55,800	<1	-	-	25,700	517	-	<0.04	<1	-	1860	-	0.4	-	<1	-	<10	<10	181	-
			Min	**138**	**0**	**40**	**1**	**0**	**25**	**0**	**2290**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**15200**	**11400**	**0**	**0**	**18900**	**18900**	**363**	**0**	**0.24**	**0**	**0**	**1350**	**0**	**0.2**	**0**	**0**	**0**	**0**	**0**	**85**	**0**
			Max	**138**	**0**	**70**	**8**	**0**	**40**	**0**	**2570**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**63200**	**63200**	**0**	**0**	**28300**	**28300**	**517**	**0**	**0.24**	**0**	**0**	**1940**	**0**	**0.4**	**0**	**0**	**0**	**0**	**0**	**181**	**0**
			mean	**138.0**	**-**	**56.3**	**5.3**	**-**	**31.7**	**-**	**2402.2**	**-**	**-**	**-**	**-**	**-**	**1.0**	**-**	**38116.7**	**41928.6**	**-**	**-**	**24166.7**	**24042.9**	**450.3**	**-**	**0.2**	**-**	**-**	**1661.1**	**-**	**0.3**	**-**	**-**	**-**	**-**	**-**	**144.7**	**-**
D102	Groundwater Bore	10/07/2019	Normal	-	<1	-	6	-	47	-	1680	-	<0.1	-	9	-	3	-	46,500	-	4	-	23,800	-	513	-	<0.04	<1	-	1790	-	0.5	-	<1	-	-	-	85	-
D102	Groundwater Bore	14/08/2019	Normal	-	<1	-	4	-	40	-	1790	-	<0.1	-	2	-	3	-	44,800	-	2	-	21,500	-	517	-	<0.04	<1	-	1810	-	0.6	-	<1	-	-	-	86	-
D102	D102	5/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D102	D102	5/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D102	Groundwater Bore	11/09/2019	Normal	-	<1	-	6	-	38	-	1880	-	<0.1	-	3	-	1	-	64,400	-	2	-	21,400	-	508	-	<0.04	<1	-	1760	-	0.4	-	<1	-	-	-	94	-
D102	Groundwater Bore	16/10/2019	Normal	-	<1	-	5	-	33	-	1750	-	<0.1	-	1	-	<1	-	63,700	-	1	-	21,100	-	534	-	<0.04	<1	-	1680	-	0.6	-	<1	-	-	-	76	-
D102	Groundwater Bore	13/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D102	Groundwater Bore	18/03/2020	Normal	-	<1	-	4	1	36	29	1680	1700	0.2	<0.1	2	<1	<1	<1	62,000	36,700	<1	<1	21,100	20,300	535	512	<0.04	<1	<1	1820	1780	0.6	0.3	<1	<1	-	-	42	30
D102	Groundwater Bore	13/05/2020	Normal	-	<1	-	6	2	36	31	1940	1660	<0.1	<0.1	3	3	1	<1	63,400	61,500	<1	<1	21,900	21,000	527	500	<0.04	<1	<1	2030	1940	0.4	0.3	<1	<1	-	-	70	52
			Min	**0**	**0**	**0**	**4**	**1**	**33**	**29**	**1680**	**1660**	**0.2**	**0**	**1**	**3**	**1**	**0**	**44800**	**36700**	**1**	**0**	**21100**	**20300**	**508**	**500**	**0**	**0**	**0**	**1680**	**1780**	**0.4**	**0.3**	**0**	**0**	**0**	**0**	**42**	**30**
			Max	**0**	**0**	**0**	**6**	**2**	**47**	**31**	**1940**	**1700**	**0.2**	**0**	**9**	**3**	**3**	**0**	**64400**	**61500**	**4**	**0**	**23800**	**21000**	**535**	**512**	**0**	**0**	**0**	**2030**	**1940**	**0.6**	**0.3**	**0**	**0**	**0**	**0**	**94**	**52**
			mean	**-**	**-**	**-**	**5.2**	**1.5**	**38.3**	**30.0**	**1786.7**	**1680.0**	**0.2**	**-**	**3.3**	**3.0**	**2.0**	**-**	**57466.7**	**49100.0**	**2.3**	**-**	**21800.0**	**20650.0**	**522.3**	**506.0**	**-**	**-**	**-**	**1815.0**	**1860.0**	**0.5**	**0.3**	**-**	**-**	**-**	**-**	**75.5**	**41.0**
D9	14 Groundwater Bore MPGM4	24/07/2019	Normal	-	-	30	4	-	42	-	1600	-	<0.1	-	<1	-	<1	-	70,000	70,000	<1	-	22,300	22,300	508	-	<0.04	2	-	1560	-	0.3	-	<1	-	<10	<10	110	-
D9	14 Groundwater Bore MPGM4	28/08/2019	Normal	-	-	30	3	-	36	-	1680	-	<0.1	-	<1	-	<1	-	40,000	40,000	<1	-	21,000	21,000	506	-	0.43	3	-	1620	-	<0.2	-	<1	-	<10	<10	94	-
D9	14 Groundwater Bore MPGM4	25/09/2019	Normal	-	-	20	3	-	34	-	1500	-	<0.1	-	<1	-	<1	-	65,800	65,800	<1	-	21,700	21,700	476	-	0.06	2	-	1440	-	<0.2	-	<1	-	<10	<10	104	-
D9	14 Groundwater Bore MPGM4	30/10/2019	Normal	-	-	40	2	-	41	-	1640	-	<0.1	-	<1	-	<1	-	27,800	-	<1	-	21,300	-	482	-	<0.04	1	-	1660	-	0.2	-	<1	-	<10	-	104	-
D9	D9	5/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D9	D9	5/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D9	14 Groundwater Bore MPGM4	27/11/2019	Normal	-	-	30	2	-	39	-	1620	-	<0.1	-	<1	-	1	-	39,000	-	<1	-	22,600	-	540	-	0.05	<1	-	1740	-	<0.2	-	<1	-	<10	<10	113	-
D9	14 Groundwater Bore MPGM4	22/01/2020	Normal	120	-	<10	1	-	34	-	1600	-	<0.1	-	<1	-	<1	-	10,600	10,600	<1	-	21,000	21,000	514	-	<0.04	<1	-	1680	-	0.2	-	<1	-	<10	<10	96	-
D9	14 Groundwater Bore MPGM4	26/02/2020	Normal	-	-	20	2	-	39	-	1930	-	<0.1	-	1	-	<1	-	-	9940	<1	-	-	22,600	479	-	<0.04	<1	-	1750	-	0.2	-	<1	-	<10	<10	89	-
D9	14 Groundwater Bore MPGM4	25/03/2020	Normal	-	-	540	8	-	40	-	1560	-	0.2	-	1	-	7	-	-	62,900	13	-	-	18,600	492	-	0.05	1	-	1510	-	1.1	-	<1	-	<10	<10	1130	-
D9	14 Groundwater Bore MPGM4	24/06/2020	Normal	-	-	140	3	-	36	-	1650	-	0.1	-	<1	-	2	-	-	69,000	<1	-	-	20,400	526	-	0.31	1	-	1620	-	0.4	-	<1	-	<10	<10	121	-
			Min	**120**	**0**	**20**	**1**	**0**	**34**	**0**	**1500**	**0**	**0.1**	**0**	**1**	**0**	**1**	**0**	**10600**	**9940**	**13**	**0**	**21000**	**18600**	**476**	**0**	**0.05**	**1**	**0**	**1440**	**0**	**0.2**	**0**	**0**	**0**	**0**	**0**	**89**	**0**
			Max	**120**	**0**	**540**	**8**	**0**	**42**	**0**	**1930**	**0**	**0.2**	**0**	**1**	**0**	**7**	**0**	**70000**	**70000**	**13**	**0**	**22600**	**22600**	**540**	**0**	**0.43**	**3**	**0**	**1750**	**0**	**1.1**	**0**	**0**	**0**	**0**	**0**	**1130**	**0**
			mean	**120.0**	**-**	**106.3**	**3.1**	**-**	**37.9**	**-**	**1642.2**	**-**	**0.2**	**-**	**1.0**	**-**	**3.3**	**-**	**42200.0**	**46891.4**	**13.0**	**-**	**21650.0**	**21085.7**	**502.6**	**-**	**0.2**	**1.7**	**-**	**1620.0**	**-**	**0.4**	**-**	**-**	**-**	**-**	**-**	**217.9**	**-**
D105	Groundwater Bore	11/07/2019	Normal	-	<1	-	1	-	31	-	380	-	<0.1	-	<1	-	<1	-	20,200	-	<1	-	14,000	-	221	-	<0.04	<1	-	650	-	<0.2	-	<1	-	-	-	65	-
D105	Groundwater Bore	14/08/2019	Normal	-	<1	-	<1	-	27	-	330	-	<0.1	-	<1	-	<1	-	21,700	-	<1	-	12,700	-	226	-	<0.04	<1	-	654	-	<0.2	-	<1	-	-	-	56	-
D105	Groundwater Bore	11/09/2019	Normal	-	<1	-	1	-	28	-	380	-	<0.1	-	<1	-	<1	-	28,500	-	<1	-	14,000	-	212	-	<0.04	<1	-	677	-	<0.2	-	<1	-	-	-	64	-
D105	Groundwater Bore	16/10/2019	Normal	-	<1	-	<1	-	26	-	370	-	<0.1	-	<1	-	<1	-	28,400	-	<1	-	13,300	-	217	-	<0.04	<1	-	648	-	<0.2	-	<1	-	-	-	58	-
D105	D105	5/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D105	D105	5/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D105	Groundwater Bore	13/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D105	Groundwater Bore	18/03/2020	Normal	-	<1	-	<1	<1	26	24	480	450	<0.1	<0.1	<1	<1	<1	<1	34,800	20,200	<1	<1	15,200	14,400	250	238	<0.04	<1	<1	782	745	<0.2	<0.2	<1	<1	-	-	65	45
D105	Groundwater Bore	13/05/2020	Normal	-	<1	-	1	<1	28	25	450	440	<0.1	<0.1	<1	<1	<1	<1	32,800	30,800	<1	<1	15,300	14,300	241	235	<0.04	<1	<1	858	791	<0.2	<0.2	<1	<1	-	-	69	56
			Min	**0**	**0**	**0**	**1**	**0**	**26**	**24**	**330**	**440**	**0**	**0**	**0**	**0**	**0**	**0**	**20200**	**20200**	**0**	**0**	**12700**	**14300**	**212**	**235**	**0**	**0**	**0**	**648**	**745**	**0**	**0**	**0**	**0**	**0**	**0**	**56**	**45**
			Max	**0**	**0**	**0**	**1**	**0**	**31**	**25**	**480**	**450**	**0**	**0**	**0**	**0**	**0**	**0**	**34800**	**30800**	**0**	**0**	**15300**	**14400**	**250**	**238**	**0**	**0**	**0**	**858**	**791**	**0**	**0**	**0**	**0**	**0**	**0**	**69**	**56**
			mean	**-**	**-**	**-**	**1.0**	**-**	**27.7**	**24.5**	**398.3**	**445.0**	**-**	**-**	**-**	**-**	**-**	**-**	**27733.3**	**25500.0**	**-**	**-**	**14083.3**	**14350.0**	**227.8**	**236.5**	**-**	**-**	**-**	**711.5**	**768.0**	**-**	**-**	**-**	**-**	**-**	**-**	**62.8**	**50.5**
D8	13 Groundwater Bore MPGM4	25/07/2019	Normal	-	-	140	<1	-	33	-	150	-	<0.1	-	<1	-	6	-	612	612	<1	-	2000	2000	48.1	-	<0.04	<1	-	93	-	<0.2	-	<1	-	<10	<10	110	-
D8	13 Groundwater Bore MPGM4	29/08/2019	Normal	-	-	60	<1	-	30	-	170	-	<0.1	-	<1	-	4	-	1520	1520	<1	-	2110	2110	46.1	-	<0.04	<1	-	88	-	<0.2	-	<1	-	<10	<10	94	-
D8	13 Groundwater Bore MPGM4	26/09/2019	Normal	-	-	340	<1	-	24	-	70	-	<0.1	-	<1	-	4	-	80	80	<1	-	393	393	21.1	-	<0.04	<1	-	32	-	<0.2	-	<1	-	<10	<10	39	-
D8	13 Groundwater Bore MPGM4	31/10/2019	Normal	-	-	70	<1	-	22	-	130	-	<0.1	-	<1	-	3	-	319	-	<1	-	828	-	29.5	-	<0.04	<1	-	50	-	<0.2	-	<1	-	<10	-	63	-
D8	D8	5/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D8	D8	5/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D8	13 Groundwater Bore MPGM4	28/11/2019	Normal	-	-	70	<1	-	27	-	90	-	<0.1	-	<1	-	2	-	848	-	<1	-	1170	-	28.3	-	<0.04	<1	-	66	-	<0.2	-	<1	-	<10	<10	78	-
D8	13 Groundwater Bore MPGM4	23/01/2020	Normal	-	-	<10	<1	-	54	-	200	-	<0.1	-	<1	-	2	-	4470	4470	<1	-	3900	3900	83.6	-	<0.04	<1	-	183	-	<0.2	-	<1	-	<10	<10	179	-
D8	13 Groundwater Bore MPGM4	27/02/2020	Normal	-	-	270	<1	-	48	-	110	-	<0.1	-	<1	-	2	-	-	39	<1	-	-	616	25.5	-	<0.04	<1	-	48	-	<0.2	-	<1	-	<10	<10	55	-
D8	13 Groundwater Bore MPGM4	26/03/2020	Normal	-	-	680	<1	-	45	-	<50	-	<0.1	-	<1	-	3	-	-	9	2	-	-	780	25.3	-	<0.04	<1	-	50	-	<0.2	-	<1	-	<10	<10	77	-
D8	13 Groundwater Bore MPGM4	25/06/2020	Normal	-	-	580	<1	-	25	-	<50	-	<0.1	-	<1	-	4	-	-	176	<1	-	-	45	11.8	-	<0.04	<1	-	20	-	<0.2	-	<1	-	<10	<10	32	-
			Min	**0**	**0**	**60**	**0**	**0**	**22**	**0**	**70**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**80**	**9**	**2**	**0**	**393**	**45**	**11.8**	**0**	**0**	**0**	**0**	**20**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**32**	**0**
			Max	**0**	**0**	**680**	**0**	**0**	**54**	**0**	**200**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**4470**	**4470**	**2**	**0**	**3900**	**3900**	**83.6**	**0**	**0**	**0**	**0**	**183**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**179**	**0**
			mean	**-**	**-**	**276.3**	**-**	**-**	**34.2**	**-**	**131.4**	**-**	**-**	**-**	**-**	**-**	**3.3**	**-**	**1308.2**	**986.6**	**2.0**	**-**	**1733.5**	**1406.3**	**35.5**	**-**	**-**	**-**	**-**	**70.0**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**80.8**	**-**
D104	Groundwater Bore	11/07/2019	Normal	-	<1	-	5	-	28	-	50	-	<0.1	-	<1	-	5	-	2780	-	<1	-	2390	-	51.5	-	<0.04	<1	-	32	-	<0.2	-	<1	-	-	-	47	-
D104	Groundwater Bore	15/08/2019	Normal	-	<1	-	4	-	25	-	50	-	<0.1	-	1	-	4	-	4850	-	<1	-	2070	-	52	-	<0.04	<1	-	35	-	<0.2	-	<1	-	-	-	36	-
D104	Groundwater Bore	12/09/2019	Normal	-	<1	-	3	-	24	-	60	-	<0.1	-	<1	-	2	-	3800	-	<1	-	2320	-	51.1	-	<0.04	<1	-	32	-	<0.2	-	<1	-	-	-	36	-
D104	Groundwater Bore	17/10/2019	Normal	-	<1	-	1	-	22	-	60	-	<0.1	-	<1	-	<1	-	3370	-	<1	-	2370	-	53.5	-	<0.04	<1	-	32	-	<0.2	-	<1	-	-	-	33	-
D104	D104	5/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D104	D104	5/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D104	Groundwater Bore	14/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D104	Groundwater Bore	19/03/2020	Normal	-	<1	-	2	<1	23	20	110	110	<0.1	<0.1	<1	<1	1	<1	7830	6150	<1	<1	3810	3640	79.9	78.8	<0.04	<1	<1	76	70	<0.2	<0.2	<1	<1	-	-	50	42
D104	Groundwater Bore	14/05/2020	Normal	-	<1	-	2	<1	57	48	120	110	<0.1	<0.1	4	<1	8	4	4390	2660	2	<1	2400	2260	51.7	46.8	<0.04	<1	<1	88	80	0.3	<0.2	<1	<1	-	-	222	193
			Min	**0**	**0**	**0**	**1**	**0**	**22**	**20**	**50**	**110**	**0**	**0**	**1**	**0**	**1**	**4**	**2780**	**2660**	**2**	**0**	**2070**	**2260**	**51.1**	**46.8**	**0**	**0**	**0**	**32**	**70**	**0.3**	**0**	**0**	**0**	**0**	**0**	**33**	**42**
			Max	**0**	**0**	**0**	**5**	**0**	**57**	**48**	**120**	**110**	**0**	**0**	**4**	**0**	**8**	**4**	**7830**	**6150**	**2**	**0**	**3810**	**3640**	**79.9**	**78.8**	**0**	**0**	**0**	**88**	**80**	**0.3**	**0**	**0**	**0**	**0**	**0**	**222**	**193**
			mean	**-**	**-**	**-**	**2.8**	**-**	**29.8**	**34.0**	**75.0**	**110.0**	**-**	**-**	**2.5**	**-**	**4.0**	**4.0**	**4503.3**	**4405.0**	**2.0**	**-**	**2560.0**	**2950.0**	**56.6**	**62.8**	**-**	**-**	**-**	**49.2**	**75.0**	**0.3**	**-**	**-**	**-**	**-**	**-**	**70.7**	**117.5**
D103	Groundwater Bore	12/07/2019	Normal	-	<1	-	4	-	37	-	1140	-	<0.1	-	1	-	2	-	19,100	-	2	-	17,200	-	282	-	<0.04	<1	-	997	-	<0.2	-	<1	-	-	-	226	-
D103	Groundwater Bore	15/08/2019	Normal	-	<1	-	5	-	30	-	1240	-	<0.1	-	34	-	1	-	15,900	-	<1	-	15,400	-	271	-	<0.04	<1	-	1000	-	<0.2	-	<1	-	-	-	213	-
D103	Groundwater Bore	11/09/2019	Normal	-	<1	-	6	-	29	-	1460	-	<0.1	-	<1	-	<1	-	22,200	-	<1	-	15,900	-	263	-	<0.04	<1	-	1000	-	<0.2	-	<1	-	-	-	224	-
D103	Groundwater Bore	16/10/2019	Normal	-	<1	-	7	-	30	-	1400	-	<0.1	-	1	-	<1	-	23,000	-	<1	-	15,300	-	272	-	<0.04	<1	-	960	-	<0.2	-	<1	-	-	-	215	-
D103	D103	4/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D103	D103	4/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D103	Groundwater Bore	13/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D103	Groundwater Bore	18/03/2020	Normal	-	<1	-	5	2	26	23	1550	1540	<0.1	<0.1	<1	<1	<1	<1	23,900	16,700	<1	<1	15,300	14,400	268	257	<0.04	<1	<1	1020	982	<0.2	<0.2	<1	<1	-	-	208	178
D103	Groundwater Bore	14/05/2020	Normal	-	<1	-	7	2	30	24	1660	1700	<0.1	<0.1	3	<1	<1	<1	22,600	23,200	<1	<1	15,400	14,600	248	238	<0.04	<1	<1	1100	1040	<0.2	<0.2	<1	<1	-	-	224	196

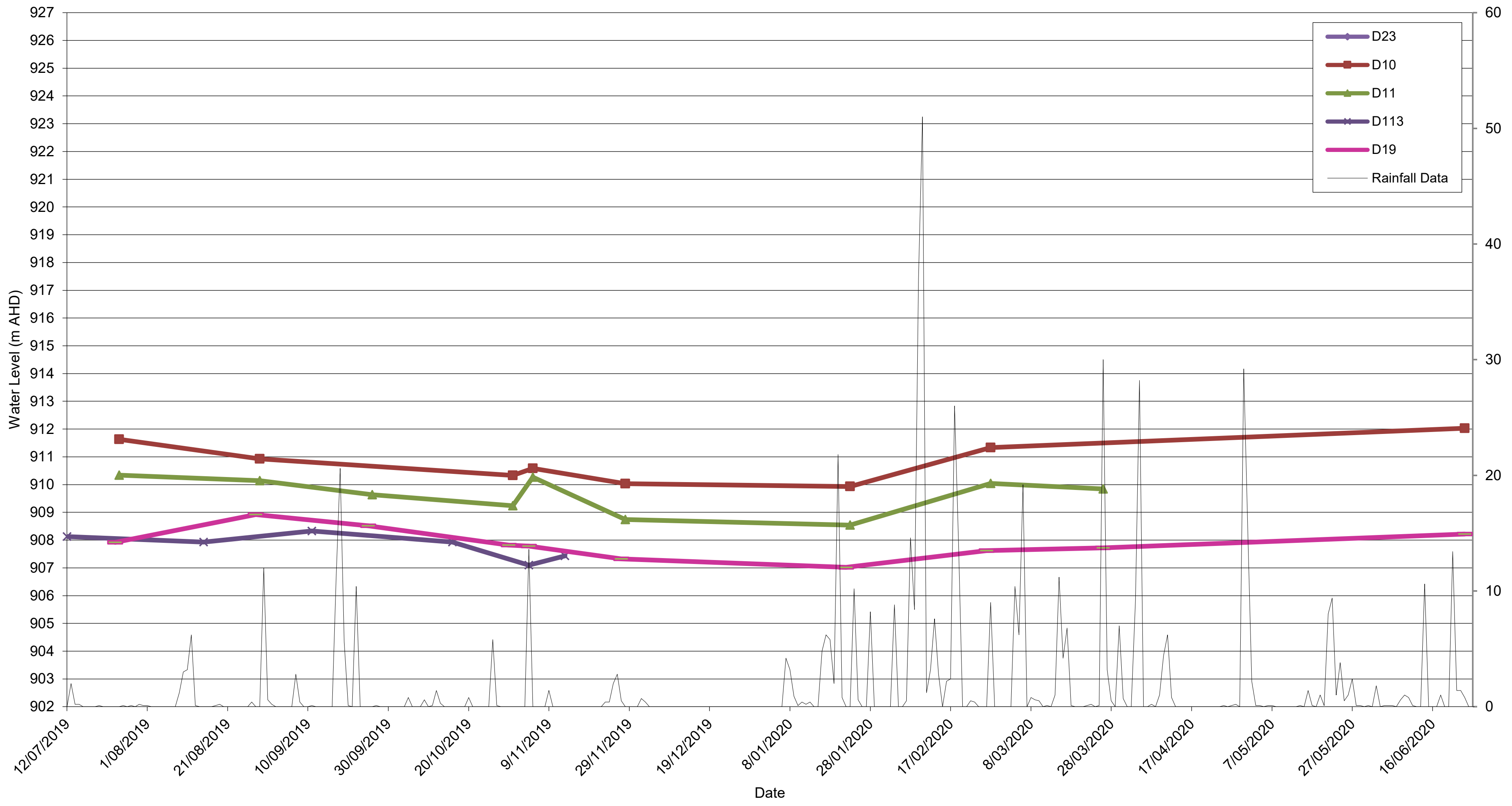
				Field Parameters				Major Anions and Cations											
				Electrical Conductivity (Field)	pH (Field)	Temperature (Field)	Total Dissolved Solids (TDS)	Calcium	Calcium (Filtered)	Chloride	Potassium	Potassium (Filtered)	Sodium	Sodium (Filtered)	Sulfate (as SO4)	Fluoride	Total Alkalinity (as CaCO3)	Total Alkalinity (as CaCO3) (Filtered)	Phenolphthalein Alkalinity (CaCO3)
				uS/cm	pH units	oC	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
ANZECC (2000) or Local Guidelines - Groundwater				2600	6.5-8		2000			350					1000	1.5			
Upgradient - Background Bores																			
LocCode	**Field_ID**	**Sampled_Date**	**Sample_Type**																
D4	9 Groundwater Bore MPGM4	12/07/2019	Normal	900	3.38	-	770	15.2	-	11.7	8.54	-	20.2	-	408	<0.1	<1	-	-
D4	9 Groundwater Bore MPGM4	7/08/2019	Normal	860	3.39	-	719	17.2	-	13.8	9.08	-	20.3	-	341	<0.1	<1	-	-
D4	9 Groundwater Bore MPGM4	5/09/2019	Normal	860	3.39	-	718	16.4	-	11.4	8.29	-	19.2	-	391	<0.1	<1	-	-
D4	9 Groundwater Bore MPGM4	3/10/2019	Normal	860	3.41	-	743	15.4	-	12.5	8.25	-	18.4	-	413	<0.1	<1	-	-
D4	9 Groundwater Bore MPGM4	5/11/2019	Normal	1142	-	15.4	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	9 Groundwater Bore MPGM4	5/11/2019	Normal	1064	-	13.9	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	9 Groundwater Bore MPGM4	7/11/2019	Normal	820	3.43	-	612	17.1	-	15.5	8.45	-	20.1	-	398	<0.1	<1	-	-
D4	9 Groundwater Bore MPGM4	12/12/2019	Normal	820	3.45	-	716	16.7	-	14.5	8.26	-	18.9	-	372	0.062	<1	<1	-
D4	9 Groundwater Bore MPGM4	16/01/2020	Normal	810	3.47	-	624	17.8	-	16	7.81	-	20	-	482	0.12	<1	-	-
D4	9 Groundwater Bore MPGM4	12/02/2020	Normal	810	3.47	-	696	16.6	-	13.2	9.65	-	22.9	-	308	0.075	<1	-	-
D4	9 Groundwater Bore MPGM4	12/03/2020	Normal	770	3.46	-	650	17.1	-	12.8	8.03	-	19.8	-	234	<0.1	<1	-	-
			Min	**770**	**3.38**	**13.9**	**612**	**15.2**	**0**	**11.4**	**7.81**	**0**	**18.4**	**0**	**234**	**0.062**	**0**	**0**	**0**
			Max	**1142**	**3.47**	**15.4**	**770**	**17.8**	**0**	**16**	**9.65**	**0**	**22.9**	**0**	**482**	**0.12**	**0**	**0**	**0**
			mean	**883.3**	**-**	**14.7**	**694.2**	**16.6**	**-**	**13.5**	**8.5**	**-**	**20.0**	**-**	**371.9**	**0.1**	**-**	**-**	**-**
D5	10 Groundwater Bore MPGM4	12/07/2019	Normal	1270	5.89	-	949	101	-	24.4	9.03	-	31.6	-	596	<0.1	77	-	-
D5	10 Groundwater Bore MPGM4	7/08/2019	Normal	1200	5.92	-	903	102	-	23.3	10.2	-	31.6	-	537	<1	87	-	-
D5	10 Groundwater Bore MPGM4	5/09/2019	Normal	1250	5.93	-	906	101	-	24.2	8.99	-	29.6	-	566	0.121	90	-	-
D5	10 Groundwater Bore MPGM4	3/10/2019	Normal	1270	5.97	-	872	101	-	23.7	9.15	-	27.1	-	592	<0.1	60	-	-
D5	10 Groundwater Bore MPGM4	7/11/2019	Normal	1260	5.92	-	853	109	-	27.6	10.4	-	32.8	-	635	0.149	93	-	-
D5	10 Groundwater Bore MPGM4	12/12/2019	Normal	1270	5.92	-	926	102	-	25.1	9.73	-	28.8	-	592	0.16	64	-	-
D5	10 Groundwater Bore MPGM4	16/01/2020	Normal	1260	6.01	-	902	108	-	25.9	10	-	32.1	-	589	0.177	84	-	-
D5	10 Groundwater Bore MPGM4	12/02/2020	Normal	1250	6.06	-	938	96.7	-	25.7	11.9	-	33	-	535	<0.1	51	-	-
D5	10 Groundwater Bore MPGM4	12/03/2020	Normal	1260	5.96	-	1020	107	-	24.8	10.6	-	33.1	-	567	<0.1	108	-	-
			Min	**1200**	**5.89**	**0**	**853**	**96.7**	**0**	**23.3**	**8.99**	**0**	**27.1**	**0**	**535**	**0.121**	**51**	**0**	**0**
			Max	**1270**	**6.06**	**0**	**1020**	**109**	**0**	**27.6**	**11.9**	**0**	**33.1**	**0**	**635**	**0.177**	**108**	**0**	**0**
			mean	**1254.4**	**-**	**-**	**918.8**	**103.1**	**-**	**25.0**	**10.0**	**-**	**31.1**	**-**	**578.8**	**0.2**	**79.3**	**-**	**-**
Within Ash Repository / Mine Spoil																			
LocCode	**Field_ID**	**Sampled_Date**	**Sample_Type**																
			Min	**2732**	**6.02**	**15.7**	**3940**	**248**	**237**	**307**	**30.4**	**33**	**602**	**574**	**2280**	**0**	**124**	**0**	**0**
			Max	**13850**	**6.4**	**16.1**	**13500**	**770**	**721**	**1750**	**253**	**241**	**2460**	**2300**	**7590**	**0**	**160**	**0**	**0**
			mean	**4610.7**	**-**	**15.9**	**4211.7**	**281.2**	**256.5**	**337.2**	**34.5**	**36.2**	**625.8**	**585.0**	**2435.0**	**-**	**135.3**	**-**	**-**
D2	7 Groundwater Bore MPGM4	11/07/2019	Normal	4360	5.7	-	3710	308	-	335	29.2	-	550	-	2460	<0.5	26	-	-
D2	7 Groundwater Bore MPGM4	8/08/2019	Normal	4950	5.71	-	4390	369	-	389	37.7	-	651	-	2430	<0.5	45	-	-
D2	7 Groundwater Bore MPGM4	6/09/2019	Normal	4920	5.77	-	3840	331	-	363	31.5	-	597	-	2590	<0.5	41	-	-
D2	7 Groundwater Bore MPGM4	4/10/2019	Normal	2250	5.56	-	1470	124	-	148	15.3	-	278	-	1030	<0.1	21	-	-
D2	D2	5/11/2019	Normal	2300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2	D2	5/11/2019	Normal	4357	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2	7 Groundwater Bore MPGM4	8/11/2019	Normal	3820	5.79	-	3090	252	-	287	29.5	-	448	-	2010	<0.5	23	-	-
D2	7 Groundwater Bore MPGM4	16/01/2020	Normal	3990	5.94	-	3090	266	-	284	30.8	-	426	-	2020	<0.5	26	-	-
D2	7 Groundwater Bore MPGM4	13/02/2020	Normal	1050	5.98	-	840	52.1	-	62.6	13.7	-	88.9	-	408	<0.1	28	-	-
D2	7 Groundwater Bore MPGM4	12/03/2020	Normal	1080	5.15	-	824	54.9	-	51.6	12.8	-	97.8	-	311	<0.1	26	-	-
			Min	**1050**	**5.15**	**0**	**824**	**52.1**	**0**	**51.6**	**12.8**	**0**	**88.9**	**0**	**311**	**0**	**21**	**0**	**0**
			Max	**4950**	**5.98**	**0**	**4390**	**369**	**0**	**389**	**37.7**	**0**	**651**	**0**	**2590**	**0**	**45**	**0**	**0**
			mean	**3307.7**	**-**	**-**	**2656.8**	**219.6**	**-**	**240.0**	**25.1**	**-**	**392.1**	**-**	**1657.4**	**-**	**29.5**	**-**	**-**
Leak Detection Bores																			
LocCode	**Field_ID**	**Sampled_Date-Time**	**Sample_Type**																
MPGM5-D5	24 Groundwater Bore MPGM5	11/07/2019	Normal	61,000	5.88	-	81,700	579	-	6010	401	-	22,700	-	55,500	<1	469	-	-
MPGM5-D5	24 Groundwater Bore MPGM5	8/08/2019	Normal	56,240	5.92	-	72,100	542	-	4660	436	-	18,000	-	37,600	1.26	456	-	-
MPGM5-D5	24 Groundwater Bore MPGM5	6/09/2019	Normal	54,910	5.94	-	73,300	547	-	4850	382	-	16,600	-	39,000	<10	506	-	-
MPGM5-D5	24 Groundwater Bore MPGM5	4/10/2019	Normal	56,320	5.98	-	67,500	600	-	6040	367	-	17,300	-	45,500	1.22	484	-	-
MPGM5-D5	24 Groundwater Bore MPGM5	8/11/2019	Normal	62,300	5.92	-	76,900	626	-	4820	775	-	22,900	-	37,600	1.15	567	-	-
MPGM5-D5	24 Groundwater Bore MPGM5	16/01/2020	Normal	42,700	5.91	-	47,100	523	-	3890	516	-	12,600	-	35,200	<5	401	-	-
MPGM5-D5	24 Groundwater Bore MPGM5	13/02/2020	Normal	13,120	5.96	-	12,300	263	-	931	108	-	2510	-	6900	<2	240	-	-
MPGM5-D5	24 Groundwater Bore MPGM5	12/03/2020	Normal	49,910	5.89	-	66,000	522	-	3400	748	-	15,100	-	24,300	<5	585	-	-
			Min	**13120**	**5.88**	**0**	**12300**	**263**	**0**	**931**	**108**	**0**	**2510**	**0**	**6900**	**1.15**	**240**	**0**	**0**
			Max	**62300**	**5.98**	**0**	**81700**	**626**	**0**	**6040**	**775**	**0**	**22900**	**0**	**55500**	**1.26**	**585**	**0**	**0**
			mean	**49562.5**	**-**	**-**	**62112.5**	**525.3**	**-**	**4325.1**	**466.6**	**-**	**15963.8**	**-**	**35200.0**	**1.2**	**463.5**	**-**	**-**
MPGM5-D6	25 Groundwater Bore MPGM5	11/07/2019	Normal	1370	5.61	-	850	14.4	-	158	5.51	-	210	-	346	<0.1	97	-	-
MPGM5-D6	25 Groundwater Bore MPGM5	8/08/2019	Normal	1340	5.62	-	860	15.7	-	156	5.54	-	211	-	296	<0.1	100	-	-
MPGM5-D6	25 Groundwater Bore MPGM5	6/09/2019	Normal	1320	5.64	-	916	14.9	-	150	4.54	-	191	-	310	<0.1	106	-	-
MPGM5-D6	25 Groundwater Bore MPGM5	4/10/2019	Normal	11,940	5.73	-	10,500	94.5	-	852	48.1	-	2490	-	6360	<0.5	118	-	-
MPGM5-D6	25 Groundwater Bore MPGM5	8/11/2019	Normal	3820	5.56	-	2980	38.9	-	345	14.4	-	661	-	1840	<0.5	98	-	-
MPGM5-D6	25 Groundwater Bore MPGM5	16/01/2020	Normal	2240	5.54	-	1380	25.5	-	209	8.33	-	308	-	850	<0.2	78	-	-
MPGM5-D6	25 Groundwater Bore MPGM5	13/02/2020	Normal	1890	5.58	-	1330	25.9	-	186	9.46	-	282	-	584	<0.2	86	-	-
MPGM5-D6	25 Groundwater Bore MPGM5	12/03/2020	Normal	1840	5.65	-	1180	22.8	-	143	9.14	-	245	-	434	<0.2	93	-	-
			Min	**1320**	**5.54**	**0**	**850**	**14.4**	**0**	**143**	**4.54**	**0**	**191**	**0**	**296**	**0**	**78**	**0**	**0**
			Max	**11940**	**5.73**	**0**	**10500**	**94.5**	**0**	**852**	**48.1**	**0**	**2490**	**0**	**6360**	**0**	**118**	**0**	**0**
			mean	**3220.0**	**-**	**-**	**2499.5**	**31.6**	**-**	**274.9**	**13.1**	**-**	**574.8**	**-**	**1377.5**	**-**	**97.0**	**-**	**-**
Statistical Summary																			
Number of Results				271	230	76	223	223	77	223	223	77	223	77	223	223	223	65	105
Number of Detects				271	230	76	223	223	77	223	223	77	223	77	223	90	222	65	63
Minimum Concentration				222	4.92	0	118	14.4	0	3.4	2.23	0	6.04	0	9.38	0	<1	0	0
Minimum Detect				222	4.92	15.7	118	14.4	64.8	3.4	2.23	7.38	6.04	94.8	9.38	0.022	4	120	ND
Maximum Concentration				62300	7	19	81700	770	721	6040	775	241	22900	2300	55500	<10	585	138	<1
Maximum Detect				62300	7	19	81700	770	721	6040	775	241	22900	2300	55500	4.63	585	138	ND
Average Concentration				7058	6	9.3	7113	315	207	671	77	48	1424	537	4010	0.34	137	22	0.25
Median Concentration				4360	5.95	15.9	3630	258	120	307	43.1	11.6	623	110	2140	0.25	125	0	0.25
Standard Deviation				10325	0.36	8.5	13514	225	246	1003	115	70	3585	710	7999	0.62	108	50	0.25
Number of Guideline Exceedances				247	210	0	198	220	0	213	206	0	212	0	202	182	175	0	0
Number of Guideline Exceedances(Detects Only)				247	210	0	198	220	0	213	206	0	212	0	202	54	175	0	0

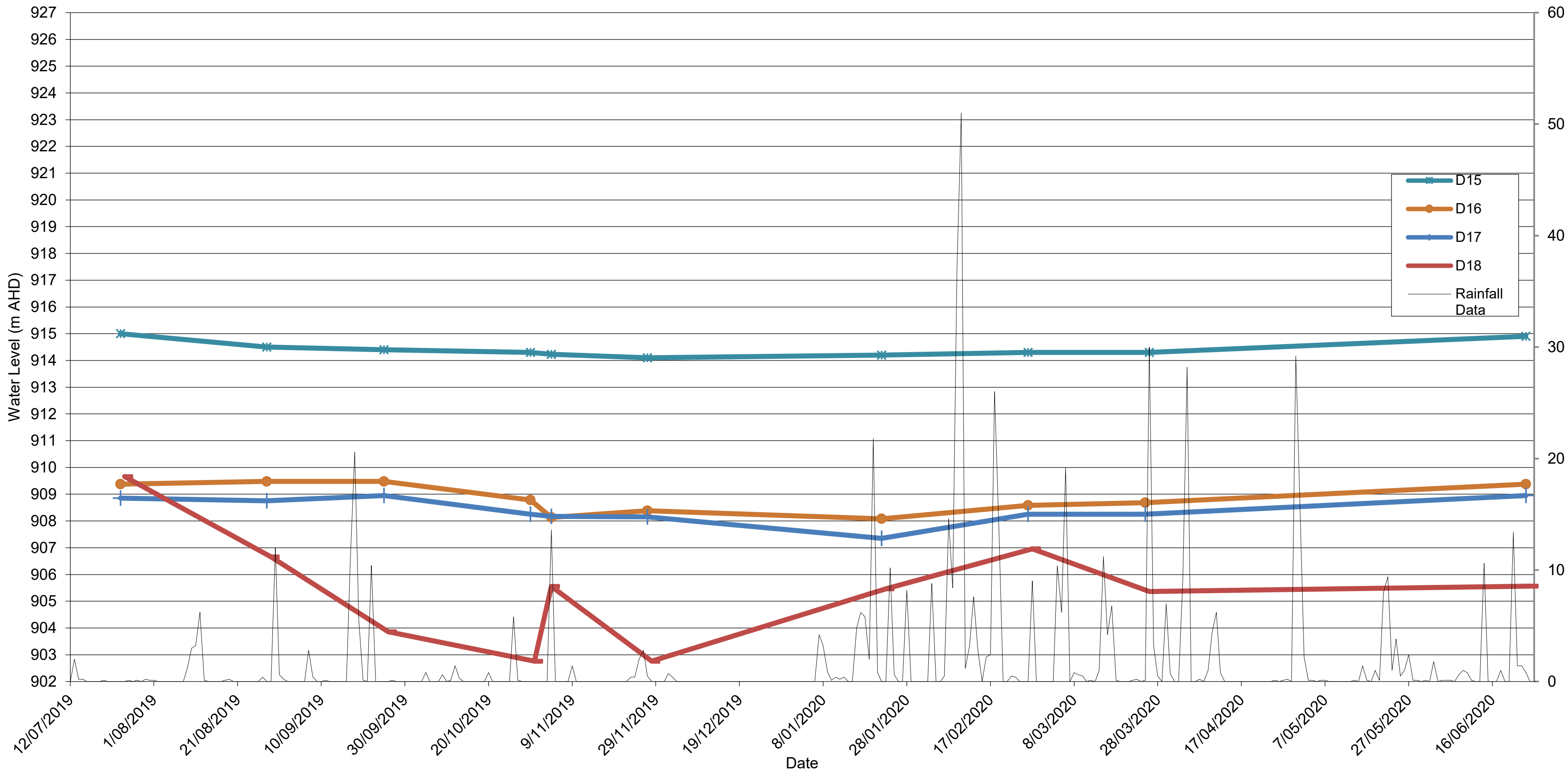
				Metals																																	
				Aluminium	Arsenic	Arsenic (Filtered)	Barium	Barium (Filtered)	Boron	Boron (Filtered)	Cadmium	Cadmium (Filtered)	Chromium	Chromium (Filtered)	Copper	Copper (Filtered)	Iron	Iron (Filtered)	Lead	Lead (Filtered)	Manganese	Manganese (Filtered)	Magnesium	Magnesium (Filtered)	Mercury	Molybdenum	Molybdenum (Filtered)	Nickel	Nickel (Filtered)	Selenium	Selenium (Filtered)	Silver	Silver (Filtered)	Vanadium	Vanadium (Filtered)	Zinc	Zinc (Filtered)
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
ANZECC (2000) or Local Guidelines - Groundwater					24	24	700	700	370	370	2	2	5	5	5	5	664	664	5	5	5704	5704			0.06	10	10	550.9	550.9	5	5	0.05	0.05			908	908
Upgradient - Background Bores																																					
LocCode	**Field_ID**	**Sampled_Date**	**Sample_Type**																																		
D4	9 Groundwater Bore MPGM4	12/07/2019	Normal	14,100	46	-	13	-	<50	-	0.6	-	2	-	3	-	105,000	105,000	19	-	778	778	9.33	-	<0.04	<1	-	18	-	0.2	-	<1	-	10	10	198	-
D4	9 Groundwater Bore MPGM4	7/08/2019	Normal	13,400	50	-	13	-	<50	-	0.5	-	3	-	1	-	90,700	90,700	22	-	762	762	10	-	<0.04	<1	-	16	-	0.2	-	<1	-	<10	<10	170	-
D4	9 Groundwater Bore MPGM4	5/09/2019	Normal	13,000	41	-	11	-	<50	-	0.6	-	2	-	<1	-	100,000	100,000	18	-	732	732	9.42	-	<0.04	<1	-	17	-	<0.2	-	<1	-	<10	<10	168	-
D4	9 Groundwater Bore MPGM4	3/10/2019	Normal	14,700	42	-	12	-	<50	-	0.6	-	2	-	<1	-	110,000	-	18	-	775	-	9.23	-	<0.04	<1	-	18	-	<0.2	-	<1	-	<10	-	188	-
D4	9 Groundwater Bore MPGM4	5/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	9 Groundwater Bore MPGM4	5/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	9 Groundwater Bore MPGM4	7/11/2019	Normal	11,800	36	-	12	-	<50	-	0.4	-	2	-	<1	-	80,300	-	17	-	767	-	8.98	-	<0.04	<1	-	15	-	<0.2	-	<1	-	<10	-	150	-
D4	9 Groundwater Bore MPGM4	12/12/2019	Normal	12,800	42	-	13	-	<50	-	0.5	-	2	-	<1	-	95,400	-	16	-	815	-	9.69	-	<0.04	<1	-	15	-	<0.2	-	<1	-	<10	<10	147	-
D4	9 Groundwater Bore MPGM4	16/01/2020	Normal	13,500	44	-	13	-	<50	-	0.5	-	2	-	<1	-	89,300	89,300	18	-	850	850	8.94	-	<0.04	<1	-	16	-	0.2	-	<1	-	<10	<10	158	-
D4	9 Groundwater Bore MPGM4	12/02/2020	Normal	12,500	41	-	12	-	<50	-	0.5	-	2	-	1	-	-	87,800	17	-	-	778	10	-	<0.04	<1	-	15	-	<0.2	-	<1	-	<10	<10	151	-
D4	9 Groundwater Bore MPGM4	12/03/2020	Normal	10,900	47	-	12	-	<50	-	0.4	-	2	-	<1	-	-	71,700	18	-	-	745	8.99	-	<0.04	<1	-	13	-	<0.2	-	<1	-	<10	<10	125	-
			Min	**10900**	**36**	**0**	**11**	**0**	**0**	**0**	**0.4**	**0**	**2**	**0**	**1**	**0**	**80300**	**71700**	**16**	**0**	**732**	**732**	**8.94**	**0**	**0**	**0**	**0**	**13**	**0**	**0.2**	**0**	**0**	**0**	**10**	**10**	**125**	**0**
			Max	**14700**	**50**	**0**	**13**	**0**	**0**	**0**	**0.6**	**0**	**3**	**0**	**3**	**0**	**110000**	**105000**	**22**	**0**	**850**	**850**	**10**	**0**	**0**	**0**	**0**	**18**	**0**	**0.2**	**0**	**0**	**0**	**10**	**10**	**198**	**0**
			mean	**12966.7**	**43.2**	**-**	**12.3**	**-**	**-**	**-**	**0.5**	**-**	**2.1**	**-**	**1.7**	**-**	**95814.3**	**90750.0**	**18.1**	**-**	**782.7**	**774.2**	**9.4**	**-**	**-**	**-**	**-**	**15.9**	**-**	**0.2**	**-**	**-**	**-**	**10.0**	**10.0**	**161.7**	**-**
D5	10 Groundwater Bore MPGM4	12/07/2019	Normal	30	<1	-	17	-	70	-	<0.1	-	<1	-	<1	-	35,500	35,500	<1	-	7960	7960	74.2	-	<0.04	<1	-	48	-	<0.2	-	<1	-	<10	<10	16	-
D5	10 Groundwater Bore MPGM4	7/08/2019	Normal	30	<1	-	17	-	100	-	<0.1	-	<1	-	<1	-	53,400	53,400	<1	-	8770	8770	71.9	-	<0.04	<1	-	38	-	0.4	-	<1	-	<10	<10	18	-
D5	10 Groundwater Bore MPGM4	5/09/2019	Normal	20	<1	-	20	-	80	-	<0.1	-	<1	-	<1	-	50,300	50,300	<1	-	8460	8460	70.8	-	<0.04	<1	-	42	-	0.2	-	<1	-	<10	<10	16	-
D5	10 Groundwater Bore MPGM4	3/10/2019	Normal	20	<1	-	18	-	120	-	<0.1	-	<1	-	<1	-	30,800	-	<1	-	8890	-	73.9	-	<0.04	<1	-	45	-	<0.2	-	<1	-	<10	-	12	-
D5	10 Groundwater Bore MPGM4	7/11/2019	Normal	30	<1	-	17	-	120	-	<0.1	-	<1	-	<1	-	30,300	-	<1	-	7990	-	71.7	-	<0.04	<1	-	42	-	<0.2	-	<1	-	<10	-	17	-
D5	10 Groundwater Bore MPGM4	12/12/2019	Normal	30	<1	-	19	-	110	-	<0.1	-	<1	-	<1	-	22,400	-	<1	-	9390	-	73.6	-	<0.04	<1	-	41	-	<0.2	-	<1	-	<10	<10	16	-
D5	10 Groundwater Bore MPGM4	16/01/2020	Normal	30	<1	-	18	-	120	-	<0.1	-	<1	-	<1	-	32,400	32,400	<1	-	9140	9140	68.5	-	<0.04	<1	-	47	-	0.3	-	<1	-	<10	<10	21	-
D5	10 Groundwater Bore MPGM4	12/02/2020	Normal	20	<1	-	17	-	110	-	<0.1	-	<1	-	<1	-	-	27,500	<1	-	-	7890	71.4	-	<0.04	<1	-	41	-	<0.2	-	<1	-	<10	<10	16	-
D5	10 Groundwater Bore MPGM4	12/03/2020	Normal	30	<1	-	16	-	110	-	<0.1	-	<1	-	<1	-	-	50,500	<1	-	-	8100	69.6	-	<0.04	<1	-	46	-	0.3	-	<1	-	<10	<10	13	-
			Min	**20**	**0**	**0**	**16**	**0**	**70**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**22400**	**27500**	**0**	**0**	**7960**	**7890**	**68.5**	**0**	**0**	**0**	**0**	**38**	**0**	**0.2**	**0**	**0**	**0**	**0**	**0**	**12**	**0**
			Max	**30**	**0**	**0**	**20**	**0**	**120**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**53400**	**53400**	**0**	**0**	**9390**	**9140**	**74.2**	**0**	**0**	**0**	**0**	**48**	**0**	**0.4**	**0**	**0**	**0**	**0**	**0**	**21**	**0**
			mean	**26.7**	**-**	**-**	**17.7**	**-**	**104.4**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**36442.9**	**41600.0**	**-**	**-**	**8657.1**	**8386.7**	**71.7**	**-**	**-**	**-**	**-**	**43.3**	**-**	**0.3**	**-**	**-**	**-**	**-**	**-**	**16.1**	**-**
Within Ash Repository / Mine Spoil																																					
LocCode	**Field_ID**	**Sampled_Date**	**Sample_Type**																																		
			Min	**0**	**4**	**2**	**26**	**23**	**1140**	**1540**	**0**	**0**	**1**	**0**	**1**	**0**	**15900**	**16700**	**2**	**0**	**15300**	**14400**	**248**	**238**	**0**	**0**	**0**	**960**	**982**	**0**	**0**	**0**	**0**	**0**	**0**	**208**	**178**
			Max	**0**	**7**	**2**	**37**	**24**	**1660**	**1700**	**0**	**0**	**34**	**0**	**2**	**0**	**23900**	**23200**	**2**	**0**	**17200**	**14600**	**786**	**700**	**0**	**0**	**0**	**1100**	**1040**	**0**	**0**	**0**	**0**	**0**	**0**	**226**	**196**
			mean	**-**	**5.7**	**2.0**	**30.3**	**23.5**	**1408.3**	**1620.0**	**-**	**-**	**9.8**	**-**	**1.5**	**-**	**21116.7**	**19950.0**	**2.0**	**-**	**15750.0**	**14500.0**	**267.3**	**247.5**	**-**	**-**	**-**	**1012.8**	**1011.0**	**-**	**-**	**-**	**-**	**-**	**-**	**218.3**	**187.0**
D2	7 Groundwater Bore MPGM4	11/07/2019	Normal	280	<1	-	57	-	670	-	<0.1	-	<1	-	<1	-	24,000	-	1	-	10,800	-	250	-	<0.04	<1	-	475	-	<0.2	-	<1	-	<10	-	247	-
D2	7 Groundwater Bore MPGM4	8/08/2019	Normal	110	<1	-	46	-	1030	-	<0.1	-	<1	-	<1	-	22,500	-	<1	-	12,600	-	279	-	<0.04	<1	-	496	-	0.2	-	<1	-	<10	-	196	-
D2	7 Groundwater Bore MPGM4	6/09/2019	Normal	10	<1	-	32	-	650	-	<0.1	-	<1	-	<1	-	26,000	-	<1	-	12,100	-	252	-	<0.04	<1	-	466	-	<0.2	-	<1	-	<10	-	171	-
D2	7 Groundwater Bore MPGM4	4/10/2019	Normal	420	<1	-	17	-	420	-	<0.1	-	<1	-	<1	-	4960	-	2	-	4860	-	96.3	-	<0.04	<1	-	218	-	<0.2	-	<1	-	<10	-	90	-
D2	D2	5/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2	D2	5/11/2019	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2	7 Groundwater Bore MPGM4	8/11/2019	Normal	340	<1	-	30	-	640	-	<0.1	-	<1	-	2	-	17,400	-	2	-	8130	-	185	-	<0.04	<1	-	343	-	<0.2	-	<1	-	<10	-	119	-
D2	7 Groundwater Bore MPGM4	16/01/2020	Normal	410	2	-	35	-	770	-	<0.1	-	2	-	1	-	-	29,800	3	-	-	9120	193	-	0.07	<1	-	454	-	0.3	-	<1	-	<10	<10	76	-
D2	7 Groundwater Bore MPGM4	13/02/2020	Normal	1040	1	-	20	-	290	-	<0.1	-	1	-	7	-	-	7310	6	-	-	1850	39.4	-	<0.04	<1	-	112	-	0.5	-	<1	-	<10	<10	38	-
D2	7 Groundwater Bore MPGM4	12/03/2020	Normal	860	1	-	26	-	300	-	<0.1	-	<1	-	3	-	-	10,700	4	-	-	1890	38.5	-	<0.04	<1	-	118	-	0.4	-	<1	-	<10	<10	29	-
			Min	**10**	**1**	**0**	**17**	**0**	**290**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**4960**	**7310**	**1**	**0**	**4860**	**1850**	**38.5**	**0**	**0.07**	**0**	**0**	**112**	**0**	**0.2**	**0**	**0**	**0**	**0**	**0**	**29**	**0**
			Max	**1040**	**2**	**0**	**57**	**0**	**1030**	**0**	**0**	**0**	**2**	**0**	**7**	**0**	**26000**	**29800**	**6**	**0**	**12600**	**9120**	**279**	**0**	**0.07**	**0**	**0**	**496**	**0**	**0.5**	**0**	**0**	**0**	**0**	**0**	**247**	**0**
			mean	**433.8**	**1.3**	**-**	**32.9**	**-**	**596.3**	**-**	**-**	**-**	**1.5**	**-**	**3.3**	**-**	**18972.0**	**15936.7**	**3.0**	**-**	**9698.0**	**4286.7**	**166.7**	**-**	**0.1**	**-**	**-**	**335.3**	**-**	**0.4**	**-**	**-**	**-**	**-**	**-**	**120.8**	**-**
Leak Detection Bores																																					
LocCode	**Field_ID**	**Sampled_Date-Time**	**Sample_Type**																																		
MPGM5-D5	24 Groundwater Bore MPGM5	11/07/2019	Normal	<100	23	-	49	-	3970	-	19.3	-	<10	-	51	-	5060	-	39	-	400,000	-	3690	-	<0.04	<10	-	8950	-	59.5	-	<10	-	<100	-	1590	-
MPGM5-D5	24 Groundwater Bore MPGM5	8/08/2019	Normal	360	24	-	51	-	3560	-	18.1	-	<10	-	69	-	4130	-	39	-	324,000	-	3290	-	<0.04	<10	-	9340	-	24.9	-	<10	-	<100	-	1400	-
MPGM5-D5	24 Groundwater Bore MPGM5	6/09/2019	Normal	200	21	-	43	-	2260	-	15.7	-	<10	-	60	-	2380	-	31	-	311,000	-	3170	-	<0.04	<10	-	9830	-	36.9	-	<10	-	<100	-	1190	-
MPGM5-D5	24 Groundwater Bore MPGM5	4/10/2019	Normal	<100	21	-	44	-	3520	-	17.8	-	<10	-	67	-	2800	-	28	-	341,000	-	3500	-	<0.04	<10	-	9740	-	39.3	-	<10	-	<100	-	1260	-
MPGM5-D5	24 Groundwater Bore MPGM5	8/11/2019	Normal	270	25	-	63	-	4380	-	18.8	-	<10	-	76	-	2190	-	23	-	328,000	-	3880	-	0.04	<10	-	10,500	-	47.5	-	<10	-	<100	-	1360	-
MPGM5-D5	24 Groundwater Bore MPGM5	16/01/2020	Normal	<100	21	-	38	-	3050	-	12	-	<10	-	48	-	-	1170	18	-	-	221,000	2430	-	0.04	<10	-	7610	-	26.1	-	<10	-	<100	<100	937	-
MPGM5-D5	24 Groundwater Bore MPGM5	13/02/2020	Normal	160	4	-	43	-	550	-	2.7	-	1	-	20	-	-	181	4	-	-	52,200	667	-	0.05	4	-	1580	-	3.4	-	<1	-	<10	<10	246	-
MPGM5-D5	24 Groundwater Bore MPGM5	12/03/2020	Normal	<100	19	-	29	-	4370	-	12.8	-	<10	-	<10	-	-	1240	<10	-	-	237,000	2750	-	0.07	<10	-	9030	-	32.7	-	<10	-	<100	<100	922	-
			Min	**160**	**4**	**0**	**29**	**0**	**550**	**0**	**2.7**	**0**	**1**	**0**	**20**	**0**	**2190**	**181**	**4**	**0**	**311000**	**52200**	**667**	**0**	**0.04**	**4**	**0**	**1580**	**0**	**3.4**	**0**	**0**	**0**	**0**	**0**	**246**	**0**
			Max	**360**	**25**	**0**	**63**	**0**	**4380**	**0**	**19.3**	**0**	**1**	**0**	**76**	**0**	**5060**	**1240**	**39**	**0**	**400000**	**237000**	**3880**	**0**	**0.07**	**4**	**0**	**10500**	**0**	**59.5**	**0**	**0**	**0**	**0**	**0**	**1590**	**0**
			mean	**247.5**	**19.8**	**-**	**45.0**	**-**	**3207.5**	**-**	**14.7**	**-**	**1.0**	**-**	**55.9**	**-**	**3312.0**	**863.7**	**26.0**	**-**	**340800.0**	**170066.7**	**2922.1**	**-**	**0.1**	**4.0**	**-**	**8322.5**	**-**	**33.8**	**-**	**-**	**-**	**-**	**-**	**1113.1**	**-**
MPGM5-D6	25 Groundwater Bore MPGM5	11/07/2019	Normal	560	2	-	43	-	<50	-	0.2	-	<1	-	<1	-	43,800	-	4	-	5820	-	38.8	-	<0.04	<1	-	72	-	0.5	-	<1	-	<10	-	98	-
MPGM5-D6	25 Groundwater Bore MPGM5	8/08/2019	Normal	30	1	-	36	-	60	-	<0.1	-	<1	-	<1	-	45,400	-	<1	-	6620	-	40.4	-	<0.04	<1	-	70	-	0.4	-	<1	-	<10	-	69	-
MPGM5-D6	25 Groundwater Bore MPGM5	6/09/2019	Normal	60	2	-	37	-	<50	-	<0.1	-	<1	-	<1	-	42,700	-	1	-	5870	-	38.6	-	0.13	<1	-	78	-	0.3	-	<1	-	<10	-	59	-
MPGM5-D6	25 Groundwater Bore MPGM5	4/10/2019	Normal	500	6	-	58	-	550	-	2.1	-	2	-	9	-	50,600	-	8	-	49,700	-	462	-	<0.04	<1	-	1380	-	3.5	-	<1	-	<10	-	216	-
MPGM5-D6	25 Groundwater Bore MPGM5	8/11/2019	Normal	20	1	-	32	-	130	-	0.2	-	<1	-	<1	-	80,600	-	<1	-	16,200	-	127	-	0.05	<1	-	351	-	0.5	-	<1	-	<10	-	103	-
MPGM5-D6	25 Groundwater Bore MPGM5	16/01/2020	Normal	120	2	-	24	-	100	-	0.2	-	<1	-	3	-	-	45,300	2	-	-	9820	66.8	-	<0.04	<1	-	190	-	0.3	-	<1	-	<10	<10	112	-
MPGM5-D6	25 Groundwater Bore MPGM5	13/02/2020	Normal	10	<1	-	21	-	<50	-	0.1	-	1	-	5	-	-	44,900	<1	-	-	7760	70.2	-	<0.04	<1	-	129	-	0.4	-	<1	-	<10	<10	70	-
MPGM5-D6	25 Groundwater Bore MPGM5	12/03/2020	Normal	830	2	-	35	-	80	-	0.2	-	2	-	4	-	-	48,900	20	-	-	8280	58.1	-	<0.04	<1	-	145	-	0.6	-	<1	-	<10	<10	133	-
			Min	**10**	**1**	**0**	**21**	**0**	**60**	**0**	**0.1**	**0**	**1**	**0**	**3**	**0**	**42700**	**44900**	**1**	**0**	**5820**	**7760**	**38.6**	**0**	**0.05**	**0**	**0**	**70**	**0**	**0.3**	**0**	**0**	**0**	**0**	**0**	**59**	**0**
			Max	**830**	**6**	**0**	**58**	**0**	**550**	**0**	**2.1**	**0**	**2**	**0**	**9**	**0**	**80600**	**48900**	**20**	**0**	**49700**	**9820**	**462**	**0**	**0.13**	**0**	**0**	**1380**	**0**	**3.5**	**0**	**0**	**0**	**0**	**0**	**216**	**0**
			mean	**266.3**	**2.3**	**-**	**35.8**	**-**	**184.0**	**-**	**0.5**	**-**	**1.7**	**-**	**5.3**	**-**	**52620.0**	**46366.7**	**7.0**	**-**	**16842.0**	**8620.0**	**112.7**	**-**	**0.1**	**-**	**-**	**301.9**	**-**	**0.8**	**-**	**-**	**-**	**-**	**-**	**107.5**	**-**
Statistical Summary																																					
Number of Results				181	223	77	223	77	223	77	223	77	223	77	223	77	186	158	223	77	186	158	223	77	223	223	77	223	77	223	77	223	77	181	155	223	77
Number of Detects				157	176	70	223	77	206	77	121	68	121	65	126	64	186	158	133	66	186	158	223	77	86	85	63	223	77	143	68	63	63	66	63	210	77
Minimum Concentration				0	0	0	8	0	<50	0	0	0	0	0	0	0	15	9	0	0	46	45	11.8	0	0	0	0	2	0	0	0	0	0	0	0	<5	0
Minimum Detect				10	1	1	8	10	50	110	0.1	0.2	1	1	1	4	15	9	1	1	46	45	11.8	46.8	0.04	1	ND	2	70	0.2	0.3	ND	ND	10	ND	7	30
Maximum Concentration				16600	124	5	695	59	5200	4570	19.3	0.7	156	3	191	4	121000	121000	202	5	400000	237000	3880	700	0.43	12	<1	10500	2680	59.5	0.3	<10	<1	<100	<100	1810	427
Maximum Detect				16600	124	5	695	59	5200	4570	19.3	0.7	156	3	191	4	121000	121000	202	5	400000	237000	3880	700	0.43	12	ND	10500	2680	59.5	0.3	ND	ND	50	ND	1810	427
Average Concentration				499	5.9	0.75	65	15	1312	977	1.1	0.093	8.6	0.38	7.2	0.39	23951	22376	7.5	0.51	25452	14769	374	198	0.042	1.2	0.13	1114	673	2.3	0.086	0.55	0.13	7.4	4.1	307	104
Median Concentration				60	2.1429	0	29	11	1030	110	0.05	0	1	0	1	0	17150	14200	1	0	9639	6272.5	199	78.8	0.02	0.5	0	711	80	0.2	0	0.5	0	5	5	112	42
Standard Deviation				1925	13	1.2	142	16	1350	1336	3.4	0.19	26	0.78	23	1	23769	25140	24	1.2	68856	34292	638	241	0.071	1.9	0.22	1840	850	8.4	0.13	0.87	0.22	12	6.1	438	133
Number of Guideline Exceedances				134	214	26	215	35	223	35	193	23	208	20	208	17	174	141	205	20	163	129	223	0	187	181	14	196	35	125	23	160	14	0	0	201	35
Number of Guideline Exceedances(Detects Only)				130	220	60	215	63	223	63	213	59	218	58	218	57	174	141	217	58	163	129	223	0	211	209	56	196	63	125	59	202	56	0	0	201	63

APPENDIX H HYDROGRAPHS

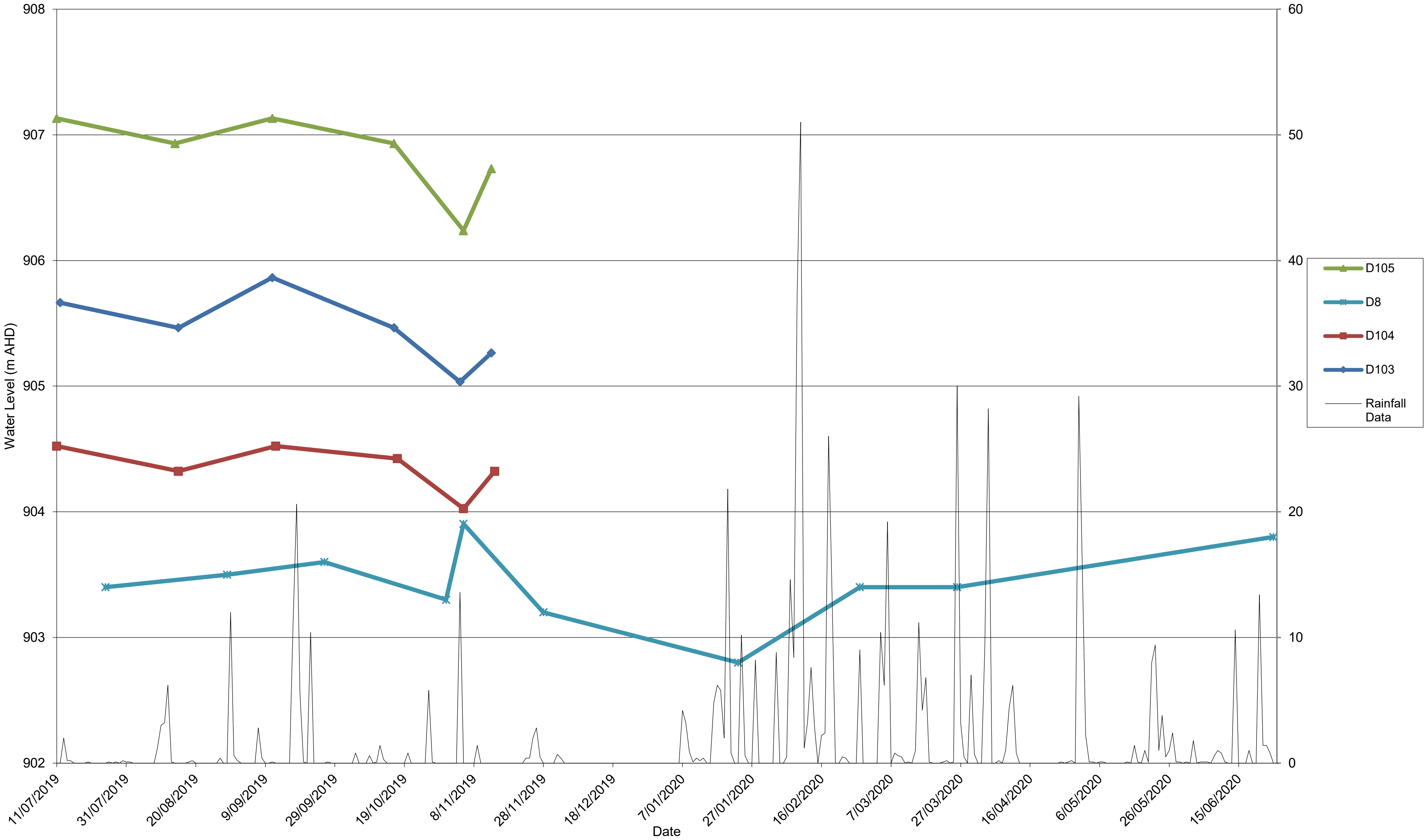

919
918
917
916
915
914
913
912
911
910
909
908
907
906
Water Level (m AHD)
60
50
40
30
20
10
0
D4
D5
D3
D107
D106
D102
D9
Rainfall Data
10/07/2019
30/07/2019
19/08/2019
8/09/2019
28/09/2019
18/10/2019
7/11/2019
27/11/2019
17/12/2019
6/01/2020
26/01/2020
15/02/2020
6/03/2020
26/03/2020
15/04/2020
5/05/2020
25/05/2020
14/06/2020
Date

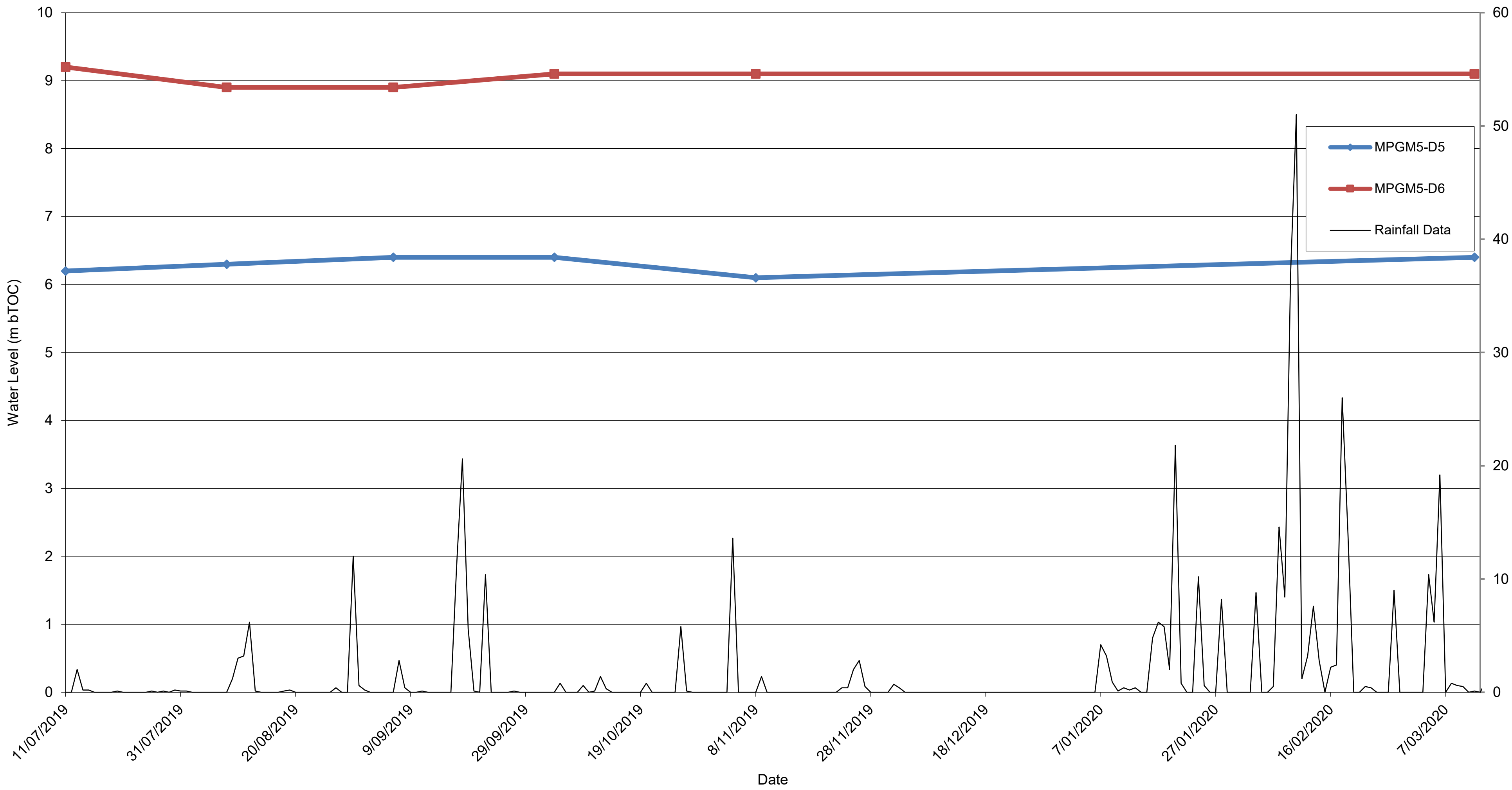
Appendix H. Water level vs Rainfall Over Time
Wells Within MPAR / Mine Disturbance Area East of MPAR
Annual Environmental Management Report - Water Management and Monitoring
Mt Piper Power Station Brine Conditioned Fly Ash Co-Placement Project
553983



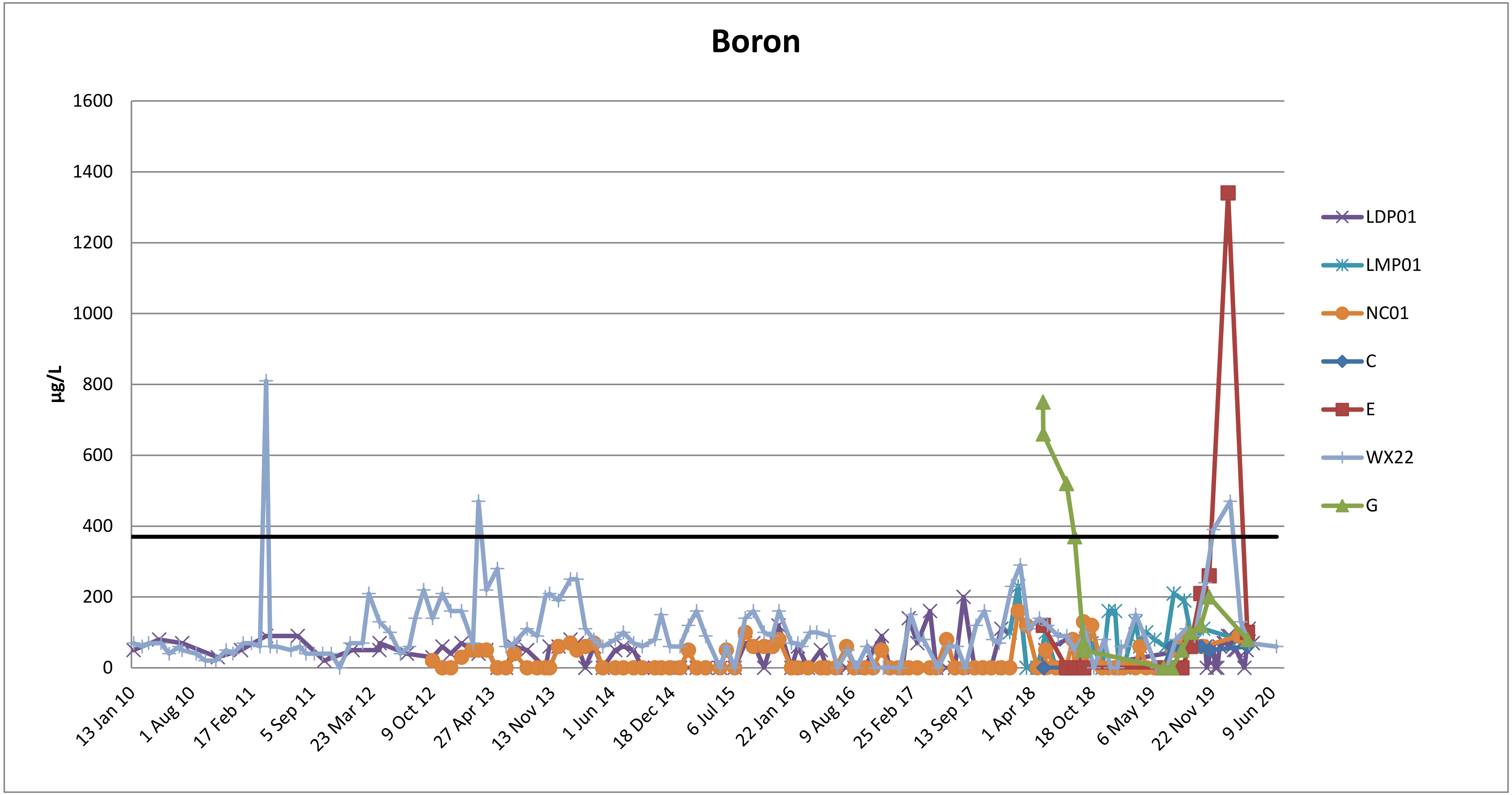

Water Level (m AHD)
Date
D15
D16
D17
D18
Rainfall Data
927
926
925
924
923
922
921
920
919
918
917
916
915
914
913
912
911
910
909
908
907
906
905
904
903
902
60
50
40
30
20
10
0
12/07/2019
1/08/2019
21/08/2019
10/09/2019
30/09/2019
20/10/2019
9/11/2019
29/11/2019
19/12/2019
8/01/2020
28/01/2020
17/02/2020
8/03/2020
28/03/2020
17/04/2020
7/05/2020
27/05/2020
16/06/2020

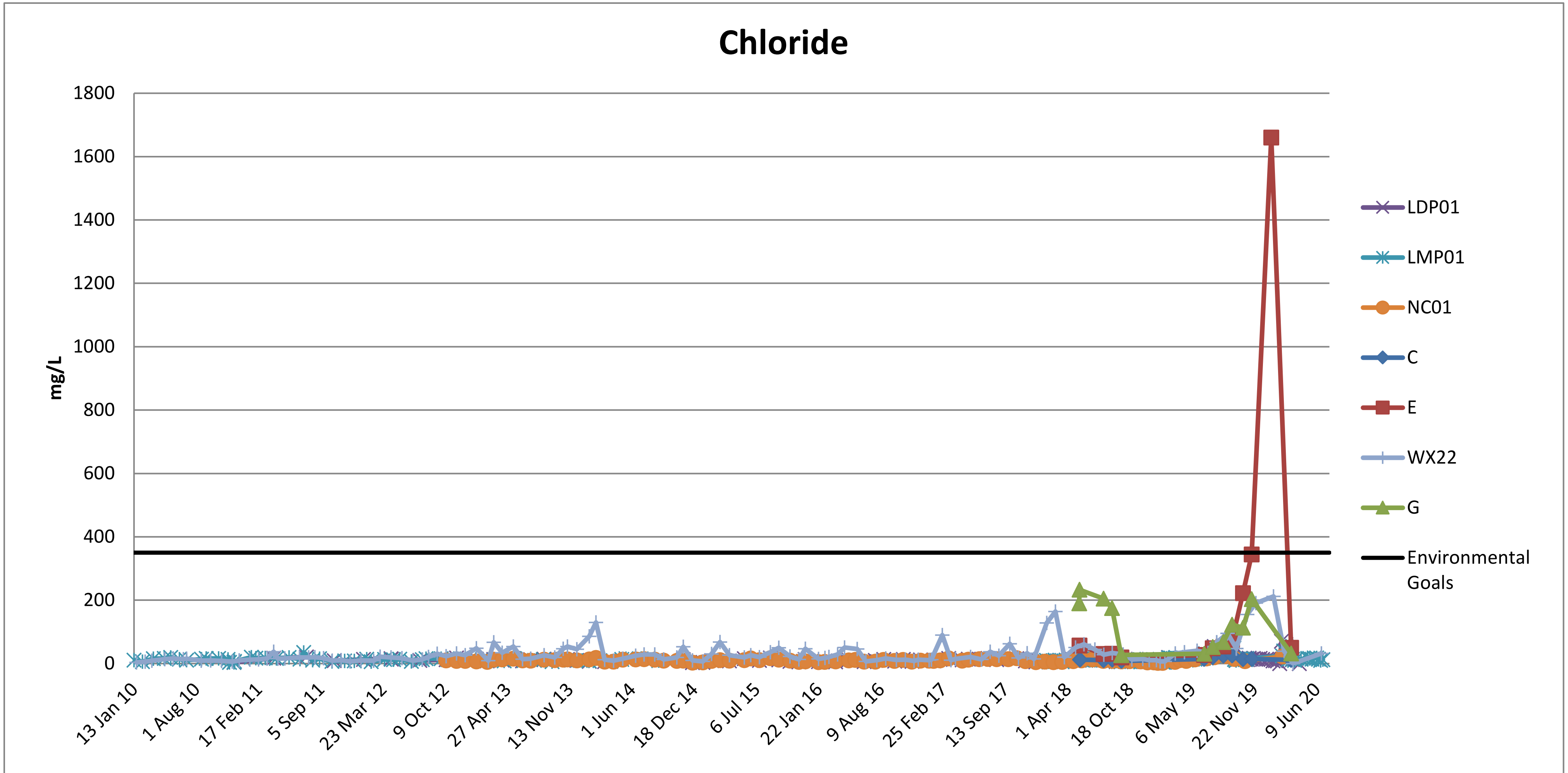
Appendix H. Water Level Vs Rainfall Over Time
Wells Adjacent MPAR and Downgradient
Annual Environmental Management Report - Water Management and Monitoring
Mt Piper Power Station Brine Conditioned Fly Ash Co-Placement Project
553983

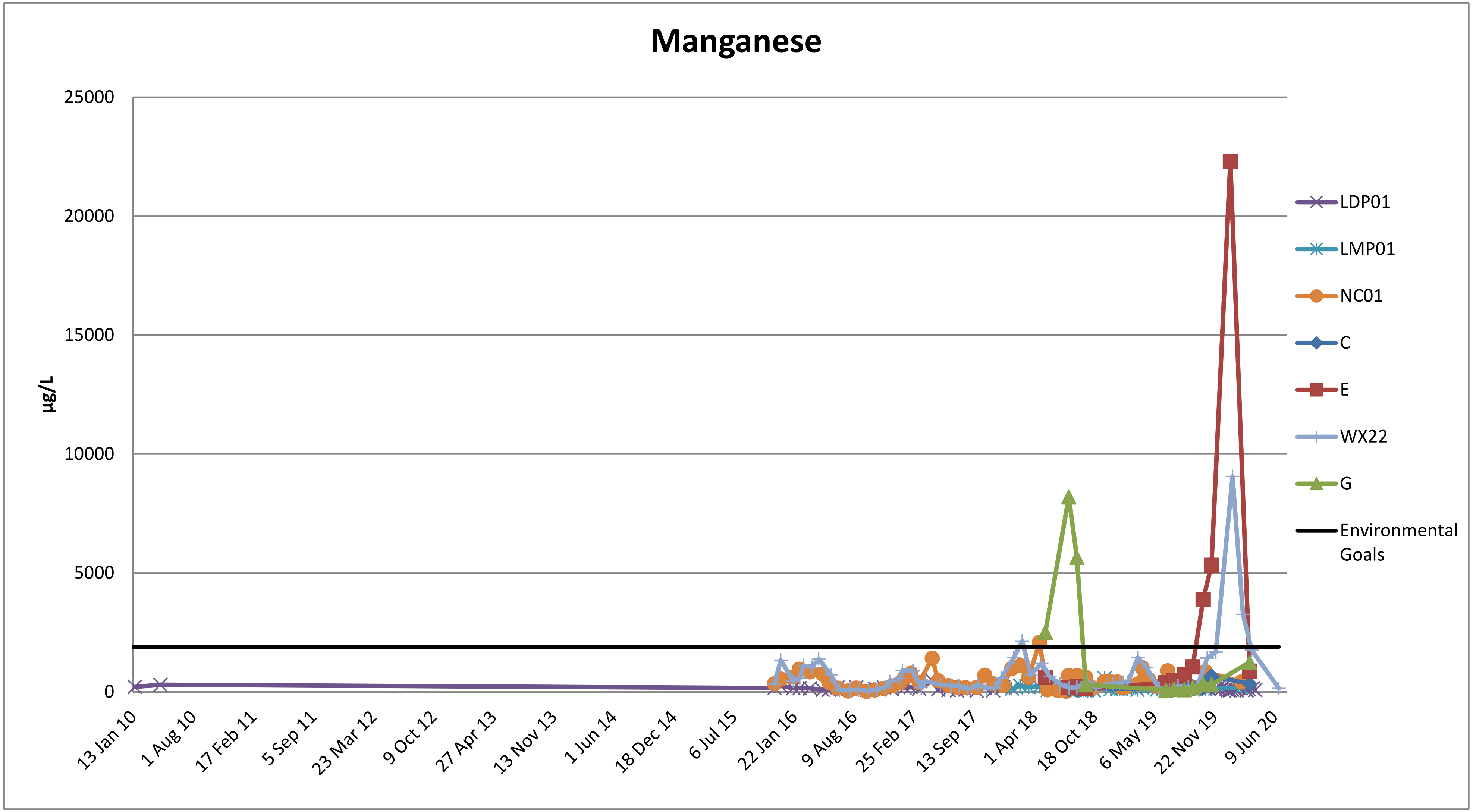


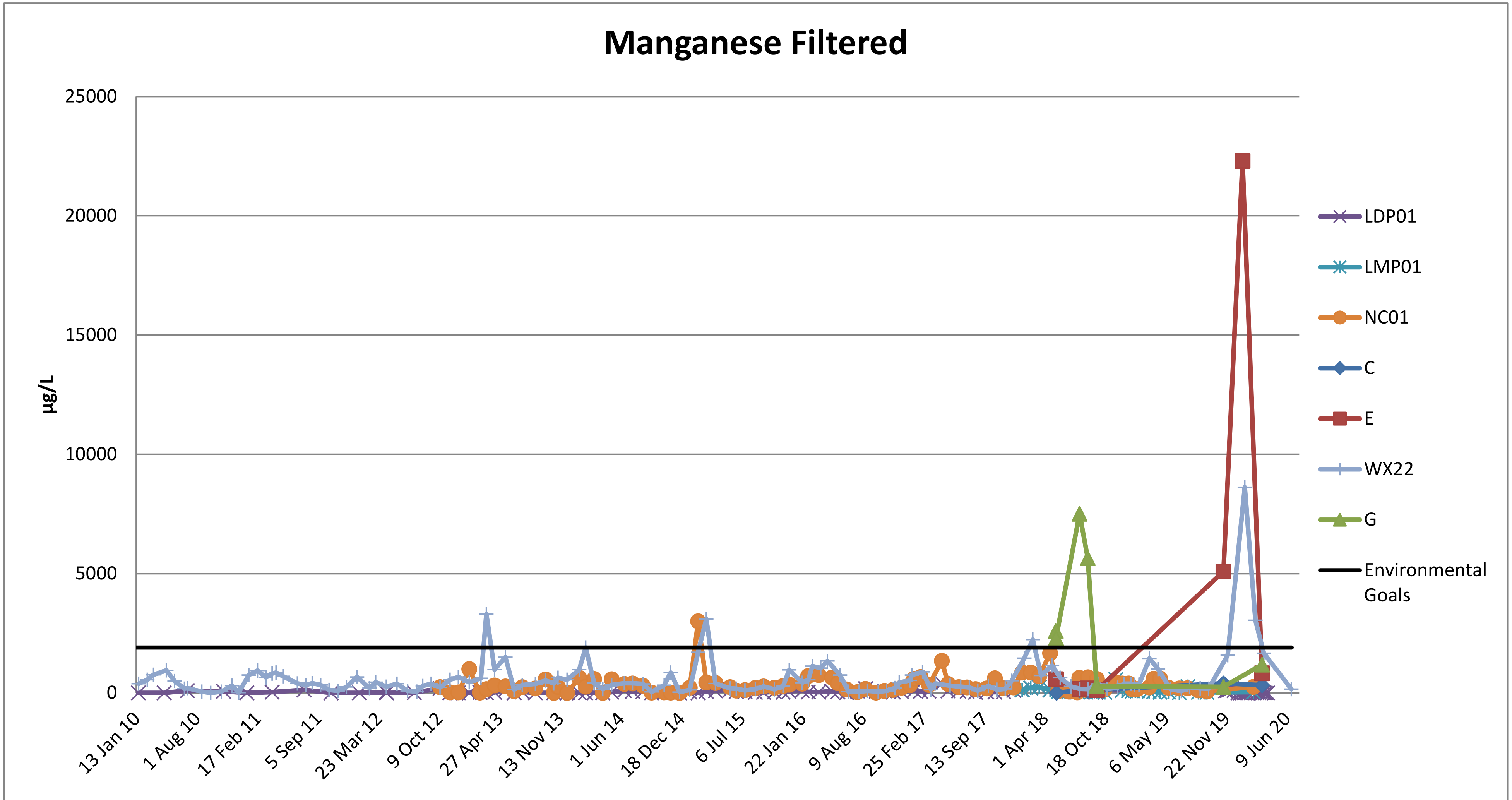

Water Level (m bTOC)
10
9
8
7
6
5
4
3
2
1
0
60
50
40
30
20
10
0
MPGM5-D5
MPGM5-D6
Rainfall Data
11/07/2019
31/07/2019
20/08/2019
9/09/2019
29/09/2019
19/10/2019
8/11/2019
28/11/2019
18/12/2019
7/01/2020
27/01/2020
16/02/2020
7/03/2020
Date

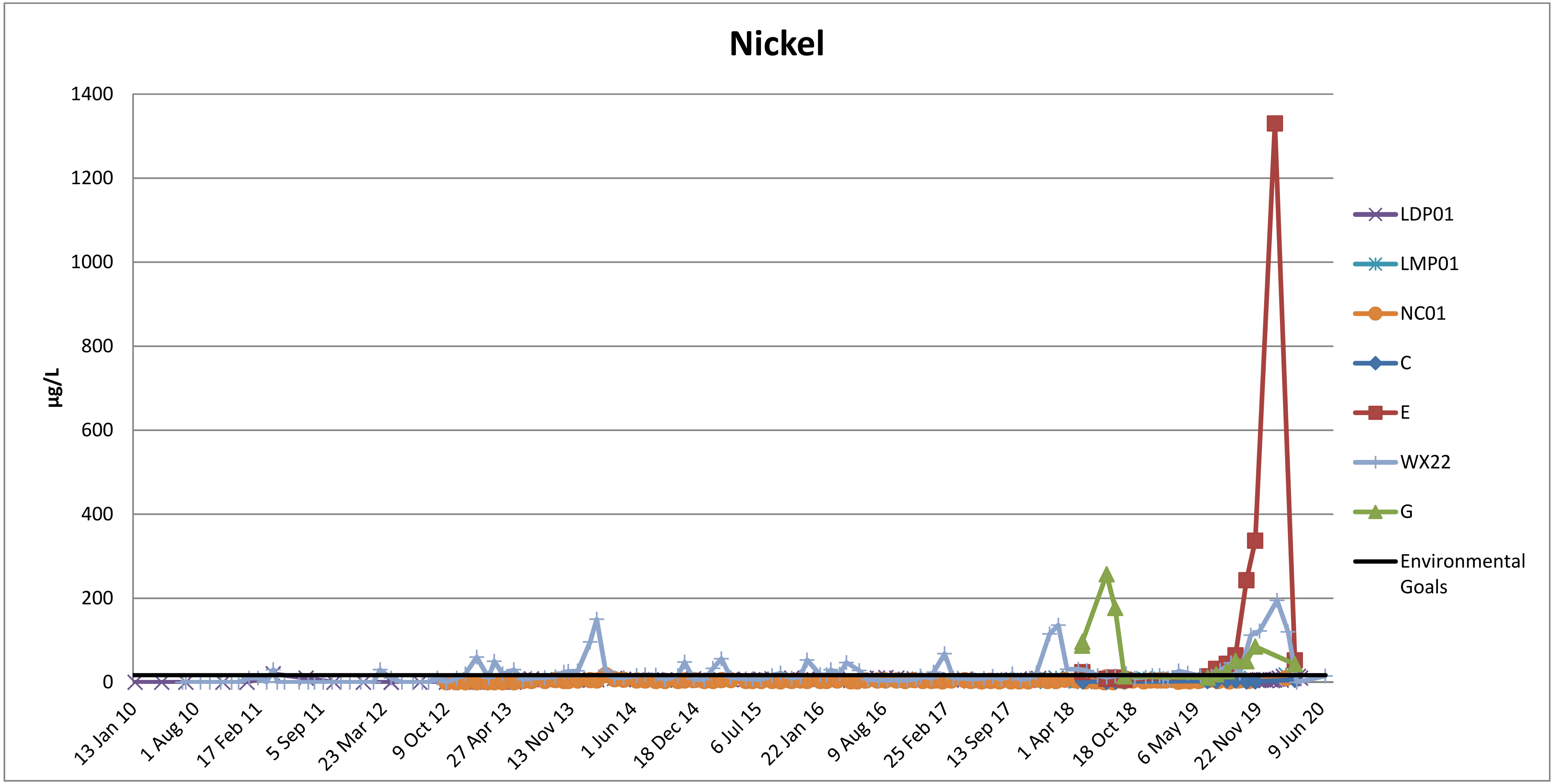
APPENDIX I TREND GRAPHS - SURFACE WATER

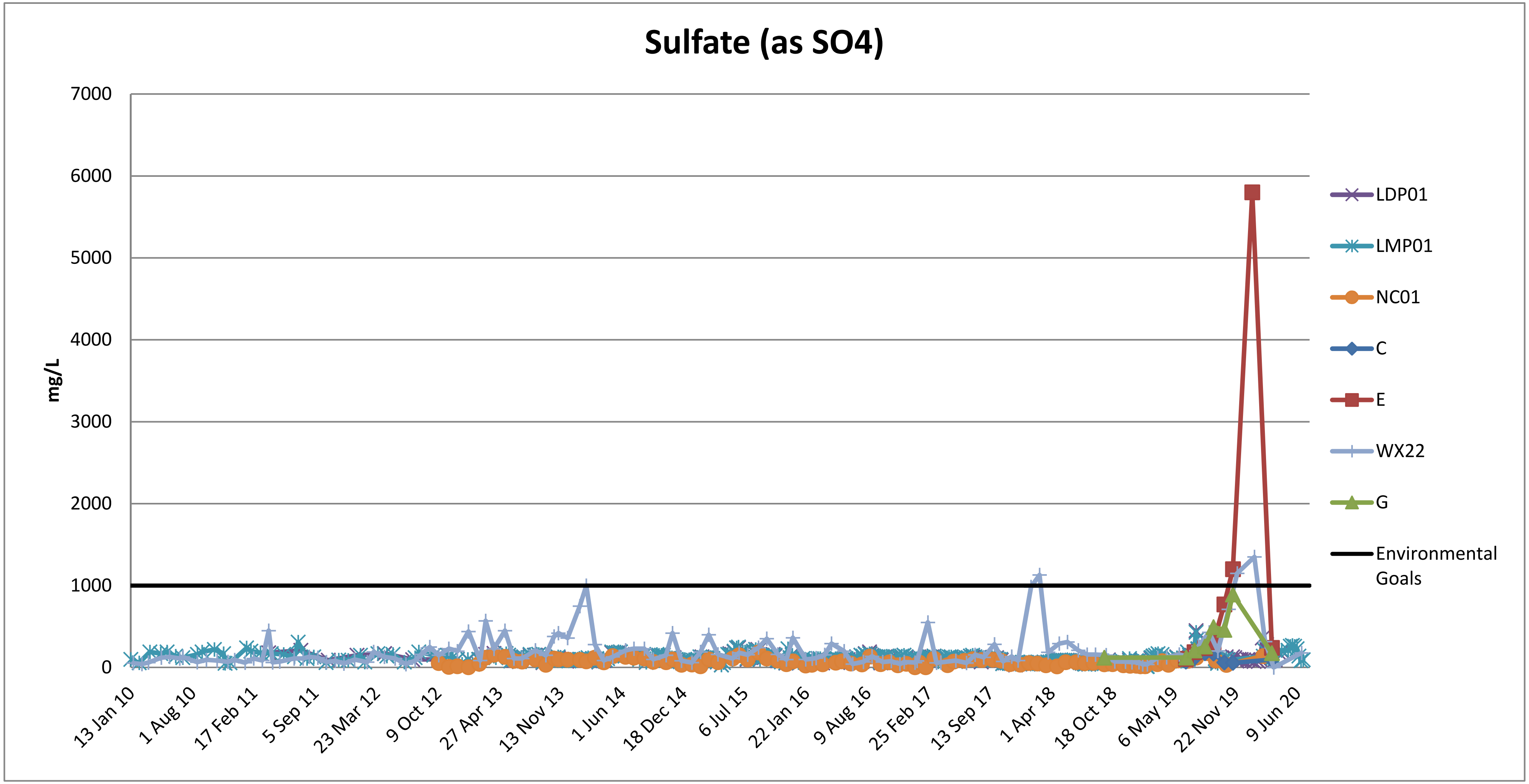

Boron
µg/L
1600
1400
1200
1000
800
600
400
200
0
13 Jan 10
1 Aug 10
17 Feb 11
5 Sep 11
23 Mar 12
9 Oct 12
27 Apr 13
13 Nov 13
1 Jun 14
18 Dec 14
6 Jul 15
22 Jan 16
9 Aug 16
25 Feb 17
13 Sep 17
1 Apr 18
18 Oct 18
6 May 19
22 Nov 19
9 Jun 20
LDP01
LMP01
NC01
C
E
WX22
G

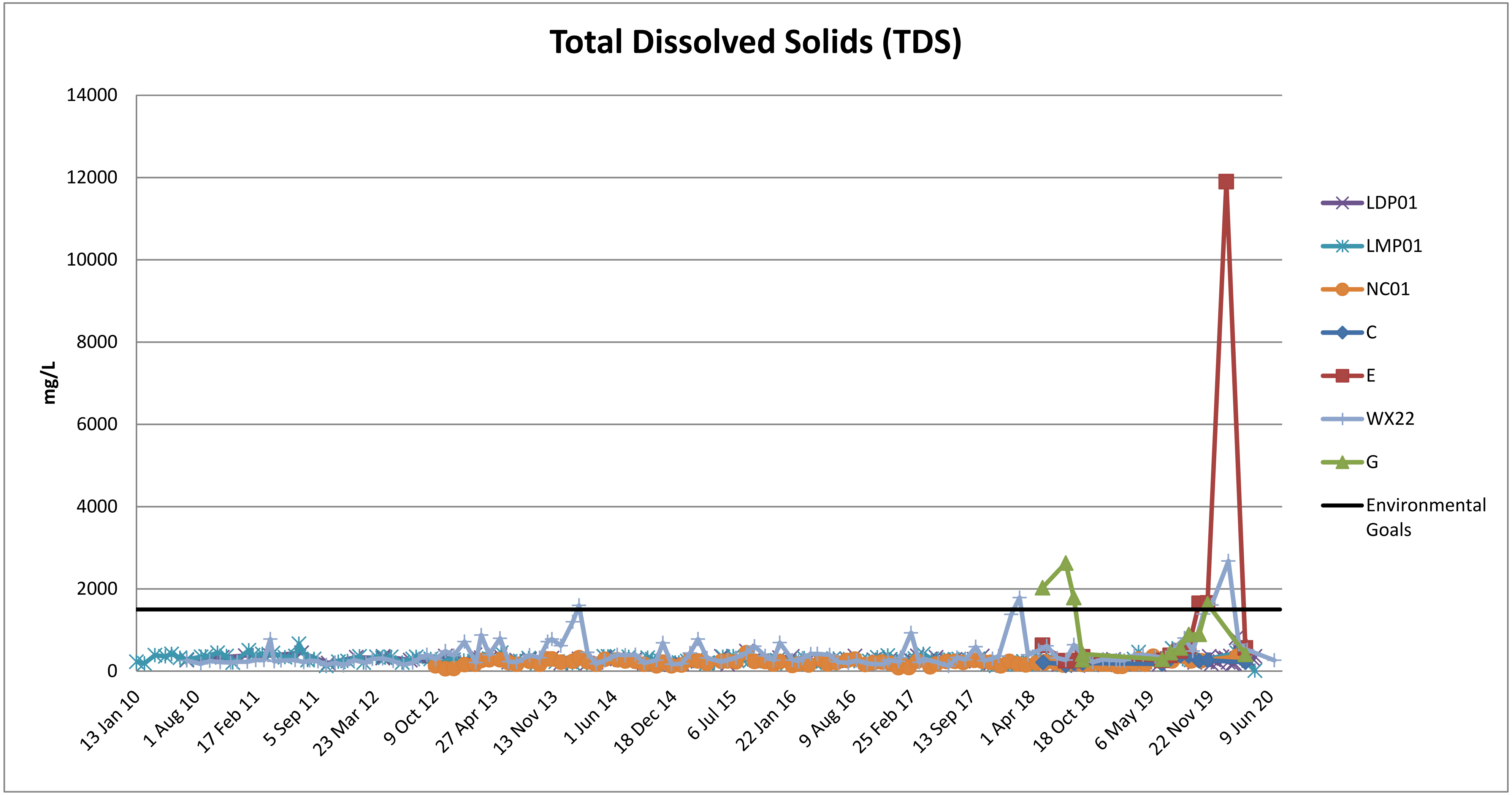

Chloride
mg/L
1800
1600
1400
1200
1000
800
600
400
200
0
13 Jan 10
1 Aug 10
17 Feb 11
5 Sep 11
23 Mar 12
9 Oct 12
27 Apr 13
13 Nov 13
1 Jun 14
18 Dec 14
6 Jul 15
22 Jan 16
9 Aug 16
25 Feb 17
13 Sep 17
1 Apr 18
18 Oct 18
6 May 19
22 Nov 19
9 Jun 20
LDP01
LMP01
NC01
C
E
WX22
G
Environmental Goals


Manganese
25000
20000
15000
10000
5000
0
µg/L
13 Jan 10
1 Aug 10
17 Feb 11
5 Sep 11
23 Mar 12
9 Oct 12
27 Apr 13
13 Nov 13
1 Jun 14
18 Dec 14
6 Jul 15
22 Jan 16
9 Aug 16
25 Feb 17
13 Sep 17
1 Apr 18
18 Oct 18
6 May 19
22 Nov 19
9 Jun 20
LDP01
LMP01
NC01
C
E
WX22
G
Environmental Goals

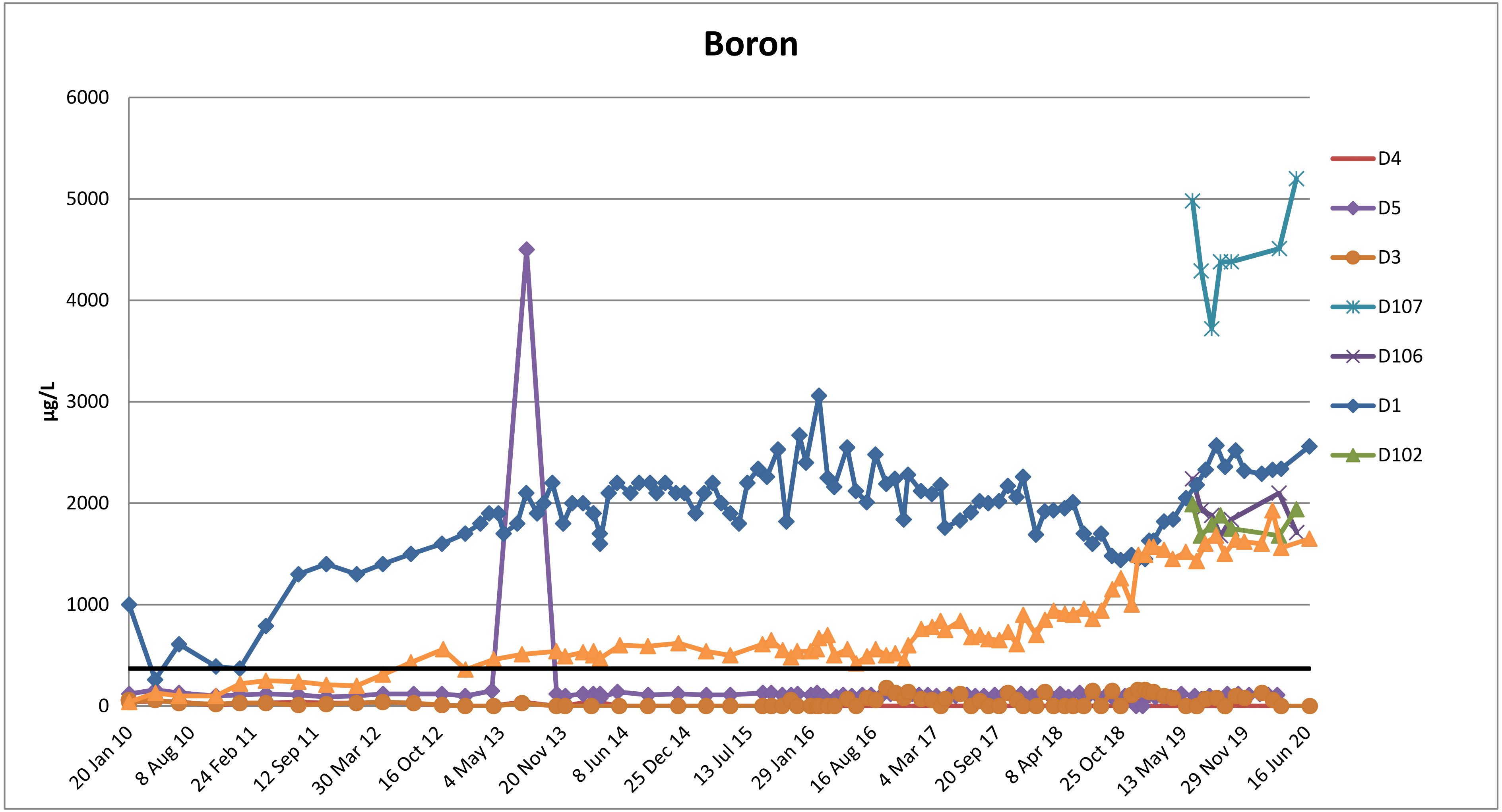

Manganese Filtered
µg/L
25000
20000
15000
10000
5000
0
13 Jan 10
1 Aug 10
17 Feb 11
5 Sep 11
23 Mar 12
9 Oct 12
27 Apr 13
13 Nov 13
1 Jun 14
18 Dec 14
6 Jul 15
22 Jan 16
9 Aug 16
25 Feb 17
13 Sep 17
1 Apr 18
18 Oct 18
6 May 19
22 Nov 19
9 Jun 20
LDP01
LMP01
NC01
C
E
WX22
G
Environmental Goals

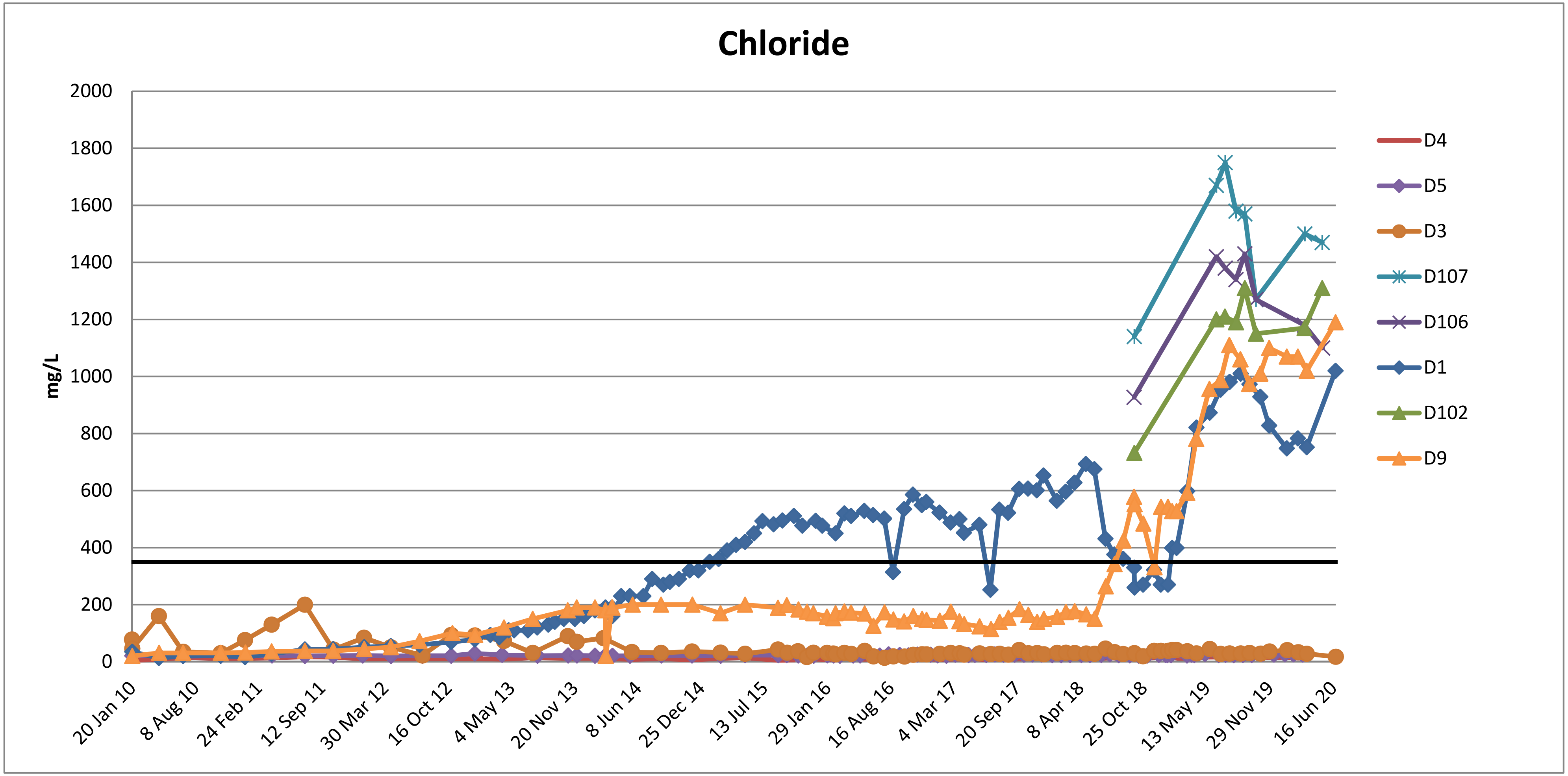

Nickel
1400
1200
1000
800
600
400
200
0
µg/L
13 Jan 10
1 Aug 10
17 Feb 11
5 Sep 11
23 Mar 12
9 Oct 12
27 Apr 13
13 Nov 13
1 Jun 14
18 Dec 14
6 Jul 15
22 Jan 16
9 Aug 16
25 Feb 17
13 Sep 17
1 Apr 18
18 Oct 18
6 May 19
22 Nov 19
9 Jun 20
LDP01
LMP01
NC01
C
E
WX22
G
Environmental Goals

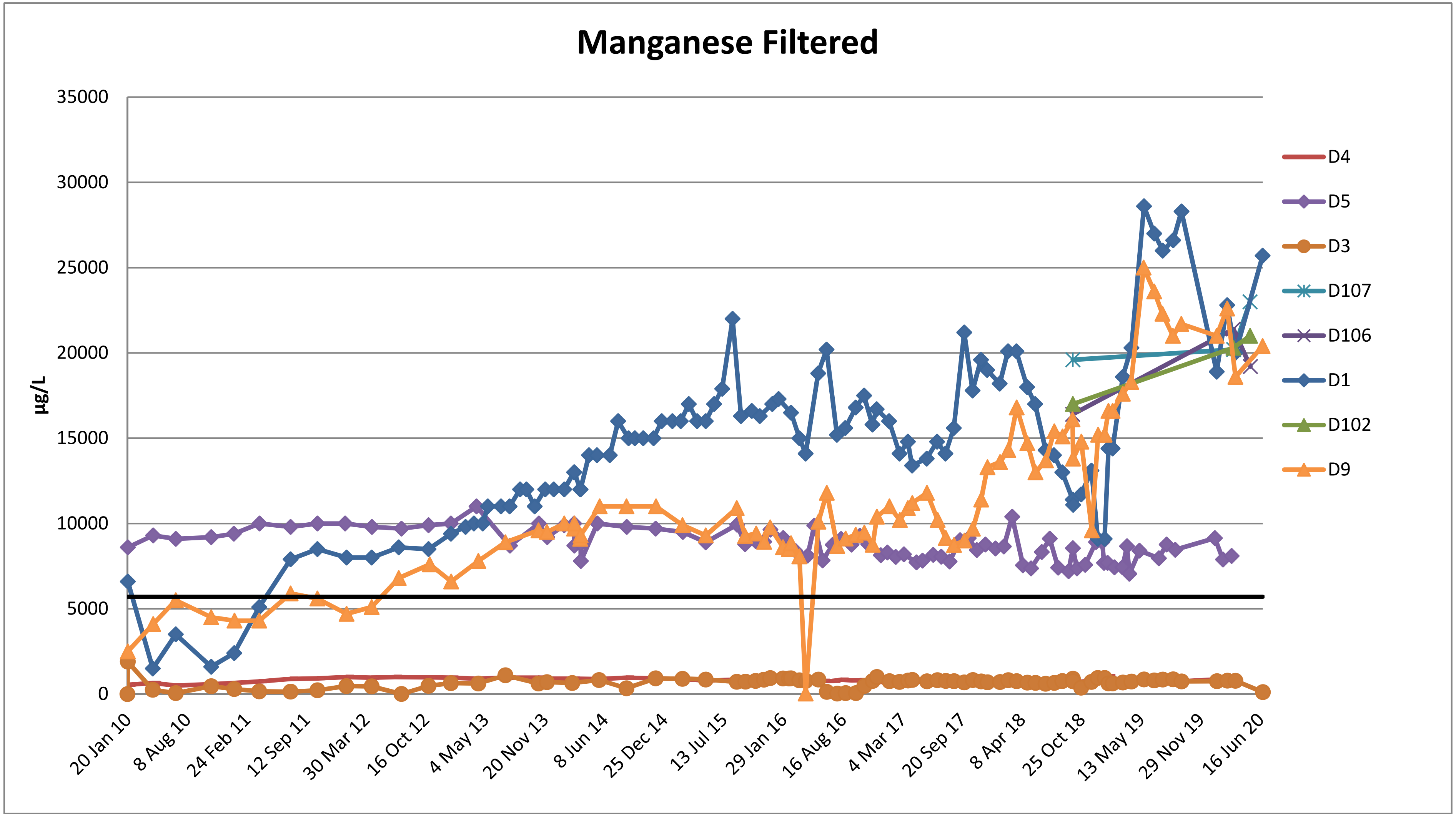

Sulfate (as SO4)
mg/L
7000
6000
5000
4000
3000
2000
1000
0
13 Jan 10
1 Aug 10
17 Feb 11
5 Sep 11
23 Mar 12
9 Oct 12
27 Apr 13
13 Nov 13
1 Jun 14
18 Dec 14
6 Jul 15
22 Jan 16
9 Aug 16
25 Feb 17
13 Sep 17
1 Apr 18
18 Oct 18
6 May 19
22 Nov 19
9 Jun 20
LDP01
LMP01
NC01
C
E
WX22
G
Environmental Goals

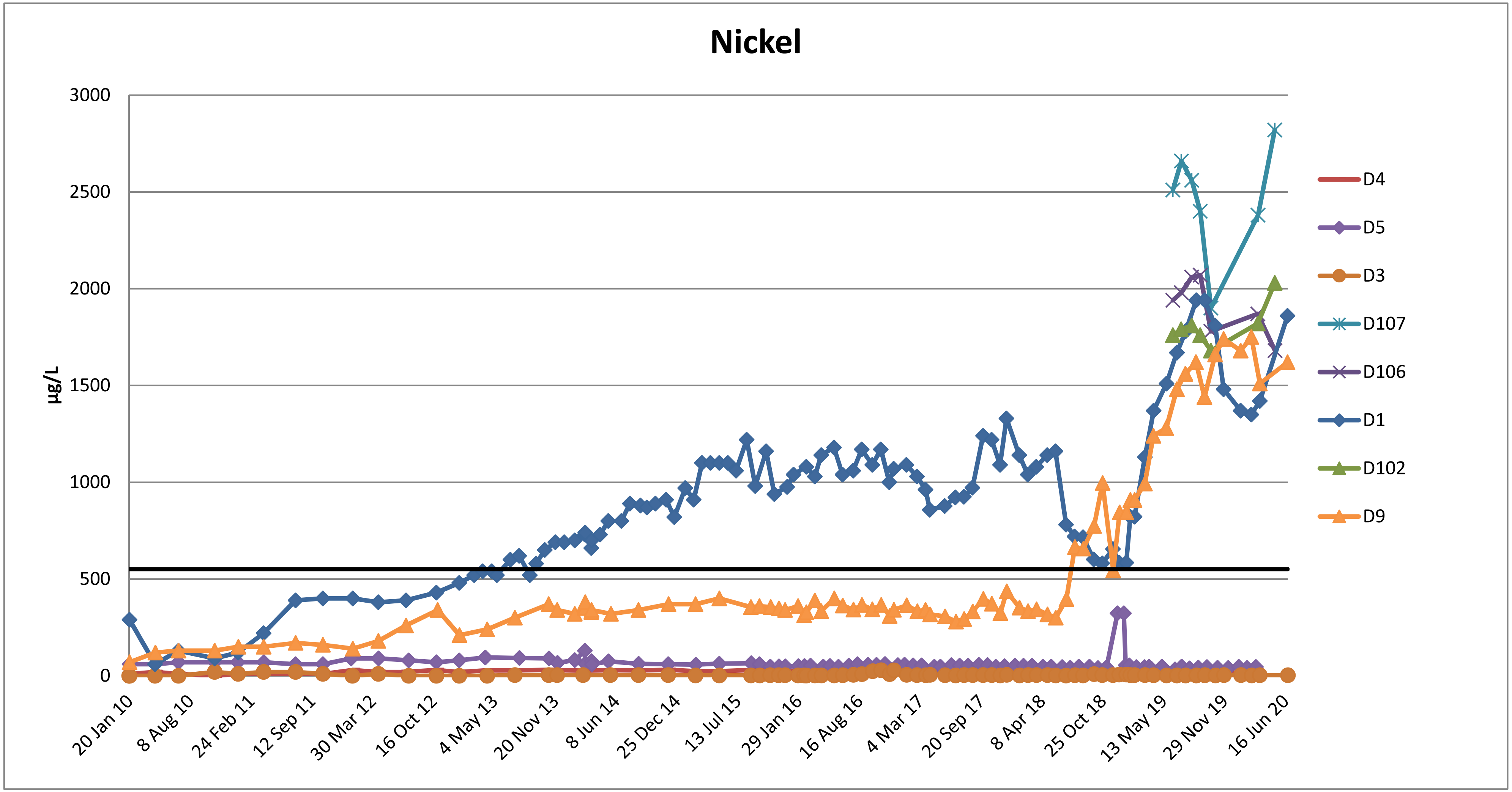

Total Dissolved Solids (TDS)
mg/L
14000
12000
10000
8000
6000
4000
2000
0
13 Jan 10
1 Aug 10
17 Feb 11
5 Sep 11
23 Mar 12
9 Oct 12
27 Apr 13
13 Nov 13
1 Jun 14
18 Dec 14
6 Jul 15
22 Jan 16
9 Aug 16
25 Feb 17
13 Sep 17
1 Apr 18
18 Oct 18
6 May 19
22 Nov 19
9 Jun 20
LDP01
LMP01
NC01
C
E
WX22
G
Environmental Goals

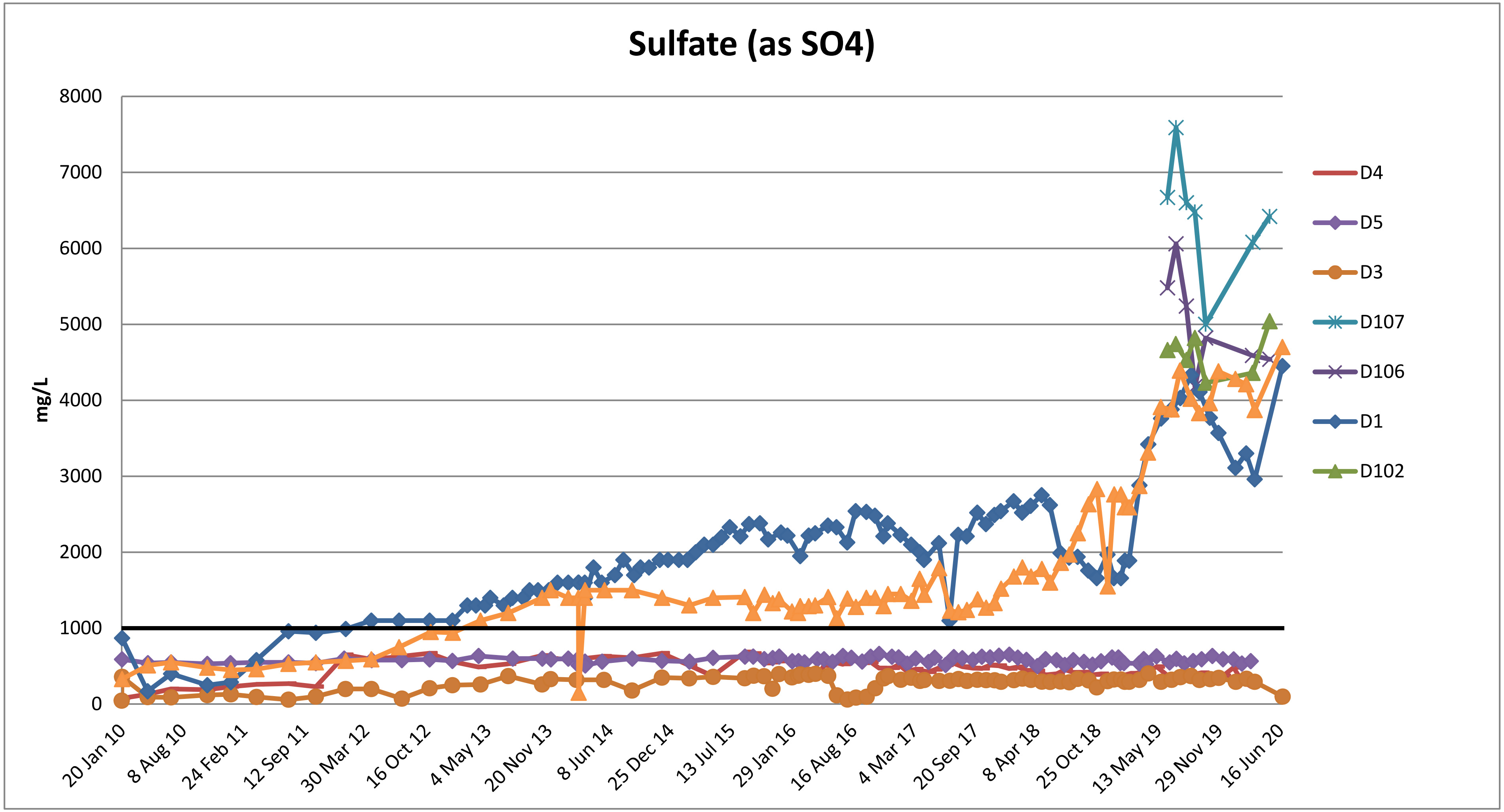
APPENDIX J TREND GRAPHS - GROUNDWATER

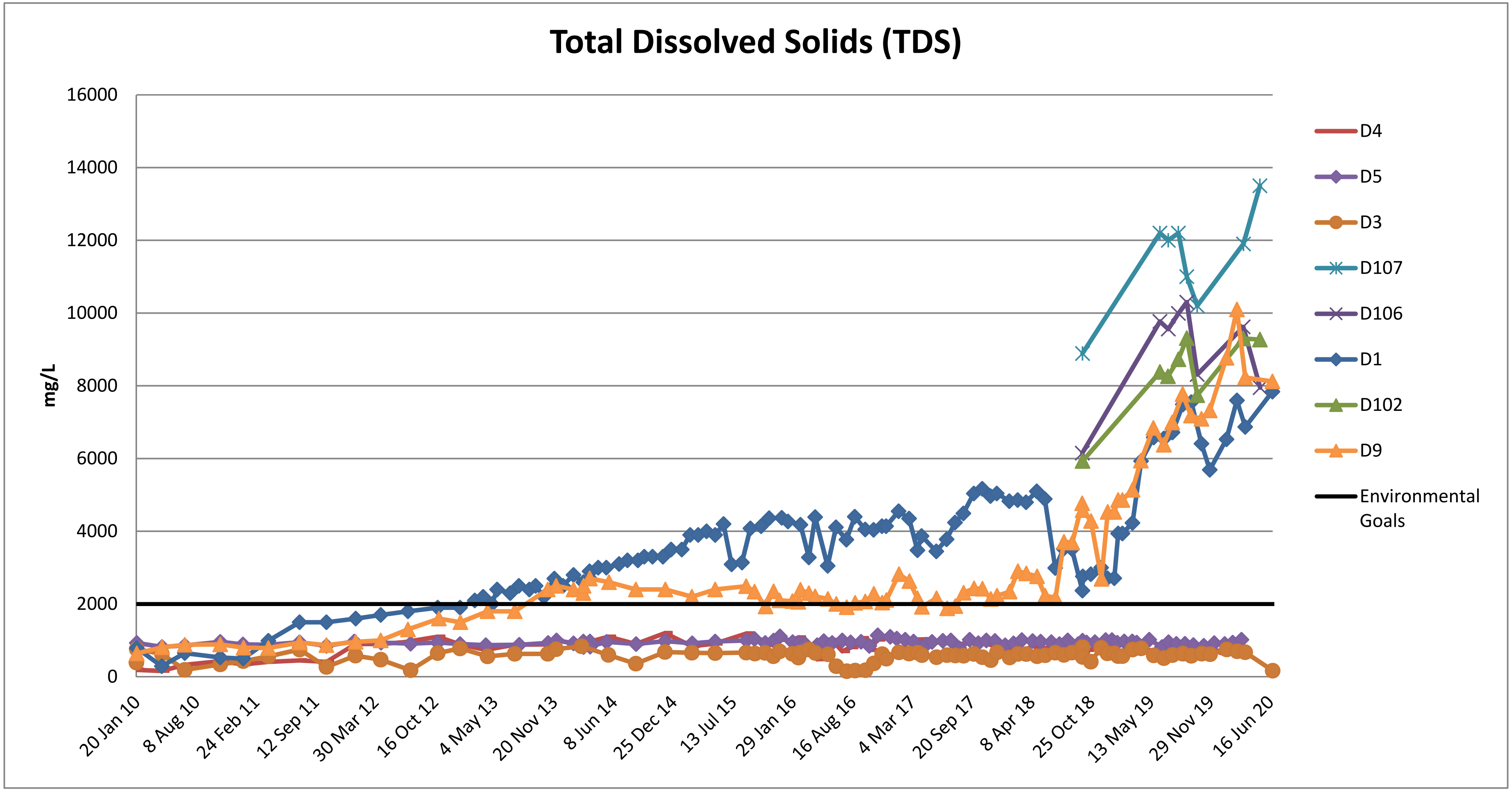

Boron
µg/L
6000
5000
4000
3000
2000
1000
0
20 Jan 10
8 Aug 10
24 Feb 11
12 Sep 11
30 Mar 12
16 Oct 12
4 May 13
20 Nov 13
8 Jun 14
25 Dec 14
13 Jul 15
29 Jan 16
16 Aug 16
4 Mar 17
20 Sep 17
8 Apr 18
25 Oct 18
13 May 19
29 Nov 19
16 Jun 20
D4
D5
D3
D107
D106
D1
D102


Chloride
mg/L
2000
1800
1600
1400
1200
1000
800
600
400
200
0
20 Jan 10
8 Aug 10
24 Feb 11
12 Sep 11
30 Mar 12
16 Oct 12
4 May 13
20 Nov 13
8 Jun 14
25 Dec 14
13 Jul 15
29 Jan 16
16 Aug 16
4 Mar 17
20 Sep 17
8 Apr 18
25 Oct 18
13 May 19
29 Nov 19
16 Jun 20
D4
D5
D3
D107
D106
D1
D102
D9


Manganese Filtered
µg/L
35000
30000
25000
20000
15000
10000
5000
0
20 Jan 10
8 Aug 10
24 Feb 11
12 Sep 11
30 Mar 12
16 Oct 12
4 May 13
20 Nov 13
8 Jun 14
25 Dec 14
13 Jul 15
29 Jan 16
16 Aug 16
4 Mar 17
20 Sep 17
8 Apr 18
25 Oct 18
13 May 19
29 Nov 19
16 Jun 20
D4
D5
D3
D107
D106
D1
D102
D9


Nickel
3000
2500
2000
1500
1000
500
0
µg/L
20 Jan 10
8 Aug 10
24 Feb 11
12 Sep 11
30 Mar 12
16 Oct 12
4 May 13
20 Nov 13
8 Jun 14
25 Dec 14
13 Jul 15
29 Jan 16
16 Aug 16
4 Mar 17
20 Sep 17
8 Apr 18
25 Oct 18
13 May 19
29 Nov 19
16 Jun 20
D4
D5
D3
D107
D106
D1
D102
D9


Sulfate (as SO4)
mg/L
8000
7000
6000
5000
4000
3000
2000
1000
0
20 Jan 10
8 Aug 10
24 Feb 11
12 Sep 11
30 Mar 12
16 Oct 12
4 May 13
20 Nov 13
8 Jun 14
25 Dec 14
13 Jul 15
29 Jan 16
16 Aug 16
4 Mar 17
20 Sep 17
8 Apr 18
25 Oct 18
13 May 19
29 Nov 19
16 Jun 20
D4
D5
D3
D107
D106
D1
D102


Total Dissolved Solids (TDS)
mg/L
16000
14000
12000
10000
8000
6000
4000
2000
0
20 Jan 10
8 Aug 10
24 Feb 11
12 Sep 11
30 Mar 12
16 Oct 12
4 May 13
20 Nov 13
8 Jun 14
25 Dec 14
13 Jul 15
29 Jan 16
16 Aug 16
4 Mar 17
20 Sep 17
8 Apr 18
25 Oct 18
13 May 19
29 Nov 19
16 Jun 20
D4
D5
D3
D107
D106
D1
D102
D9
Environmental Goals

APPENDIX K GWSDAT DATA ASSESSMENT METHODOLOGY

K.1 GWSDAT DATA ASSESSMENT METHODOLOGY

For data processing and the production of the trend evaluation outputs presented in the AEMR, ERM used the Shell Ground Water Spatio-Temporal Data Analysis Tool (Shell Global Solutions, 2012). The Shell Ground Water Spatio-Temporal Data Analysis Tool (GWSDAT) is a free-ware application developed to analyse historical trends (both spatially and temporally) of groundwater solute concentrations.

Trend analysis of the laboratory analytical data was completed using the Mann-Kendall procedure. The Mann-Kendall method is a non-parametric method and does not require assumptions about the underlying data distribution. The Mann Kendall test is based on the relative magnitude of the data rather than the actual measured values, and is a tool commonly used in the statistical assessment of trends over time for the purpose of evaluating trends in groundwater data.

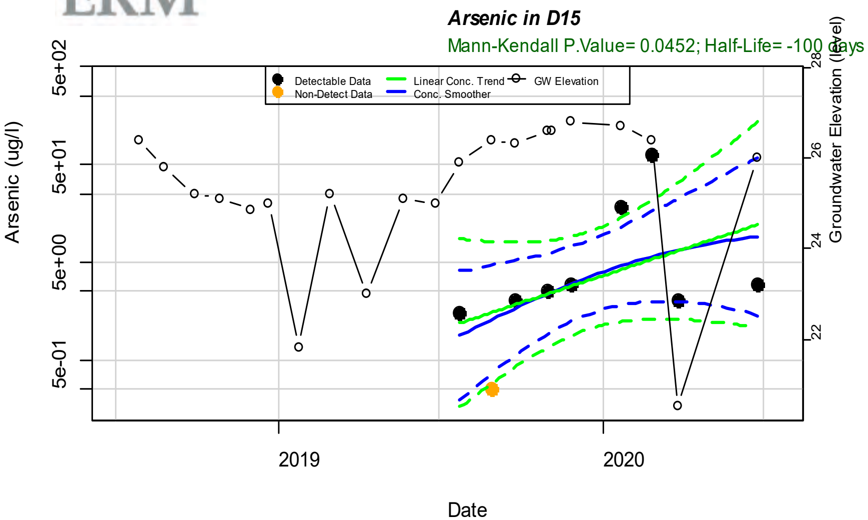
The p-value presented in the monitoring bore trend plots indicates the level of statistical significance that can be attributed to the trend, with a p-value less than 0.05 indicating a statistically significant trend. A p-value of less than 0.05 relates to a statistical significance of 95%, i.e. if a trend has a p-value of less than 0.05 there is a 95% level of confidence that the data presents an actual trend and not a random distribution of data. Trends with these characteristics, which are considered by the program to be statistically significant, are shown in green text in the trend plots in Appendix L; those that are not statistically significant are shown in red text.

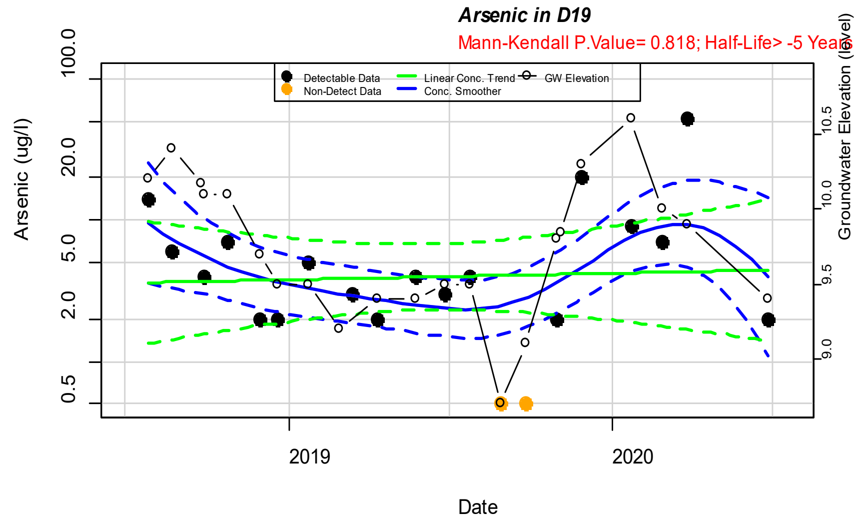
Where no p-value is given on the graphical outputs, a sufficient number of data points were not available to evaluate the significance of trends through the Mann-Kendall test. This output has been included to show concentrations both above and below the laboratory limit of reporting.

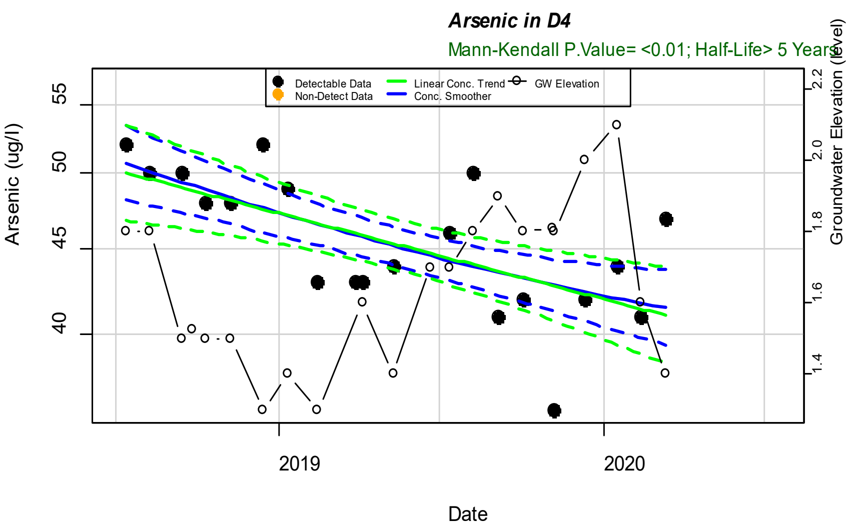
It is noted that for the EC and pH trend plots, concentrations are shown as mg/L although the data shown are actually in µS/cm and pH standard units respectively. This is because of a limitation of the GWSDAT program.

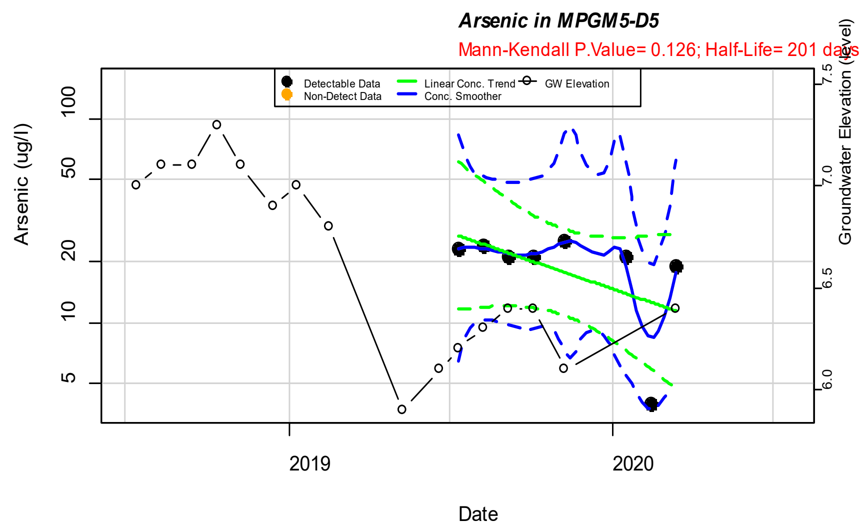
In addition to the Mann-Kendall test, a linear trend analysis is represented on the plots (using a green line). The trend displays a linear time series trend estimate to the log of historical solute concentrations. Due to different monitoring bores being tested at varying frequencies throughout history, some locations did not have sufficient data points to graphically represent either linear or non-linear trends.

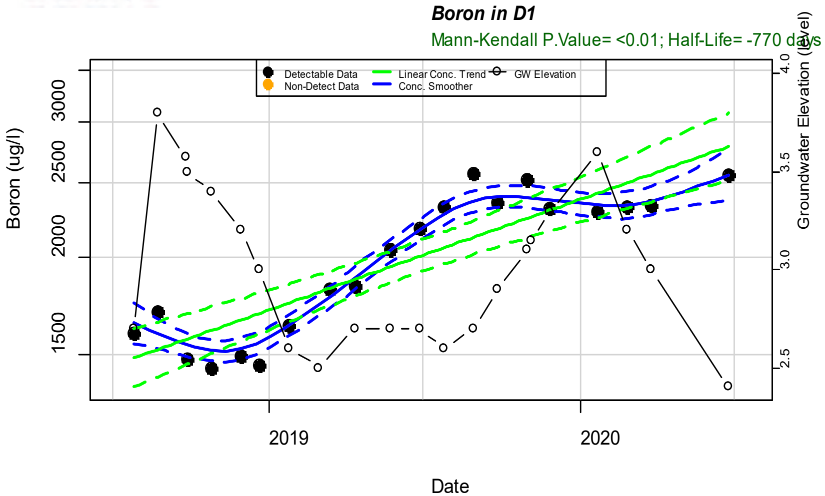
APPENDIX L GWSDAT OUTPUTS

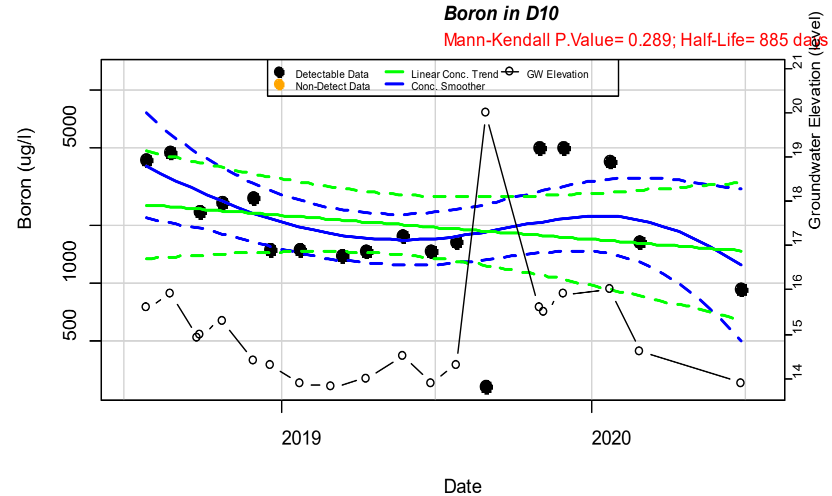

Arsenic in D15
Mann-Kendall P.Value= 0.0452; Half-Life= -100 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Arsenic (ug/l)
5e+02
5e+01
5e+00
5e-01
Groundwater Elevation (level)
28
26
24
22
2019
2020
Date

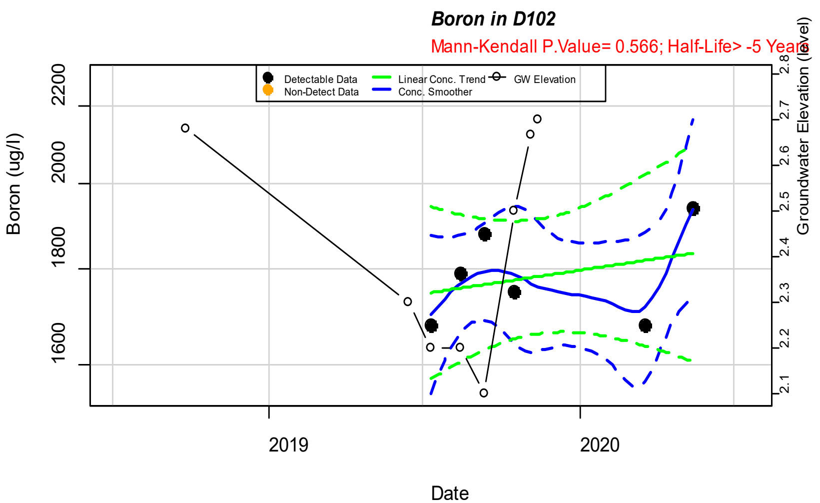

Arsenic in D19
Mann-Kendall P.Value= 0.818; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Arsenic (ug/l)
100.0
20.0
5.0
2.0
0.5
Groundwater Elevation (level)
10.5
10.0
9.5
9.0
2019
2020
Date

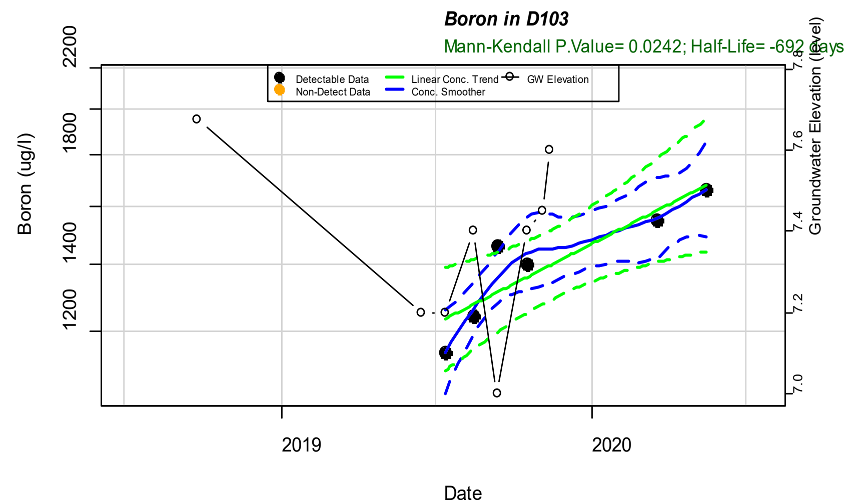

Arsenic in D4
Mann-Kendall P.Value= <0.01; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Arsenic (ug/l)
55
50
45
40
Groundwater Elevation (level)
2.2
2.0
1.8
1.6
1.4
2019
2020
Date

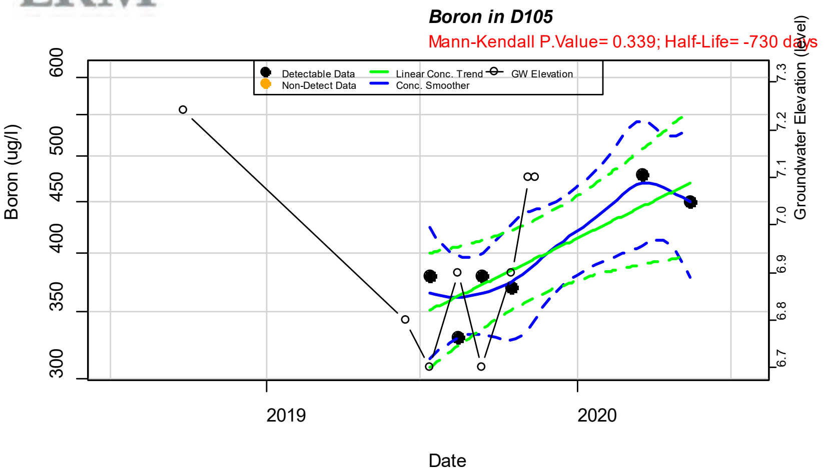

Arsenic in MPGM5-D5
Mann-Kendall P.Value= 0.126; Half-Life= 201 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Arsenic (ug/l)
100
50
20
10
5
Groundwater Elevation (level)
7.5
7.0
6.5
6.0
2019
2020
Date

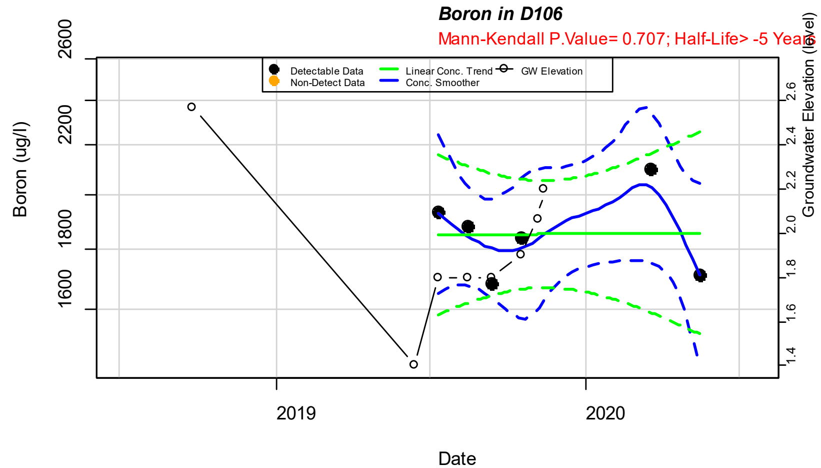

Boron in D1
Mann-Kendall P.Value= <0.01; Half-Life= -770 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Boron (ug/l)
Groundwater Elevation (level)
Date
1500
2000
2500
3000
2.5
3.0
3.5
4.0
2019
2020

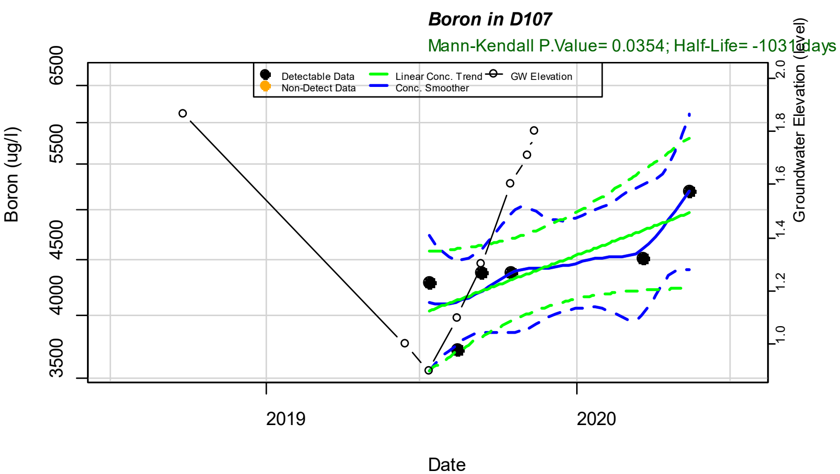

Boron in D10
Mann-Kendall P.Value= 0.289; Half-Life= 885 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Boron (ug/l)
Groundwater Elevation (level)
Date
500
1000
5000
14
15
16
17
18
19
20
21
2019
2020

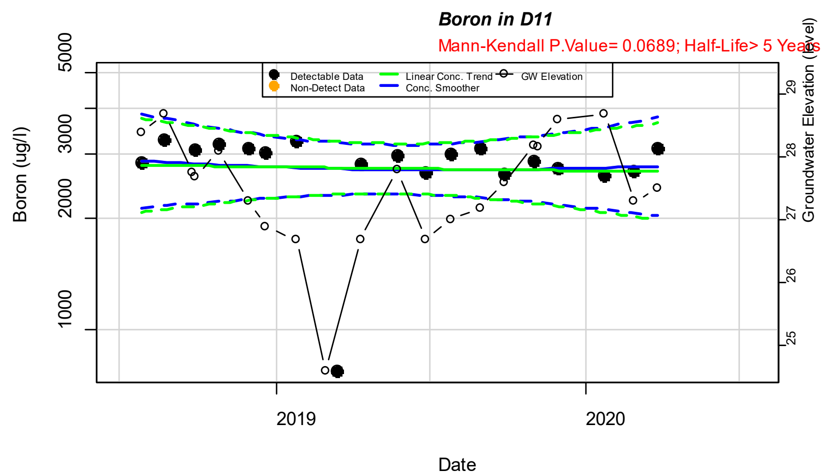

Boron in D102
Mann-Kendall P.Value= 0.566; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Boron (ug/l)
Groundwater Elevation (level)
Date
1600
1800
2000
2200
2.1
2.2
2.3
2.4
2.5
2.6
2.7
2.8
2019
2020

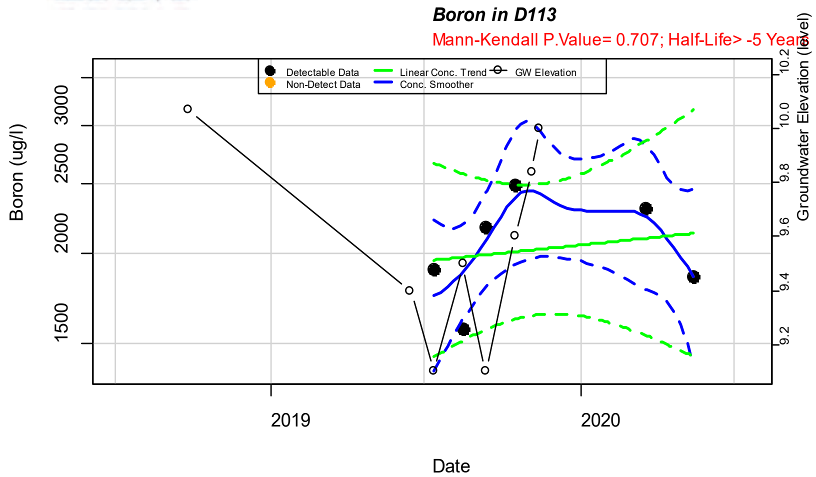

Boron in D103
Mann-Kendall P.Value= 0.0242; Half-Life= -692 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Boron (ug/l)
Groundwater Elevation (level)
Date
1200
1400
1800
2200
7.0
7.2
7.4
7.6
7.8
2019
2020

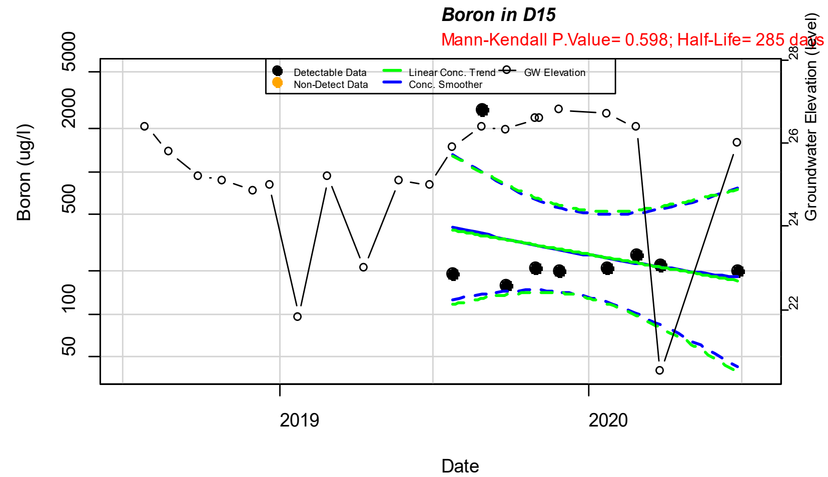

Boron in D105
Mann-Kendall P.Value= 0.339; Half-Life= -730 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Boron (ug/l)
Groundwater Elevation (level)
Date
2019
2020

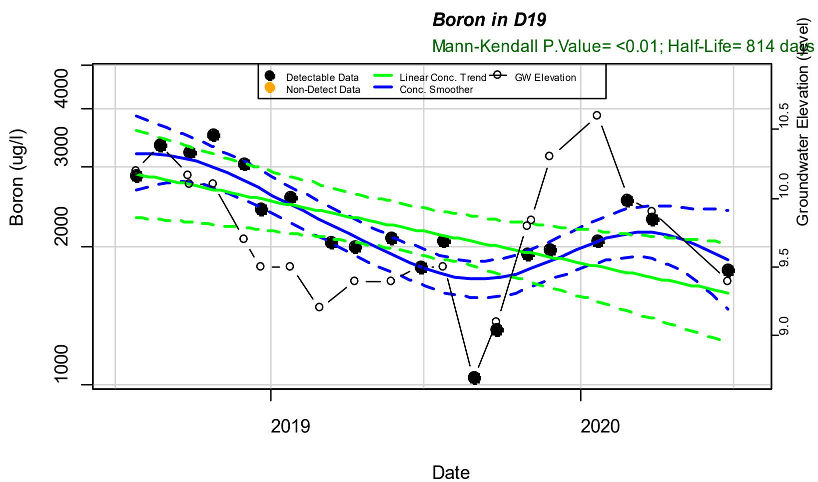

Boron in D106
Mann-Kendall P.Value= 0.707; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Boron (ug/l)
Groundwater Elevation (level)
Date
2019
2020

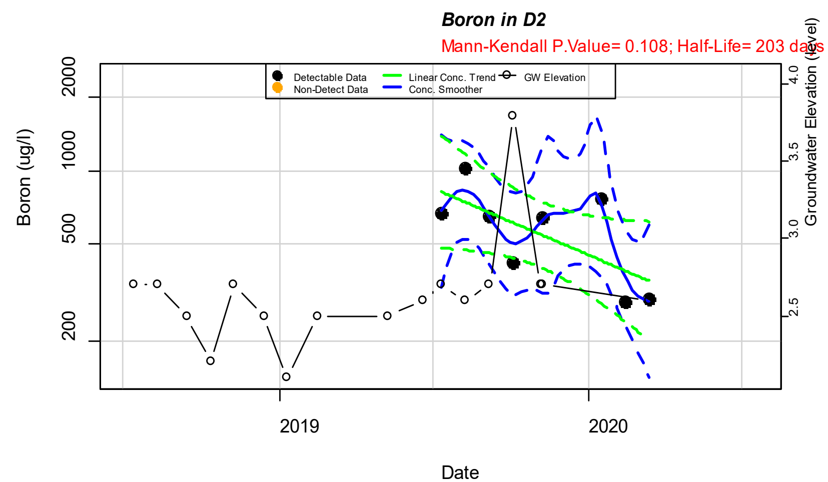

Boron in D107
Mann-Kendall P.Value= 0.0354; Half-Life= -1031 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Boron (ug/l)
Groundwater Elevation (level)
Date
2019
2020

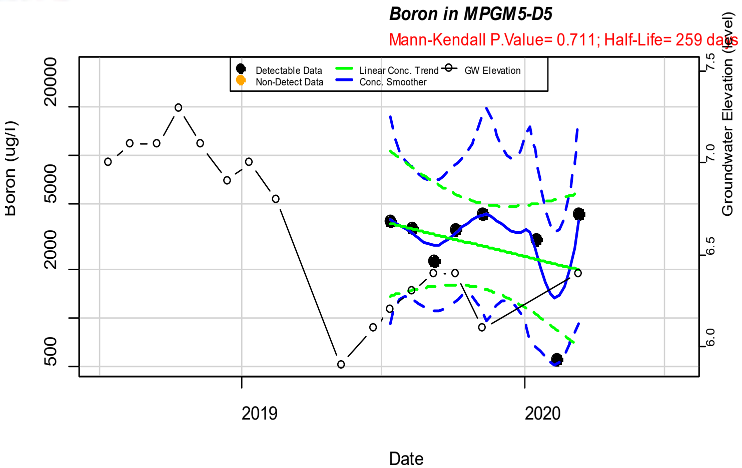

Boron in D11
Mann-Kendall P.Value= 0.0689; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Boron (ug/l)
Groundwater Elevation (level)
Date
2019
2020

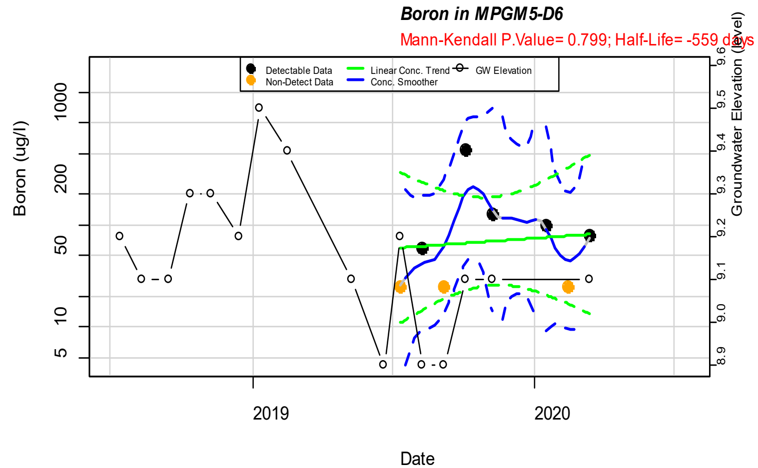

Boron in D113
Mann-Kendall P.Value= 0.707; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Boron (ug/l)
Groundwater Elevation (level)
1500
2000
2500
3000
9.2
9.4
9.6
9.8
10.0
10.2
2019
2020
Date

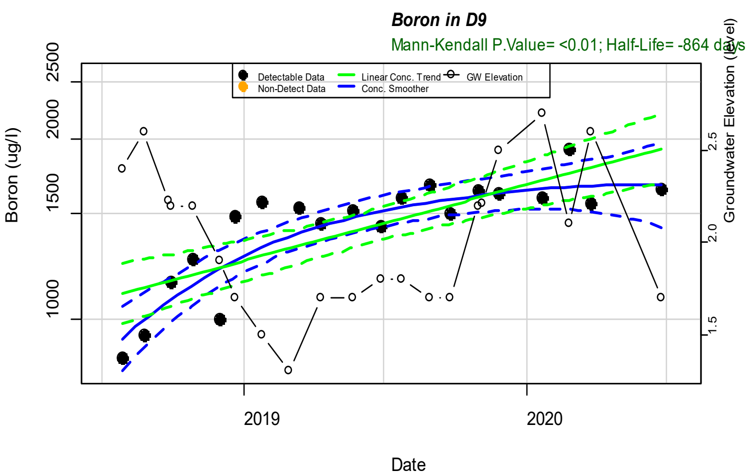

Boron in D15
Mann-Kendall P.Value= 0.598; Half-Life= 285 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Boron (ug/l)
Groundwater Elevation (level)
50
100
500
2000
5000
22
24
26
28
2019
2020
Date

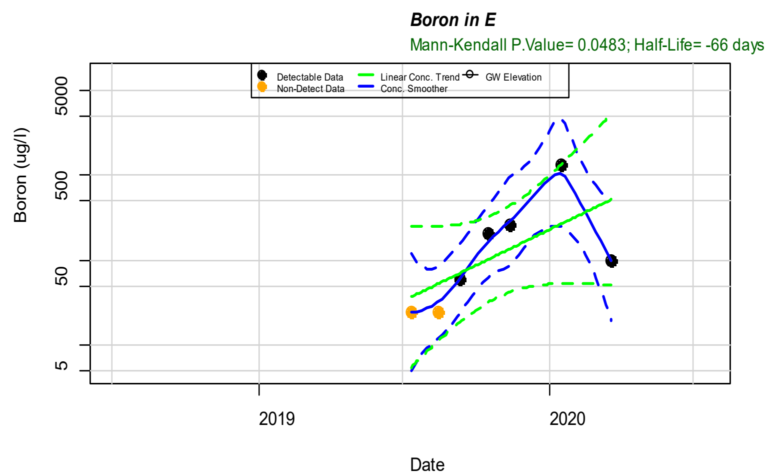

Boron in D19
Mann-Kendall P.Value= <0.01; Half-Life= 814 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Boron (ug/l)
Groundwater Elevation (level)
1000
2000
3000
4000
9.0
9.5
10.0
10.5
2019
2020
Date

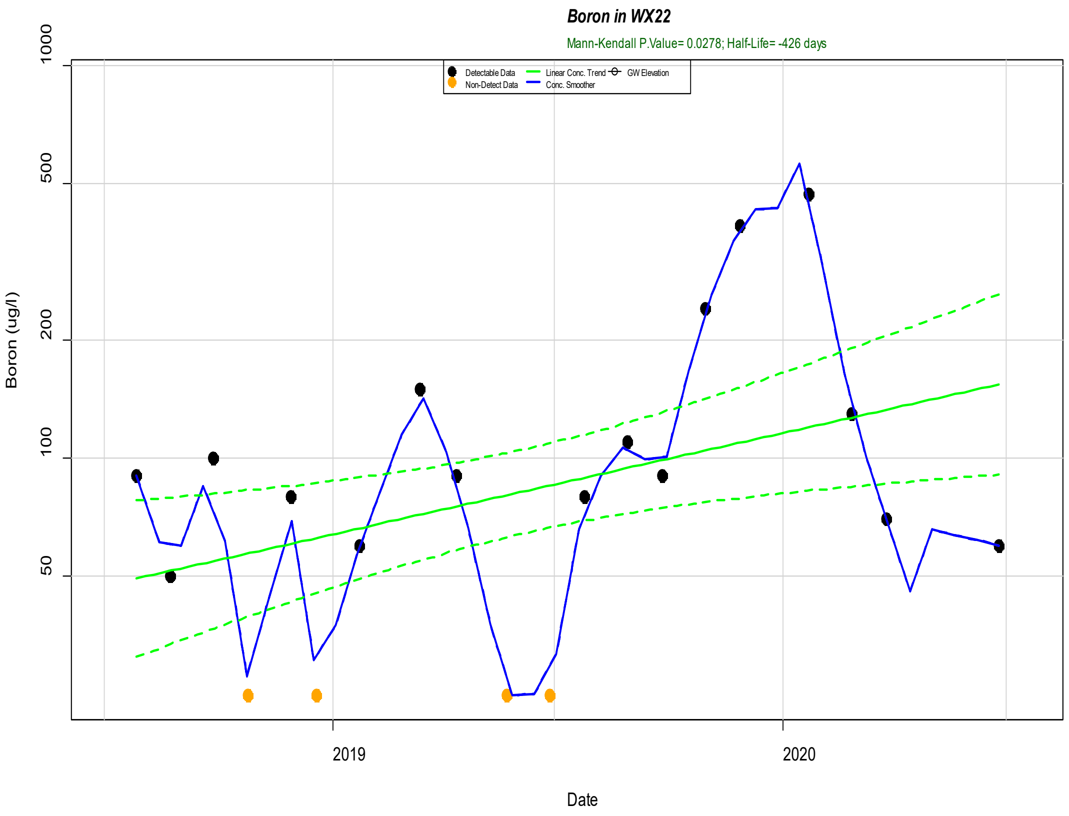

Boron in D2
Mann-Kendall P.Value= 0.108; Half-Life= 203 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Boron (ug/l)
Groundwater Elevation (level)
200
500
1000
2000
2.5
3.0
3.5
4.0
2019
2020
Date


Boron in MPGM5-D5
Mann-Kendall P.Value= 0.711; Half-Life= 259 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Boron (ug/l)
20000
5000
2000
500
Groundwater Elevation (level)
7.5
7.0
6.5
6.0
2019
2020
Date

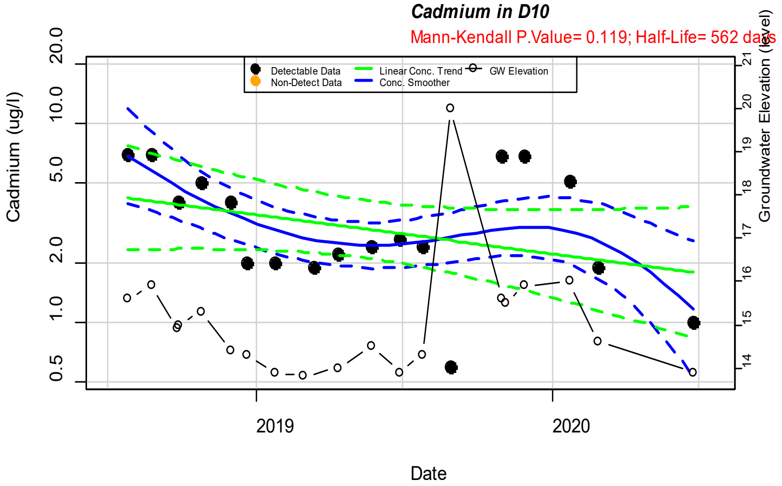

Boron in MPGM5-D6
Mann-Kendall P.Value= 0.799; Half-Life= -559 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Boron (ug/l)
1000
200
50
10
5
Groundwater Elevation (level)
9.6
9.5
9.4
9.3
9.2
9.1
9.0
8.9
2019
2020
Date


Boron in D9
Mann-Kendall P.Value= <0.01; Half-Life= -864 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Boron (ug/l)
2500
2000
1500
1000
Groundwater Elevation (level)
2.5
2.0
1.5
2019
2020
Date

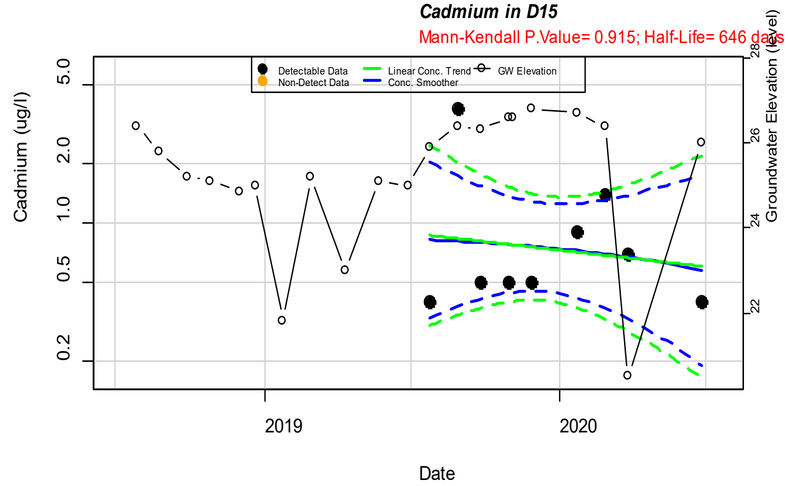

Boron in E
Mann-Kendall P.Value= 0.0483; Half-Life= -66 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Boron (ug/l)
5000
500
50
5
2019
2020
Date


Boron in WX22
Mann-Kendall P.Value= 0.0278; Half-Life= -426 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
1000
500
200
100
50
Boron (ug/l)
2019
2020
Date

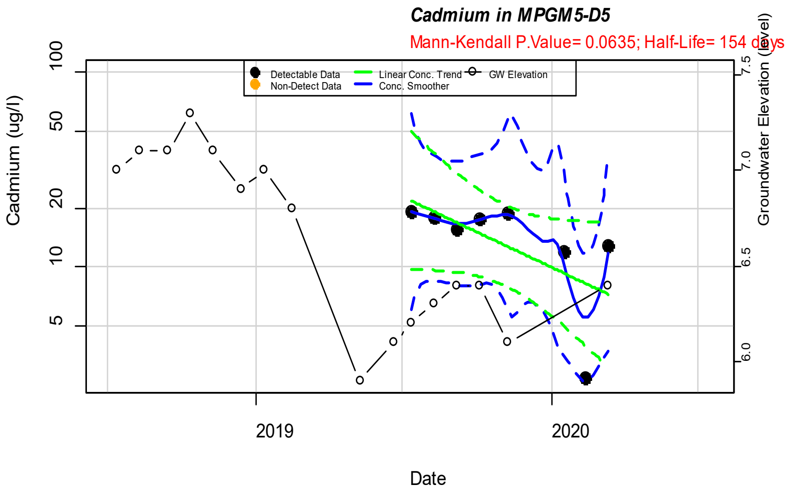
ERM



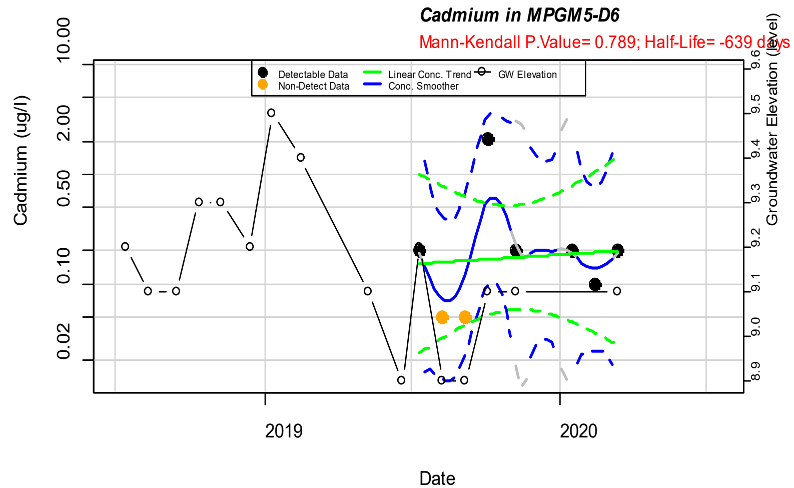
Cadmium in D10
Mann-Kendall P.Value= 0.119; Half-Life= 562 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Cadmium (ug/l)
Groundwater Elevation (level)
Date
2019
2020



Cadmium in D15
Mann-Kendall P.Value= 0.915; Half-Life= 646 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Cadmium (ug/l)
Groundwater Elevation (level)
Date
2019
2020



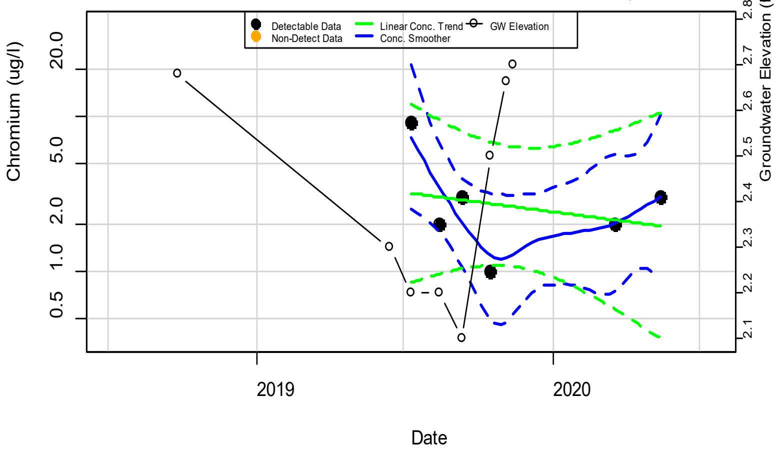
Cadmium in MPGM5-D5
Mann-Kendall P.Value= 0.0635; Half-Life= 154 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Cadmium (ug/l)
Groundwater Elevation (level)
Date
2019
2020



Cadmium in MPGM5-D6
Mann-Kendall P.Value= 0.789; Half-Life= -639 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Cadmium (ug/l)
Groundwater Elevation (level)
Date
2019
2020

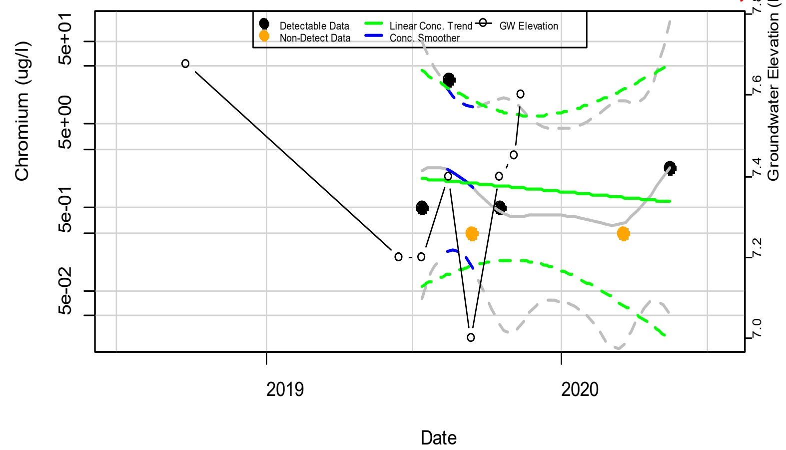
Chromium in D102

Mann-Kendall P.Value= 0.697; Half-Life= 443 days



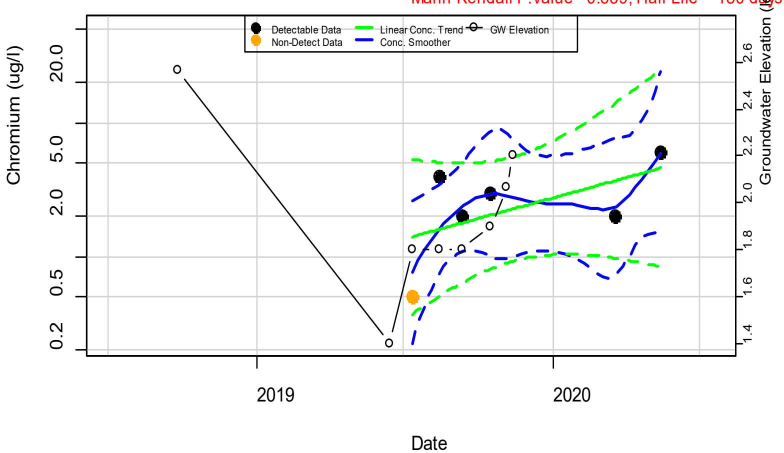
Chromium in D103

Mann-Kendall P.Value= 1; Half-Life= 332 days



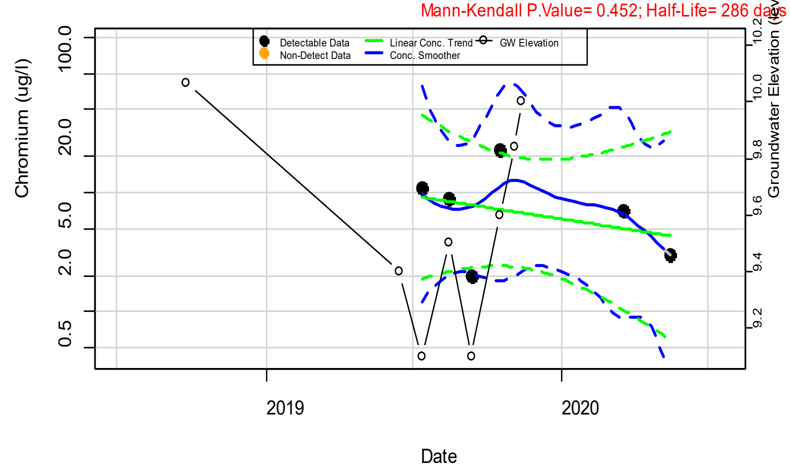
Chromium in D106

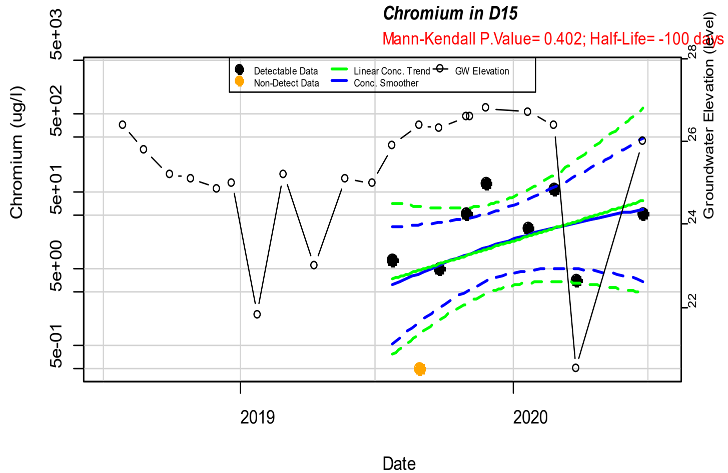
Mann-Kendall P.Value= 0.339; Half-Life= -180 days

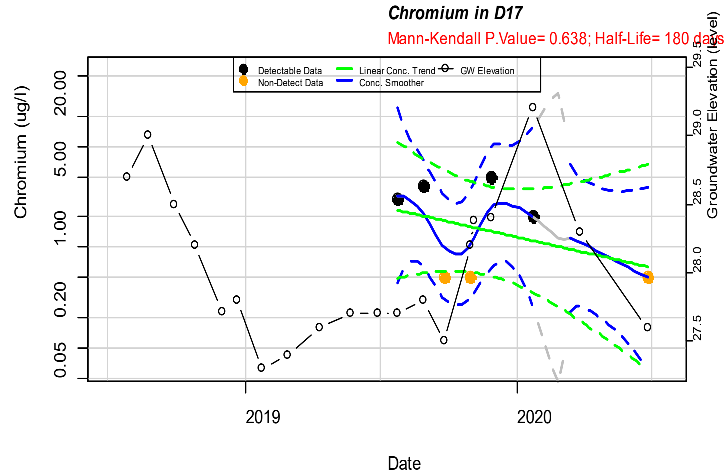


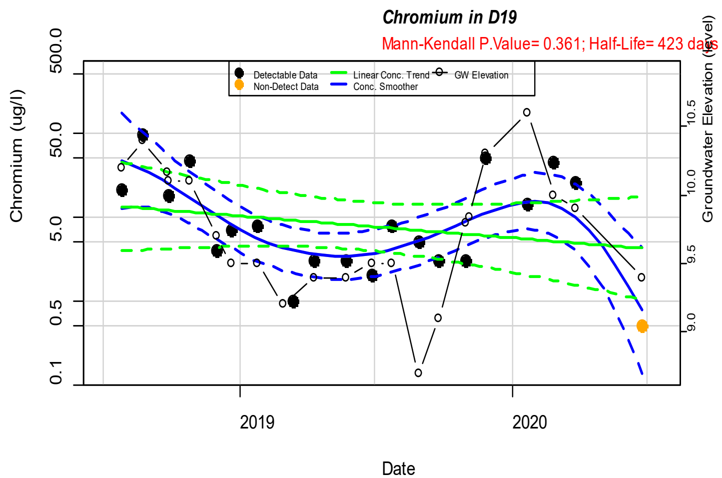
Chromium in D113

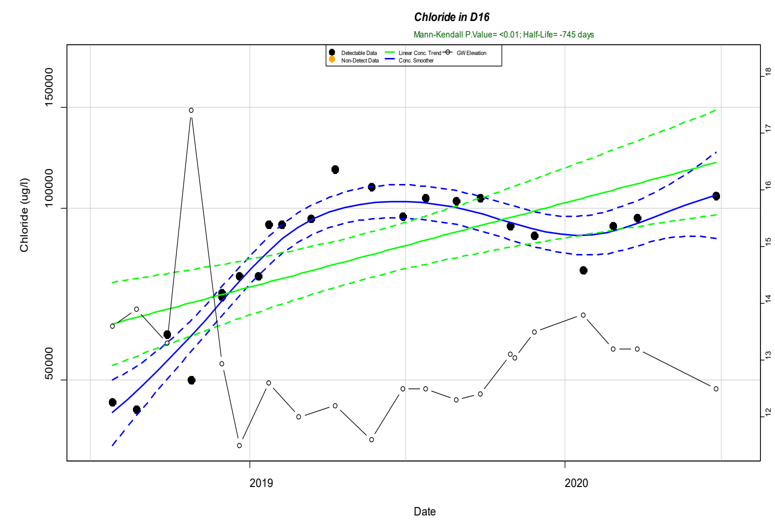
Mann-Kendall P.Value= 0.452; Half-Life= 286 days

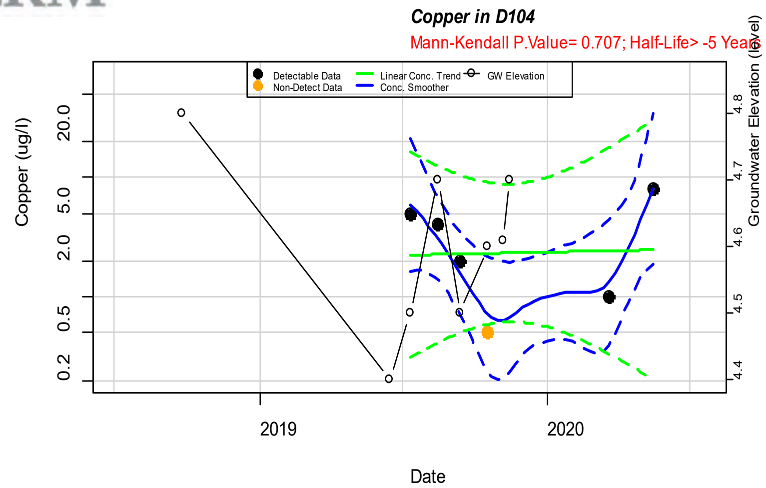


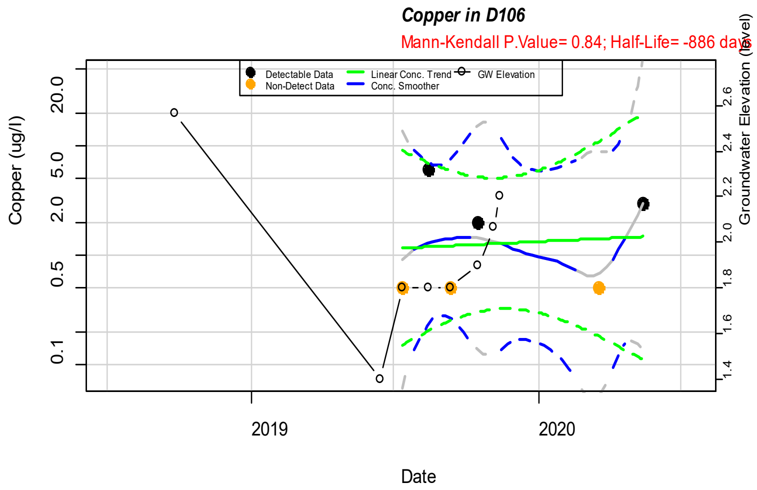

Chromium in D15
Mann-Kendall P.Value= 0.402; Half-Life= -100 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chromium (ug/l)
5e+03
5e+02
5e+01
5e+00
5e-01
Groundwater Elevation (level)
28
26
24
22
2019
2020
Date

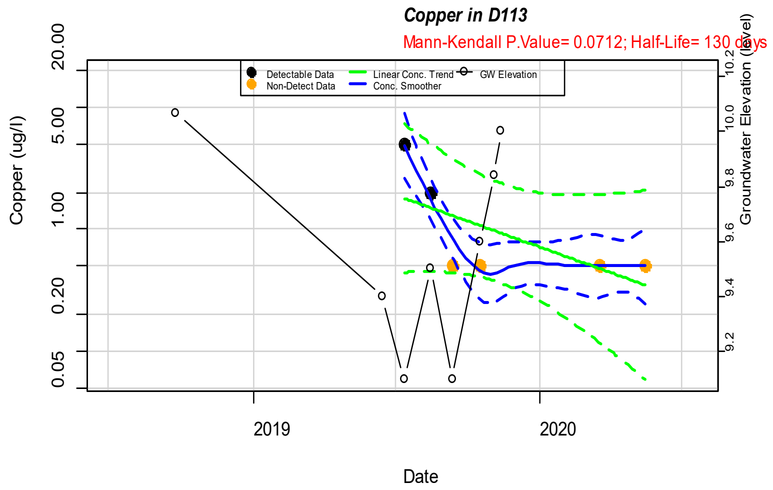

Chromium in D17
Mann-Kendall P.Value= 0.638; Half-Life= 180 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chromium (ug/l)
20.00
5.00
1.00
0.20
0.05
Groundwater Elevation (level)
29.5
29.0
28.5
28.0
27.5
2019
2020
Date

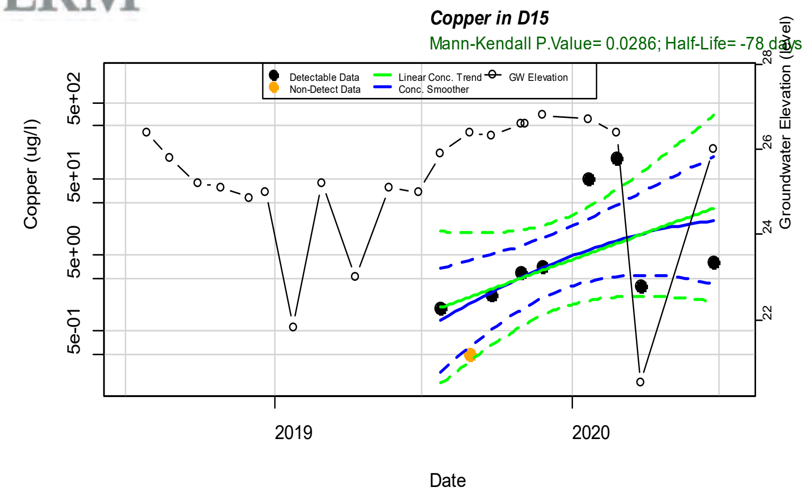

Chromium in D19
Mann-Kendall P.Value= 0.361; Half-Life= 423 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chromium (ug/l)
500.0
50.0
5.0
0.5
0.1
Groundwater Elevation (level)
10.5
10.0
9.5
9.0
2019
2020
Date

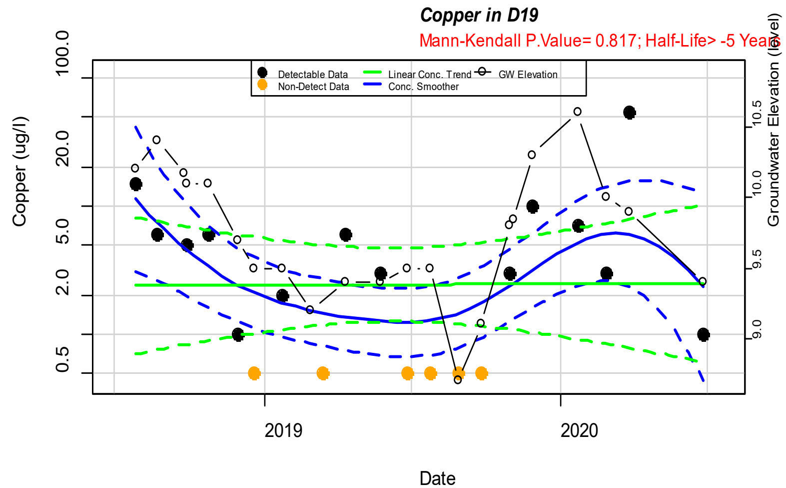

Chloride in D16
Mann-Kendall P.Value= <0.01; Half-Life= -745 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
150000
100000
50000
Groundwater Elevation (level)
18
17
16
15
14
13
12
2019
2020
Date

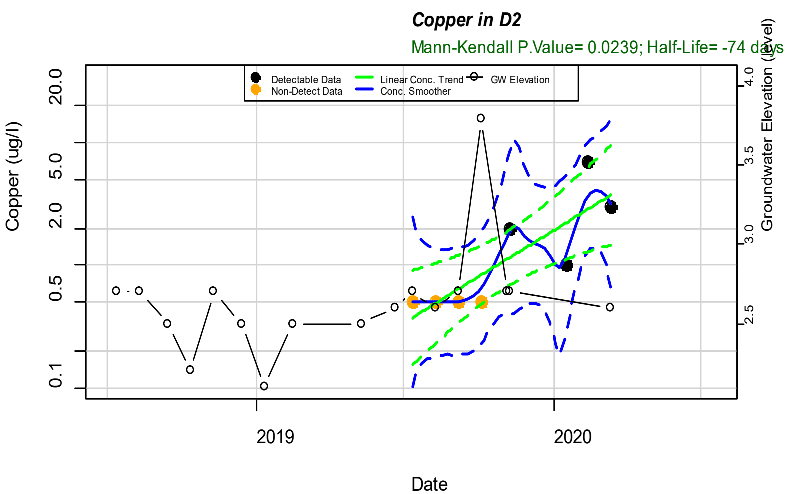

Copper in D104
Mann-Kendall P.Value= 0.707; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Copper (ug/l)
0.2
0.5
2.0
5.0
20.0
Groundwater Elevation (level)
4.4
4.5
4.6
4.7
4.8
2019
2020
Date

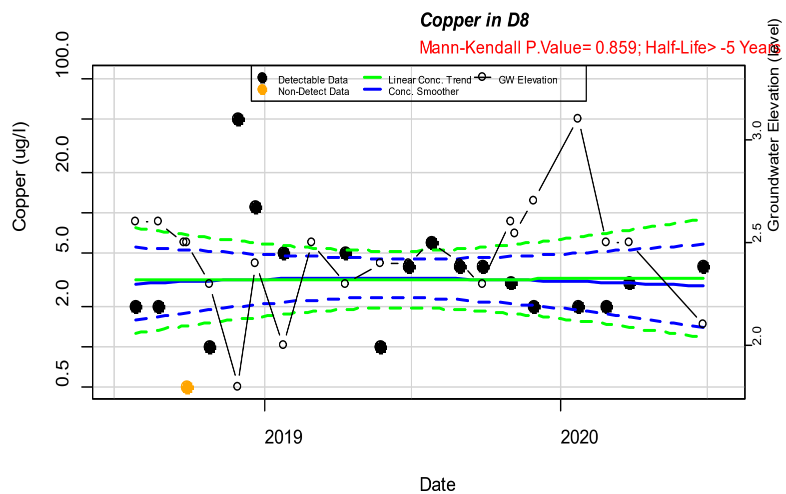

Copper in D106
Mann-Kendall P.Value= 0.84; Half-Life= -886 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Copper (ug/l)
0.1
0.5
2.0
5.0
20.0
Groundwater Elevation (level)
1.4
1.6
1.8
2.0
2.2
2.4
2.6
2019
2020
Date


Copper in D113
Mann-Kendall P.Value= 0.0712; Half-Life= 130 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Copper (ug/l)
0.05
0.20
1.00
5.00
20.00
Groundwater Elevation (level)
9.2
9.4
9.6
9.8
10.0
10.2
2019
2020
Date


Copper in D15
Mann-Kendall P.Value= 0.0286; Half-Life= -78 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Copper (ug/l)
5e-01
5e+00
5e+01
5e+02
Groundwater Elevation (level)
22
24
26
28
2019
2020
Date


Copper in D19
Mann-Kendall P.Value= 0.817; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Copper (ug/l)
0.5
2.0
5.0
20.0
100.0
Groundwater Elevation (level)
9.0
9.5
10.0
10.5
2019
2020
Date

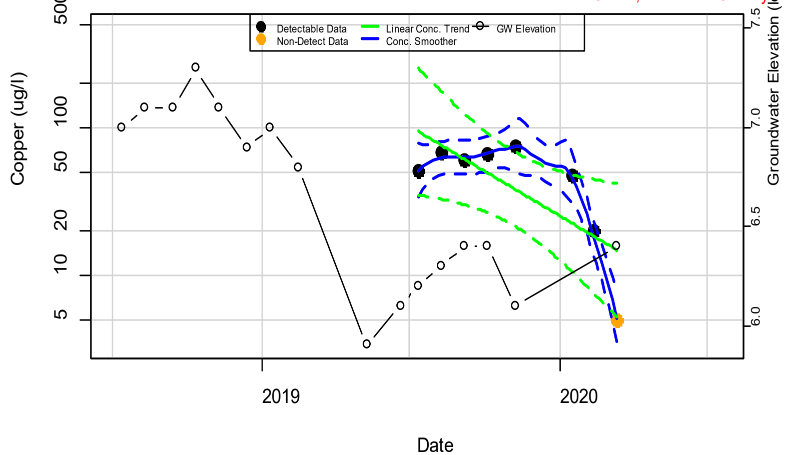

Copper in D2
Mann-Kendall P.Value= 0.0239; Half-Life= -74 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Copper (ug/l)
0.1
0.5
2.0
5.0
20.0
Groundwater Elevation (level)
2.5
3.0
3.5
4.0
2019
2020
Date


Copper in D8
Mann-Kendall P.Value= 0.859; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Copper (ug/l)
0.5
2.0
5.0
20.0
100.0
Groundwater Elevation (level)
2.0
2.5
3.0
2019
2020
Date

ERM

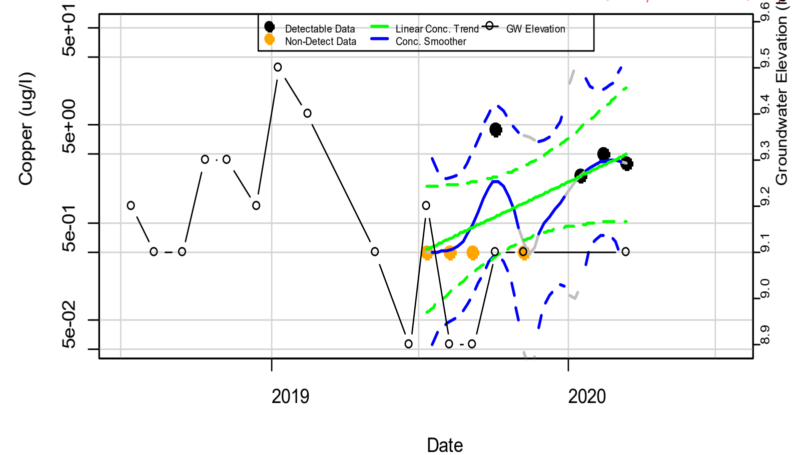
Copper in MPGM5-D5

Mann-Kendall P.Value= 0.174; Half-Life= 91 days



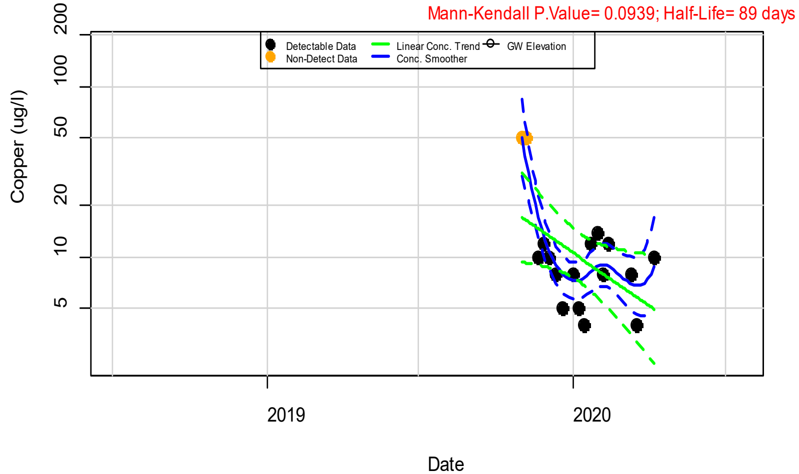
Copper in MPGM5-D6

Mann-Kendall P.Value= 0.144; Half-Life= -76 days



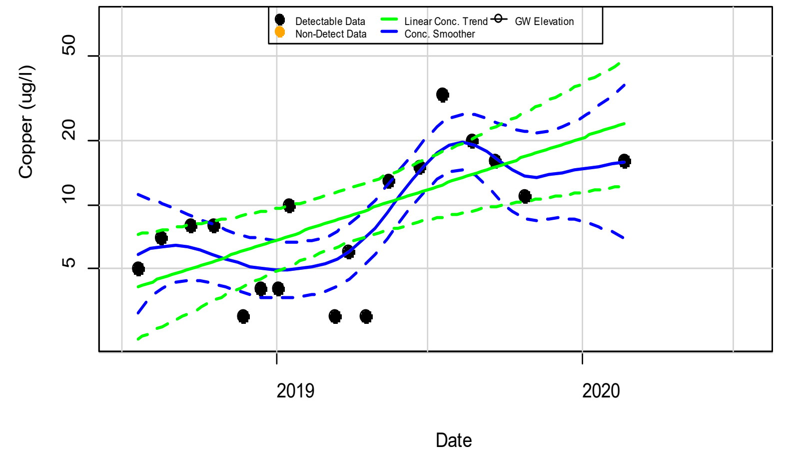
Copper in LDP01

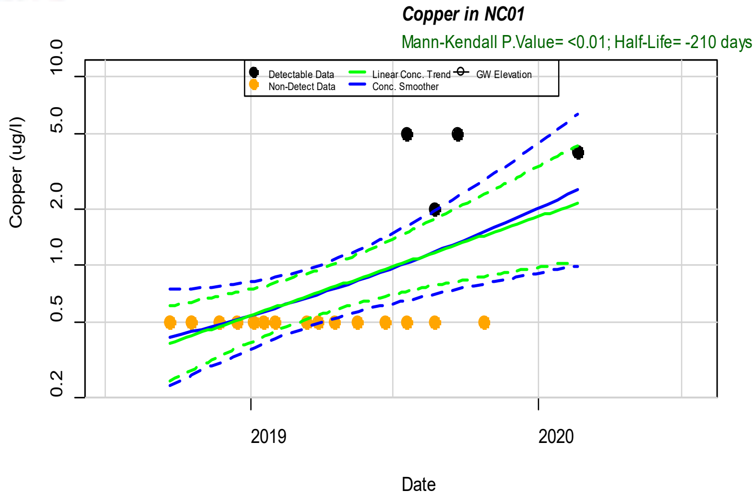
Mann-Kendall P.Value= 0.0939; Half-Life= 89 days

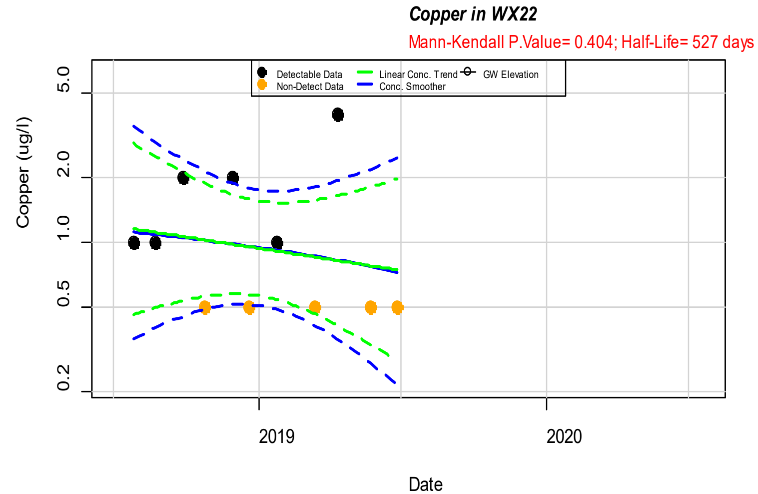


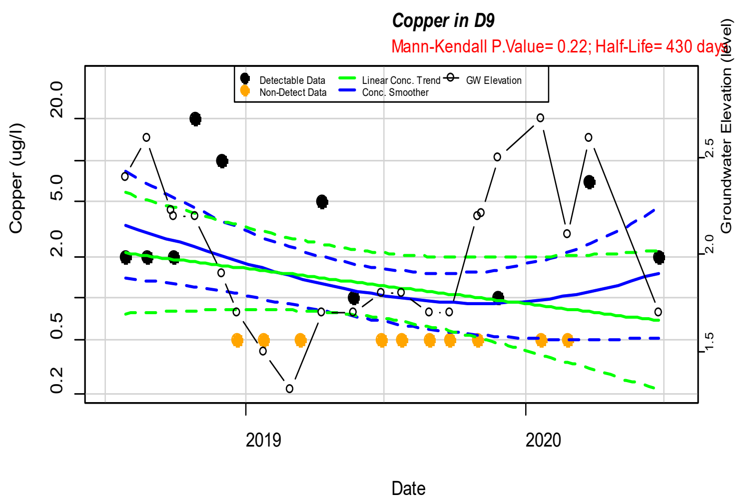
Copper in LMP01

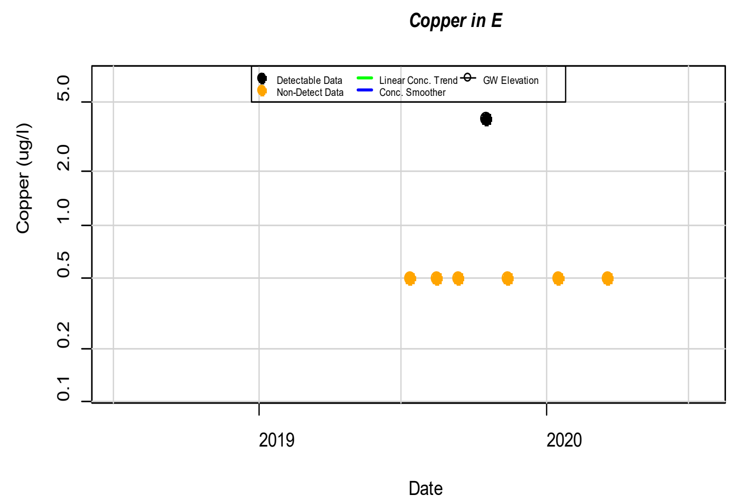
Mann-Kendall P.Value= <0.01; Half-Life= -228 days

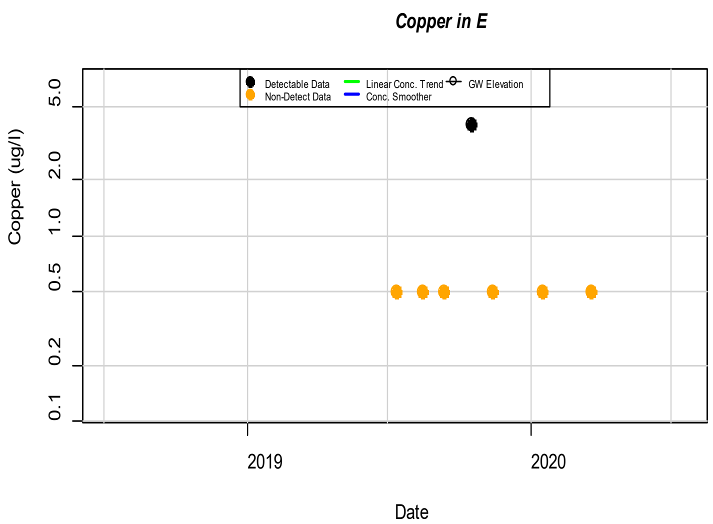



Copper in NC01
Mann-Kendall P.Value= <0.01; Half-Life= -210 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Copper (ug/l)
10.0
5.0
2.0
1.0
0.5
0.2
2019
2020
Date

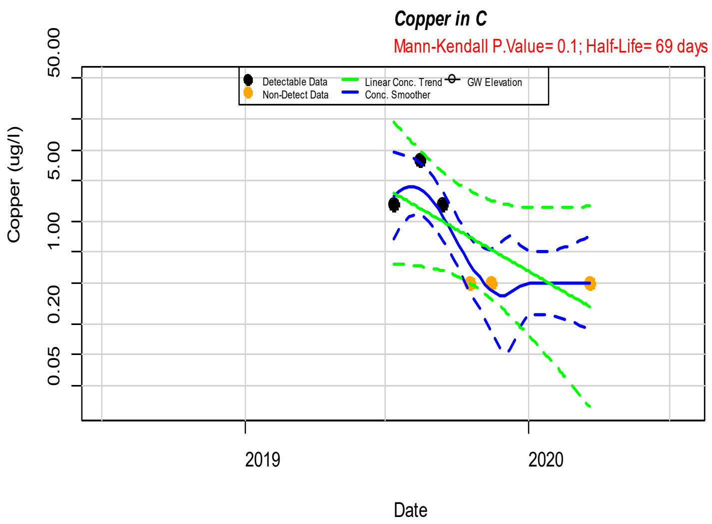

Copper in WX22
Mann-Kendall P.Value= 0.404; Half-Life= 527 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Copper (ug/l)
5.0
2.0
1.0
0.5
0.2
2019
2020
Date


Copper in D9
Mann-Kendall P.Value= 0.22; Half-Life= 430 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Copper (ug/l)
20.0
5.0
2.0
0.5
0.2
Groundwater Elevation (level)
2.5
2.0
1.5
2019
2020
Date

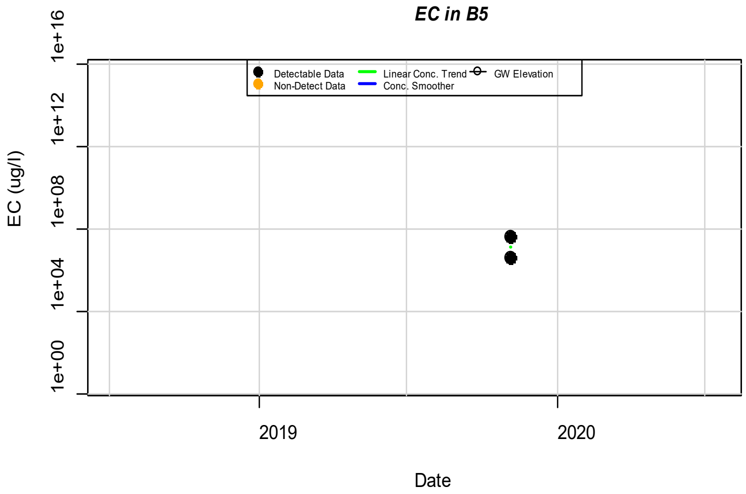

Copper in E
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Copper (ug/l)
5.0
2.0
1.0
0.5
0.2
0.1
2019
2020
Date

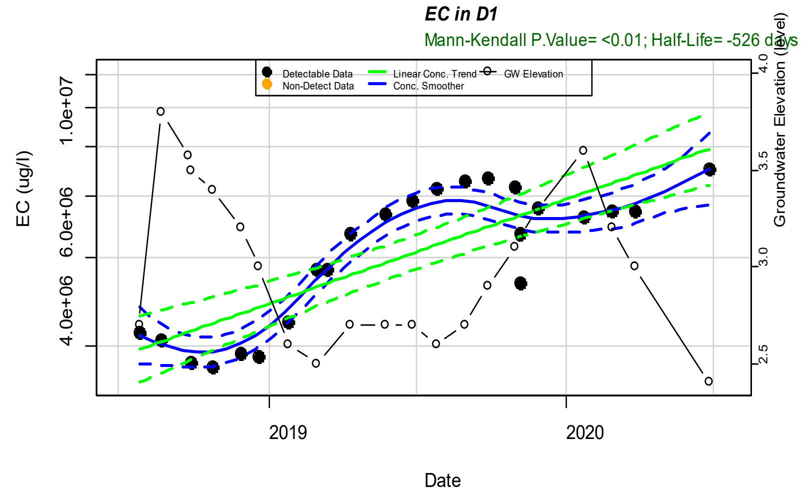


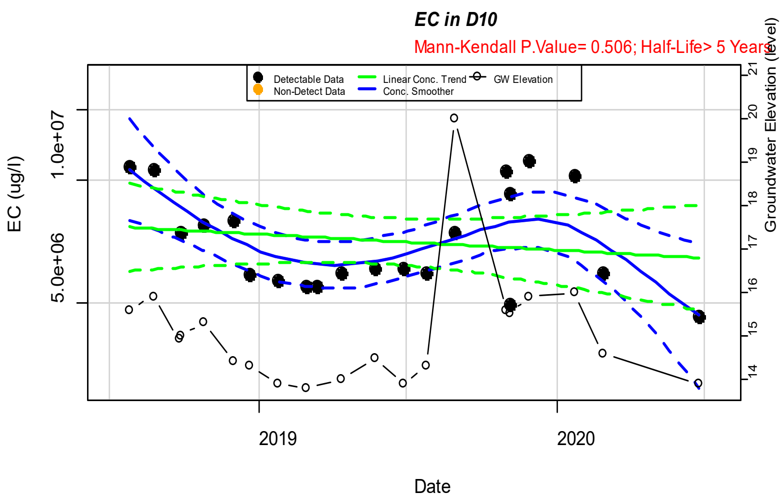
Copper in E
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Copper (ug/l)
0.1
0.2
0.5
1.0
2.0
5.0
2019
2020
Date

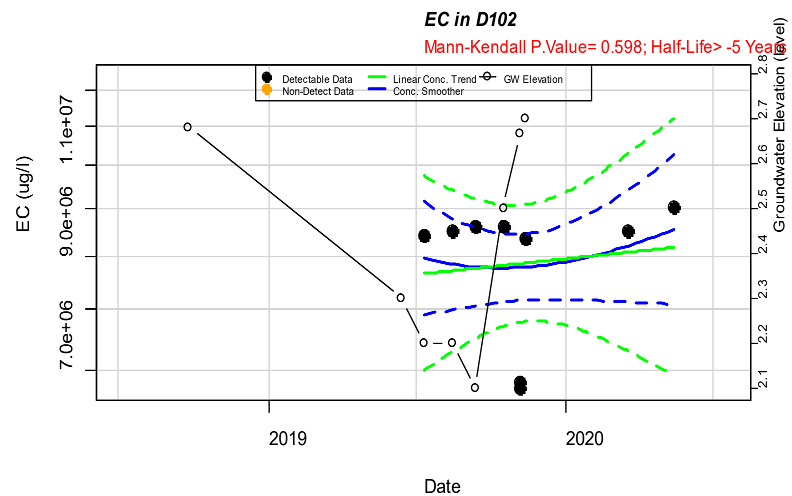


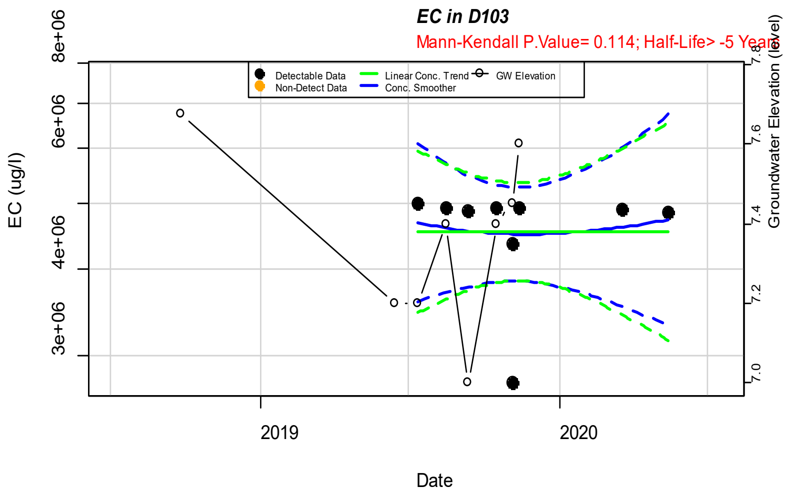
Copper in C
Mann-Kendall P.Value= 0.1; Half-Life= 69 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Copper (ug/l)
0.05
0.20
1.00
5.00
50.00
2019
2020
Date

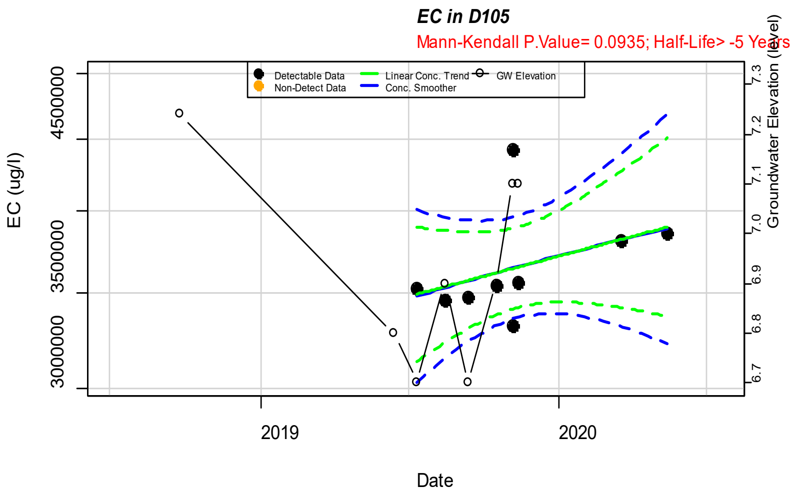

EC in B5
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
1e+16
1e+12
1e+08
1e+04
1e+00
EC (ug/l)
2019
2020
Date

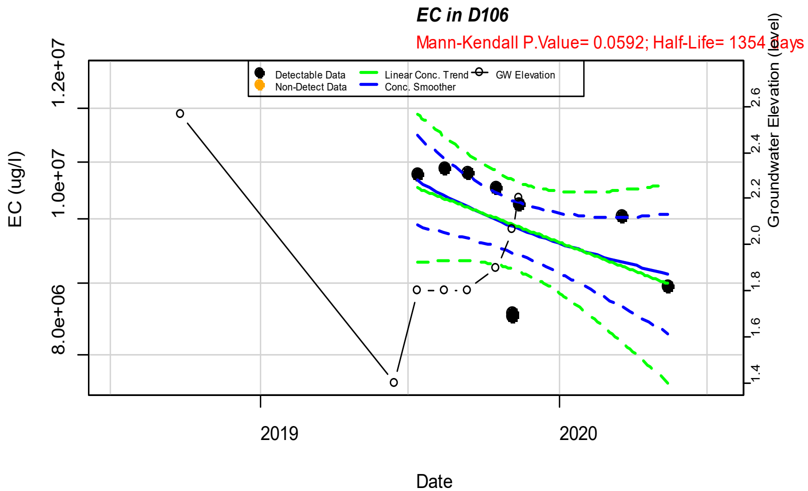

EC in D1
Mann-Kendall P.Value= <0.01; Half-Life= -526 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
1.0e+07
6.0e+06
4.0e+06
EC (ug/l)
Groundwater Elevation (level)
4.0
3.5
3.0
2.5
2019
2020
Date

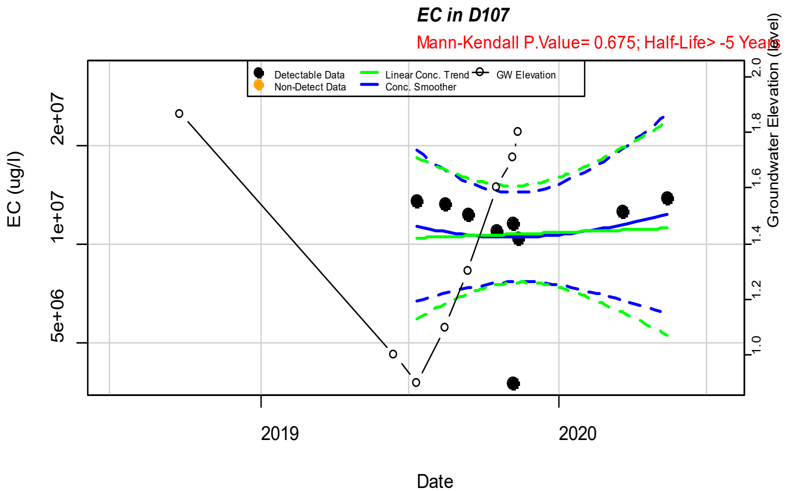

EC in D10
Mann-Kendall P.Value= 0.506; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
1.0e+07
5.0e+06
EC (ug/l)
Groundwater Elevation (level)
21
20
19
18
17
16
15
14
2019
2020
Date

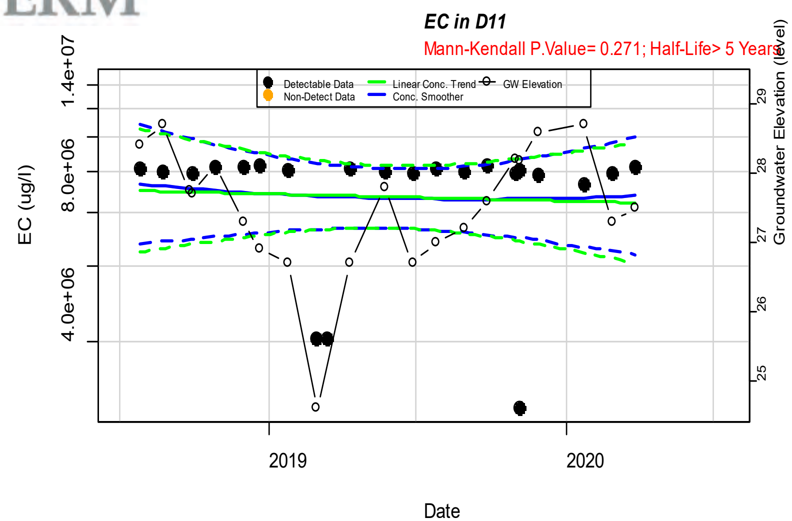

EC in D102
Mann-Kendall P.Value= 0.598; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
1.1e+07
9.0e+06
7.0e+06
EC (ug/l)
Groundwater Elevation (level)
2.8
2.7
2.6
2.5
2.4
2.3
2.2
2.1
2019
2020
Date

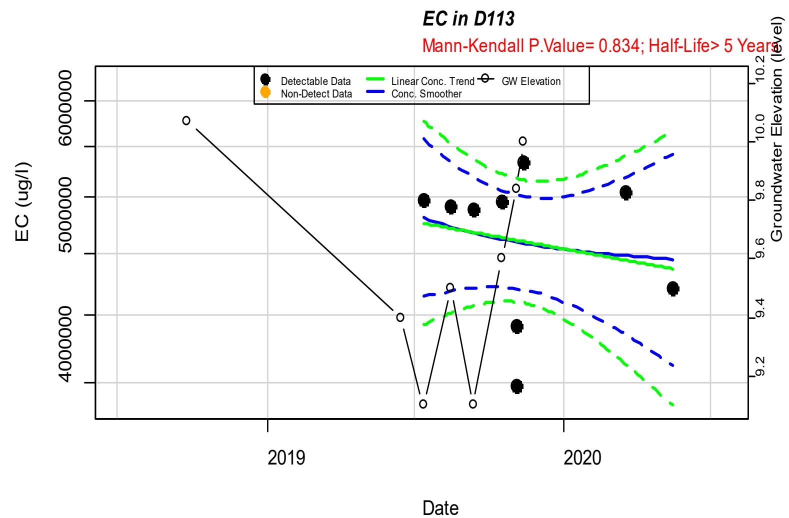

EC in D103
Mann-Kendall P.Value= 0.114; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
EC (ug/l)
Groundwater Elevation (level)
Date
2019
2020

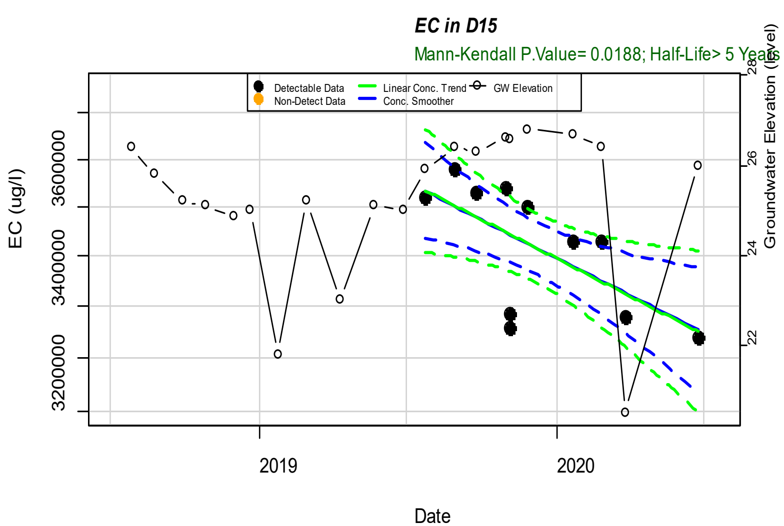

EC in D105
Mann-Kendall P.Value= 0.0935; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
EC (ug/l)
Groundwater Elevation (level)
Date
2019
2020

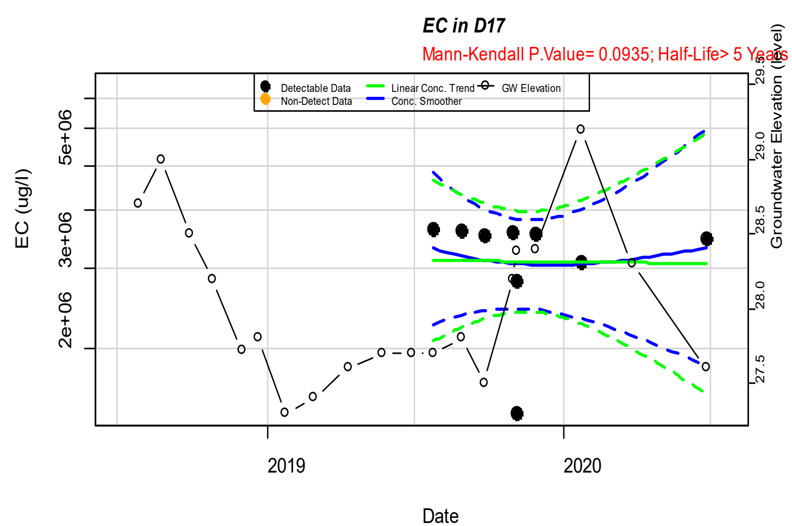

EC in D106
Mann-Kendall P.Value= 0.0592; Half-Life= 1354 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
EC (ug/l)
Groundwater Elevation (level)
Date
2019
2020


EC in D107
Mann-Kendall P.Value= 0.675; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
EC (ug/l)
Groundwater Elevation (level)
Date
2019
2020


EC in D11
Mann-Kendall P.Value= 0.271; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
EC (ug/l)
Groundwater Elevation (level)
Date
4.0e+06
8.0e+06
1.4e+07
25
26
27
28
29
2019
2020

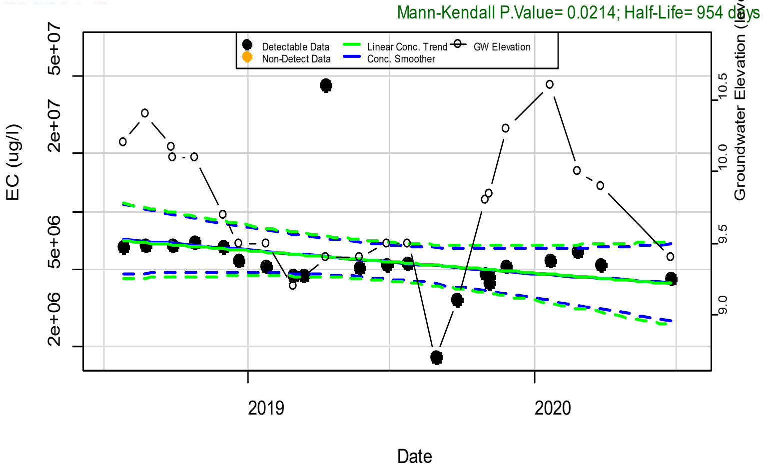

EC in D113
Mann-Kendall P.Value= 0.834; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
EC (ug/l)
Groundwater Elevation (level)
Date
4000000
5000000
6000000
9.2
9.4
9.6
9.8
10.0
10.2
2019
2020


EC in D15
Mann-Kendall P.Value= 0.0188; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
EC (ug/l)
Groundwater Elevation (level)
Date
3200000
3400000
3600000
22
24
26
28
2019
2020


EC in D17
Mann-Kendall P.Value= 0.0935; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
EC (ug/l)
Groundwater Elevation (level)
Date
2e+06
3e+06
5e+06
27.5
28.0
28.5
29.0
29.5
2019
2020

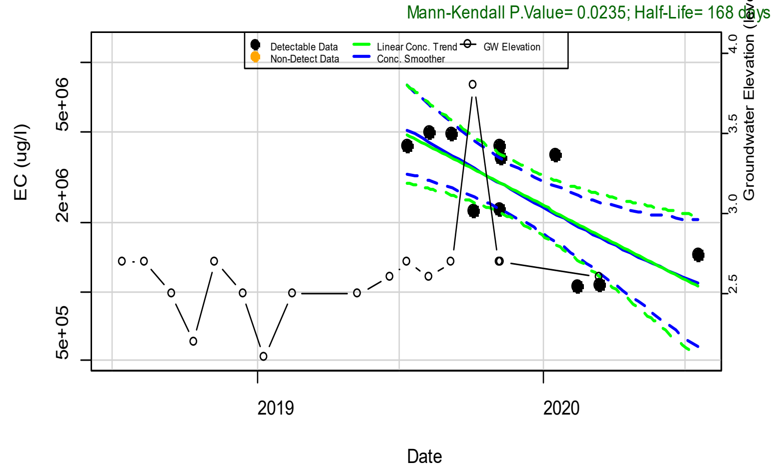
EC in D19

Mann-Kendall P.Value= 0.0214; Half-Life= 954 days



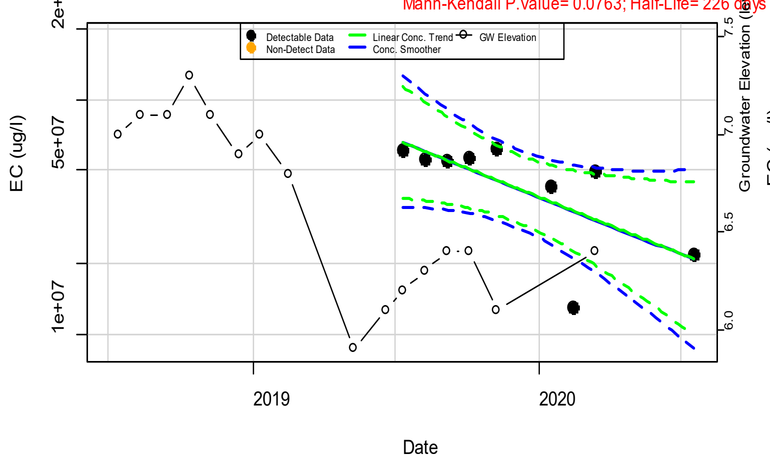
EC in D2

Mann-Kendall P.Value= 0.0235; Half-Life= 168 days



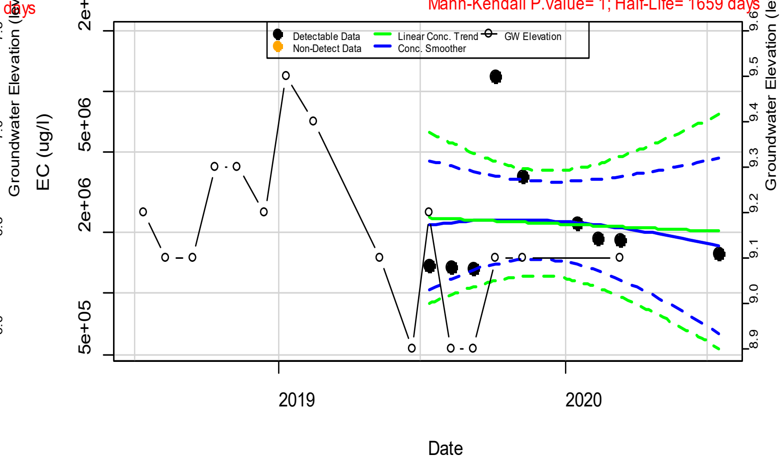
EC in MPGM5-D5

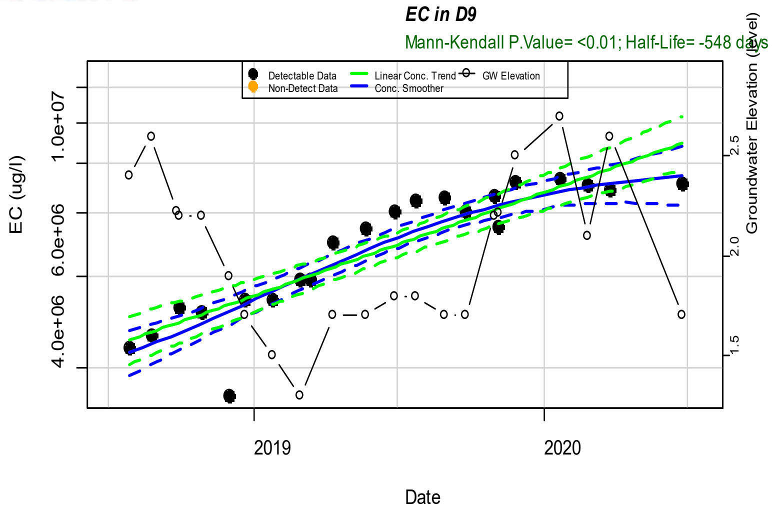
Mann-Kendall P.Value= 0.0763; Half-Life= 226 days

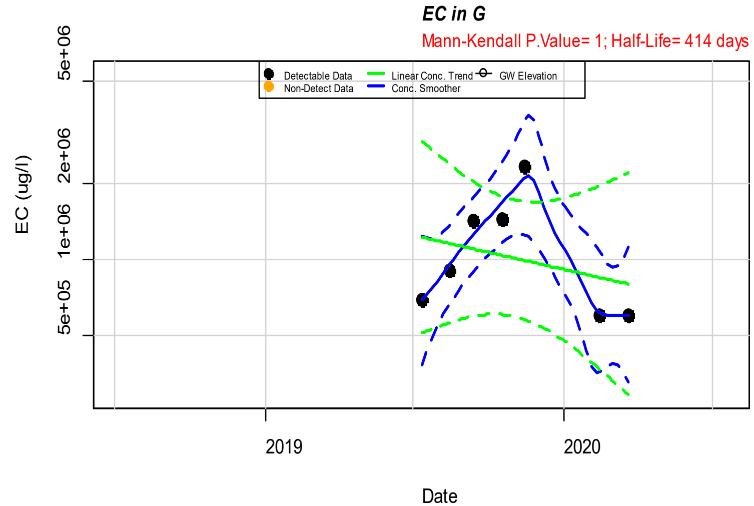


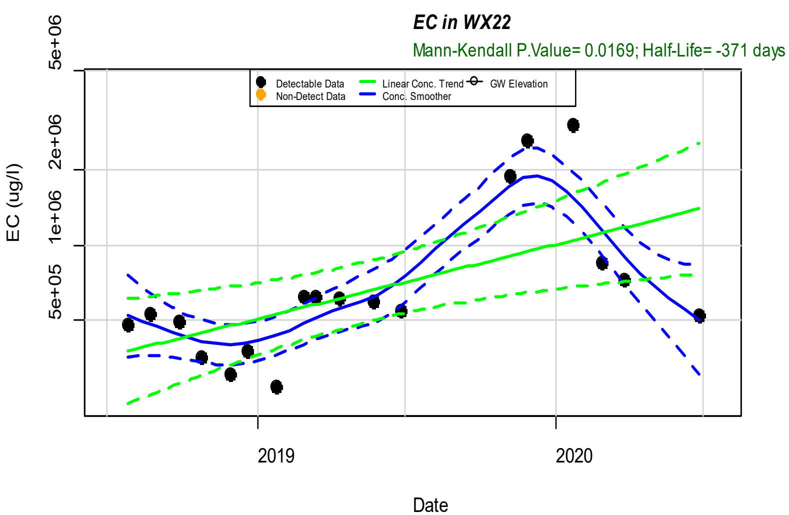
EC in MPGM5-D6

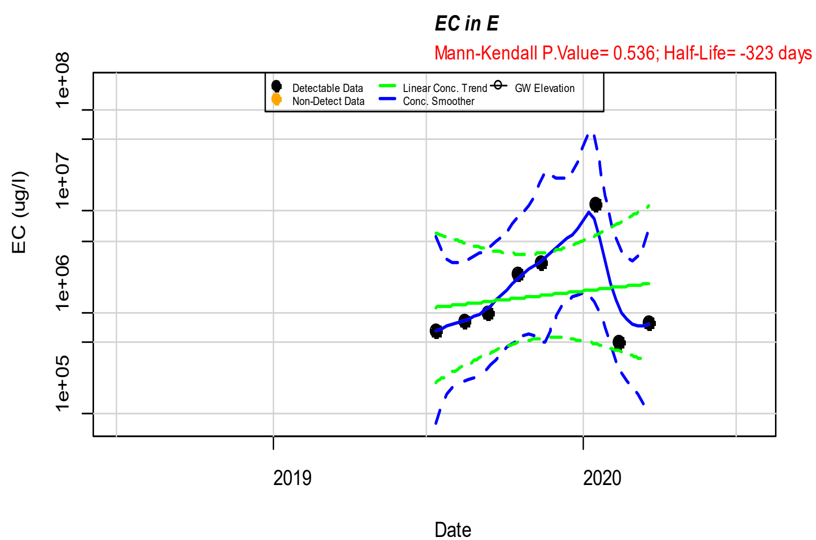
Mann-Kendall P.Value= 1; Half-Life= 1659 days

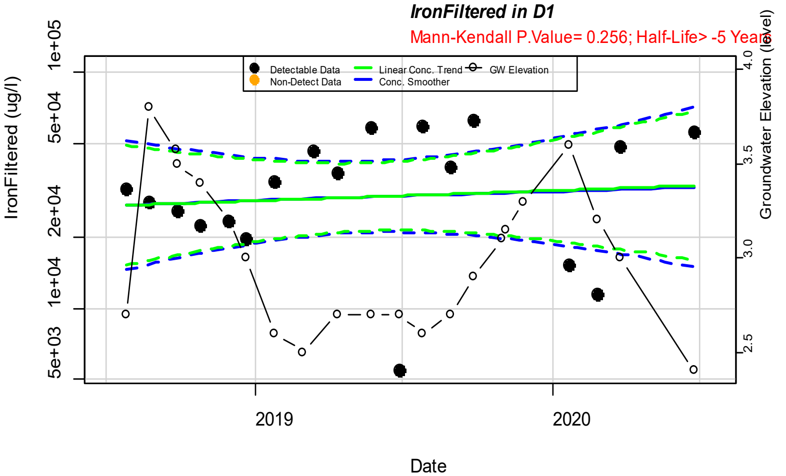


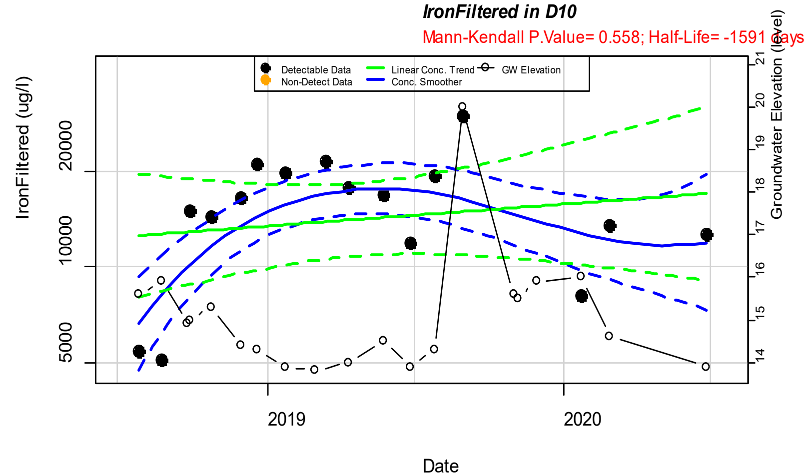

EC in D9
Mann-Kendall P.Value= <0.01; Half-Life= -548 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
EC (ug/l)
4.0e+06
6.0e+06
1.0e+07
Groundwater Elevation (level)
1.5
2.0
2.5
2019
2020
Date

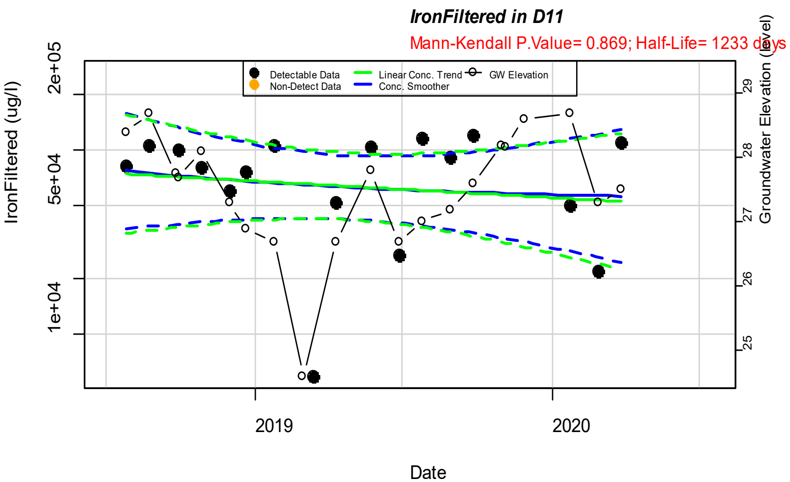

EC in G
Mann-Kendall P.Value= 1; Half-Life= 414 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
EC (ug/l)
5e+05
1e+06
2e+06
5e+06
2019
2020
Date

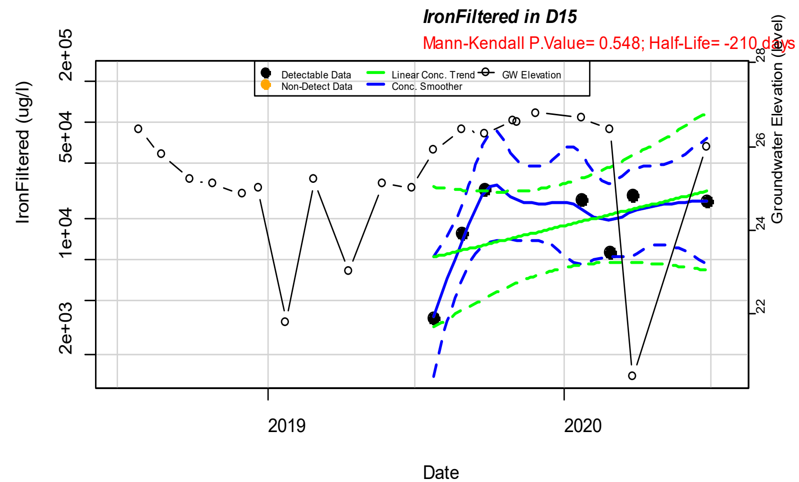

EC in WX22
Mann-Kendall P.Value= 0.0169; Half-Life= -371 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
EC (ug/l)
5e+05
1e+06
2e+06
5e+06
2019
2020
Date

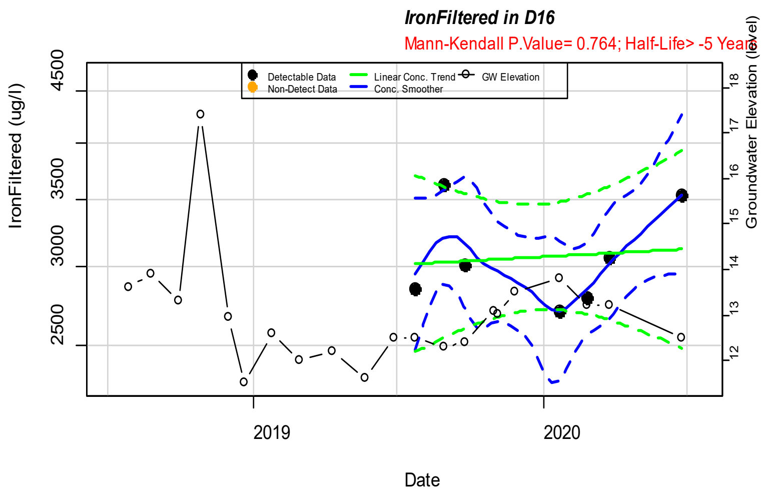

EC in E
Mann-Kendall P.Value= 0.536; Half-Life= -323 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
EC (ug/l)
1e+05
1e+06
1e+07
1e+08
2019
2020
Date

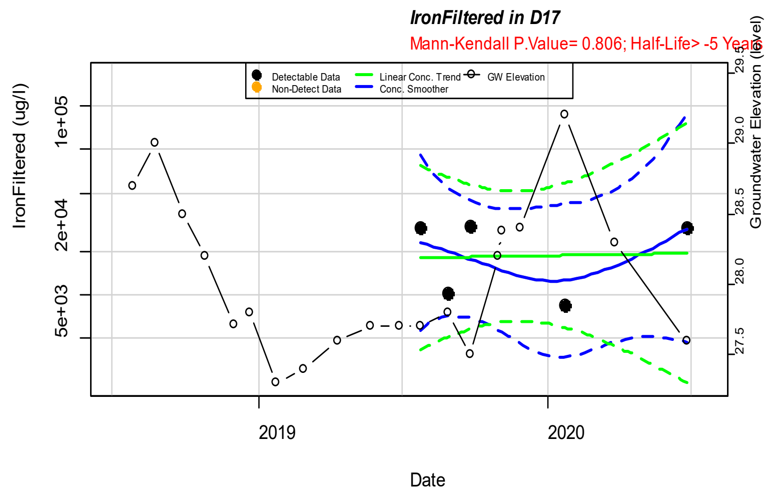

IronFiltered in D1
Mann-Kendall P.Value= 0.256; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronFiltered (ug/l)
Groundwater Elevation (level)
Date
2019
2020

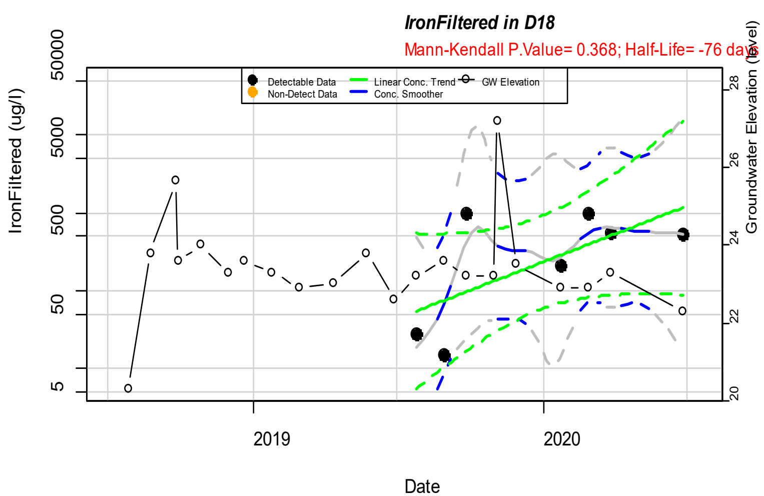

IronFiltered in D10
Mann-Kendall P.Value= 0.558; Half-Life= -1591 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronFiltered (ug/l)
Groundwater Elevation (level)
Date
2019
2020

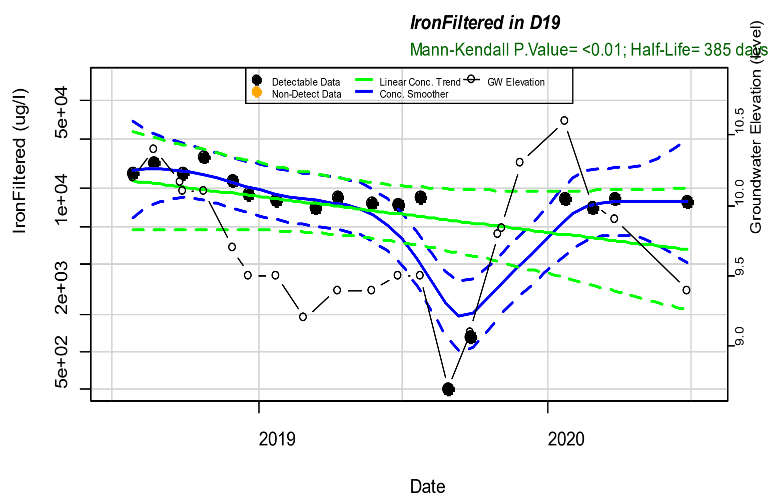

IronFiltered in D11
Mann-Kendall P.Value= 0.869; Half-Life= 1233 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronFiltered (ug/l)
Groundwater Elevation (level)
Date
2019
2020

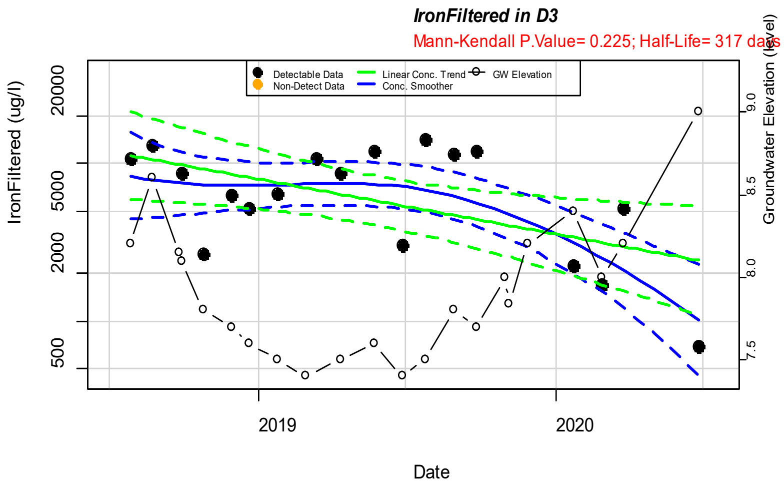

IronFiltered in D15
Mann-Kendall P.Value= 0.548; Half-Life= -210 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronFiltered (ug/l)
Groundwater Elevation (level)
Date
2019
2020

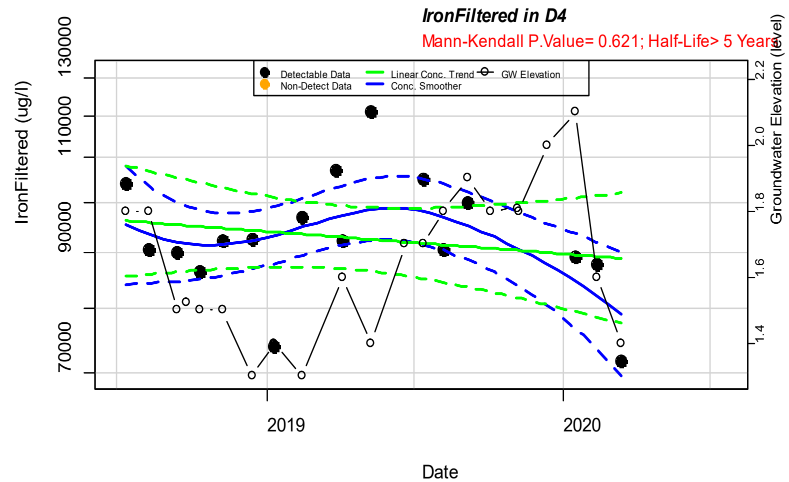

IronFiltered in D16
Mann-Kendall P.Value= 0.764; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronFiltered (ug/l)
Groundwater Elevation (level)
2500
3000
3500
4500
2019
2020
Date

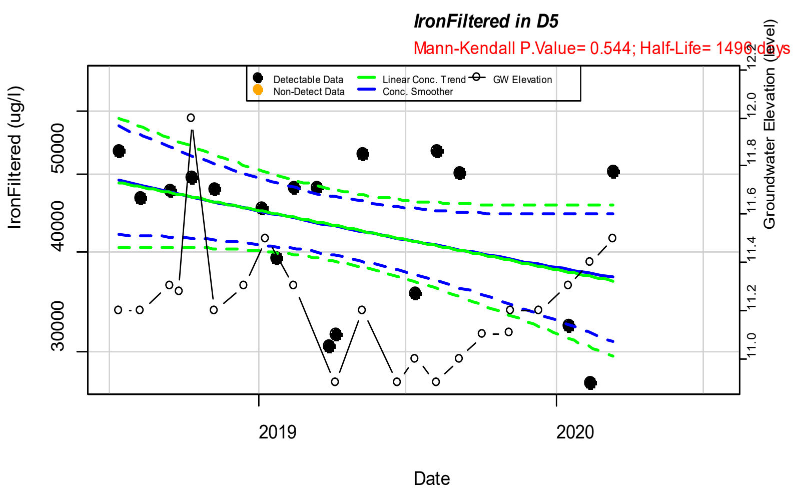

IronFiltered in D17
Mann-Kendall P.Value= 0.806; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronFiltered (ug/l)
Groundwater Elevation (level)
5e+03
2e+04
1e+05
2019
2020
Date

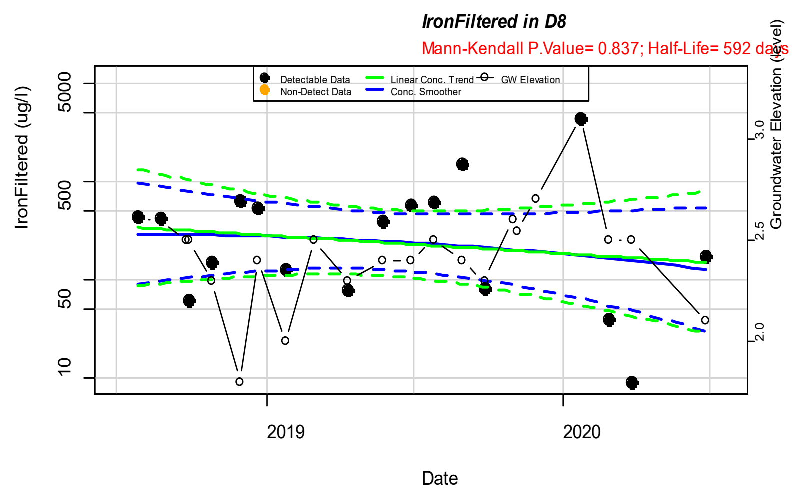

IronFiltered in D18
Mann-Kendall P.Value= 0.368; Half-Life= -76 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronFiltered (ug/l)
Groundwater Elevation (level)
5
50
500
5000
50000
2019
2020
Date

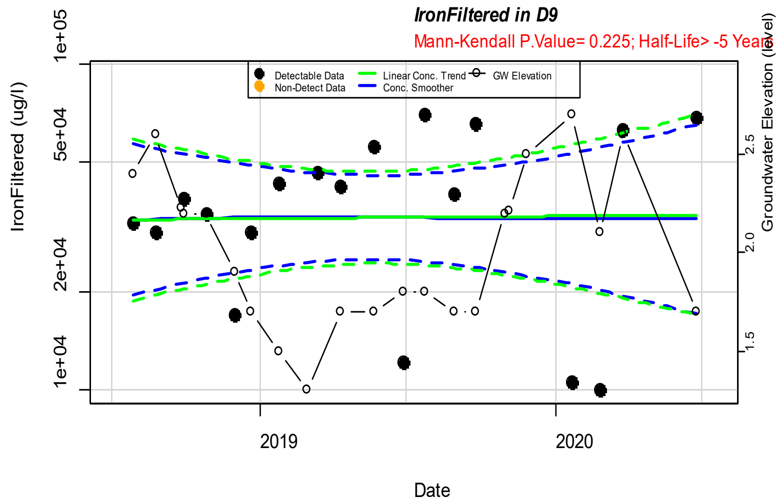

IronFiltered in D19
Mann-Kendall P.Value= <0.01; Half-Life= 385 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronFiltered (ug/l)
Groundwater Elevation (level)
5e+02
2e+03
1e+04
5e+04
2019
2020
Date

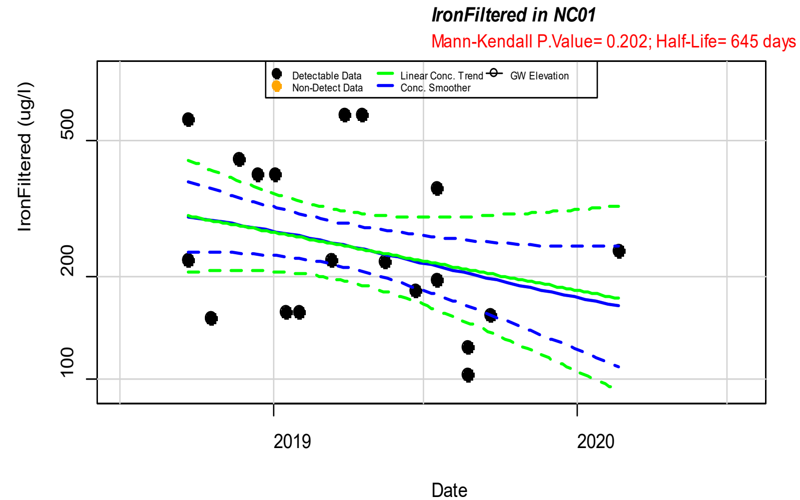

IronFiltered in D3
Mann-Kendall P.Value= 0.225; Half-Life= 317 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronFiltered (ug/l)
Groundwater Elevation (level)
20000
5000
2000
500
9.0
8.5
8.0
7.5
2019
2020
Date

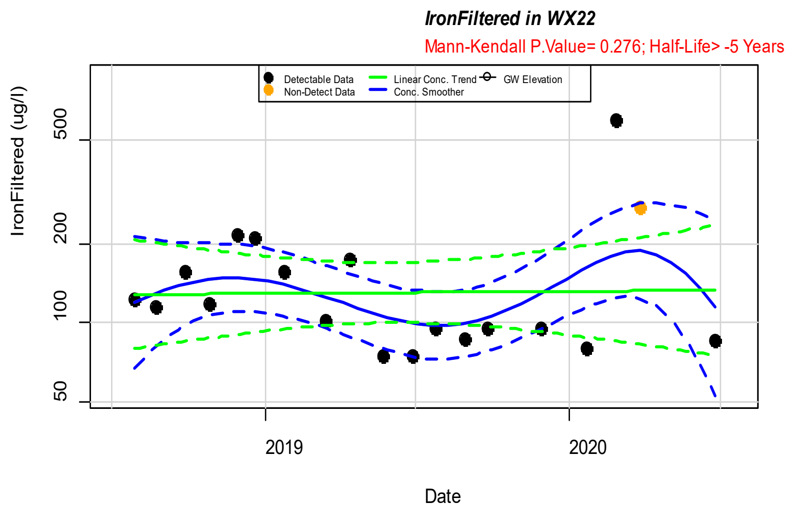

IronFiltered in D4
Mann-Kendall P.Value= 0.621; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronFiltered (ug/l)
Groundwater Elevation (level)
130000
110000
90000
70000
2.2
2.0
1.8
1.6
1.4
2019
2020
Date

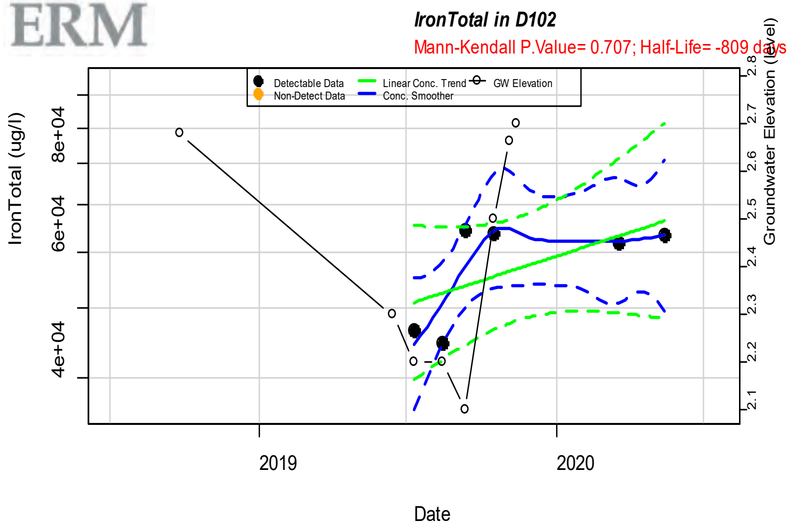

IronFiltered in D5
Mann-Kendall P.Value= 0.544; Half-Life= 1496 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronFiltered (ug/l)
Groundwater Elevation (level)
50000
40000
30000
12.2
12.0
11.8
11.6
11.4
11.2
11.0
2019
2020
Date

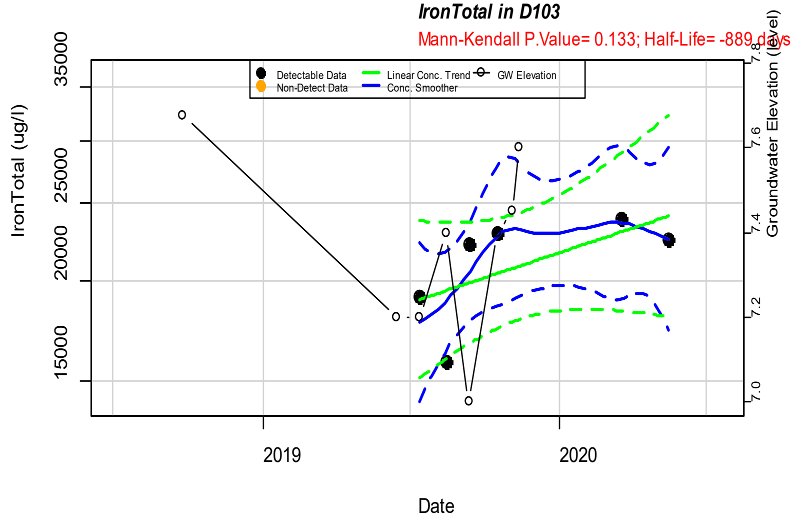

IronFiltered in D8
Mann-Kendall P.Value= 0.837; Half-Life= 592 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronFiltered (ug/l)
Groundwater Elevation (level)
5000
500
50
10
3.0
2.5
2.0
2019
2020
Date

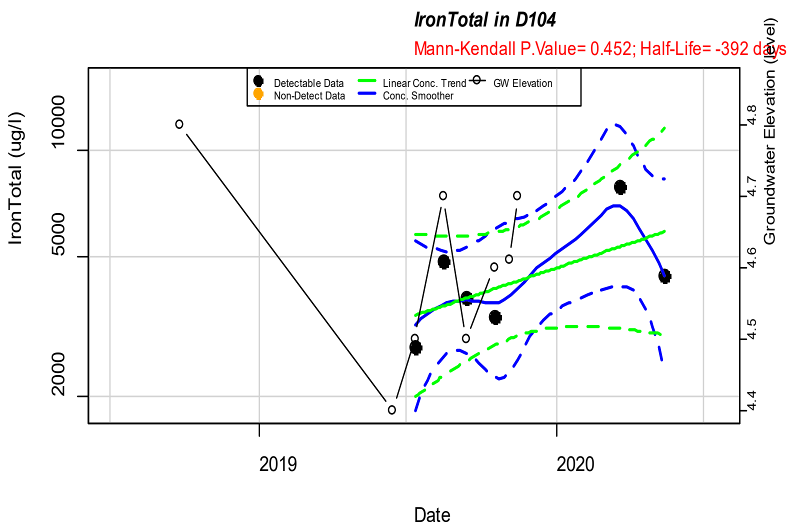

IronFiltered in D9
Mann-Kendall P.Value= 0.225; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronFiltered (ug/l)
Groundwater Elevation (level)
1e+05
5e+04
2e+04
1e+04
2.5
2.0
1.5
2019
2020
Date

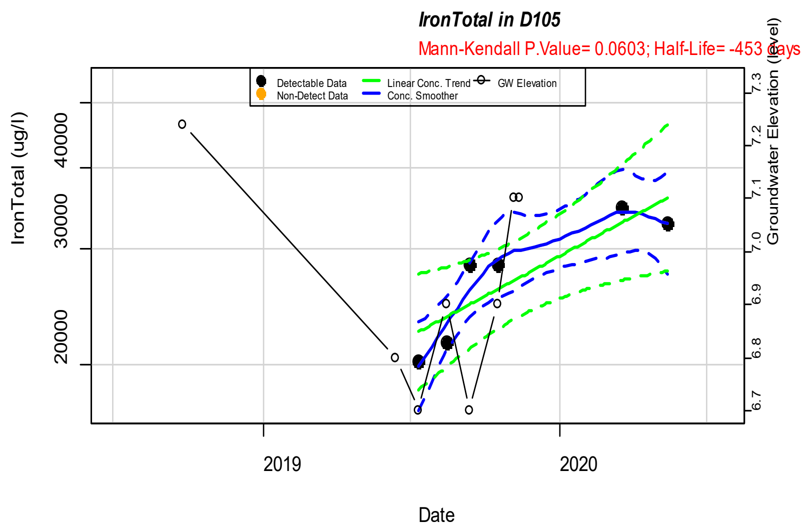

IronFiltered in NC01
Mann-Kendall P.Value= 0.202; Half-Life= 645 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronFiltered (ug/l)
500
200
100
2019
2020
Date

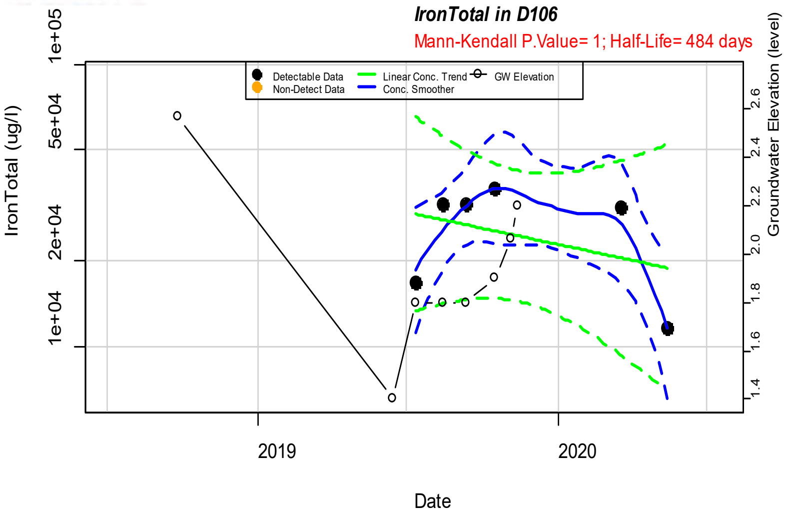

IronFiltered in WX22
Mann-Kendall P.Value= 0.276; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronFiltered (ug/l)
500
200
100
50
2019
2020
Date

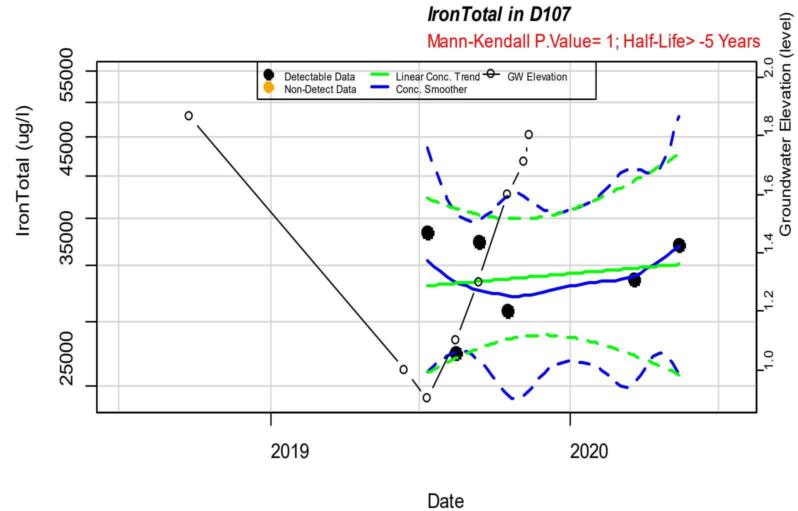

IronTotal in D102
Mann-Kendall P.Value= 0.707; Half-Life= -809 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronTotal (ug/l)
Groundwater Elevation (level)
4e+04
6e+04
8e+04
2.1
2.2
2.3
2.4
2.5
2.6
2.7
2.8
2019
2020
Date

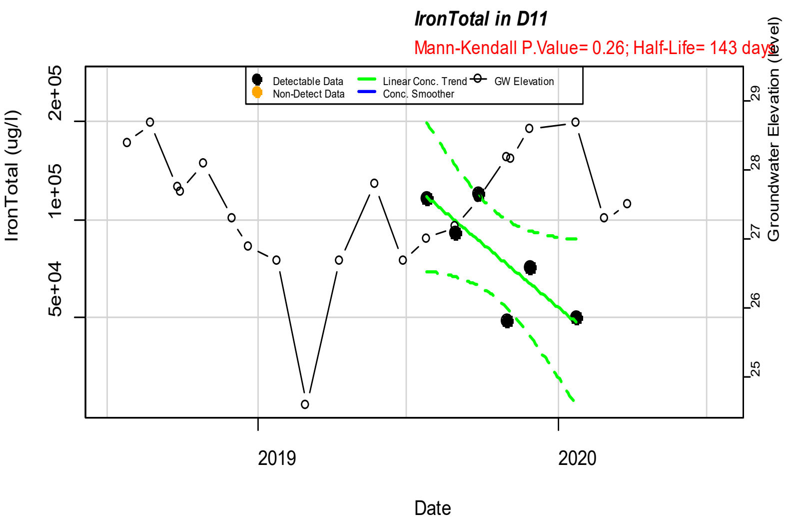

IronTotal in D103
Mann-Kendall P.Value= 0.133; Half-Life= -889 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronTotal (ug/l)
Groundwater Elevation (level)
15000
20000
25000
35000
7.0
7.2
7.4
7.6
7.8
2019
2020
Date

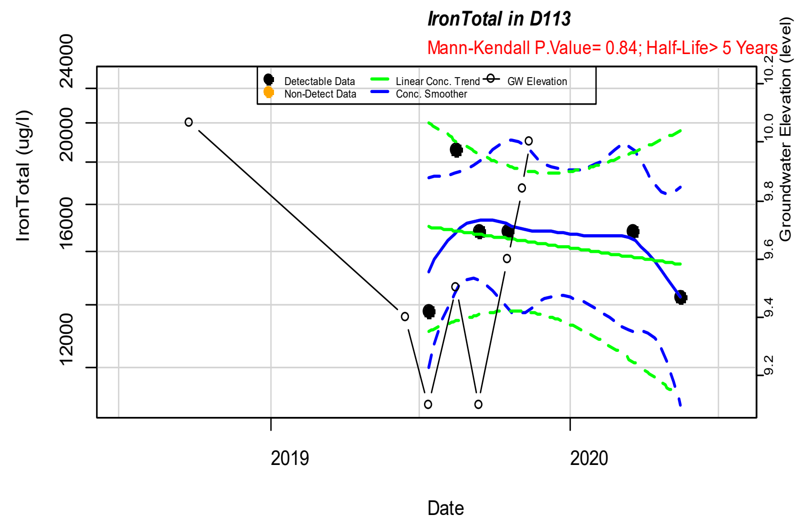

IronTotal in D104
Mann-Kendall P.Value= 0.452; Half-Life= -392 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronTotal (ug/l)
Groundwater Elevation (level)
2000
5000
10000
4.4
4.5
4.6
4.7
4.8
2019
2020
Date

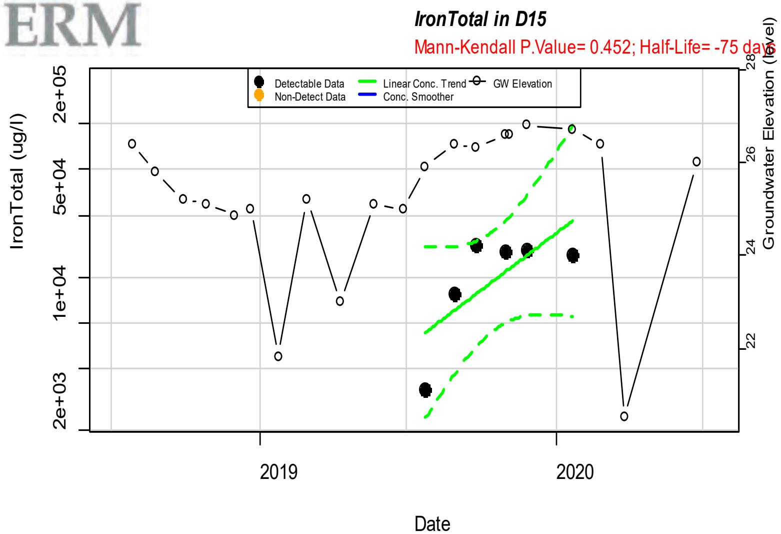

IronTotal in D105
Mann-Kendall P.Value= 0.0603; Half-Life= -453 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronTotal (ug/l)
Groundwater Elevation (level)
20000
30000
40000
6.7
6.8
6.9
7.0
7.1
7.2
7.3
2019
2020
Date

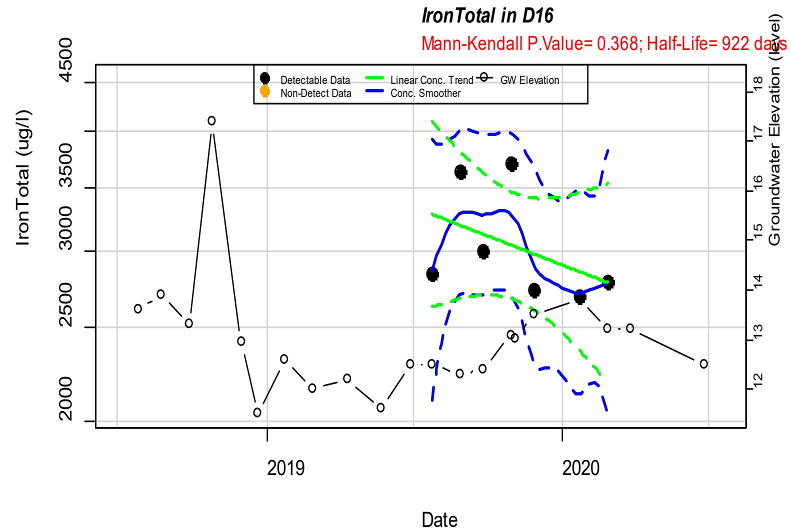

IronTotal in D106
Mann-Kendall P.Value= 1; Half-Life= 484 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronTotal (ug/l)
1e+05
5e+04
2e+04
1e+04
Groundwater Elevation (level)
2.6
2.4
2.2
2.0
1.8
1.6
1.4
2019
2020
Date

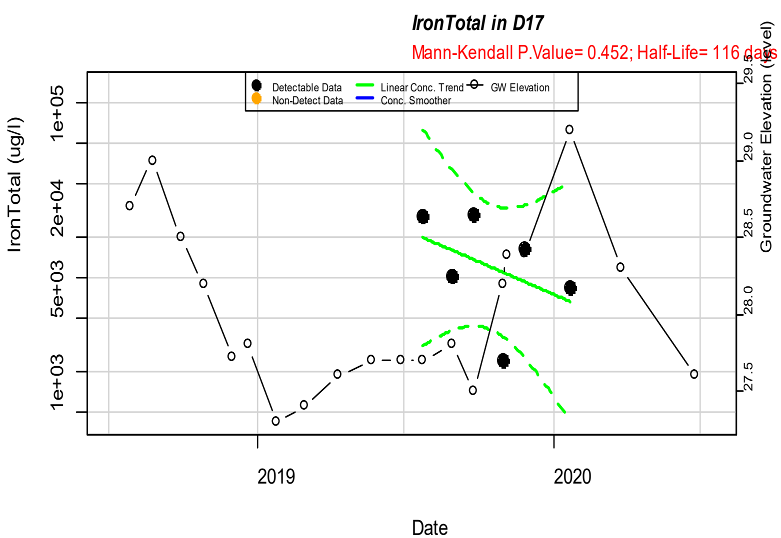

IronTotal in D107
Mann-Kendall P.Value= 1; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronTotal (ug/l)
55000
45000
35000
25000
Groundwater Elevation (level)
2.0
1.8
1.6
1.4
1.2
1.0
2019
2020
Date

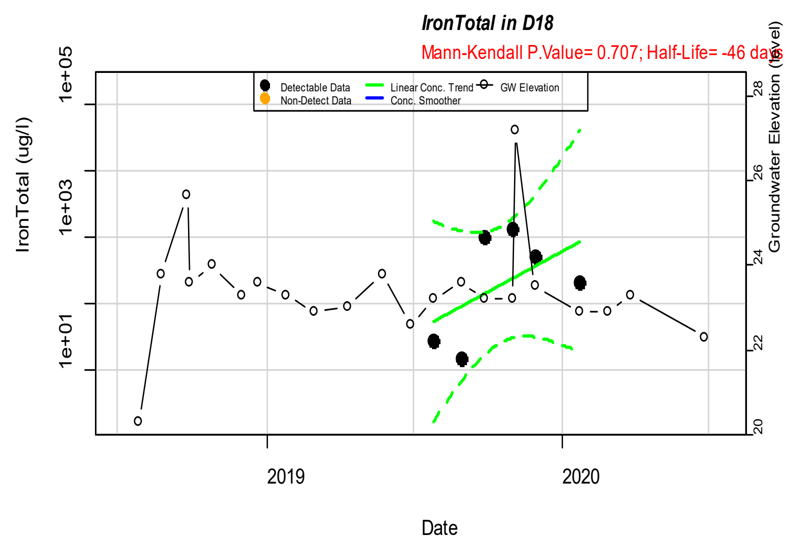

IronTotal in D11
Mann-Kendall P.Value= 0.26; Half-Life= 143 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronTotal (ug/l)
2e+05
1e+05
5e+04
Groundwater Elevation (level)
29
28
27
26
25
2019
2020
Date

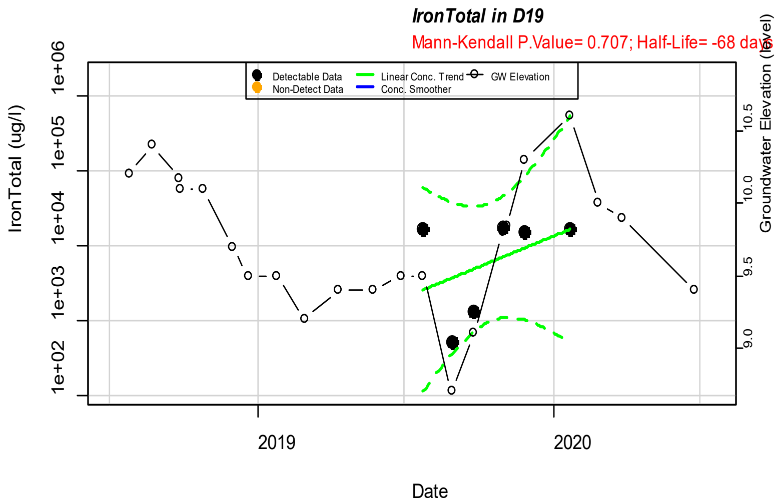

IronTotal in D113
Mann-Kendall P.Value= 0.84; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronTotal (ug/l)
24000
20000
16000
12000
Groundwater Elevation (level)
10.2
10.0
9.8
9.6
9.4
9.2
2019
2020
Date

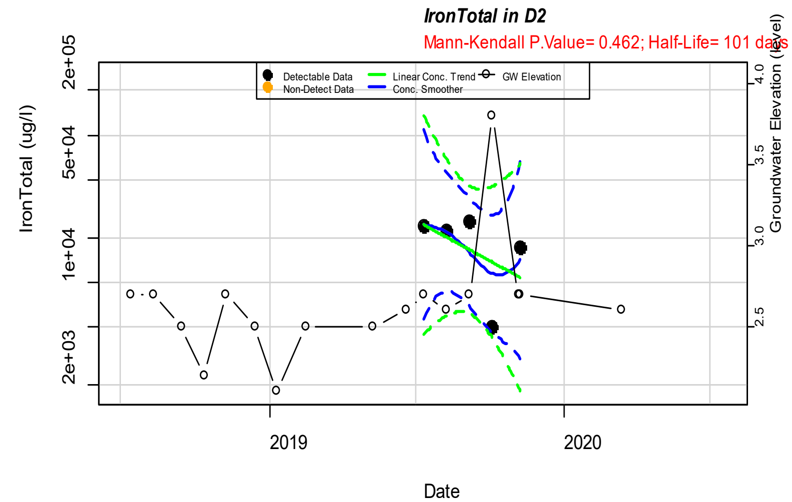

IronTotal in D15
Mann-Kendall P.Value= 0.452; Half-Life= -75 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronTotal (ug/l)
Groundwater Elevation (level)
Date
2e+03
1e+04
5e+04
2e+05
22
24
26
28
2019
2020

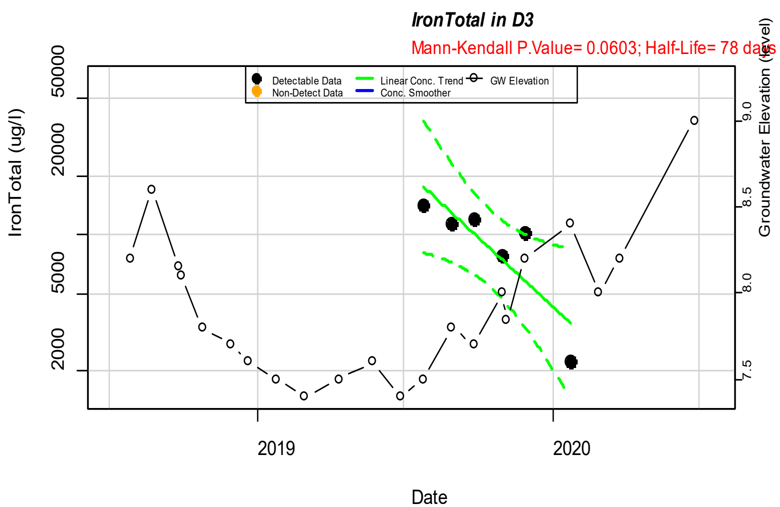

IronTotal in D16
Mann-Kendall P.Value= 0.368; Half-Life= 922 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronTotal (ug/l)
Groundwater Elevation (level)
Date
2000
2500
3000
3500
4500
12
13
14
15
16
17
18
2019
2020

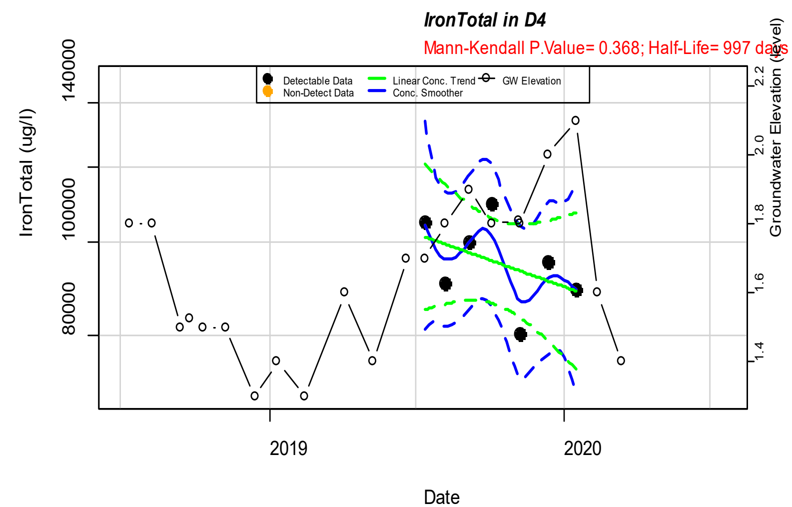

IronTotal in D17
Mann-Kendall P.Value= 0.452; Half-Life= 116 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronTotal (ug/l)
Groundwater Elevation (level)
Date
1e+03
5e+03
2e+04
1e+05
27.5
28.0
28.5
29.0
29.5
2019
2020

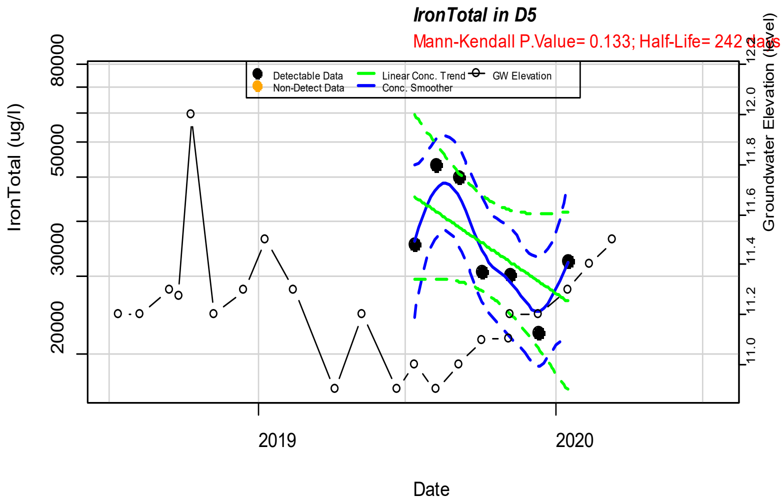

IronTotal in D18
Mann-Kendall P.Value= 0.707; Half-Life= -46 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronTotal (ug/l)
Groundwater Elevation (level)
Date
1e+01
1e+03
1e+05
20
22
24
26
28
2019
2020

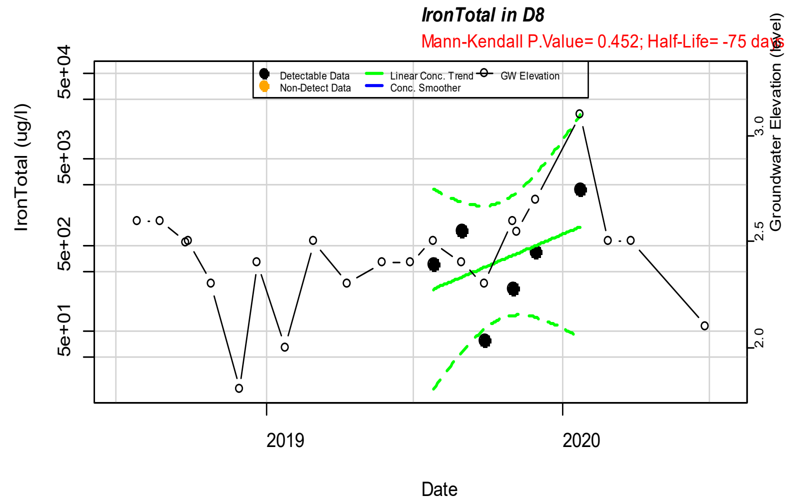

IronTotal in D19
Mann-Kendall P.Value= 0.707; Half-Life= -68 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronTotal (ug/l)
1e+02
1e+03
1e+04
1e+05
1e+06
Groundwater Elevation (level)
9.0
9.5
10.0
10.5
2019
2020
Date

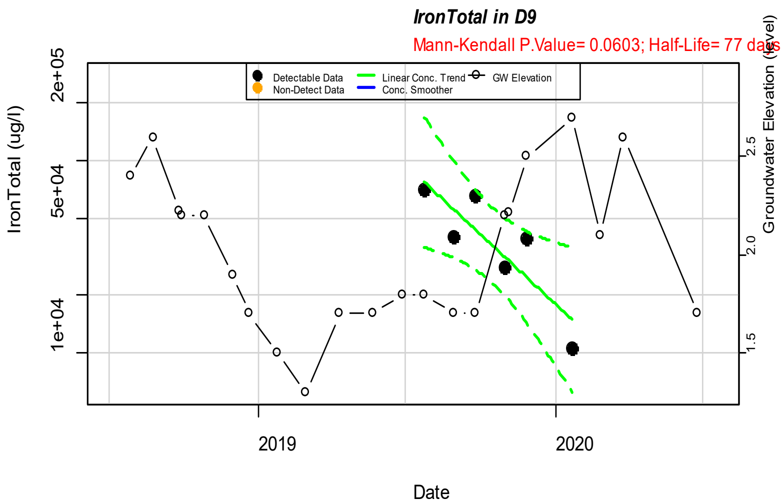

IronTotal in D2
Mann-Kendall P.Value= 0.462; Half-Life= 101 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronTotal (ug/l)
2e+03
1e+04
5e+04
2e+05
Groundwater Elevation (level)
2.5
3.0
3.5
4.0
2019
2020
Date

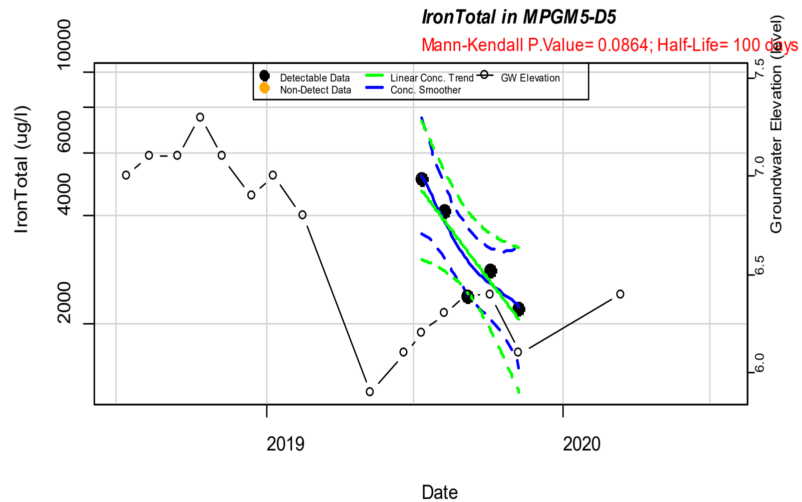

IronTotal in D3
Mann-Kendall P.Value= 0.0603; Half-Life= 78 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronTotal (ug/l)
2000
5000
20000
50000
Groundwater Elevation (level)
7.5
8.0
8.5
9.0
2019
2020
Date

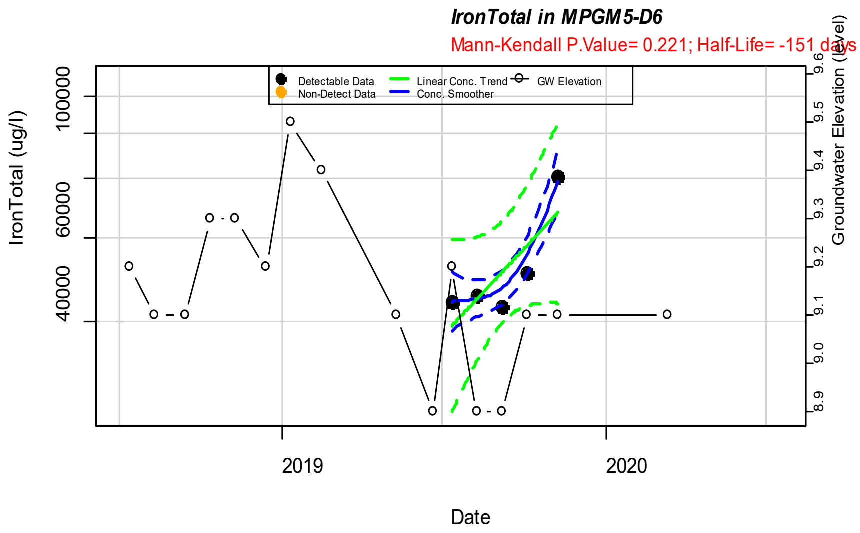

IronTotal in D4
Mann-Kendall P.Value= 0.368; Half-Life= 997 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronTotal (ug/l)
80000
100000
140000
Groundwater Elevation (level)
1.4
1.6
1.8
2.0
2.2
2019
2020
Date


IronTotal in D5
Mann-Kendall P.Value= 0.133; Half-Life= 242 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronTotal (ug/l)
Groundwater Elevation (level)
Date
2019
2020


IronTotal in D8
Mann-Kendall P.Value= 0.452; Half-Life= -75 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronTotal (ug/l)
Groundwater Elevation (level)
Date
2019
2020


IronTotal in D9
Mann-Kendall P.Value= 0.0603; Half-Life= 77 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronTotal (ug/l)
Groundwater Elevation (level)
Date
2019
2020

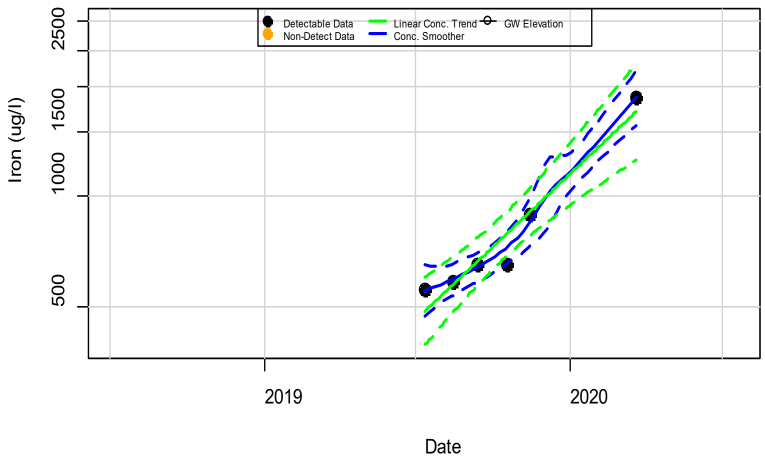

IronTotal in MPGM5-D5
Mann-Kendall P.Value= 0.0864; Half-Life= 100 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronTotal (ug/l)
Groundwater Elevation (level)
Date
2019
2020



IronTotal in MPGM5-D6
Mann-Kendall P.Value= 0.221; Half-Life= -151 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
IronTotal (ug/l)
40000
60000
100000
Groundwater Elevation (level)
8.9
9.0
9.1
9.2
9.3
9.4
9.5
9.6
2019
2020
Date

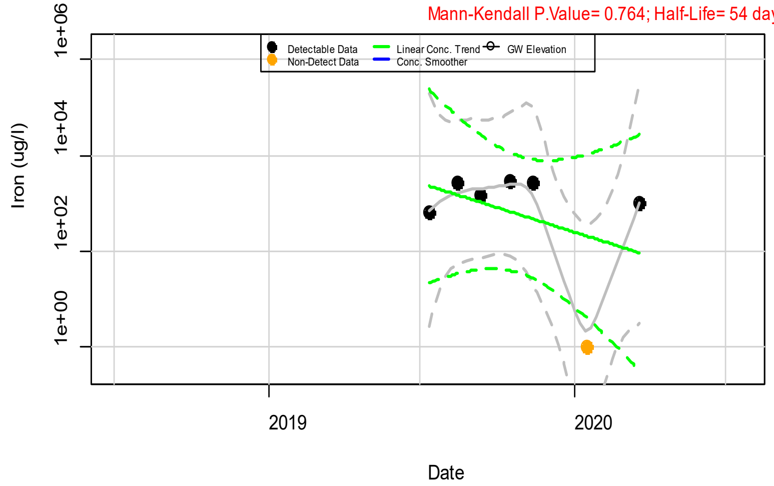
Iron in C

Mann-Kendall P.Value= <0.01; Half-Life= -140 days



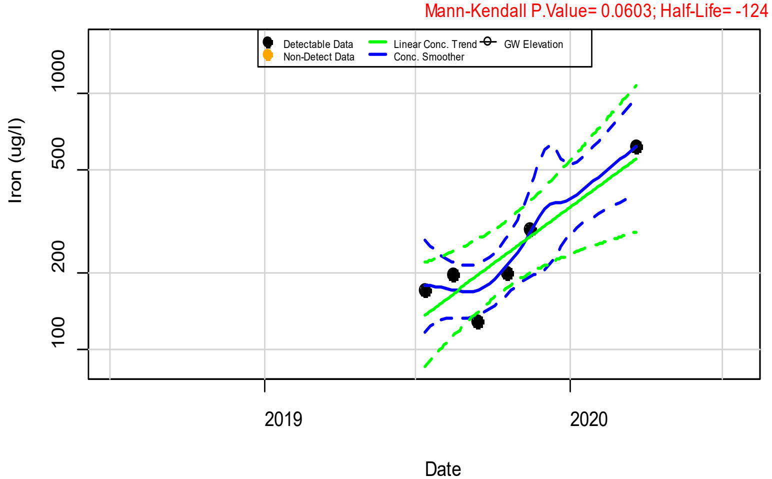
Iron in E

Mann-Kendall P.Value= 0.764; Half-Life= 54 days



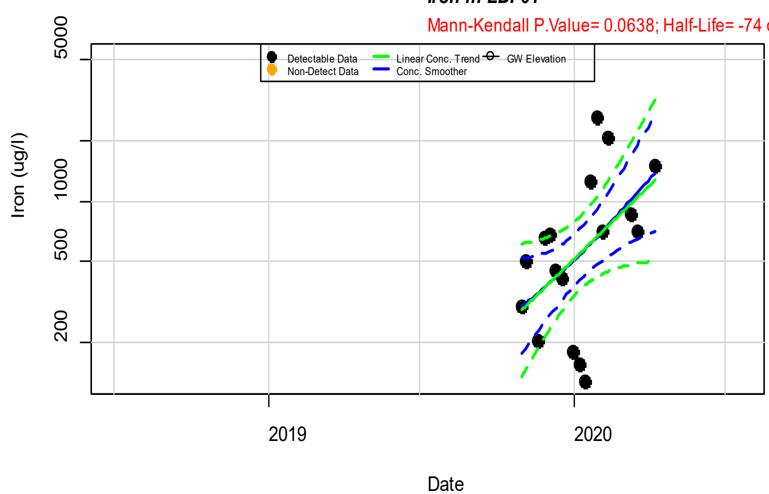
Iron in G

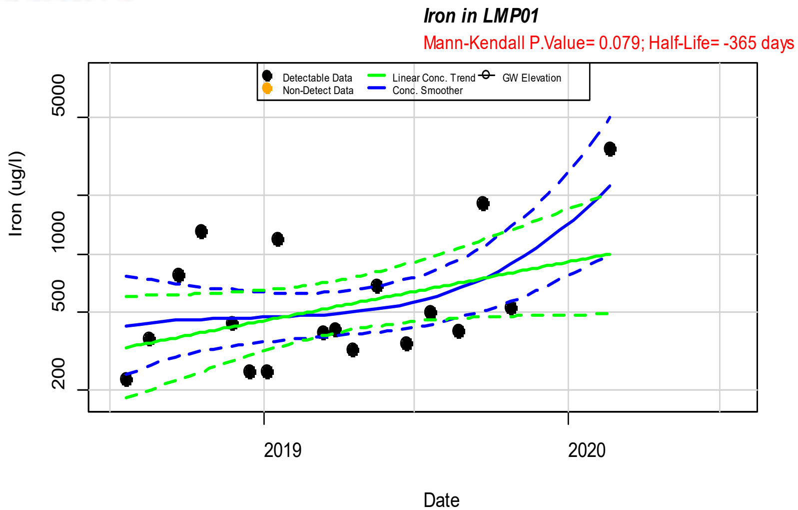
Mann-Kendall P.Value= 0.0603; Half-Life= -124 days



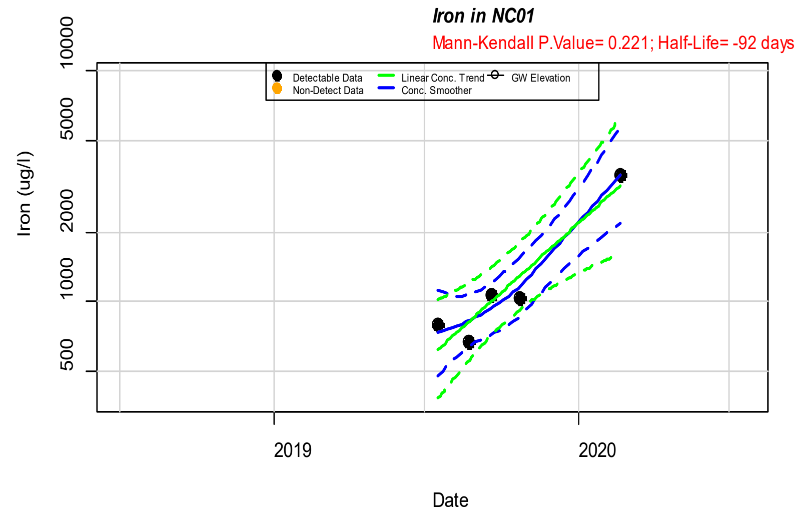
Iron in LDP01

Mann-Kendall P.Value= 0.0638; Half-Life= -74 days

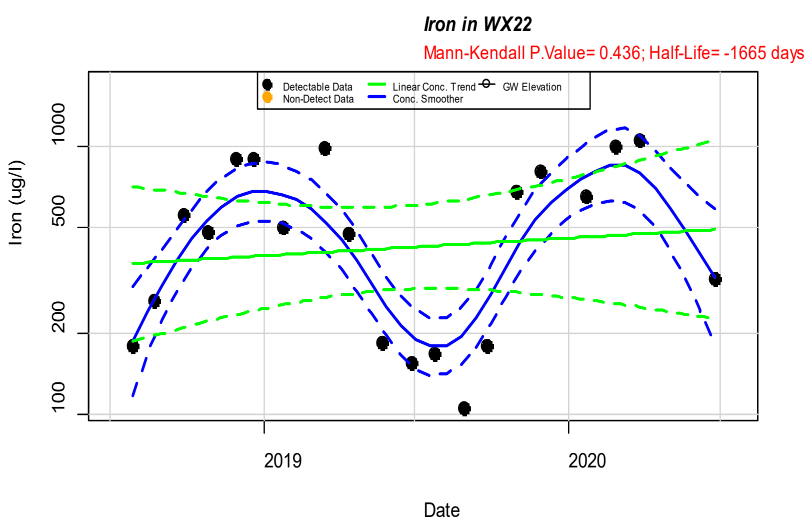




Iron in LMP01
Mann-Kendall P.Value= 0.079; Half-Life= -365 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Iron (ug/l)
200
500
1000
5000
2019
2020
Date



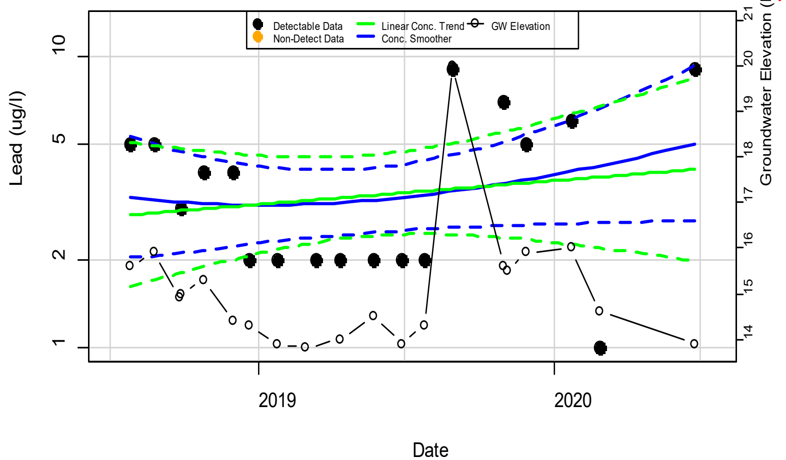
Iron in NC01
Mann-Kendall P.Value= 0.221; Half-Life= -92 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Iron (ug/l)
500
1000
2000
5000
10000
2019
2020
Date



Iron in WX22
Mann-Kendall P.Value= 0.436; Half-Life= -1665 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Iron (ug/l)
100
200
500
1000
2019
2020
Date

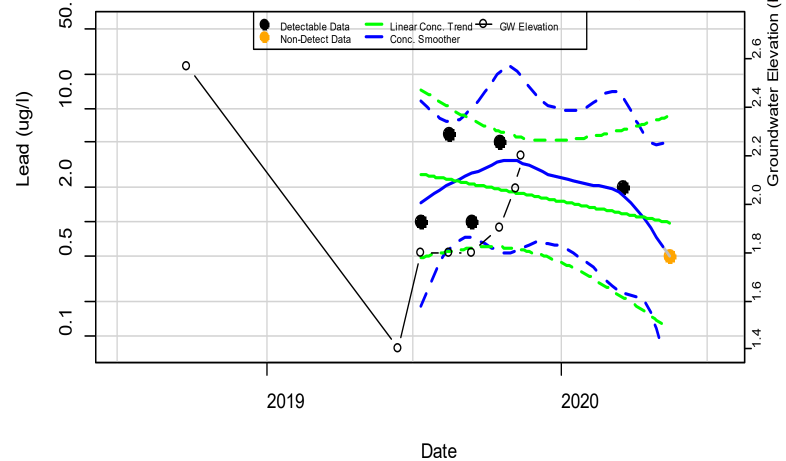
Lead in D10

Mann-Kendall P.Value= 0.937; Half-Life= -1355 days



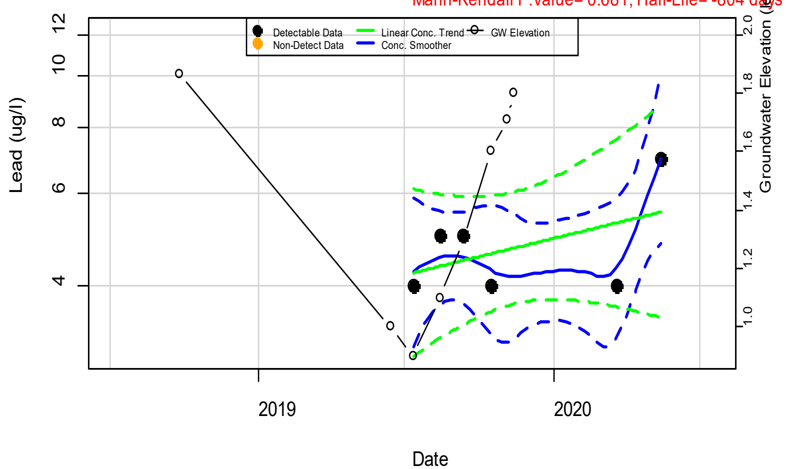
Lead in D106

Mann-Kendall P.Value= 0.566; Half-Life= 217 days



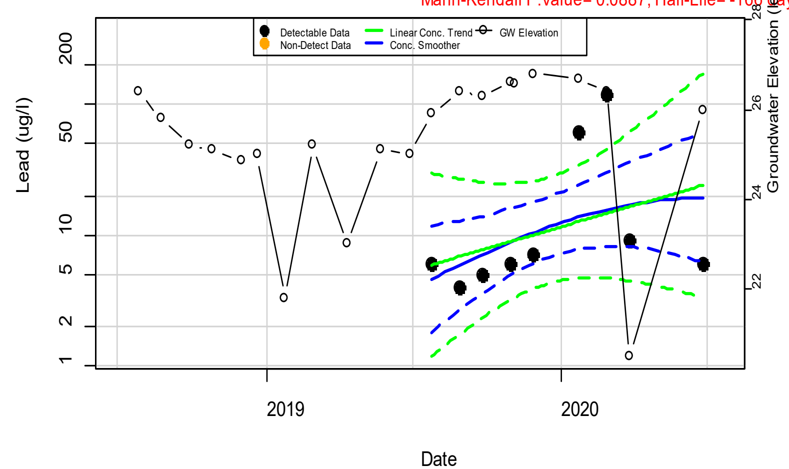
Lead in D107

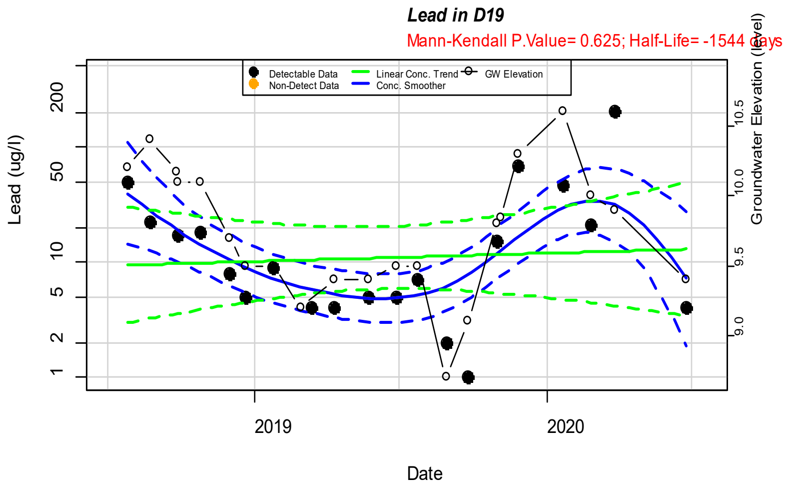
Mann-Kendall P.Value= 0.681; Half-Life= -804 days

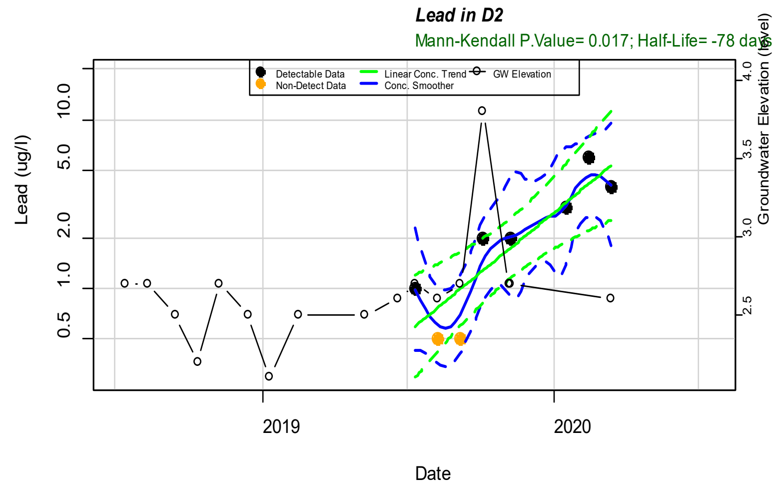


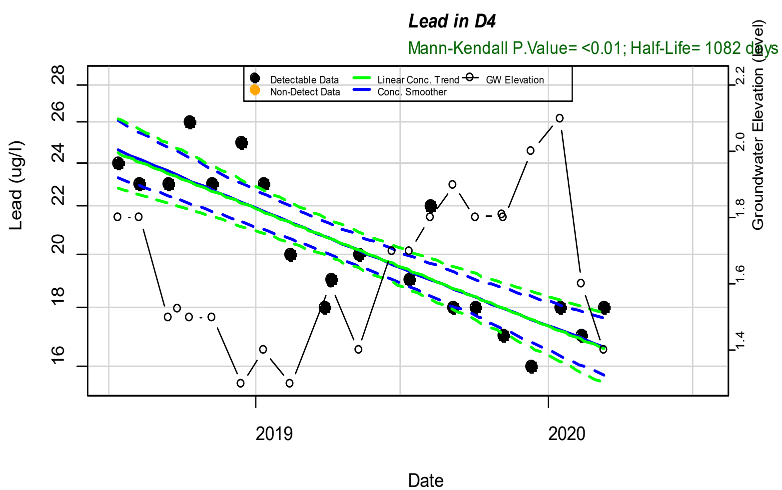
Lead in D15

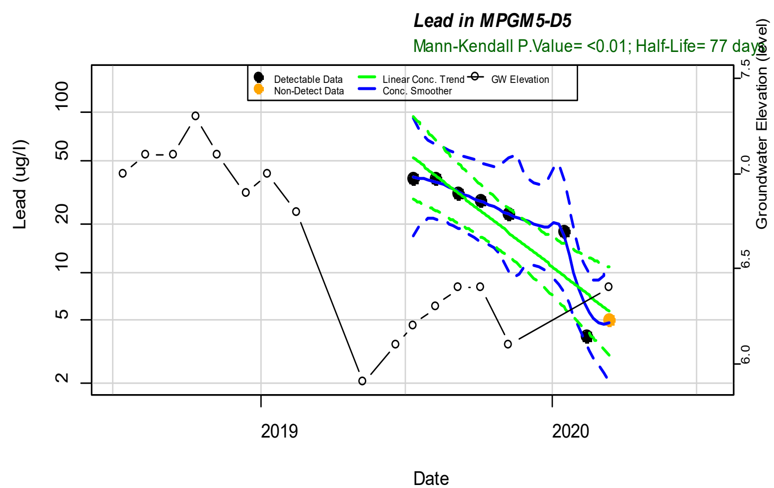
Mann-Kendall P.Value= 0.0887; Half-Life= -166 days

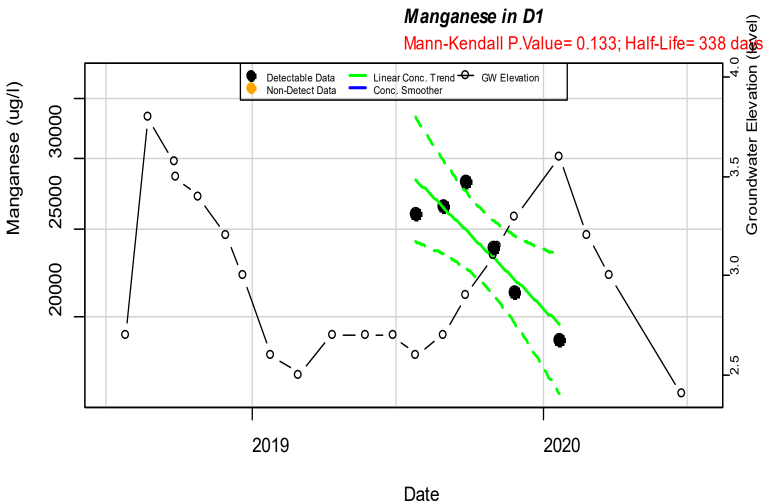


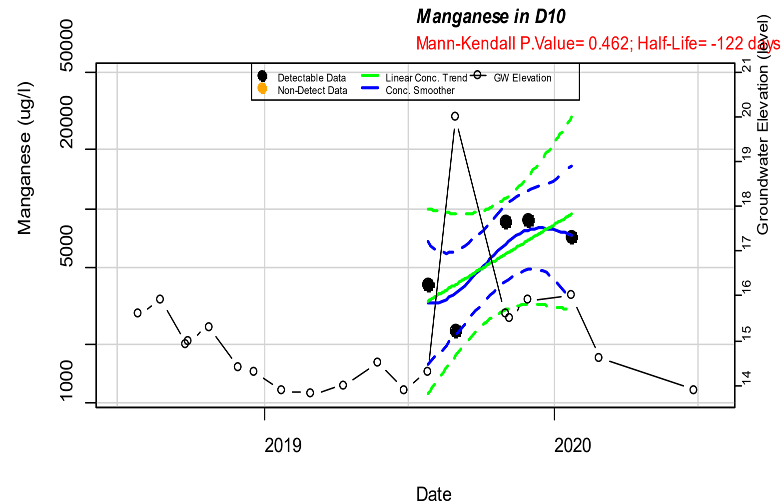

Lead in D19
Mann-Kendall P.Value= 0.625; Half-Life= -1544 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Lead (ug/l)
Groundwater Elevation (level)
Date
2019
2020

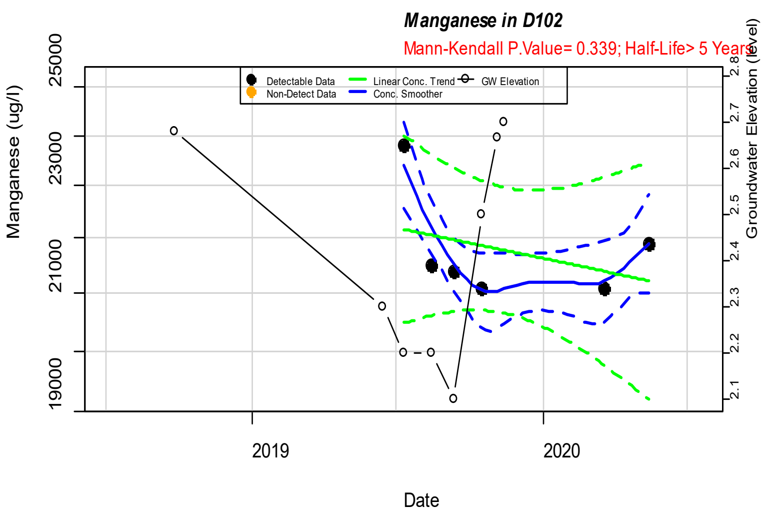

Lead in D2
Mann-Kendall P.Value= 0.017; Half-Life= -78 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Lead (ug/l)
Groundwater Elevation (level)
Date
2019
2020

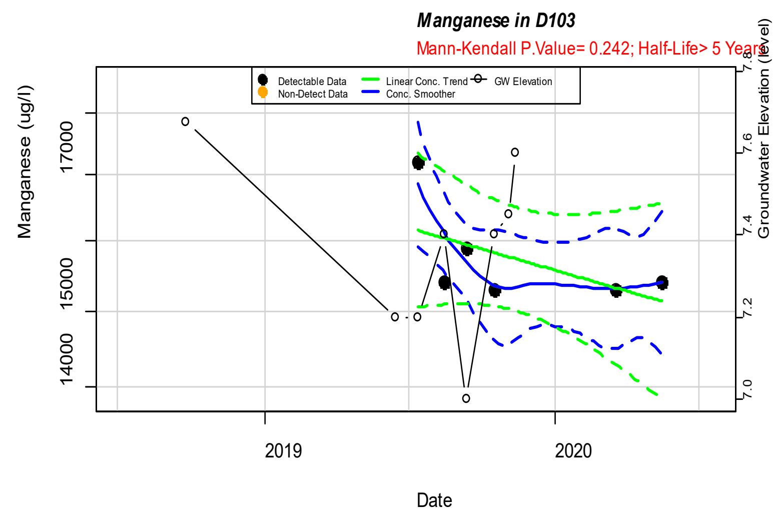

Lead in D4
Mann-Kendall P.Value= <0.01; Half-Life= 1082 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Lead (ug/l)
Groundwater Elevation (level)
Date
2019
2020

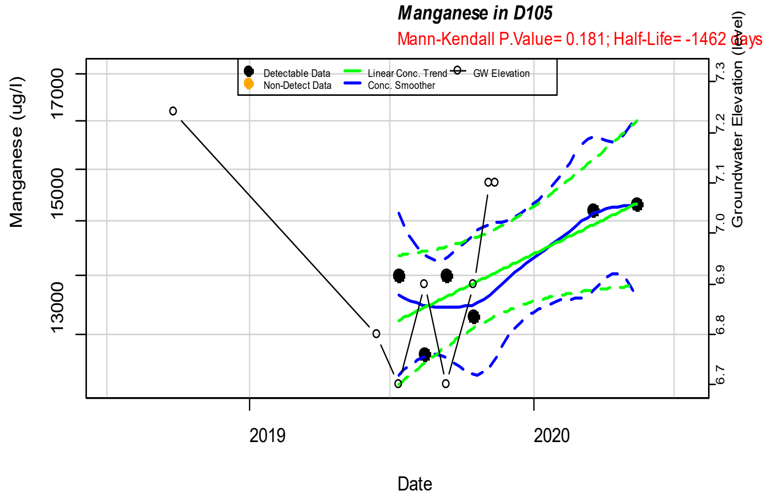

Lead in MPGM5-D5
Mann-Kendall P.Value= <0.01; Half-Life= 77 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Lead (ug/l)
Groundwater Elevation (level)
Date
2019
2020

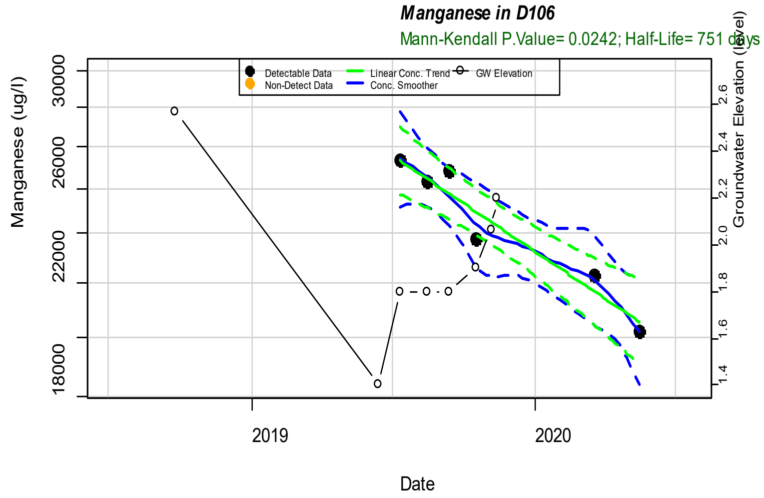

Manganese in D1
Mann-Kendall P.Value= 0.133; Half-Life= 338 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Manganese (ug/l)
Groundwater Elevation (level)
Date
2019
2020

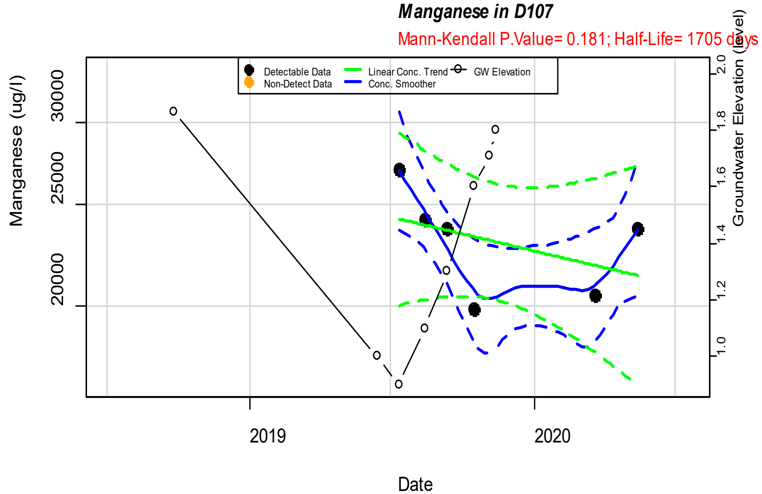

Manganese in D10
Mann-Kendall P.Value= 0.462; Half-Life= -122 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Manganese (ug/l)
Groundwater Elevation (level)
Date
2019
2020

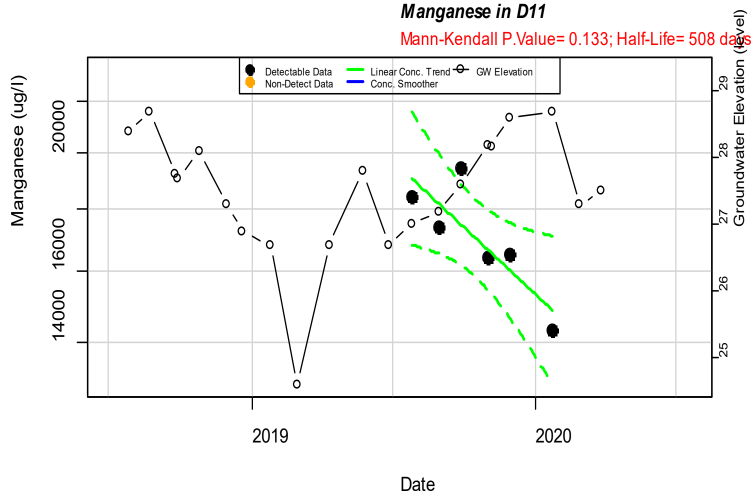

Manganese in D102
Mann-Kendall P.Value= 0.339; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Manganese (ug/l)
Groundwater Elevation (level)
Date
2019
2020

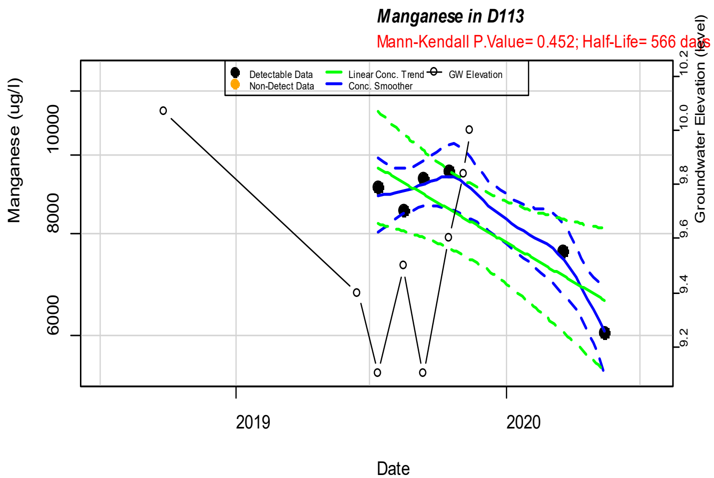

Manganese in D103
Mann-Kendall P.Value= 0.242; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Manganese (ug/l)
Groundwater Elevation (level)
Date
2019
2020


Manganese in D105
Mann-Kendall P.Value= 0.181; Half-Life= -1462 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Manganese (ug/l)
Groundwater Elevation (level)
Date
2019
2020

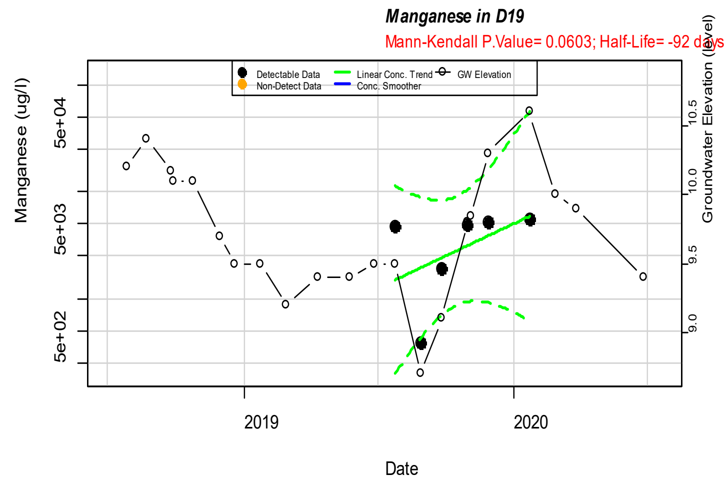

Manganese in D106
Mann-Kendall P.Value= 0.0242; Half-Life= 751 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Manganese (ug/l)
Groundwater Elevation (level)
Date
2019
2020


Manganese in D107
Mann-Kendall P.Value= 0.181; Half-Life= 1705 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Manganese (ug/l)
Groundwater Elevation (level)
Date
2019
2020

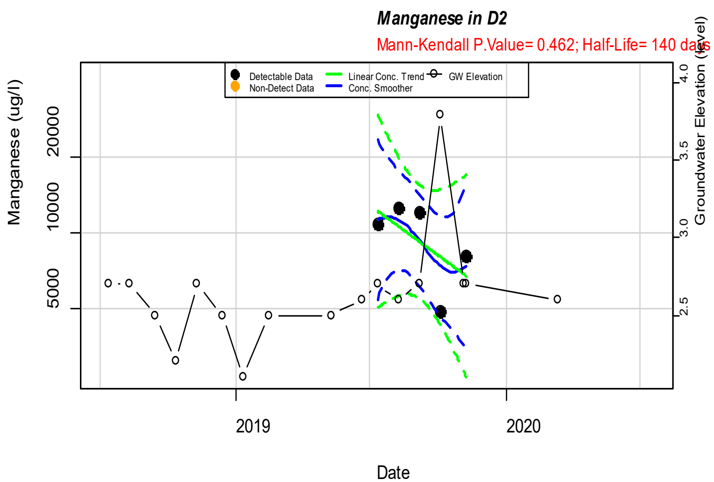

Manganese in D11
Mann-Kendall P.Value= 0.133; Half-Life= 508 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Manganese (ug/l)
Groundwater Elevation (level)
Date
2019
2020



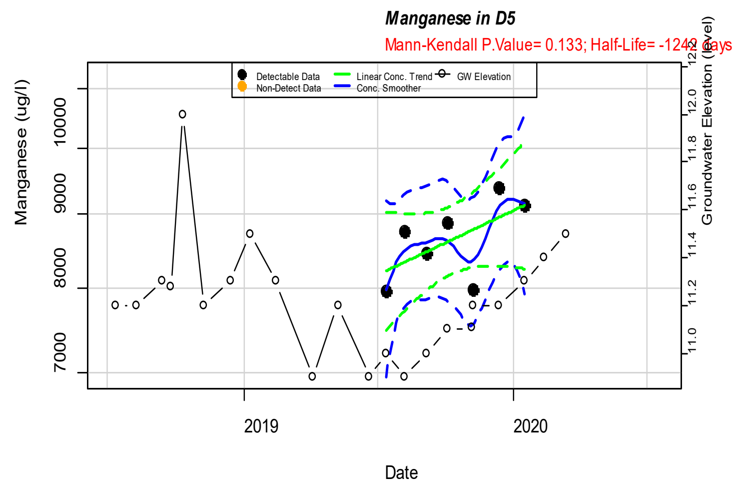
Manganese in D113
Mann-Kendall P.Value= 0.452; Half-Life= 566 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Manganese (ug/l)
Groundwater Elevation (level)
6000
8000
10000
9.2
9.4
9.6
9.8
10.0
10.2
2019
2020
Date



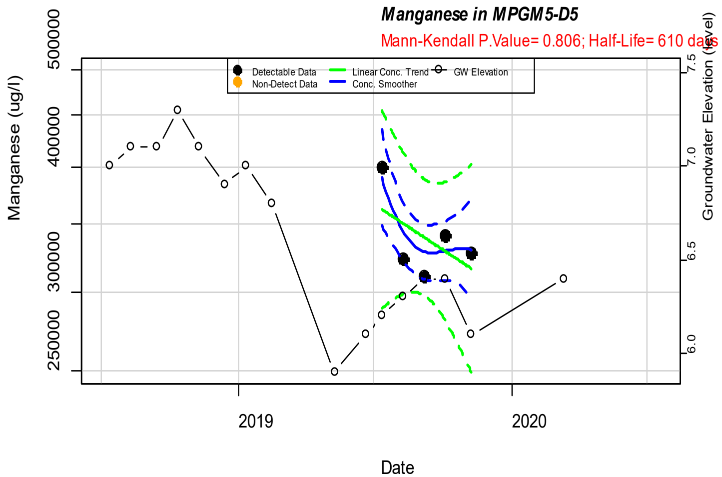
Manganese in D19
Mann-Kendall P.Value= 0.0603; Half-Life= -92 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Manganese (ug/l)
Groundwater Elevation (level)
5e+02
5e+03
5e+04
9.0
9.5
10.0
10.5
2019
2020
Date

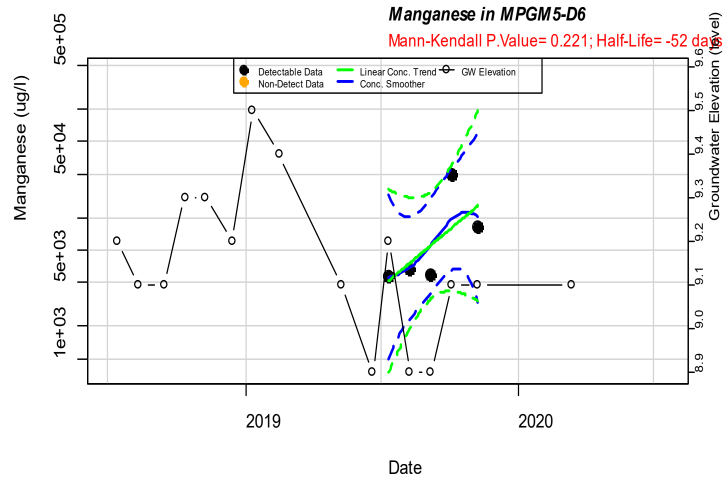


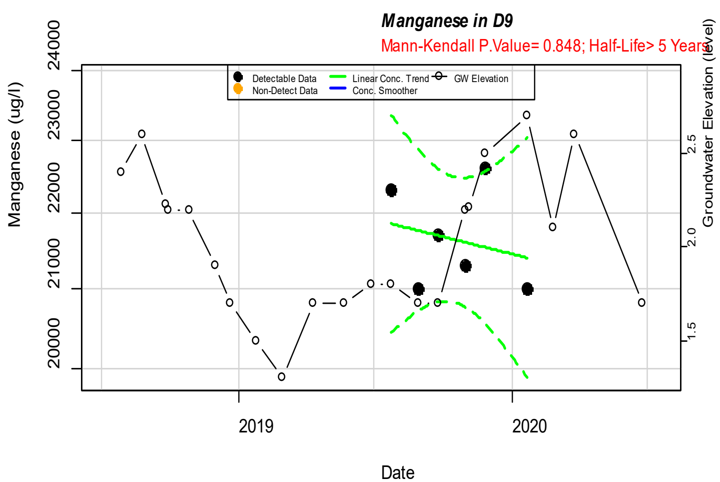
Manganese in D2
Mann-Kendall P.Value= 0.462; Half-Life= 140 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Manganese (ug/l)
Groundwater Elevation (level)
5000
10000
20000
2.5
3.0
3.5
4.0
2019
2020
Date

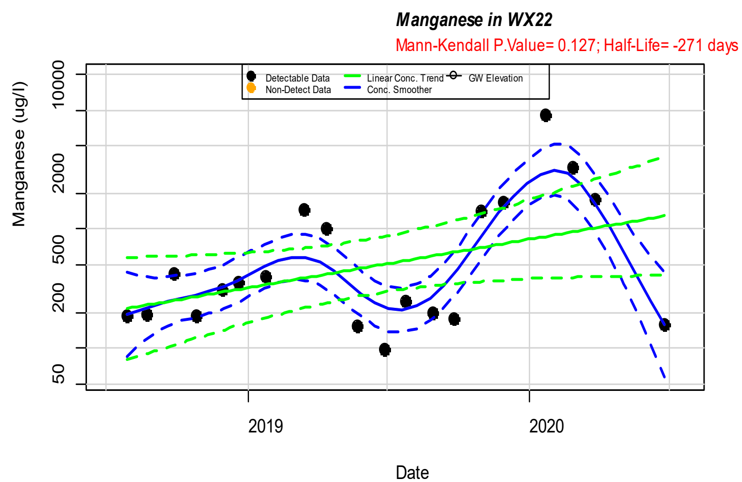


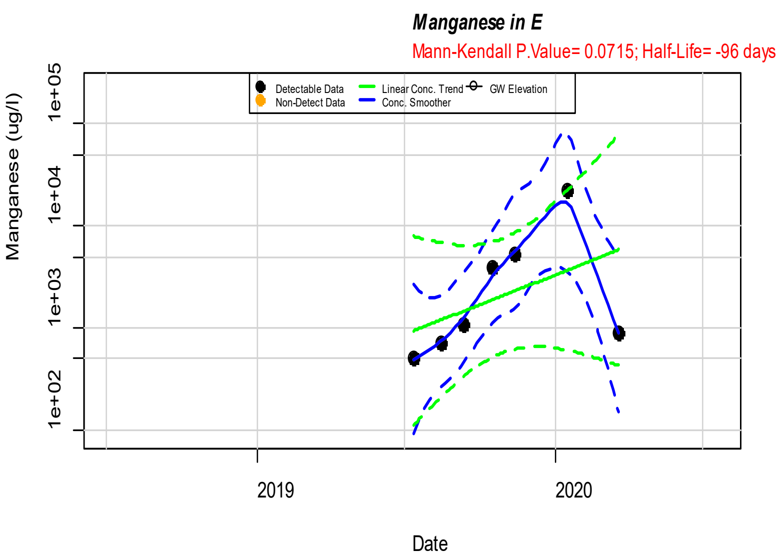
Manganese in D5
Mann-Kendall P.Value= 0.133; Half-Life= -1242 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Manganese (ug/l)
Groundwater Elevation (level)
7000
8000
9000
10000
11.0
11.2
11.4
11.6
11.8
12.0
2019
2020
Date


Manganese in MPGM5-D5
Mann-Kendall P.Value= 0.806; Half-Life= 610 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Manganese (ug/l)
Groundwater Elevation (level)
250000
300000
400000
500000
6.0
6.5
7.0
7.5
2019
2020
Date


Manganese in MPGM5-D6
Mann-Kendall P.Value= 0.221; Half-Life= -52 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Manganese (ug/l)
Groundwater Elevation (level)
1e+03
5e+03
5e+04
5e+05
8.9
9.0
9.1
9.2
9.3
9.4
9.5
9.6
2019
2020
Date


Manganese in D9
Mann-Kendall P.Value= 0.848; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Manganese (ug/l)
Groundwater Elevation (level)
20000
21000
22000
23000
24000
1.5
2.0
2.5
2019
2020
Date

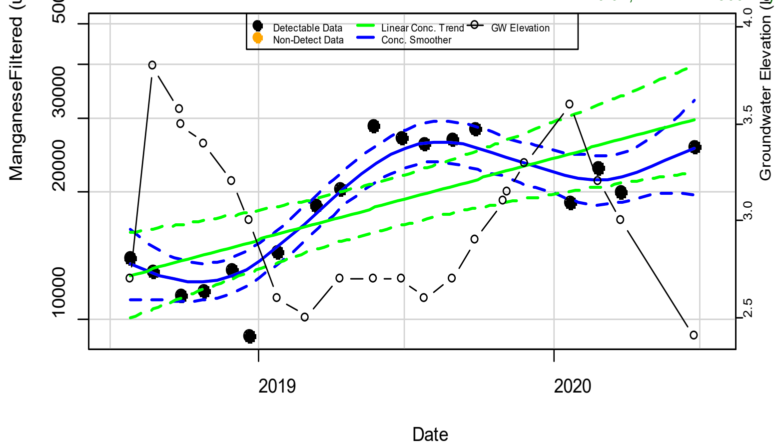

Manganese in WX22
Mann-Kendall P.Value= 0.127; Half-Life= -271 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Manganese (ug/l)
50
200
500
2000
10000
2019
2020
Date



Manganese in E
Mann-Kendall P.Value= 0.0715; Half-Life= -96 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Manganese (ug/l)
1e+05
1e+04
1e+03
1e+02
2019
2020
Date

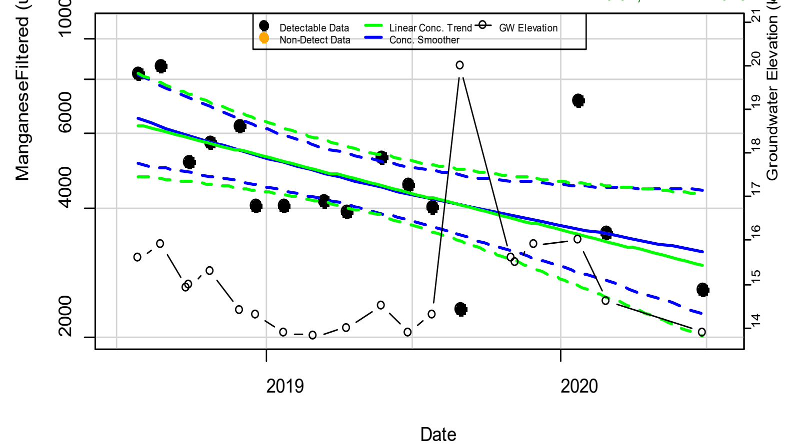
ManganeseFiltered in D1

Mann-Kendall P.Value= <0.01; Half-Life= -569 days

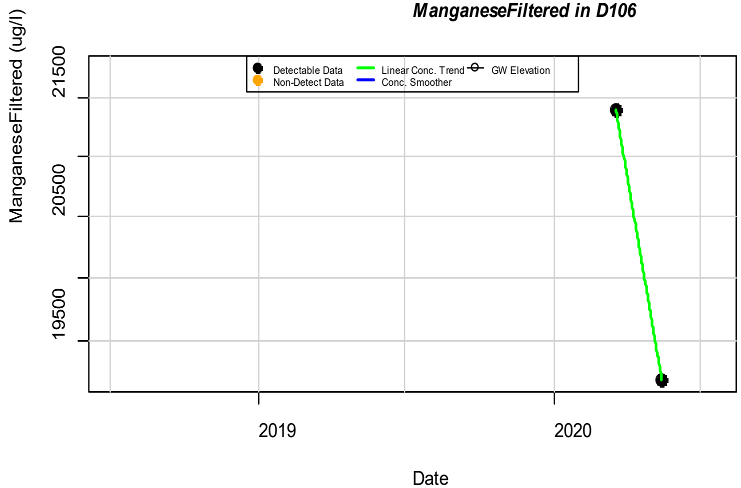


ManganeseFiltered in D10

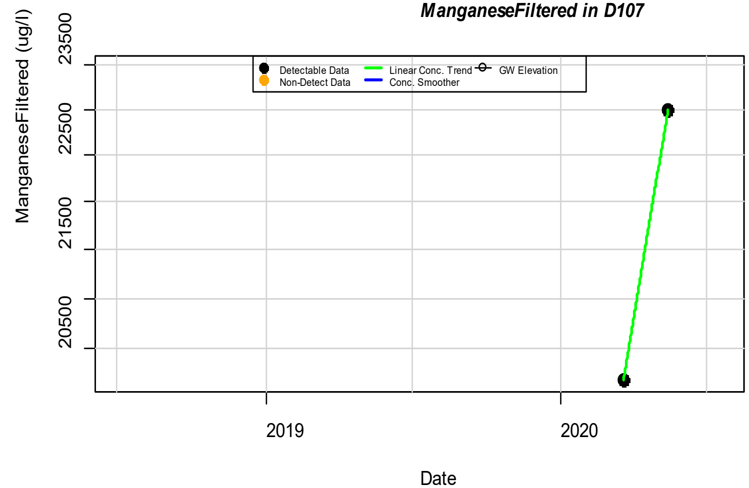
Mann-Kendall P.Value= <0.01; Half-Life= 645 days

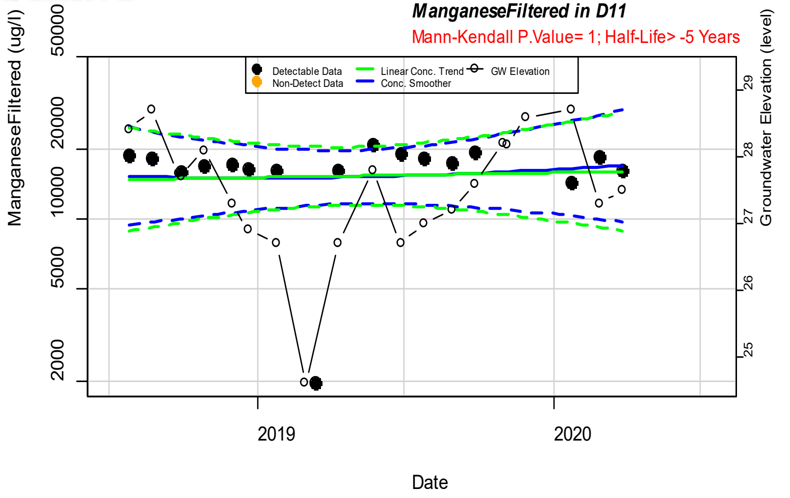


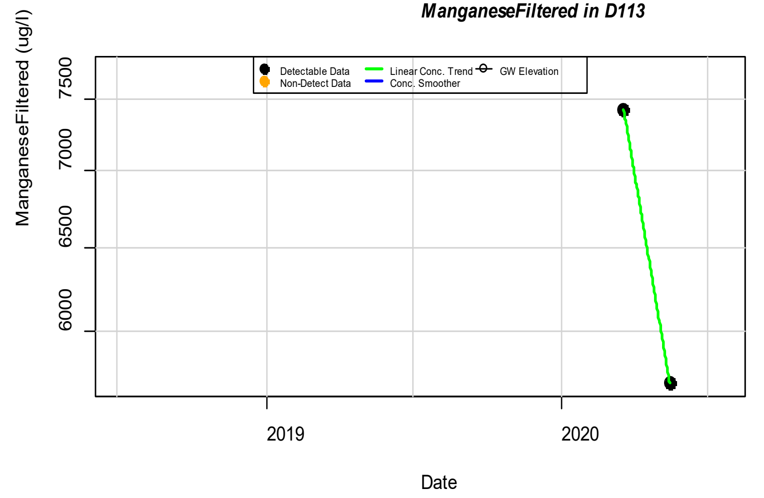
ManganeseFiltered in D106

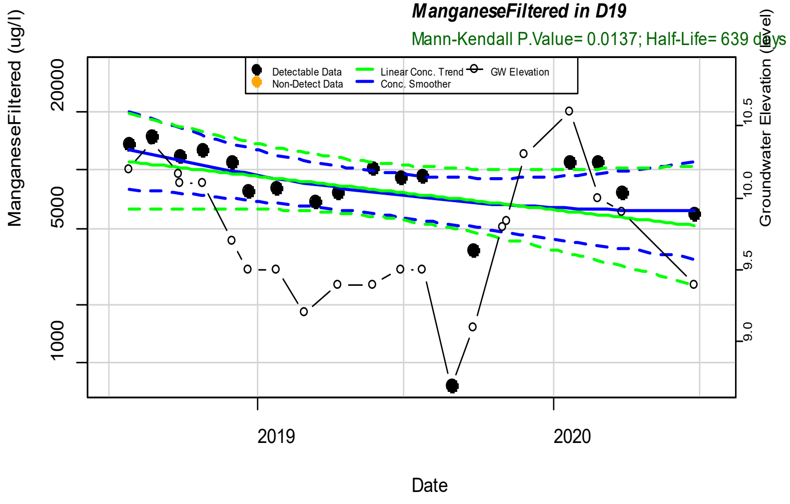


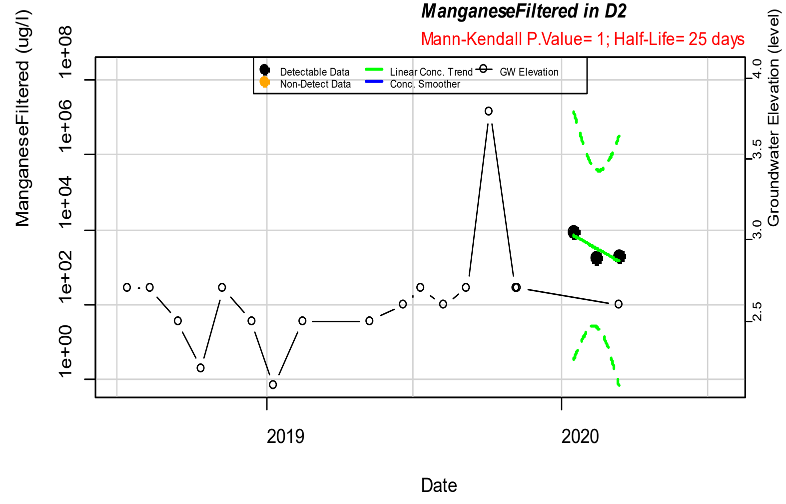
ManganeseFiltered in D107

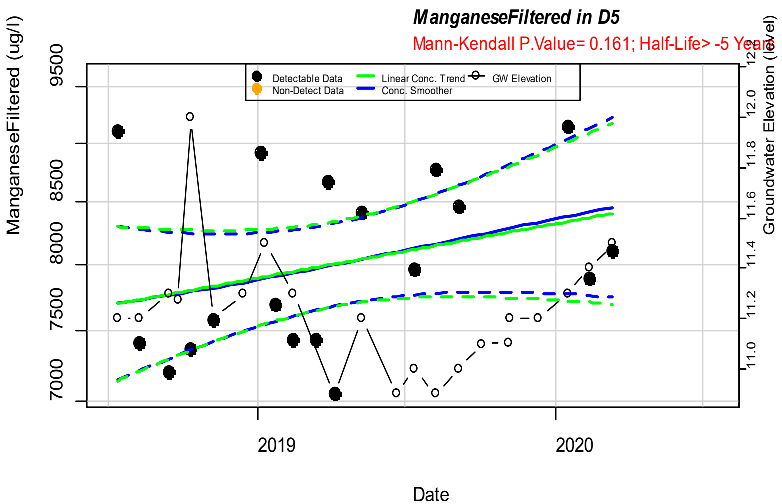


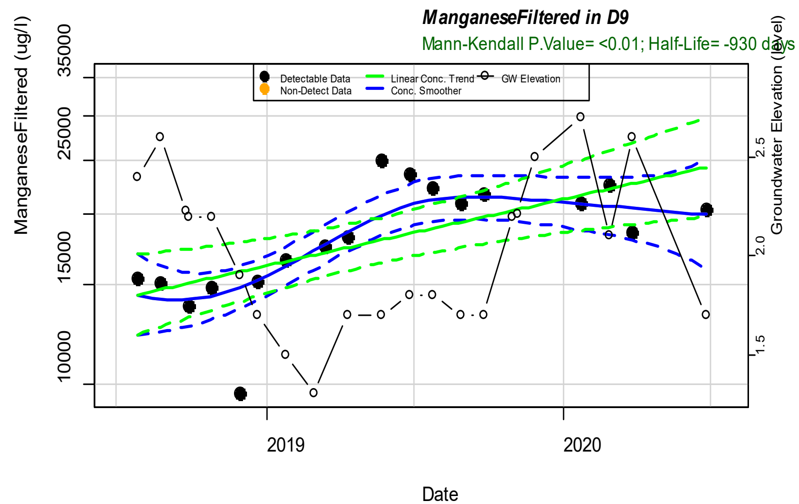

ManganeseFiltered in D11
Mann-Kendall P.Value= 1; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
ManganeseFiltered (ug/l)
Groundwater Elevation (level)
2000
5000
10000
20000
50000
25
26
27
28
29
2019
2020
Date

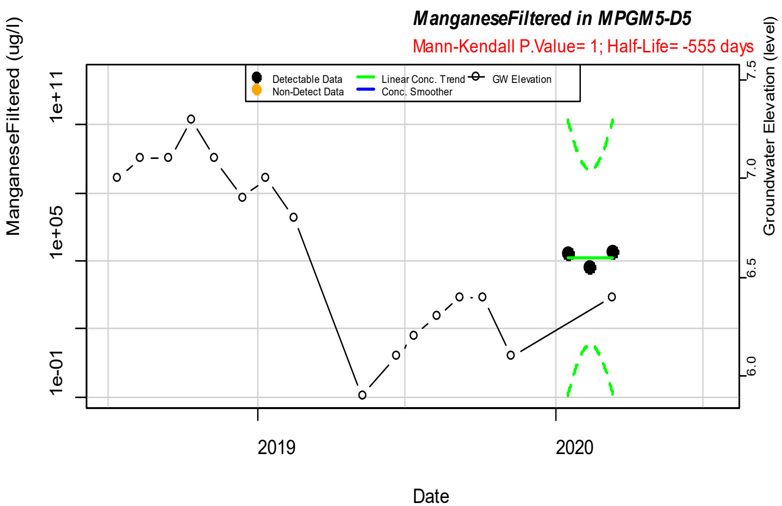

ManganeseFiltered in D113
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
ManganeseFiltered (ug/l)
6000
6500
7000
7500
2019
2020
Date

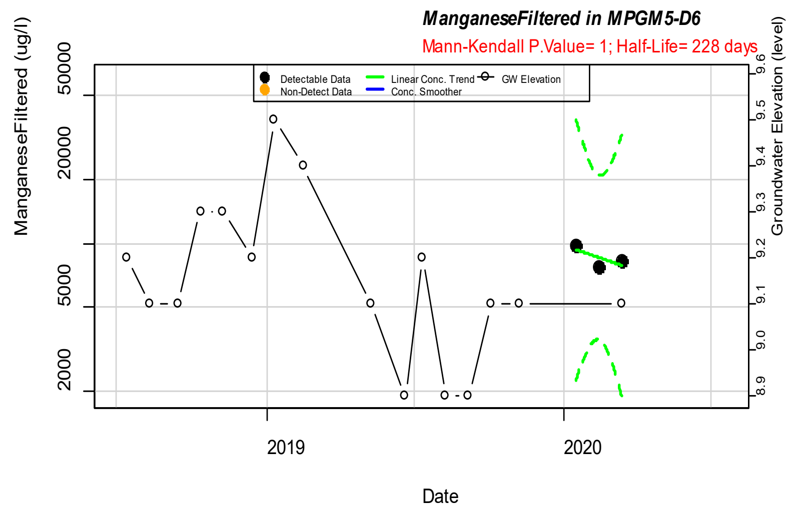

ManganeseFiltered in D19
Mann-Kendall P.Value= 0.0137; Half-Life= 639 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
ManganeseFiltered (ug/l)
Groundwater Elevation (level)
1000
5000
20000
9.0
9.5
10.0
10.5
2019
2020
Date

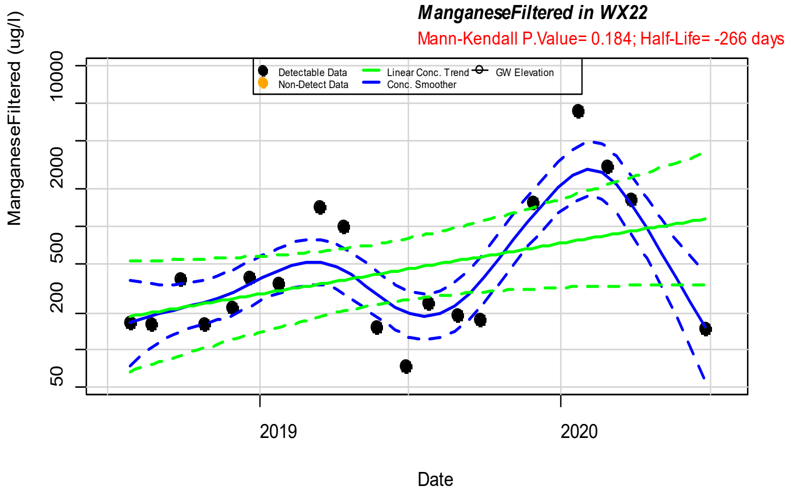

ManganeseFiltered in D2
Mann-Kendall P.Value= 1; Half-Life= 25 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
ManganeseFiltered (ug/l)
Groundwater Elevation (level)
1e+00
1e+02
1e+04
1e+06
1e+08
2.5
3.0
3.5
4.0
2019
2020
Date


ManganeseFiltered in D5
Mann-Kendall P.Value= 0.161; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
ManganeseFiltered (ug/l)
Groundwater Elevation (level)
Date
2019
2020

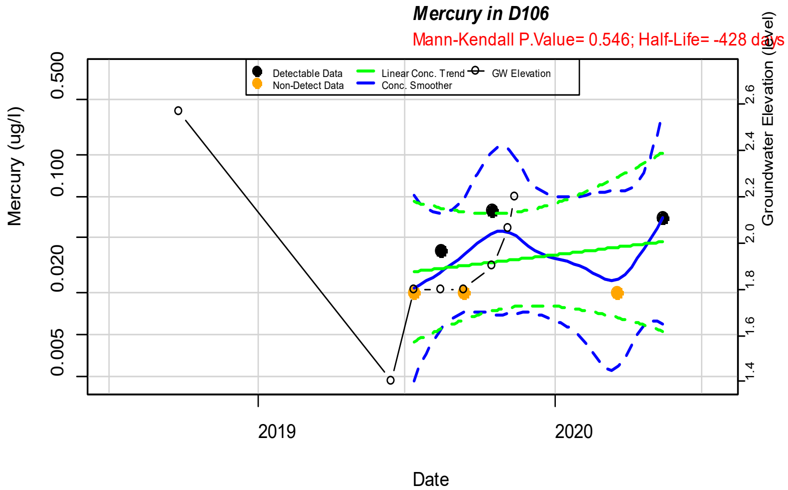

ManganeseFiltered in D9
Mann-Kendall P.Value= <0.01; Half-Life= -930 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
ManganeseFiltered (ug/l)
Groundwater Elevation (level)
Date
2019
2020

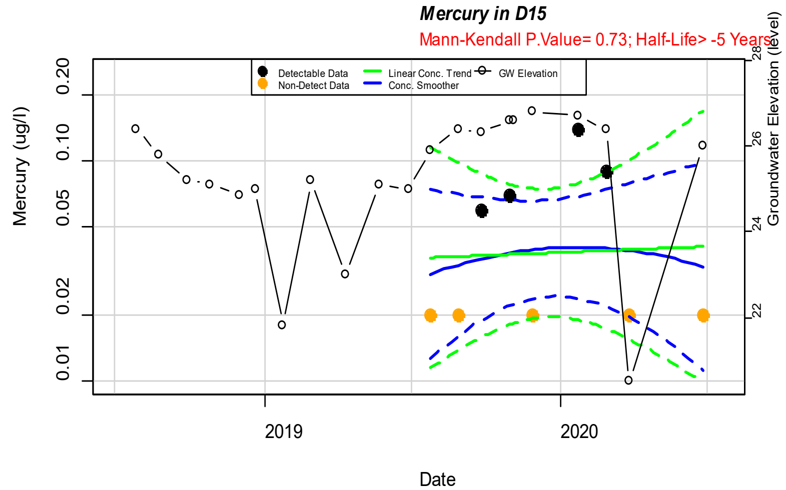

ManganeseFiltered in MPGM5-D5
Mann-Kendall P.Value= 1; Half-Life= -555 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
ManganeseFiltered (ug/l)
Groundwater Elevation (level)
Date
2019
2020

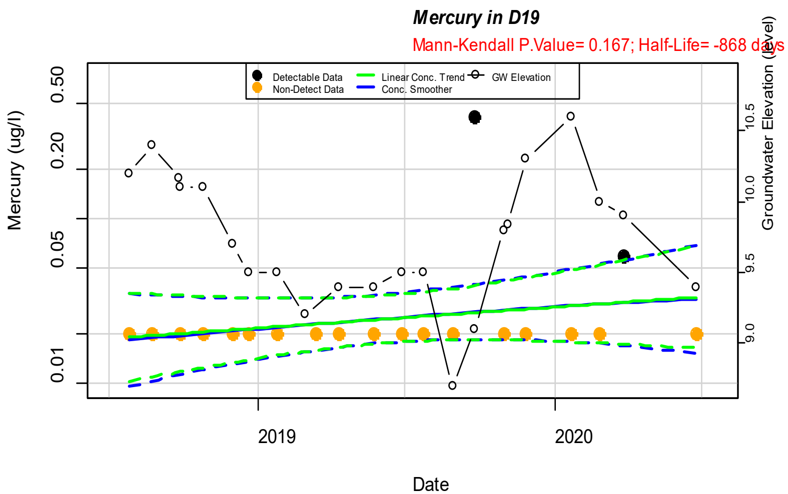

ManganeseFiltered in MPGM5-D6
Mann-Kendall P.Value= 1; Half-Life= 228 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
ManganeseFiltered (ug/l)
Groundwater Elevation (level)
Date
2019
2020

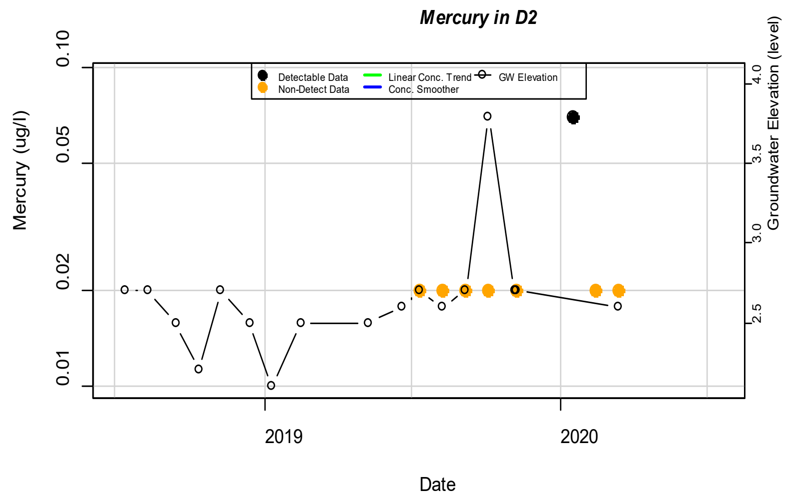


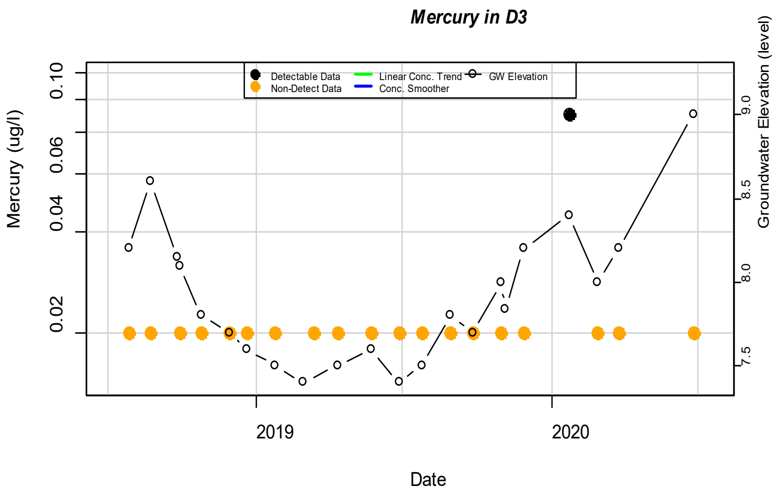
ManganeseFiltered in WX22
Mann-Kendall P.Value= 0.184; Half-Life= -266 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
ManganeseFiltered (ug/l)
10000
2000
500
200
50
2019
2020
Date

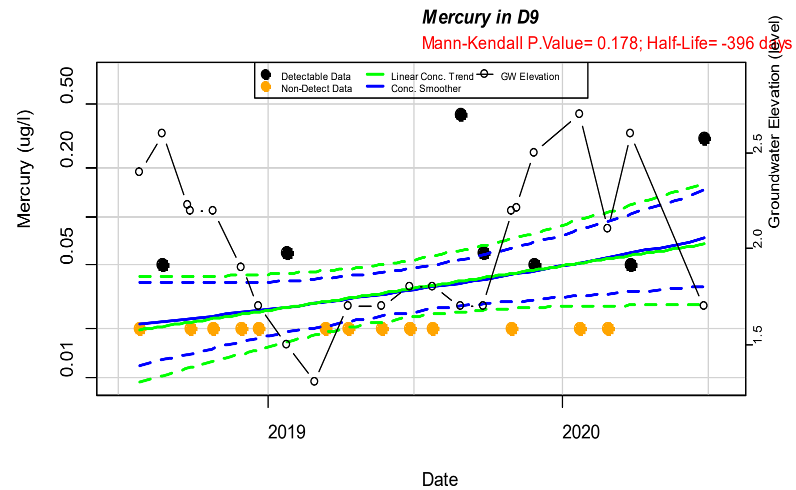

Mercury in D106
Mann-Kendall P.Value= 0.546; Half-Life= -428 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Mercury (ug/l)
Groundwater Elevation (level)
Date
2019
2020

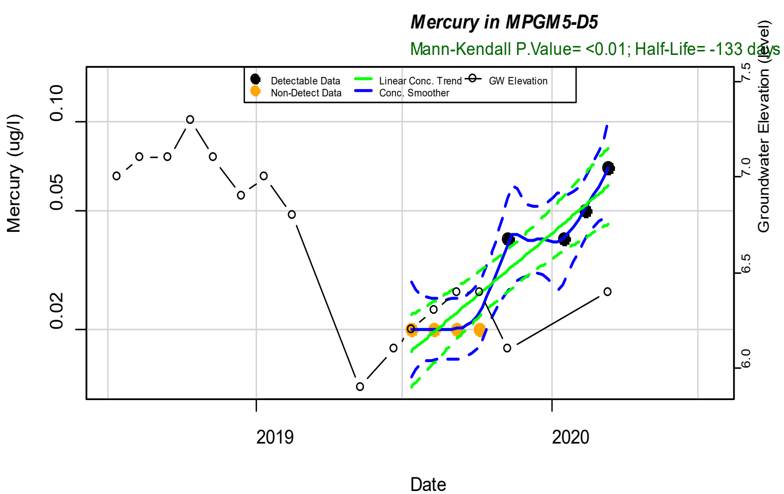

Mercury in D15
Mann-Kendall P.Value= 0.73; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Mercury (ug/l)
Groundwater Elevation (level)
Date
2019
2020

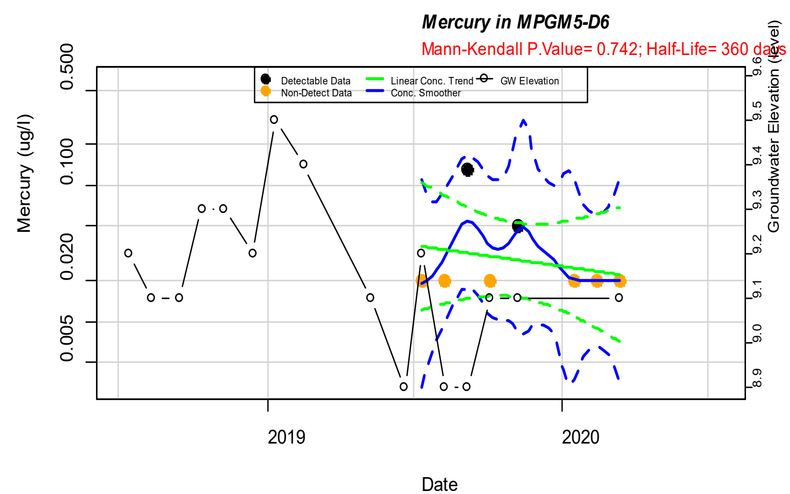

Mercury in D19
Mann-Kendall P.Value= 0.167; Half-Life= -868 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Mercury (ug/l)
Groundwater Elevation (level)
Date
2019
2020

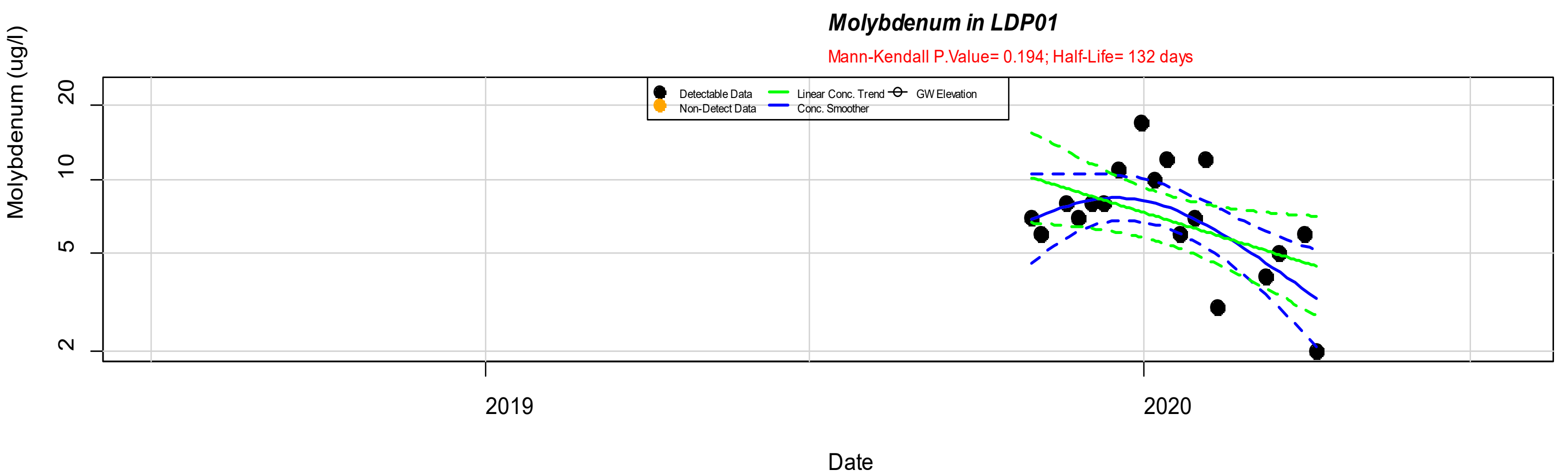

Mercury in D2
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Mercury (ug/l)
Groundwater Elevation (level)
Date
2019
2020

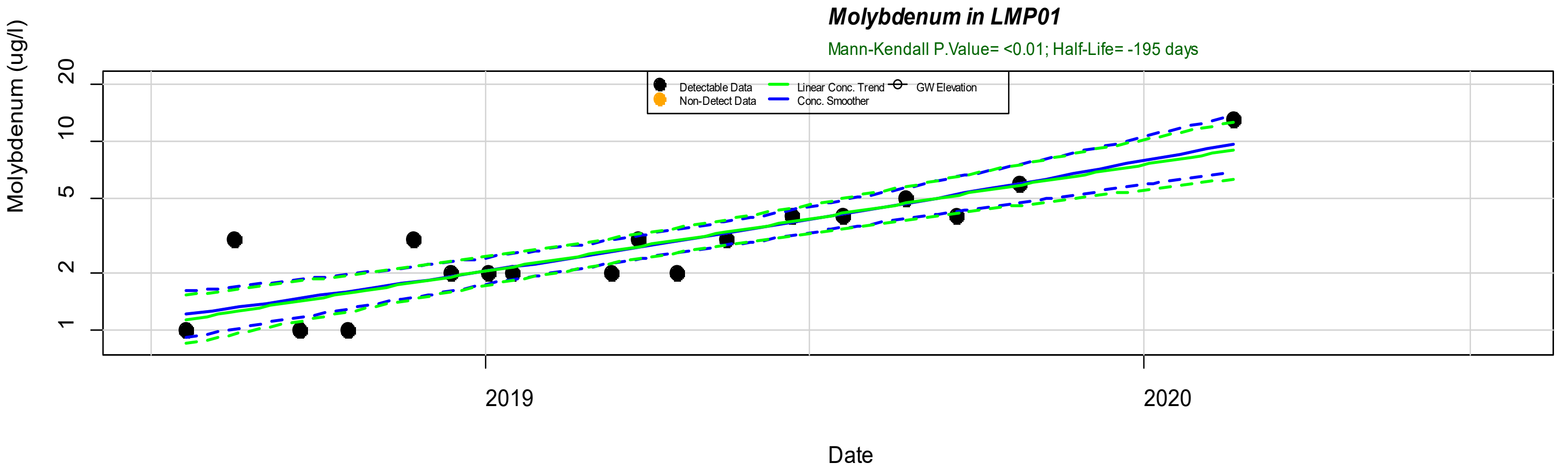

Mercury in D3
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Mercury (ug/l)
0.02
0.04
0.06
0.10
Groundwater Elevation (level)
7.5
8.0
8.5
9.0
2019
2020
Date

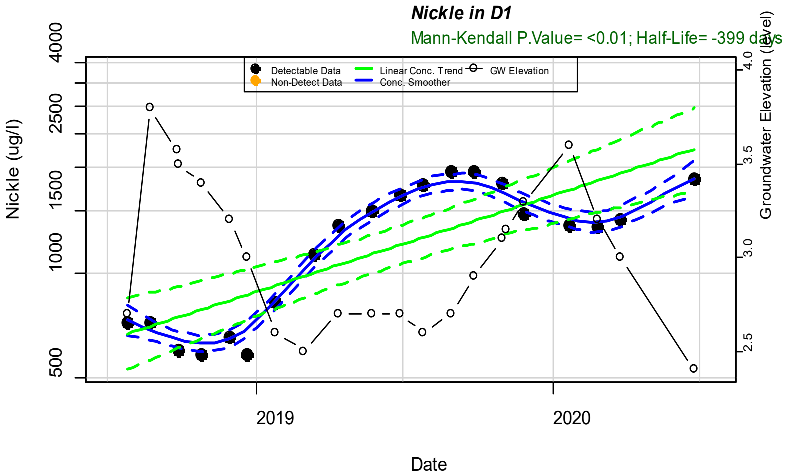

Mercury in D9
Mann-Kendall P.Value= 0.178; Half-Life= -396 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Mercury (ug/l)
0.01
0.05
0.20
0.50
Groundwater Elevation (level)
1.5
2.0
2.5
2019
2020
Date


Mercury in MPGM5-D5
Mann-Kendall P.Value= <0.01; Half-Life= -133 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Mercury (ug/l)
0.02
0.05
0.10
Groundwater Elevation (level)
6.0
6.5
7.0
7.5
2019
2020
Date

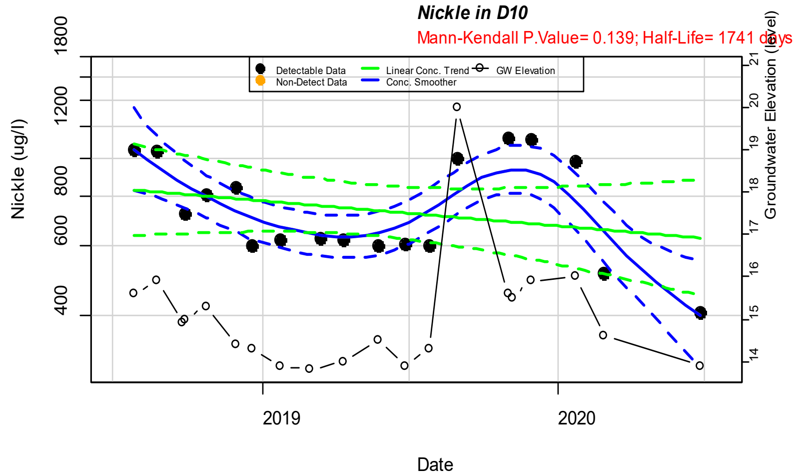

Mercury in MPGM5-D6
Mann-Kendall P.Value= 0.742; Half-Life= 360 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Mercury (ug/l)
0.005
0.020
0.100
0.500
Groundwater Elevation (level)
8.9
9.0
9.1
9.2
9.3
9.4
9.5
9.6
2019
2020
Date


Molybdenum in LDP01
Mann-Kendall P.Value= 0.194; Half-Life= 132 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Molybdenum (ug/l)
20
10
5
2
2019
2020
Date

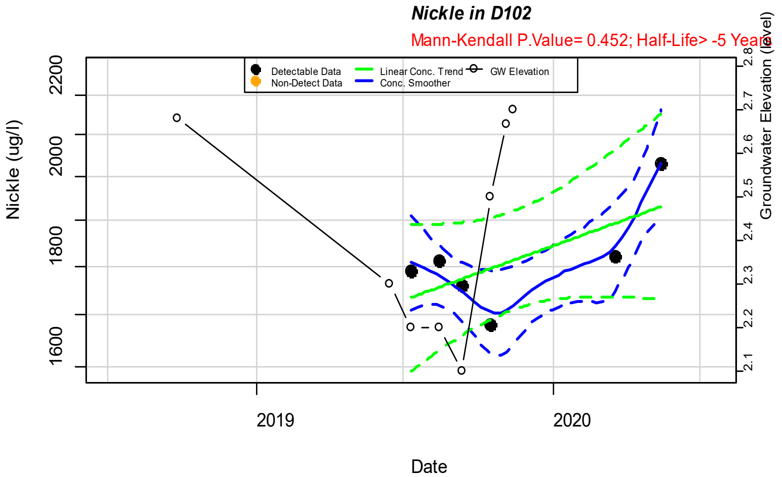

Molybdenum in LMP01
Mann-Kendall P.Value= <0.01; Half-Life= -195 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Molybdenum (ug/l)
20
10
5
2
1
2019
2020
Date



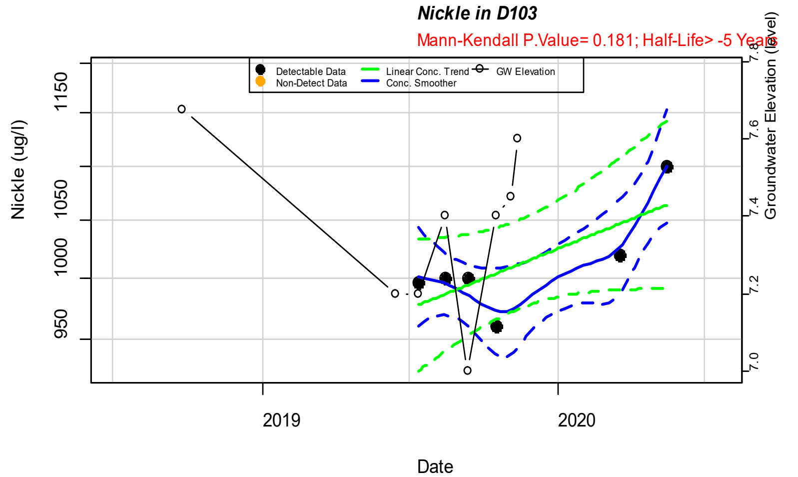
Nickle in D1
Mann-Kendall P.Value= <0.01; Half-Life= -399 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Nickle (ug/l)
Groundwater Elevation (level)
Date
2019
2020



Nickle in D10
Mann-Kendall P.Value= 0.139; Half-Life= 1741 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Nickle (ug/l)
Groundwater Elevation (level)
Date
2019
2020



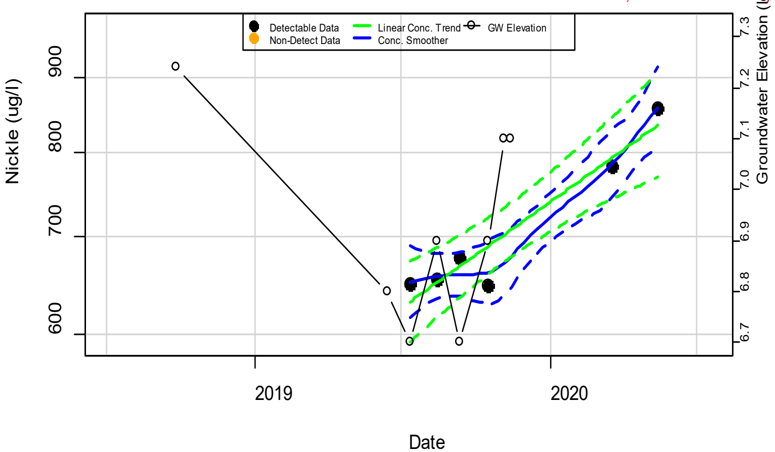
Nickle in D102
Mann-Kendall P.Value= 0.452; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Nickle (ug/l)
Groundwater Elevation (level)
Date
2019
2020



Nickle in D103
Mann-Kendall P.Value= 0.181; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Nickle (ug/l)
Groundwater Elevation (level)
Date
2019
2020

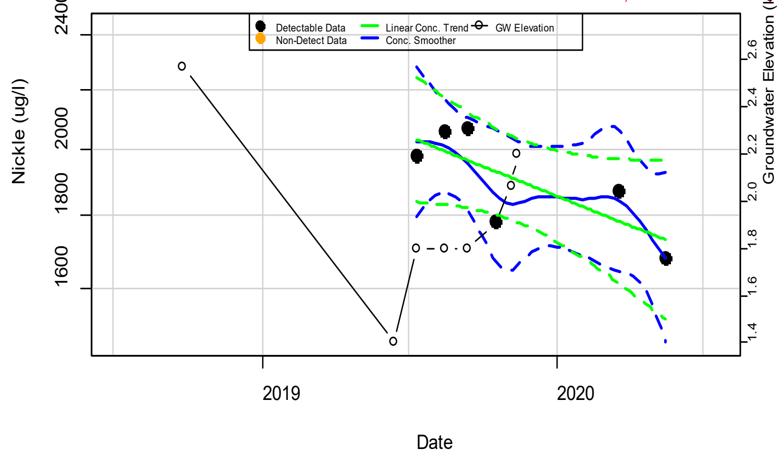
Nickle in D105

Mann-Kendall P.Value= 0.133; Half-Life= -761 days



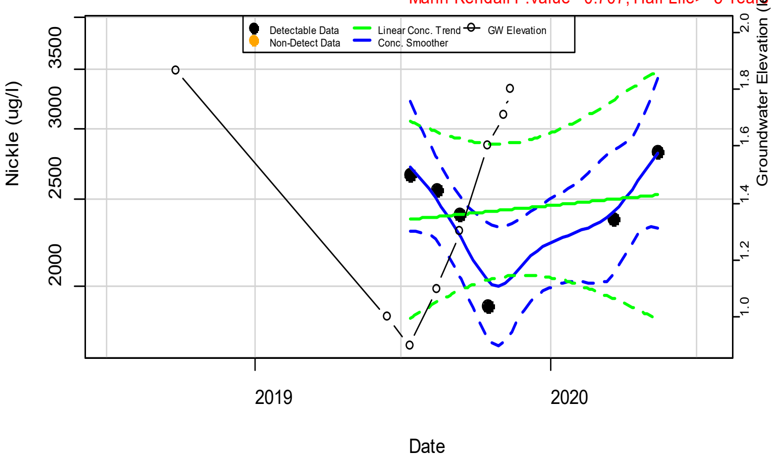
Nickle in D106

Mann-Kendall P.Value= 0.26; Half-Life= 1332 days



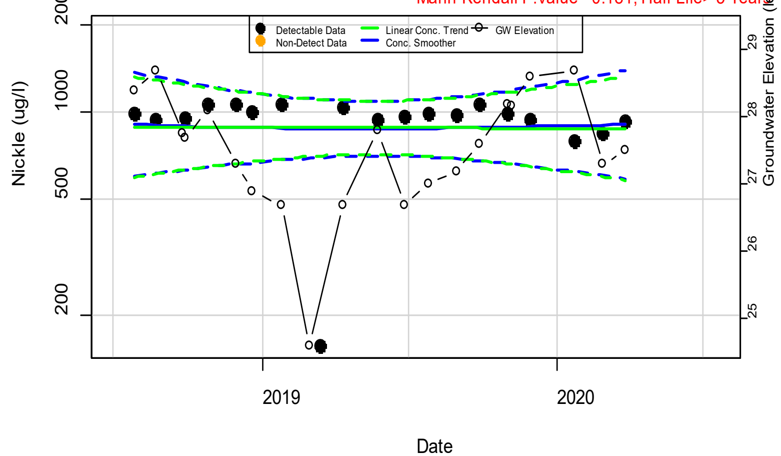
Nickle in D107

Mann-Kendall P.Value= 0.707; Half-Life> -5 Years



Nickle in D11

Mann-Kendall P.Value= 0.181; Half-Life> 5 Years



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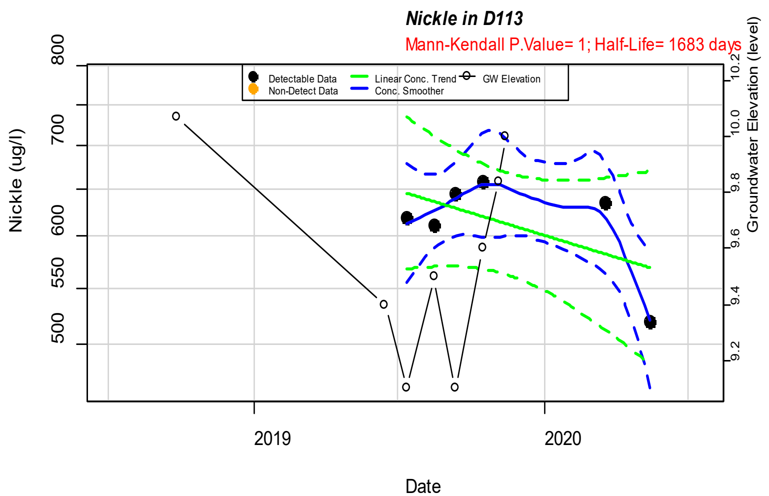
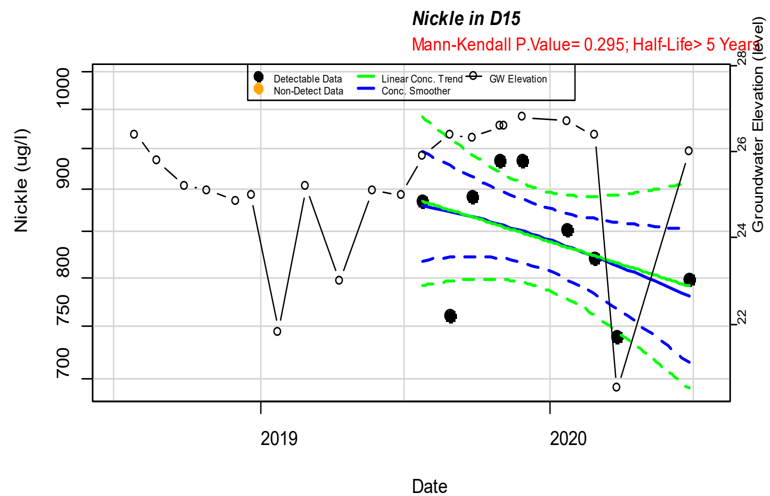
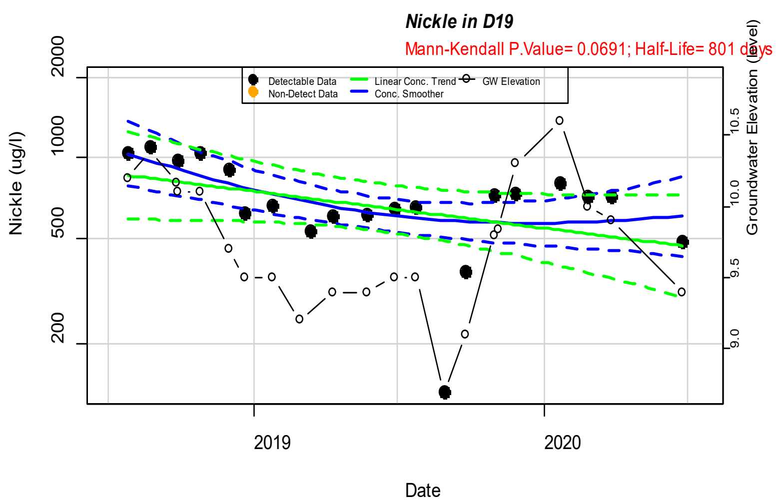


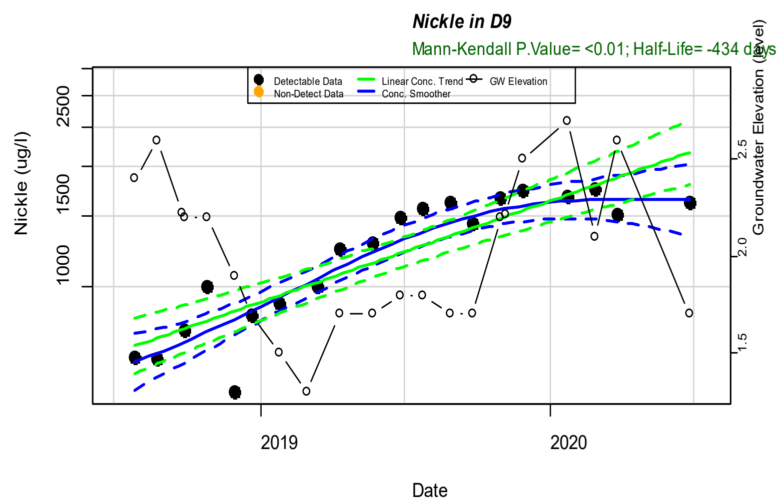
Nickle in D113
Mann-Kendall P.Value= 1; Half-Life= 1683 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Nickle (ug/l)
Groundwater Elevation (level)
Date
2019
2020



Nickle in D15
Mann-Kendall P.Value= 0.295; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Nickle (ug/l)
Groundwater Elevation (level)
Date
2019
2020



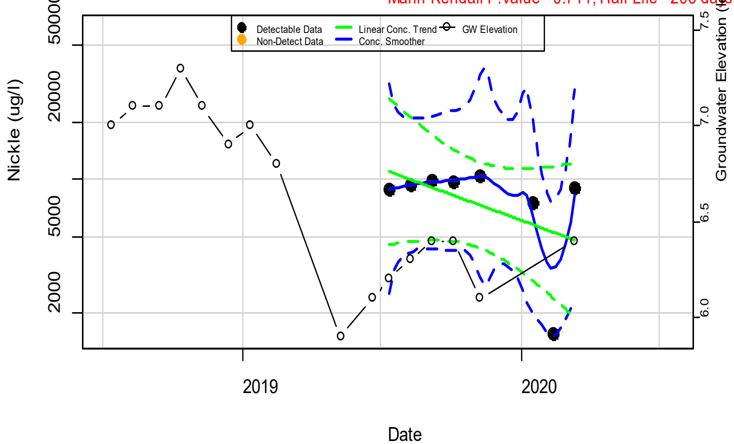
Nickle in D19
Mann-Kendall P.Value= 0.0691; Half-Life= 801 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Nickle (ug/l)
Groundwater Elevation (level)
Date
2019
2020



Nickle in D9
Mann-Kendall P.Value= <0.01; Half-Life= -434 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Nickle (ug/l)
Groundwater Elevation (level)
Date
2019
2020

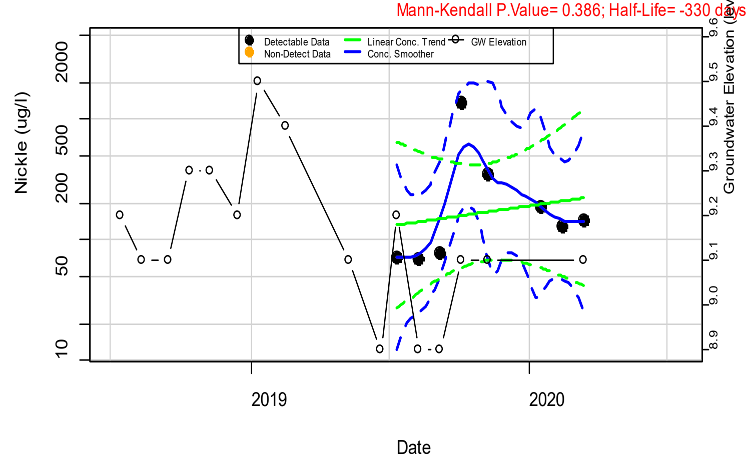
Nickle in MPGM5-D5

Mann-Kendall P.Value= 0.711; Half-Life= 206 days



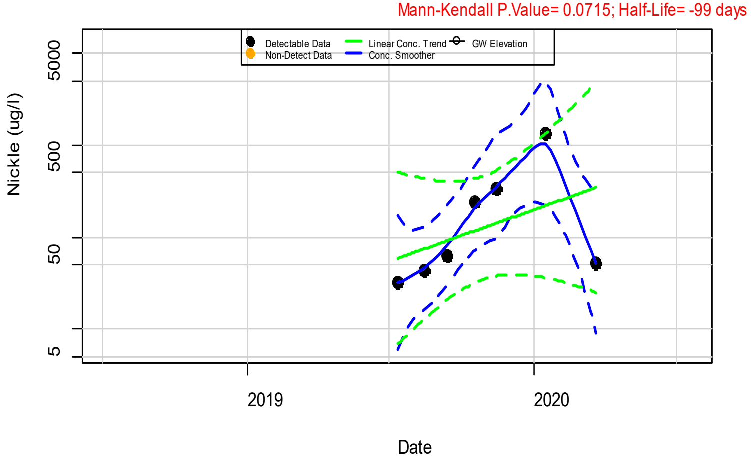
Nickle in MPGM5-D6

Mann-Kendall P.Value= 0.386; Half-Life= -330 days



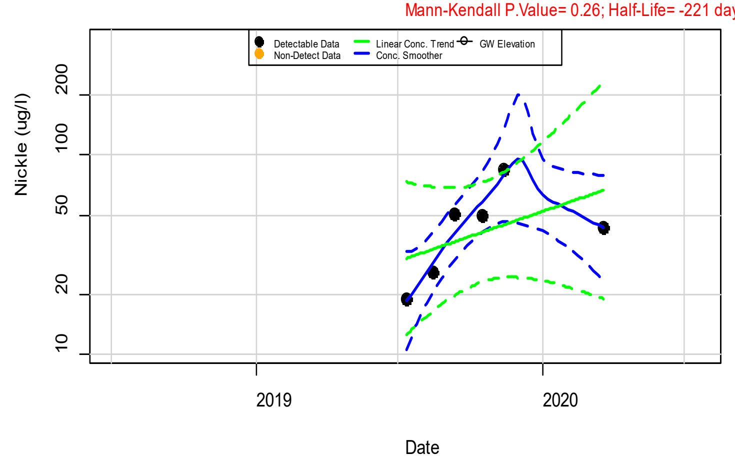
Nickle in E

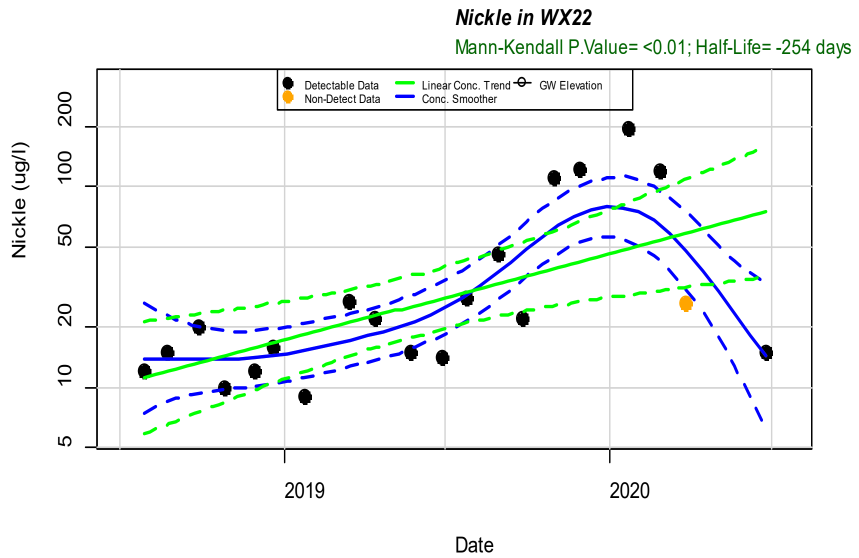
Mann-Kendall P.Value= 0.0715; Half-Life= -99 days



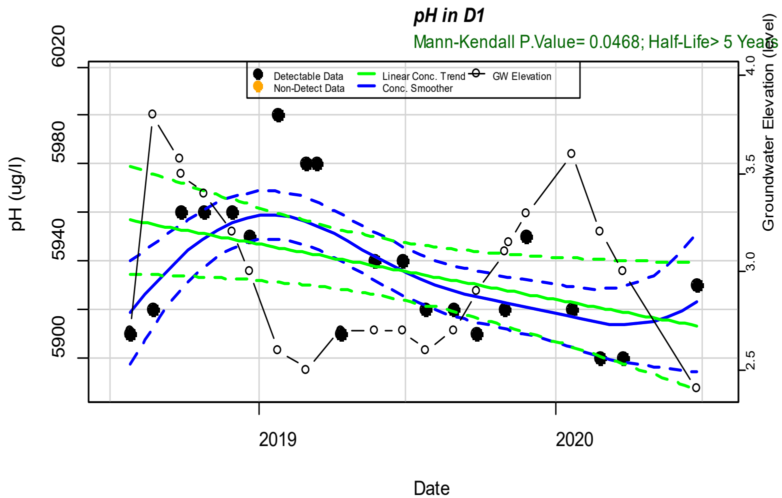
Nickle in G

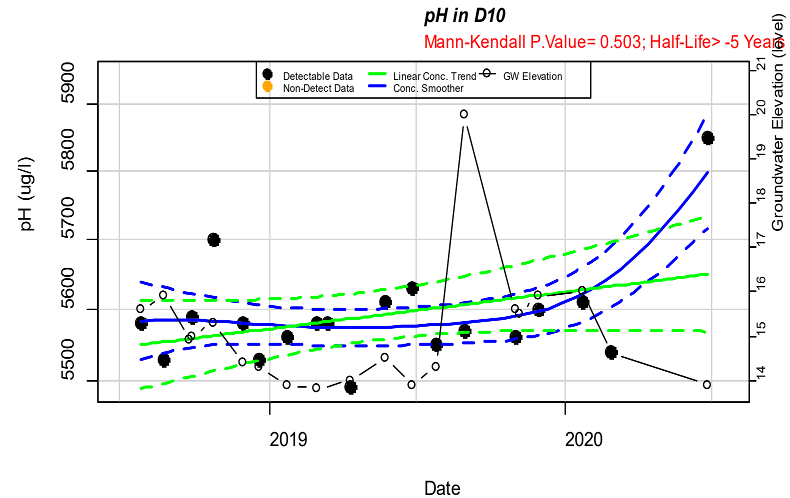
Mann-Kendall P.Value= 0.26; Half-Life= -221 days

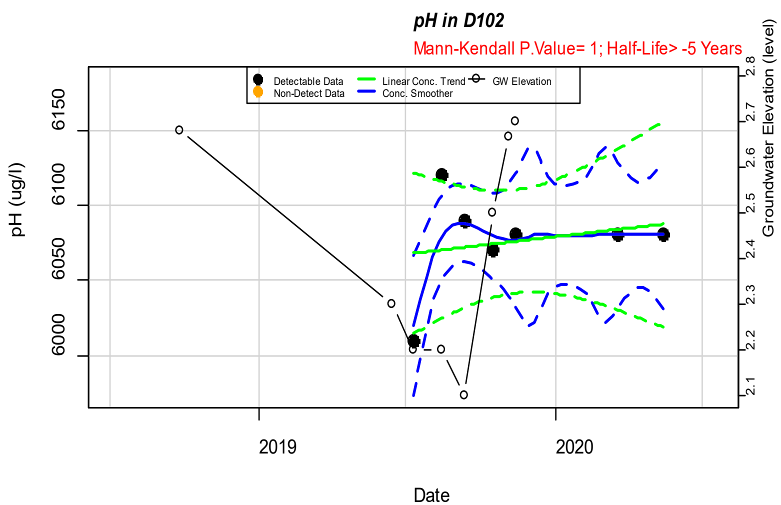


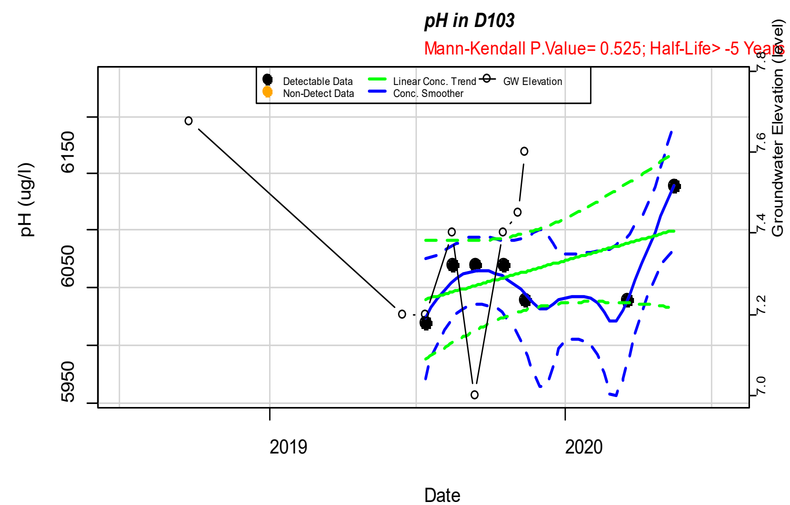


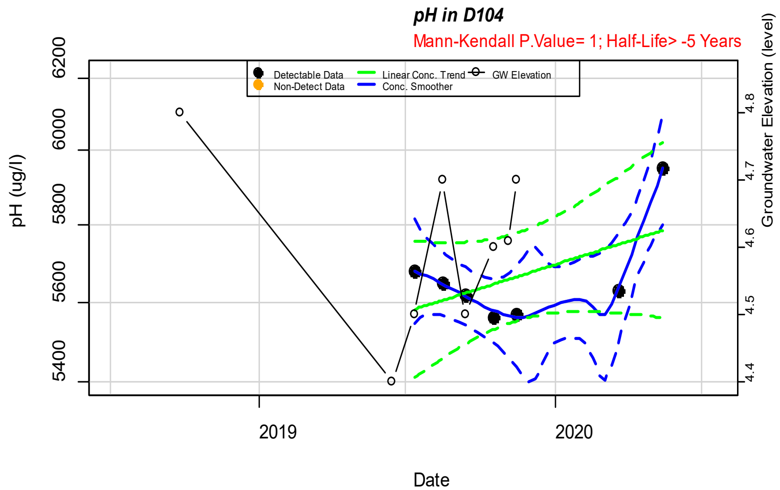
Nickle in WX22
Mann-Kendall P.Value= <0.01; Half-Life= -254 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Nickle (ug/l)
5
10
20
50
100
200
2019
2020
Date

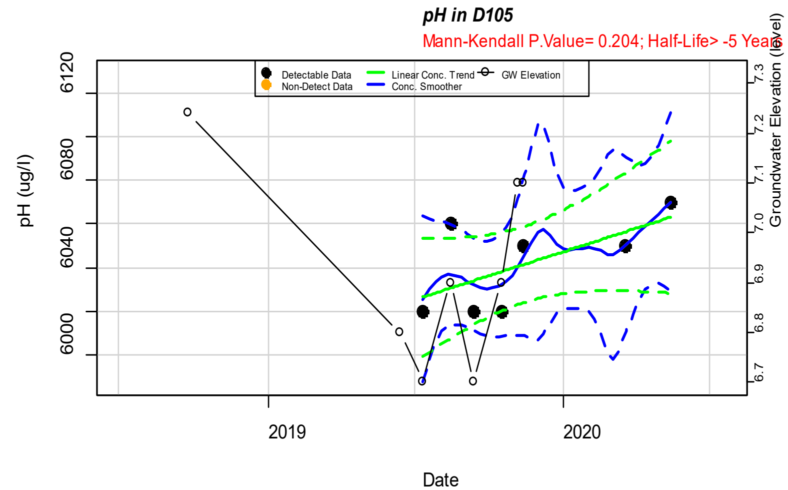

pH in D1
Mann-Kendall P.Value= 0.0468; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
pH (ug/l)
Groundwater Elevation (level)
Date
2019
2020

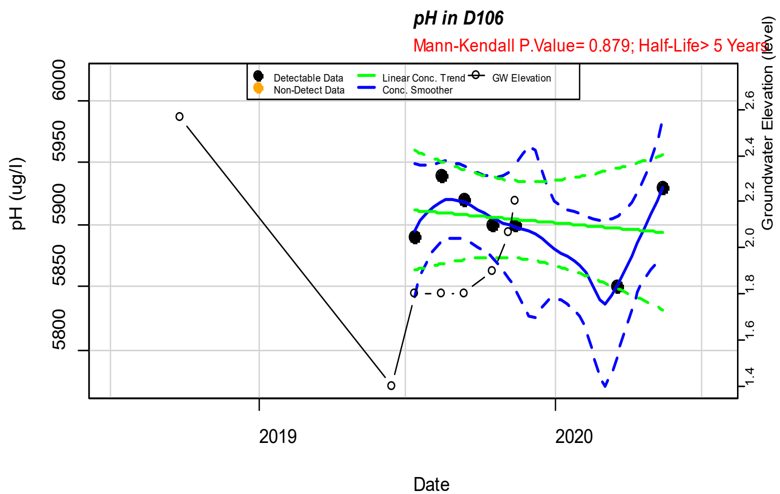

pH in D10
Mann-Kendall P.Value= 0.503; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
pH (ug/l)
Groundwater Elevation (level)
Date
2019
2020

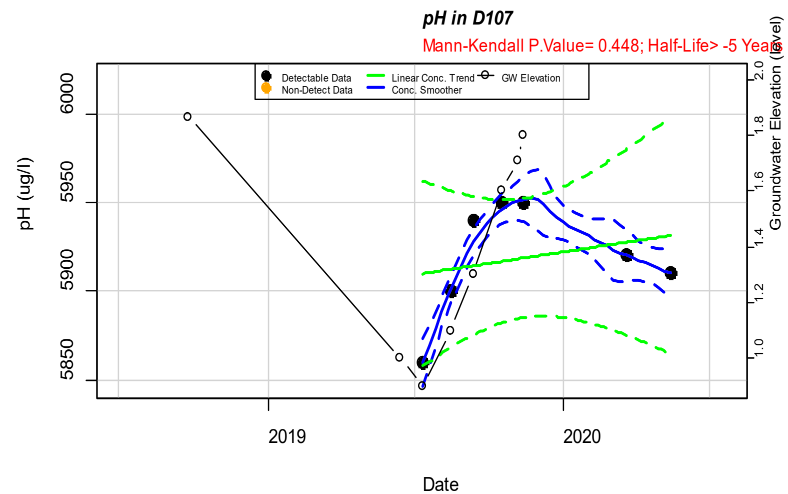

pH in D102
Mann-Kendall P.Value= 1; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
pH (ug/l)
Groundwater Elevation (level)
Date
2019
2020


pH in D103
Mann-Kendall P.Value= 0.525; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
pH (ug/l)
Groundwater Elevation (level)
Date
2019
2020

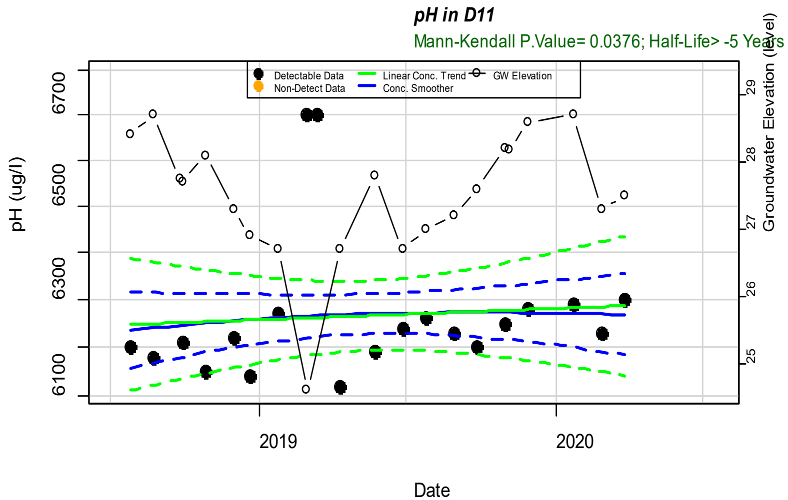

pH in D104
Mann-Kendall P.Value= 1; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
pH (ug/l)
Groundwater Elevation (level)
2019
2020
Date

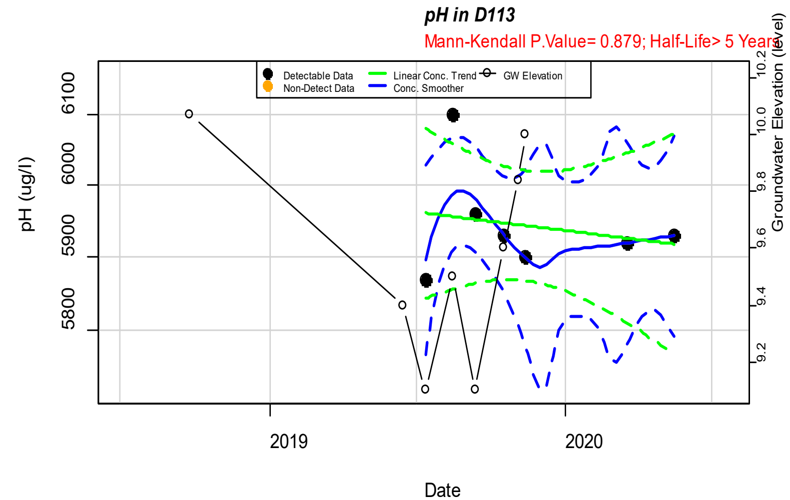

pH in D105
Mann-Kendall P.Value= 0.204; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
pH (ug/l)
Groundwater Elevation (level)
2019
2020
Date

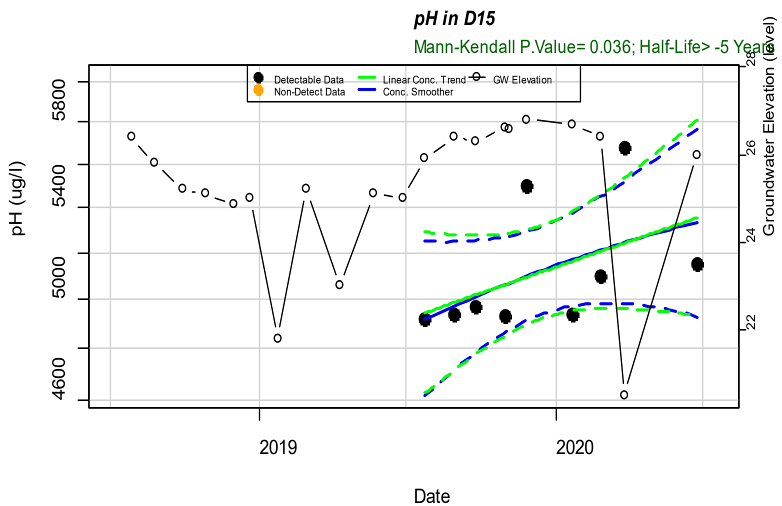

pH in D106
Mann-Kendall P.Value= 0.879; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
pH (ug/l)
Groundwater Elevation (level)
2019
2020
Date

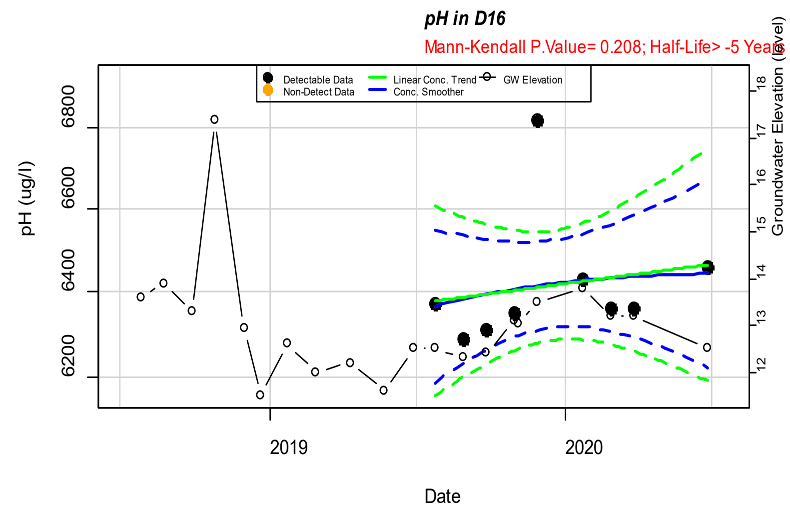

pH in D107
Mann-Kendall P.Value= 0.448; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
pH (ug/l)
Groundwater Elevation (level)
2019
2020
Date

ERM


pH in D11
Mann-Kendall P.Value= 0.0376; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
pH (ug/l)
6100
6300
6500
6700
Groundwater Elevation (level)
25
26
27
28
29
2019
2020
Date

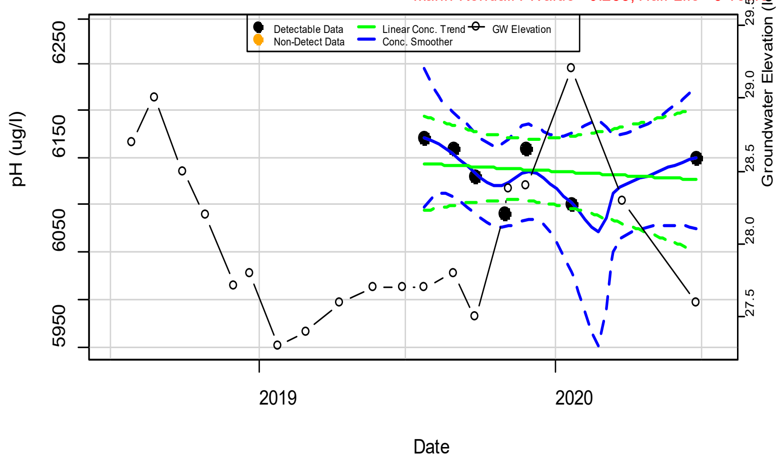

pH in D113
Mann-Kendall P.Value= 0.879; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
pH (ug/l)
5800
5900
6000
6100
Groundwater Elevation (level)
9.2
9.4
9.6
9.8
10.0
10.2
2019
2020
Date


pH in D15
Mann-Kendall P.Value= 0.036; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
pH (ug/l)
4600
5000
5400
5800
Groundwater Elevation (level)
22
24
26
28
2019
2020
Date


pH in D16
Mann-Kendall P.Value= 0.208; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
pH (ug/l)
6200
6400
6600
6800
Groundwater Elevation (level)
12
13
14
15
16
17
18
2019
2020
Date

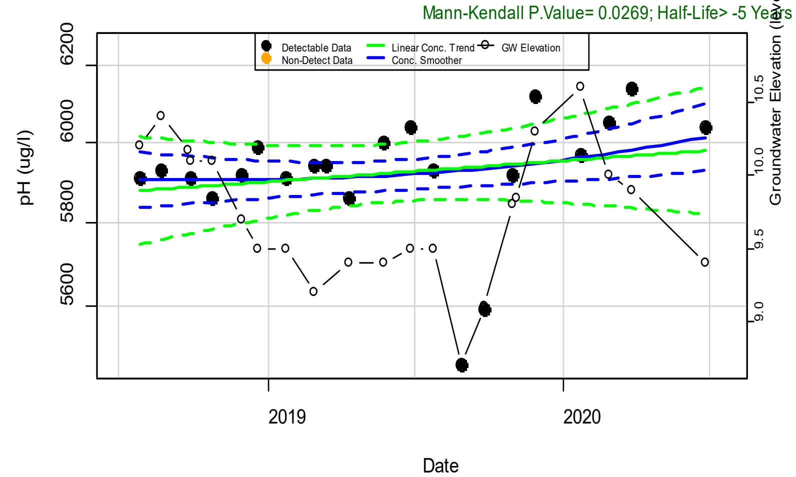
pH in D17

Mann-Kendall P.Value= 0.288; Half-Life> 5 Years



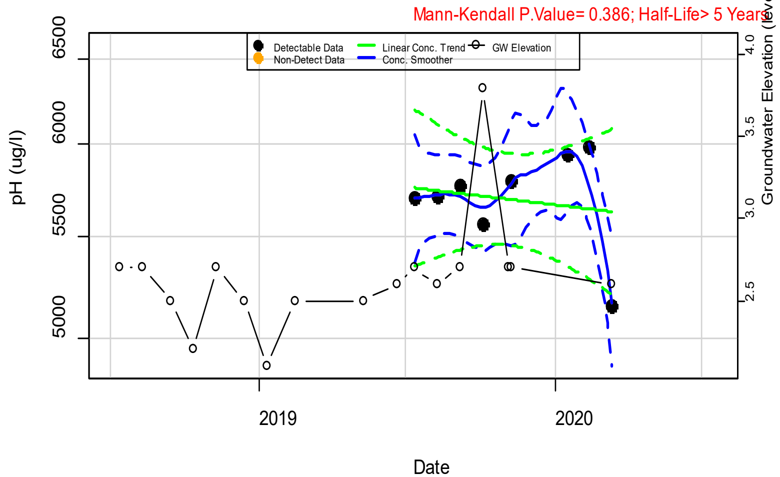
pH in D19

Mann-Kendall P.Value= 0.0269; Half-Life> -5 Years



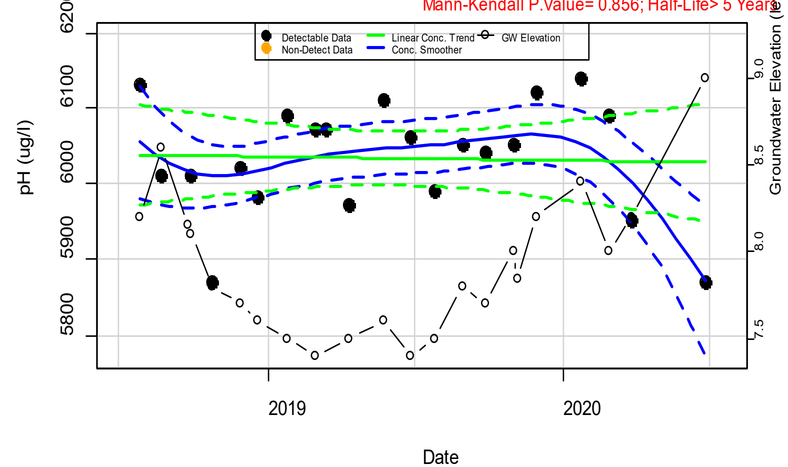
pH in D2

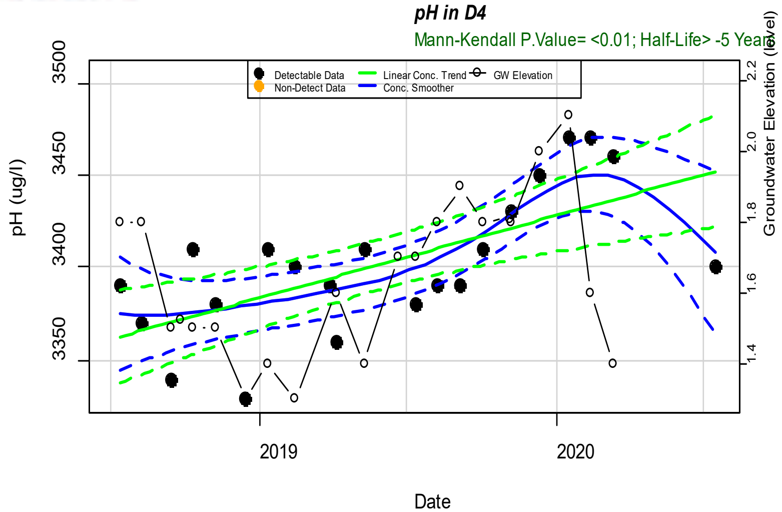
Mann-Kendall P.Value= 0.386; Half-Life> 5 Years

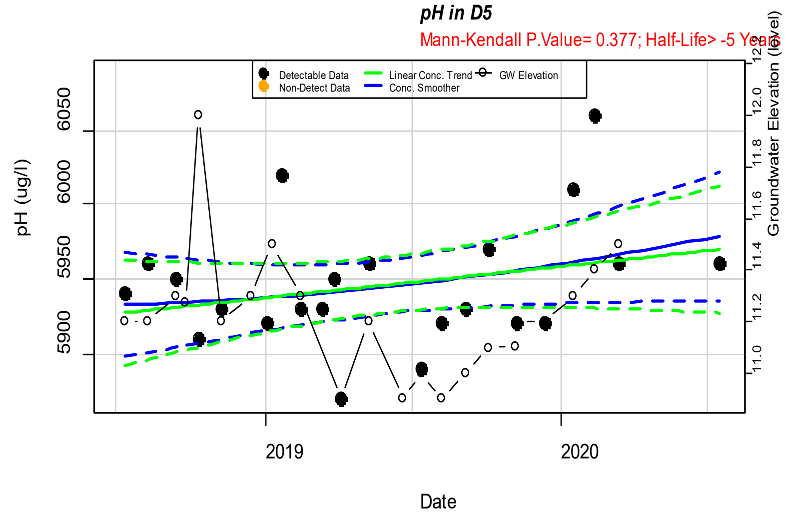


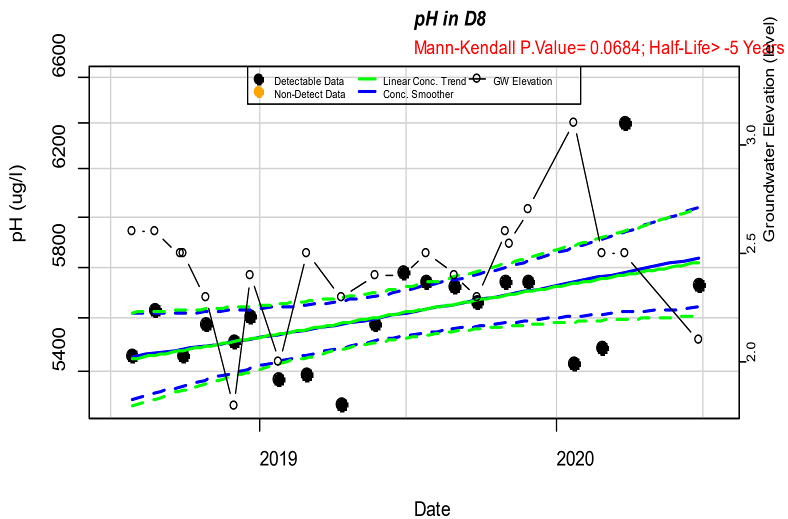
pH in D3

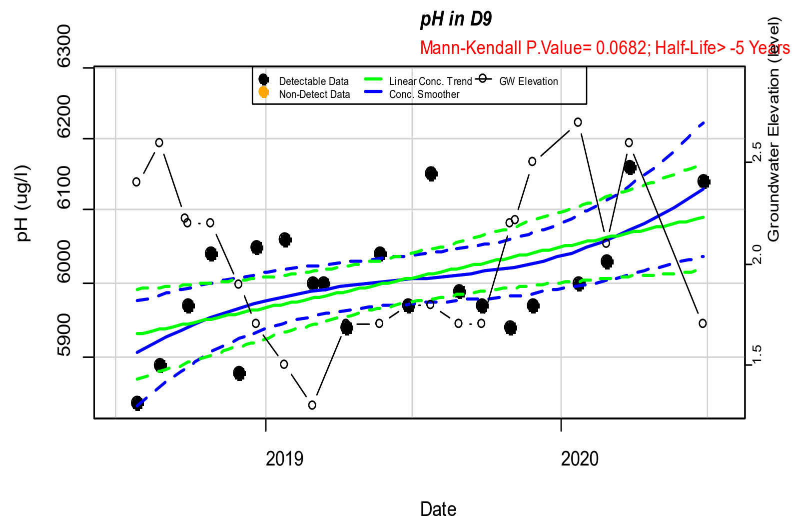
Mann-Kendall P.Value= 0.856; Half-Life> 5 Years

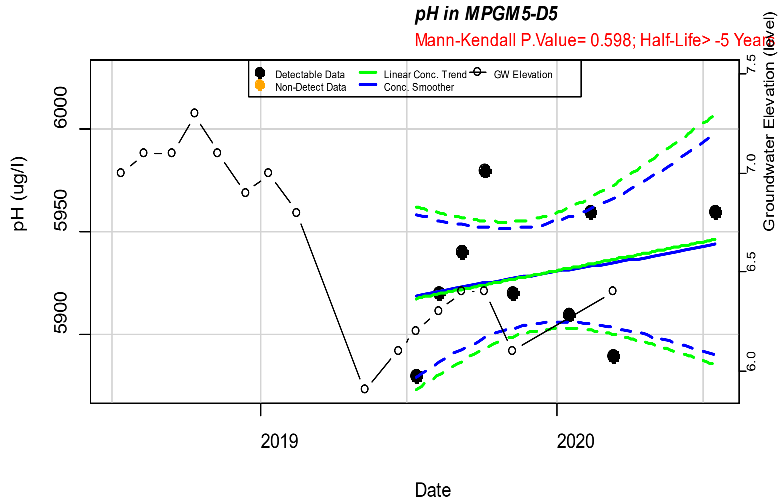


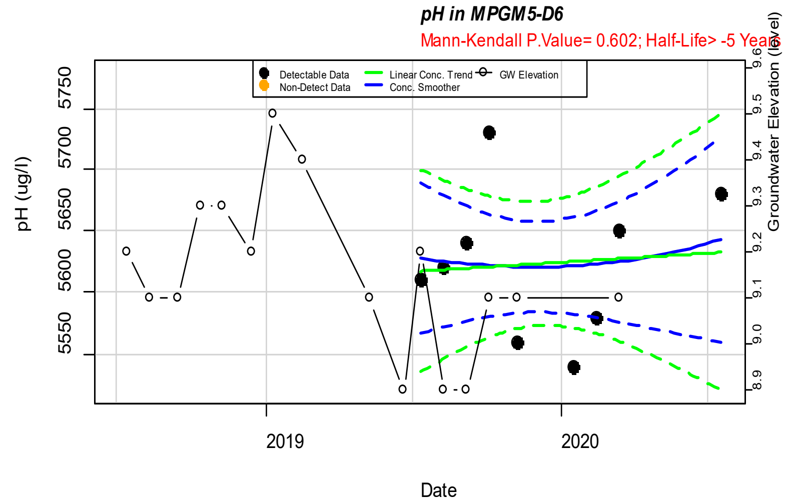

pH in D4
Mann-Kendall P.Value= <0.01; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
pH (ug/l)
Groundwater Elevation (level)
Date
2019
2020


pH in D5
Mann-Kendall P.Value= 0.377; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
pH (ug/l)
Groundwater Elevation (level)
Date
2019
2020


pH in D8
Mann-Kendall P.Value= 0.0684; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
pH (ug/l)
Groundwater Elevation (level)
Date
2019
2020

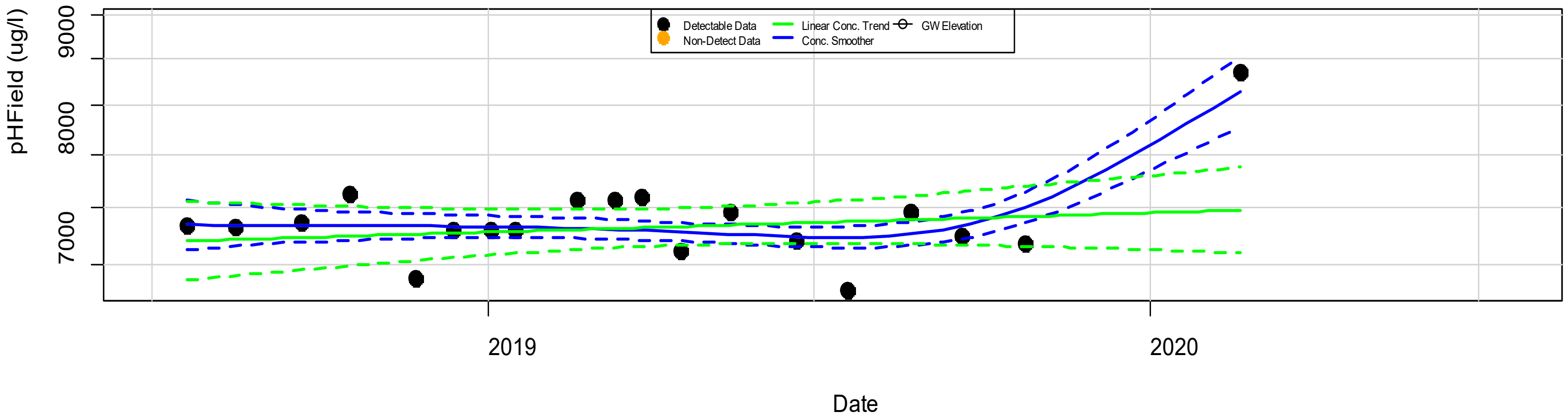

pH in D9
Mann-Kendall P.Value= 0.0682; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
pH (ug/l)
Groundwater Elevation (level)
Date
2019
2020


pH in MPGM5-D5
Mann-Kendall P.Value= 0.598; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
pH (ug/l)
Groundwater Elevation (level)
Date
2019
2020


pH in MPGM5-D6
Mann-Kendall P.Value= 0.602; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
pH (ug/l)
Groundwater Elevation (level)
Date
2019
2020

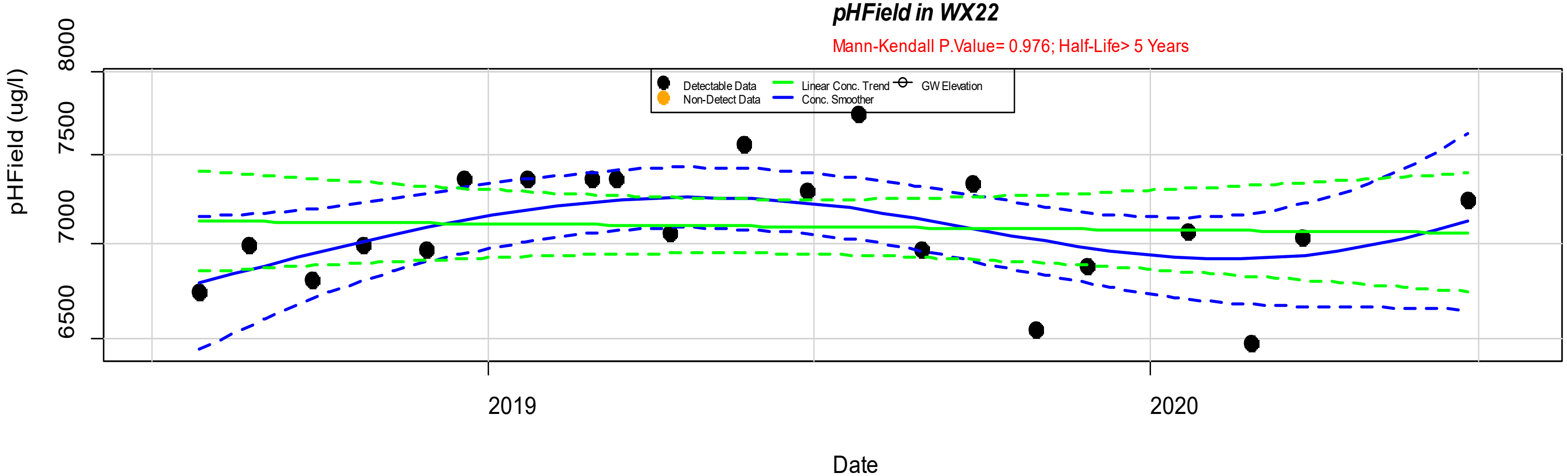
pHField in LMP01

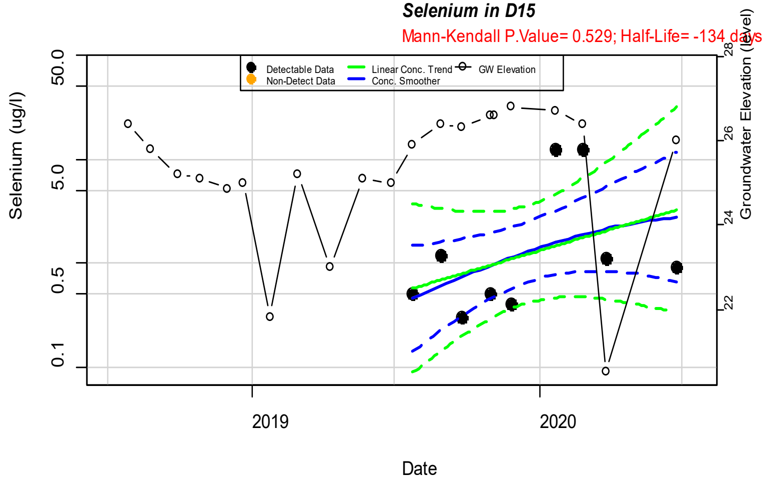
Mann-Kendall P.Value= 0.532; Half-Life> -5 Years

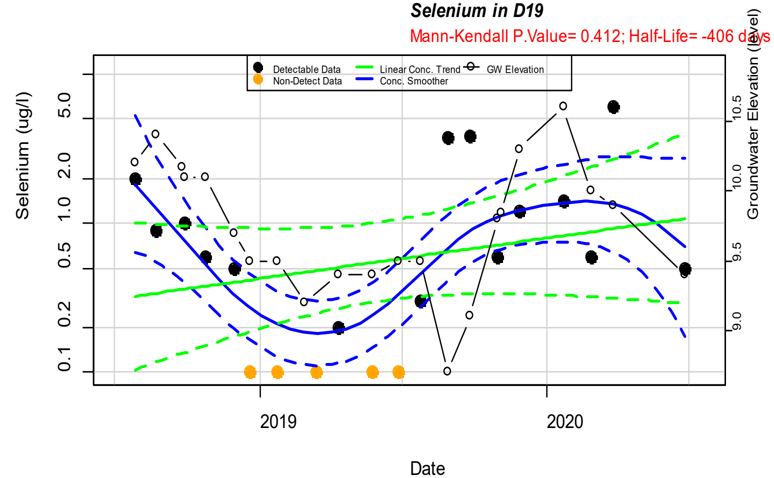


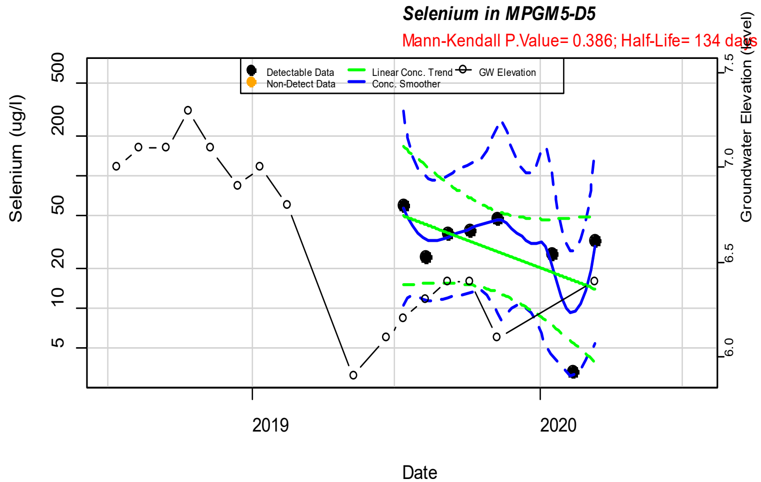
pHField in WX22

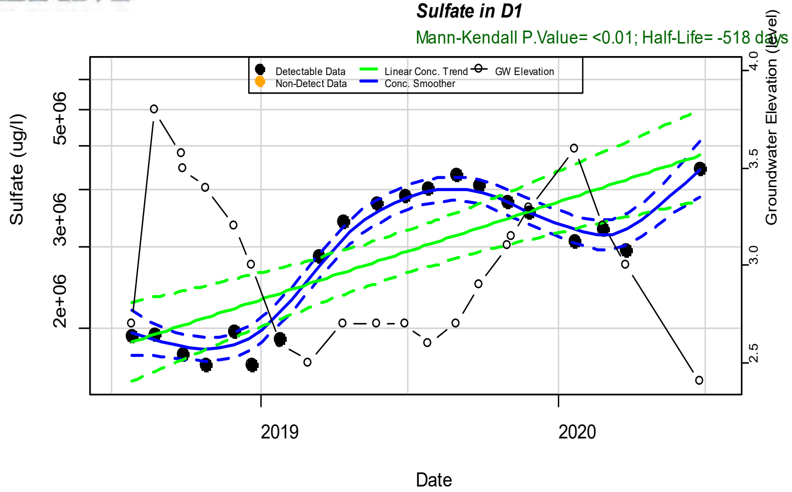
Mann-Kendall P.Value= 0.976; Half-Life> 5 Years

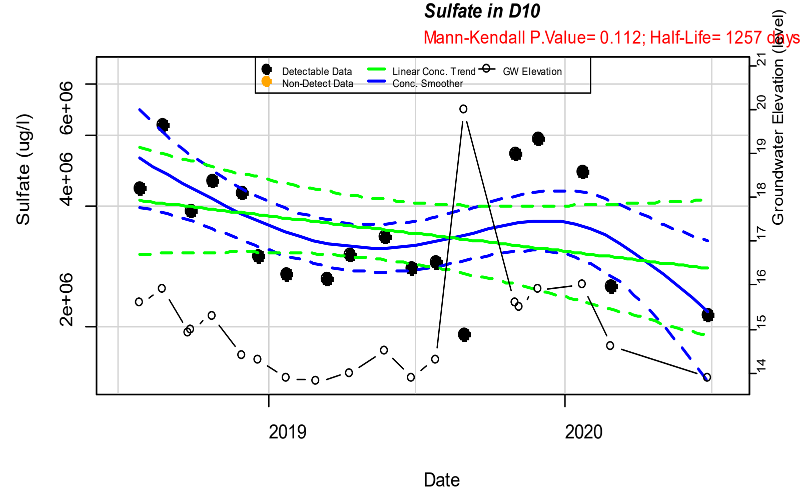


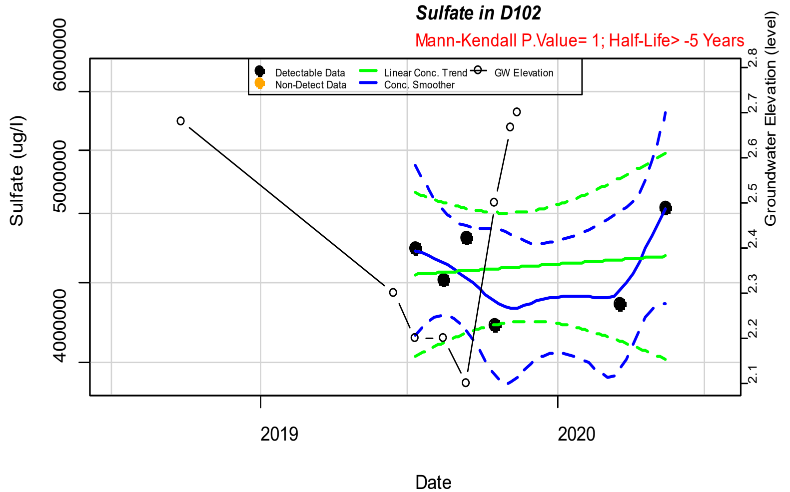

Selenium in D15
Mann-Kendall P.Value= 0.529; Half-Life= -134 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Selenium (ug/l)
0.1
0.5
5.0
50.0
Groundwater Elevation (level)
22
24
26
28
2019
2020
Date

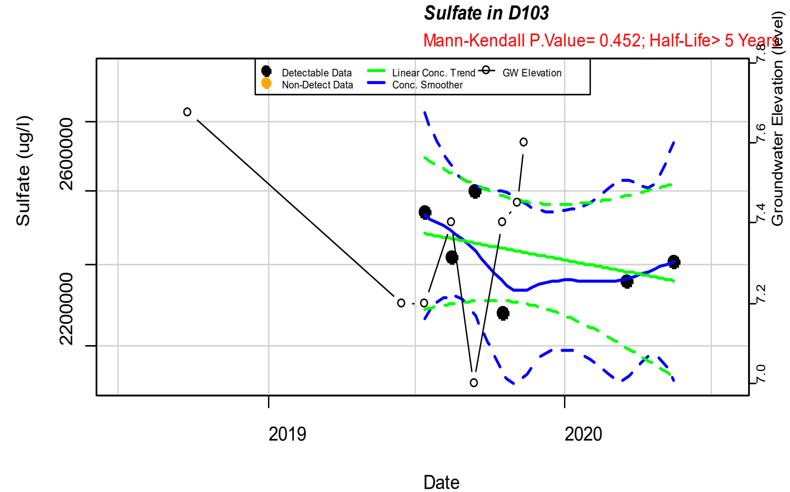

Selenium in D19
Mann-Kendall P.Value= 0.412; Half-Life= -406 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Selenium (ug/l)
0.1
0.2
0.5
1.0
2.0
5.0
Groundwater Elevation (level)
9.0
9.5
10.0
10.5
2019
2020
Date

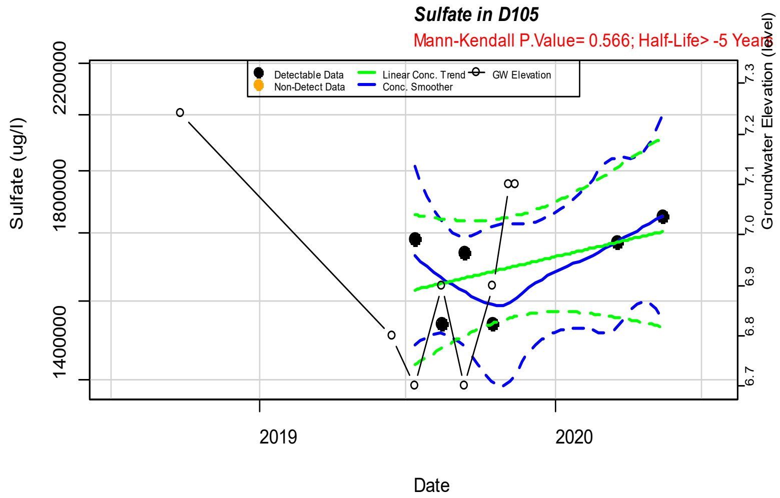

Selenium in MPGM5-D5
Mann-Kendall P.Value= 0.386; Half-Life= 134 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Selenium (ug/l)
5
10
20
50
200
500
Groundwater Elevation (level)
6.0
6.5
7.0
7.5
2019
2020
Date

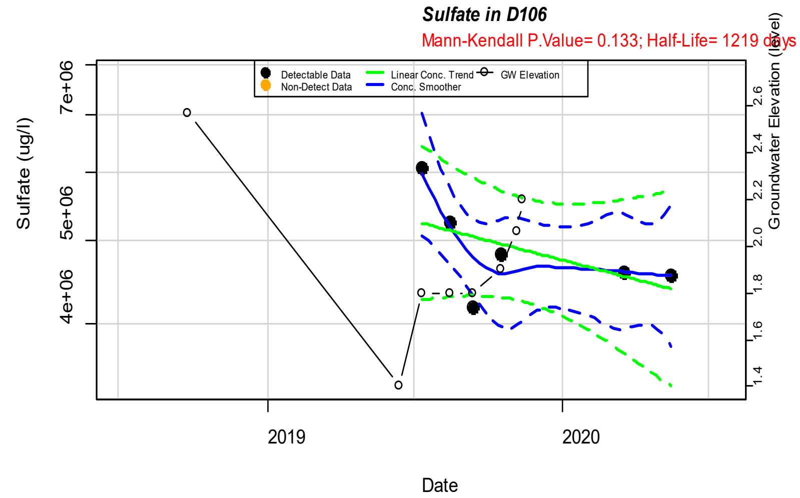

Sulfate in D1
Mann-Kendall P.Value= <0.01; Half-Life= -518 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Sulfate (ug/l)
Groundwater Elevation (level)
Date

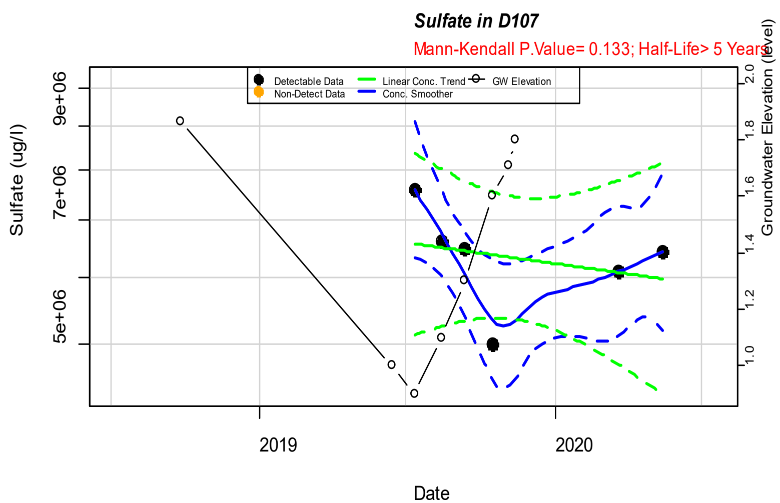

Sulfate in D10
Mann-Kendall P.Value= 0.112; Half-Life= 1257 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Sulfate (ug/l)
Groundwater Elevation (level)
Date

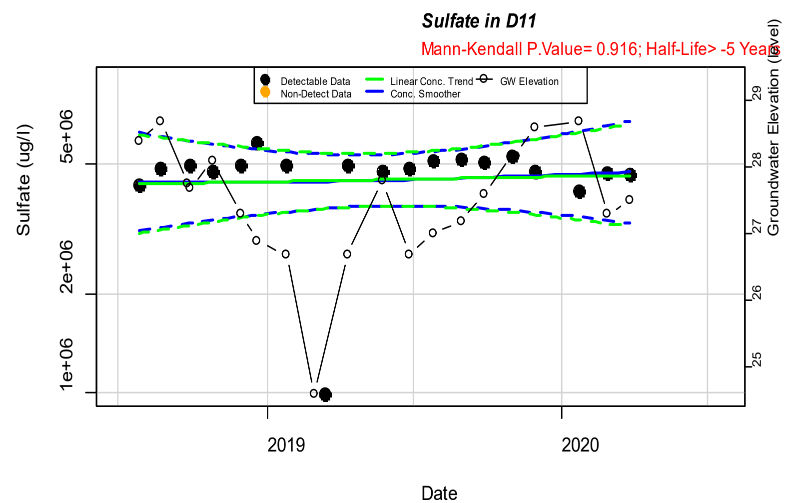

Sulfate in D102
Mann-Kendall P.Value= 1; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Sulfate (ug/l)
Groundwater Elevation (level)
Date

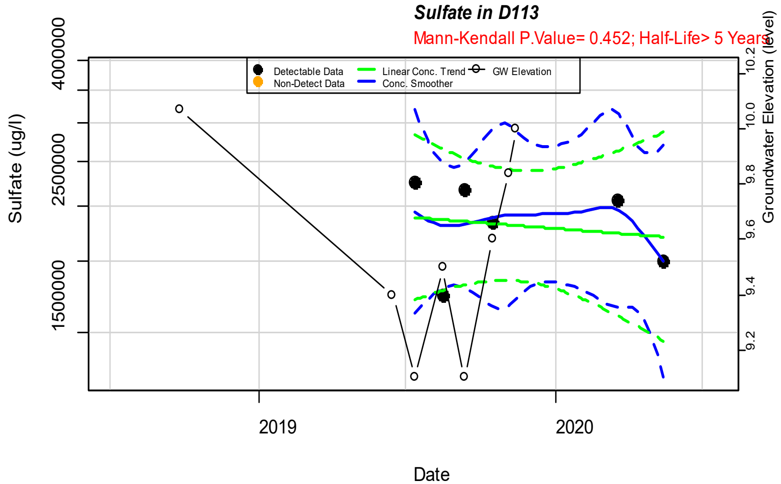

Sulfate in D103
Mann-Kendall P.Value= 0.452; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Sulfate (ug/l)
Groundwater Elevation (level)
Date


Sulfate in D105
Mann-Kendall P.Value= 0.566; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Sulfate (ug/l)
Groundwater Elevation (level)
2019
2020
Date

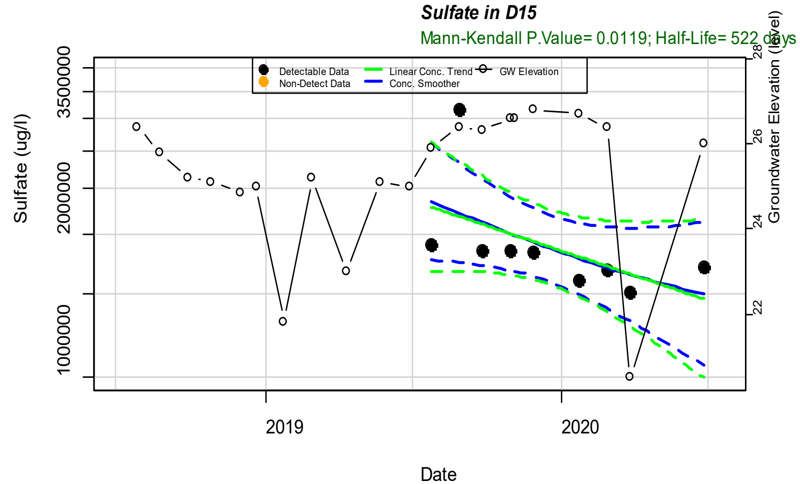

Sulfate in D106
Mann-Kendall P.Value= 0.133; Half-Life= 1219 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Sulfate (ug/l)
Groundwater Elevation (level)
2019
2020
Date


Sulfate in D107
Mann-Kendall P.Value= 0.133; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Sulfate (ug/l)
Groundwater Elevation (level)
2019
2020
Date

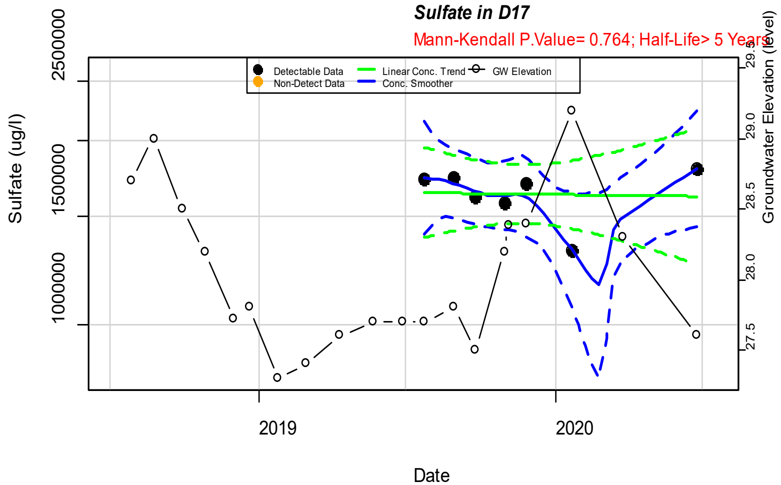

Sulfate in D11
Mann-Kendall P.Value= 0.916; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Sulfate (ug/l)
Groundwater Elevation (level)
2019
2020
Date



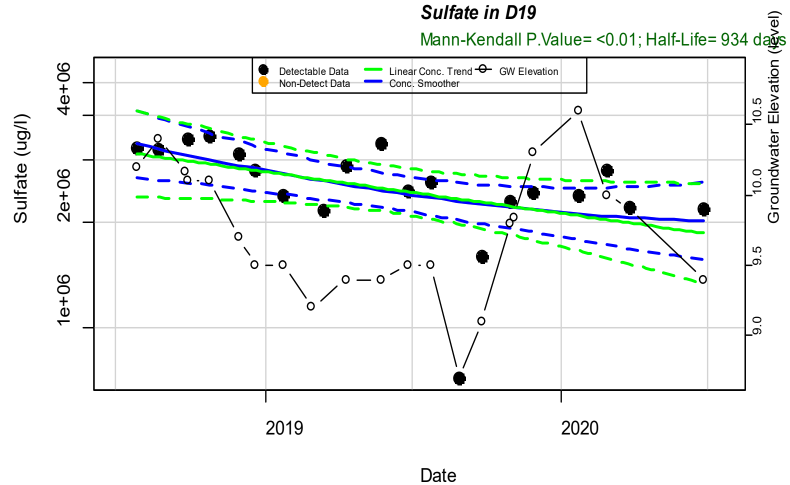
Sulfate in D113
Mann-Kendall P.Value= 0.452; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Sulfate (ug/l)
Groundwater Elevation (level)
Date
2019
2020



Sulfate in D15
Mann-Kendall P.Value= 0.0119; Half-Life= 522 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Sulfate (ug/l)
Groundwater Elevation (level)
Date
2019
2020

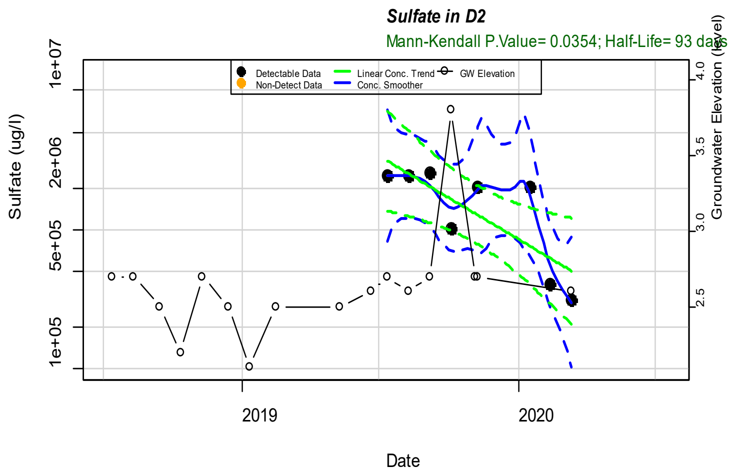


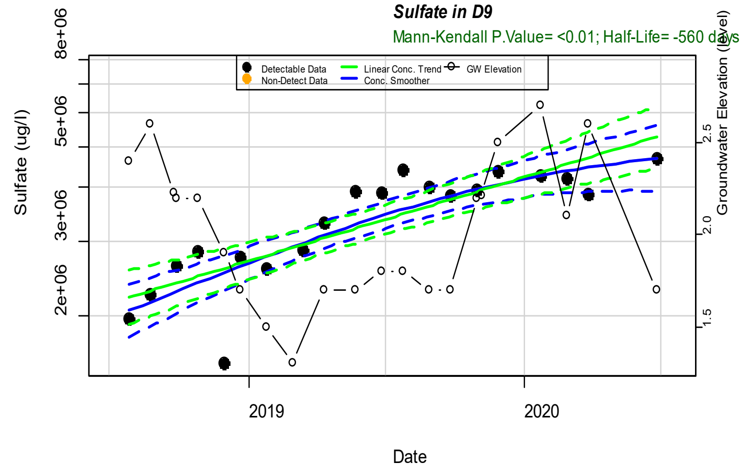
Sulfate in D17
Mann-Kendall P.Value= 0.764; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Sulfate (ug/l)
Groundwater Elevation (level)
Date
2019
2020

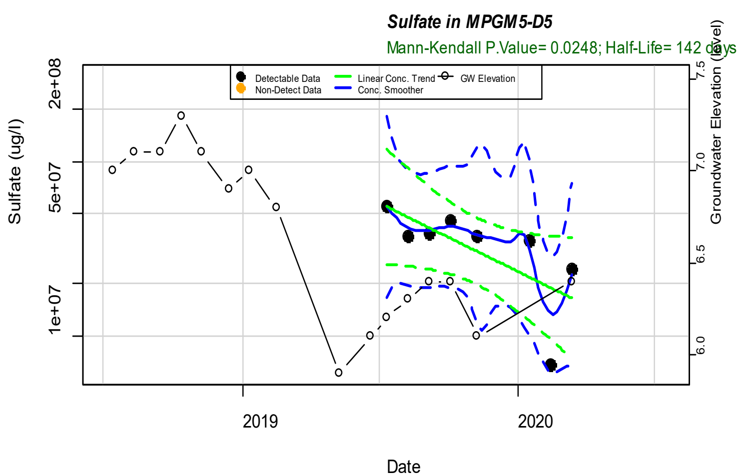


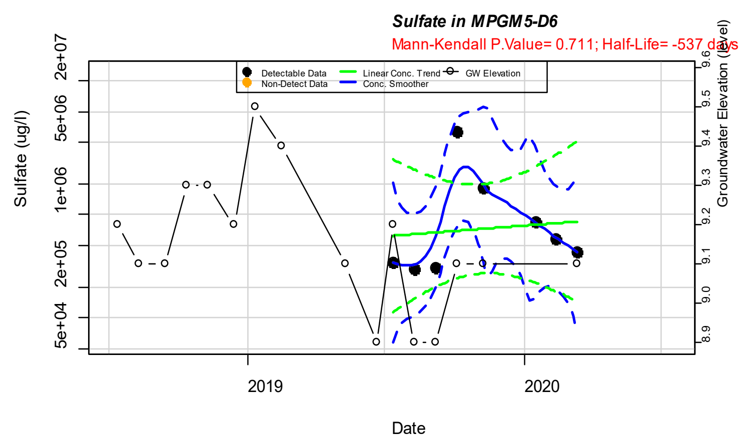
Sulfate in D19
Mann-Kendall P.Value= <0.01; Half-Life= 934 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Sulfate (ug/l)
Groundwater Elevation (level)
Date
2019
2020

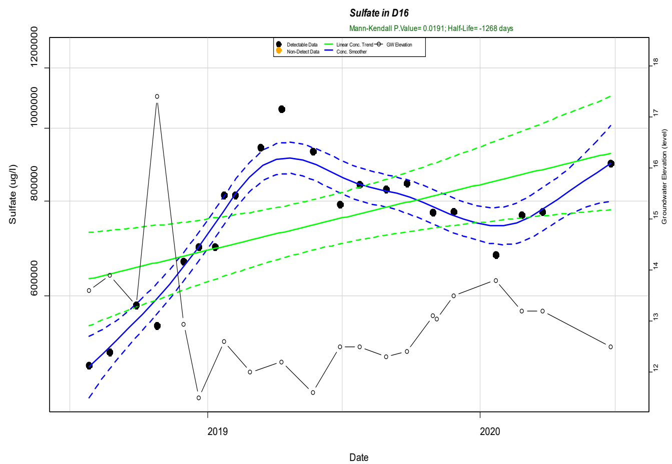
ıys

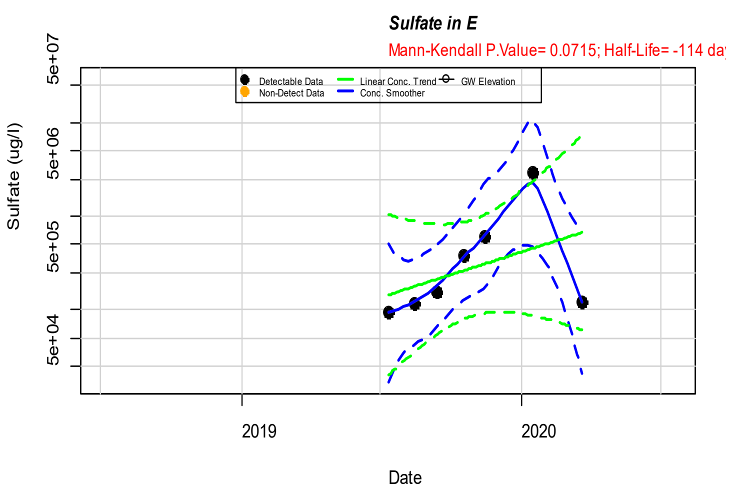

Sulfate in D2
Mann-Kendall P.Value= 0.0354; Half-Life= 93 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Sulfate (ug/l)
Groundwater Elevation (level)
1e+07
2e+06
5e+05
1e+05
4.0
3.5
3.0
2.5
2019
2020
Date

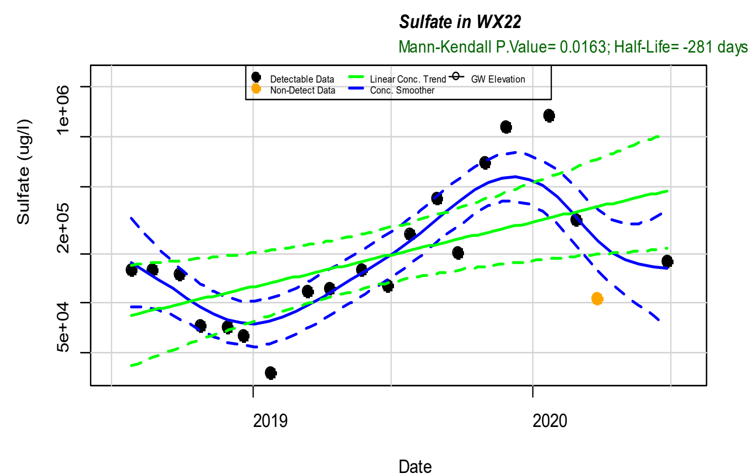

Sulfate in D9
Mann-Kendall P.Value= <0.01; Half-Life= -560 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Sulfate (ug/l)
Groundwater Elevation (level)
8e+06
5e+06
3e+06
2e+06
2.5
2.0
1.5
2019
2020
Date

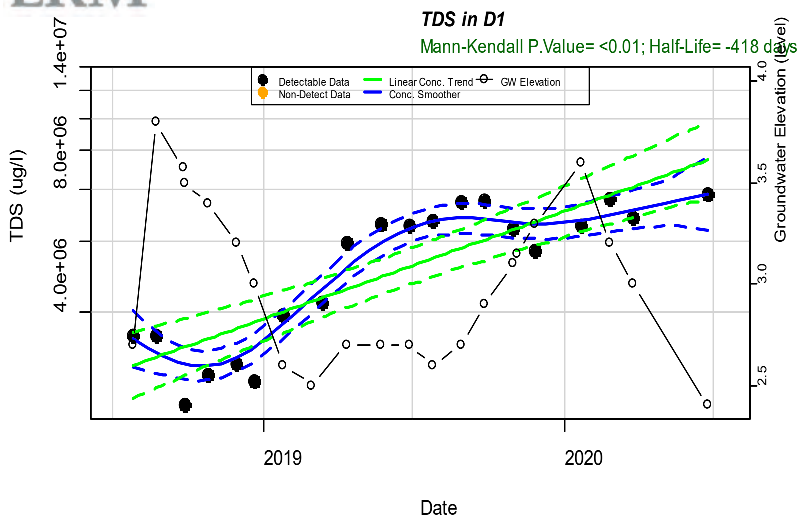

Sulfate in MPGM5-D5
Mann-Kendall P.Value= 0.0248; Half-Life= 142 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Sulfate (ug/l)
Groundwater Elevation (level)
2e+08
5e+07
1e+07
7.5
7.0
6.5
6.0
2019
2020
Date

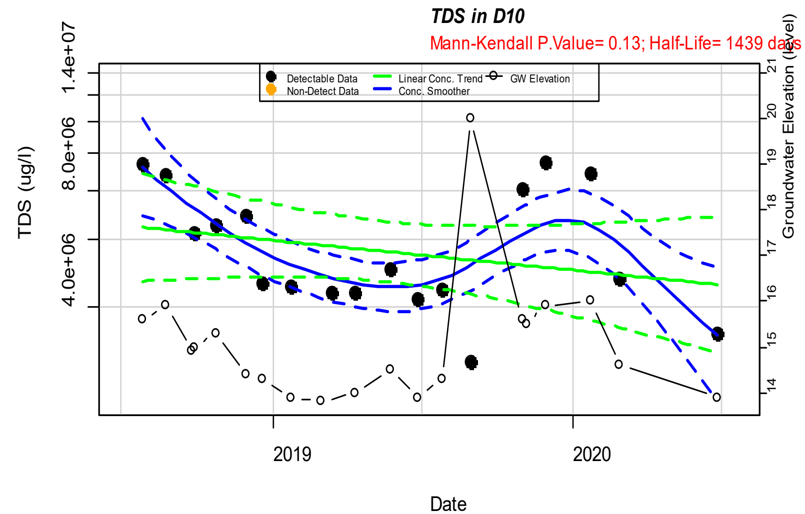

Sulfate in MPGM5-D6
Mann-Kendall P.Value= 0.711; Half-Life= -537 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Sulfate (ug/l)
Groundwater Elevation (level)
2e+07
5e+06
1e+06
2e+05
5e+04
9.6
9.5
9.4
9.3
9.2
9.1
9.0
8.9
2019
2020
Date

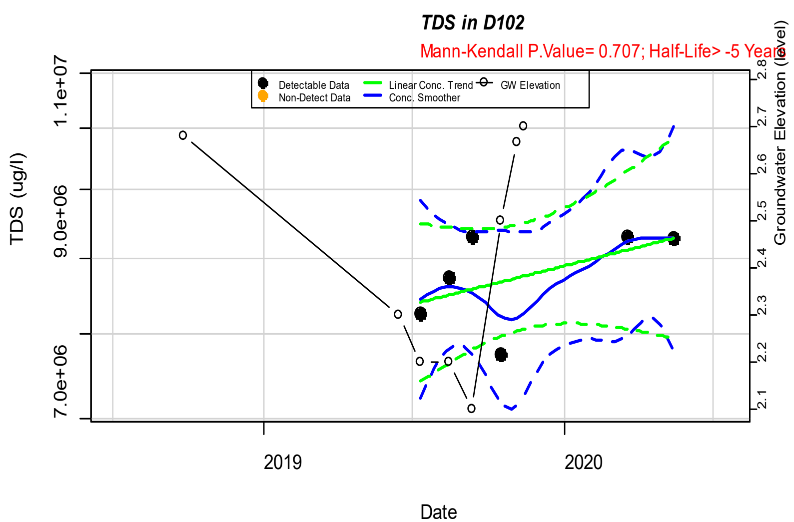

Sulfate in D16
Mann-Kendall P.Value= 0.0191; Half-Life= -1268 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Sulfate (ug/l)
1200000
1000000
800000
600000
Groundwater Elevation (level)
18
17
16
15
14
13
12
2019
2020
Date

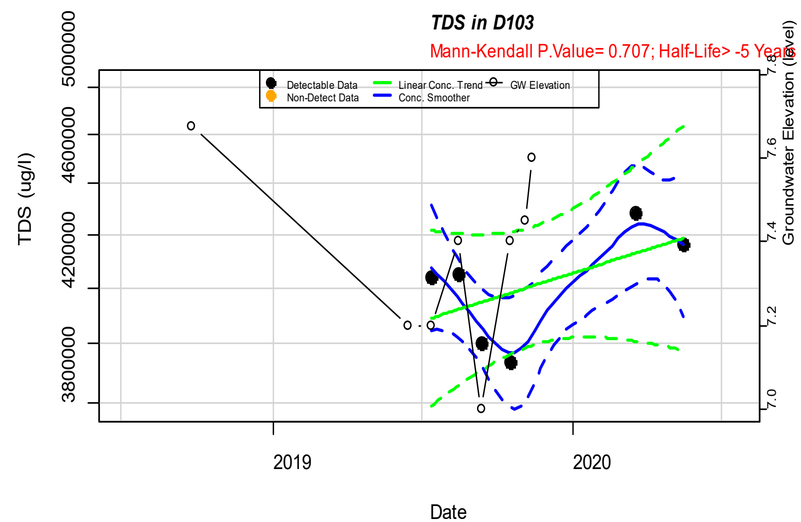

Sulfate in E
Mann-Kendall P.Value= 0.0715; Half-Life= -114 da
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Sulfate (ug/l)
5e+07
5e+06
5e+05
5e+04
2019
2020
Date


Sulfate in WX22
Mann-Kendall P.Value= 0.0163; Half-Life= -281 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Sulfate (ug/l)
1e+06
2e+05
5e+04
2019
2020
Date

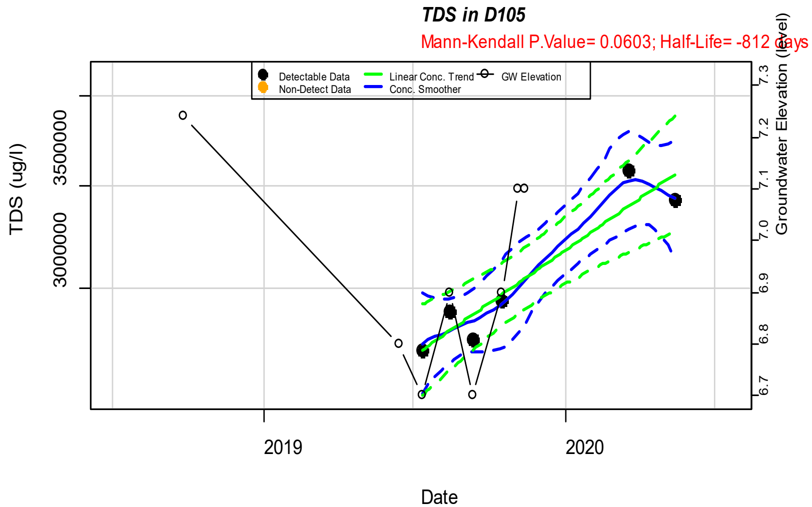

TDS in D1
Mann-Kendall P.Value= <0.01; Half-Life= -418 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
TDS (ug/l)
Groundwater Elevation (level)
Date
2019
2020


TDS in D10
Mann-Kendall P.Value= 0.13; Half-Life= 1439 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
TDS (ug/l)
Groundwater Elevation (level)
Date
2019
2020

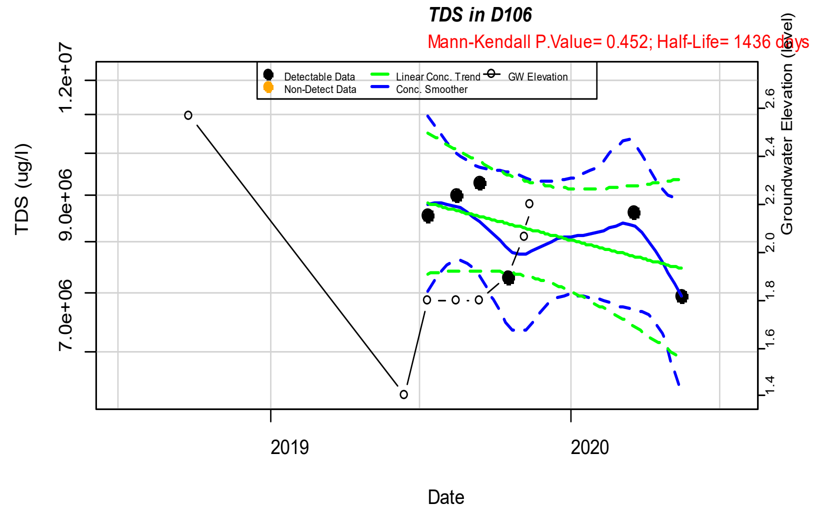

TDS in D102
Mann-Kendall P.Value= 0.707; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
TDS (ug/l)
Groundwater Elevation (level)
Date
2019
2020


TDS in D103
Mann-Kendall P.Value= 0.707; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
TDS (ug/l)
Groundwater Elevation (level)
Date
2019
2020

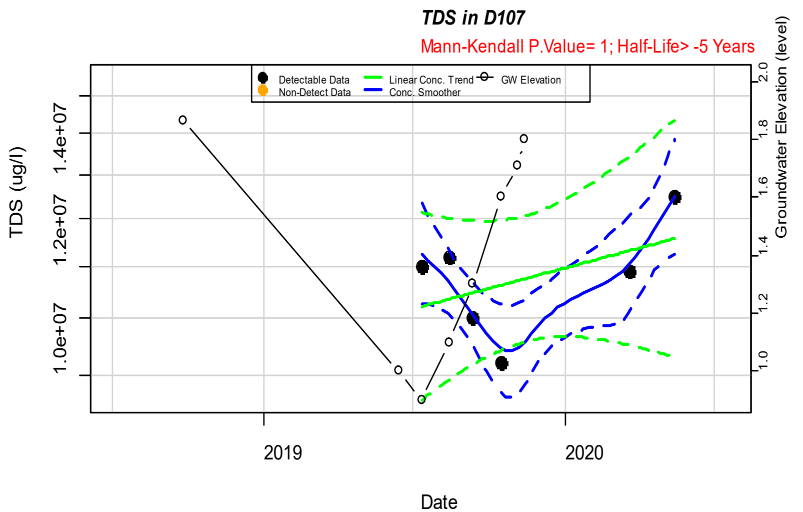
ERM



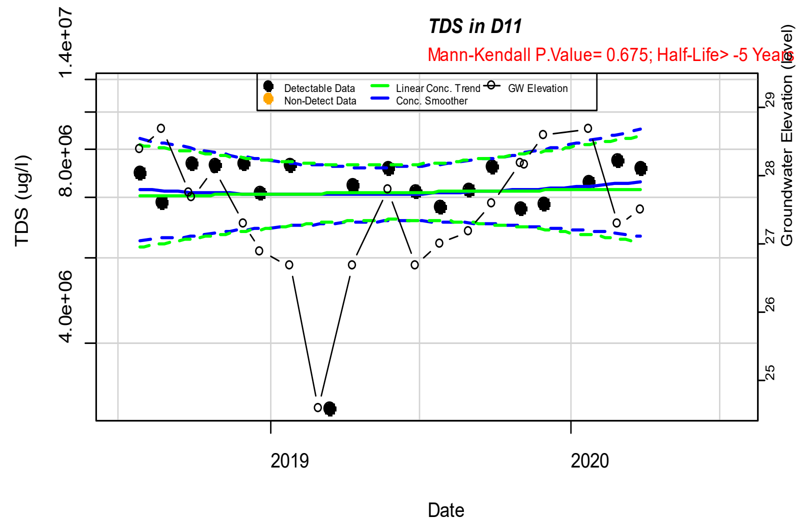
TDS in D105
Mann-Kendall P.Value= 0.0603; Half-Life= -812 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
TDS (ug/l)
Groundwater Elevation (level)
3000000
3500000
6.7
6.8
6.9
7.0
7.1
7.2
7.3
2019
2020
Date



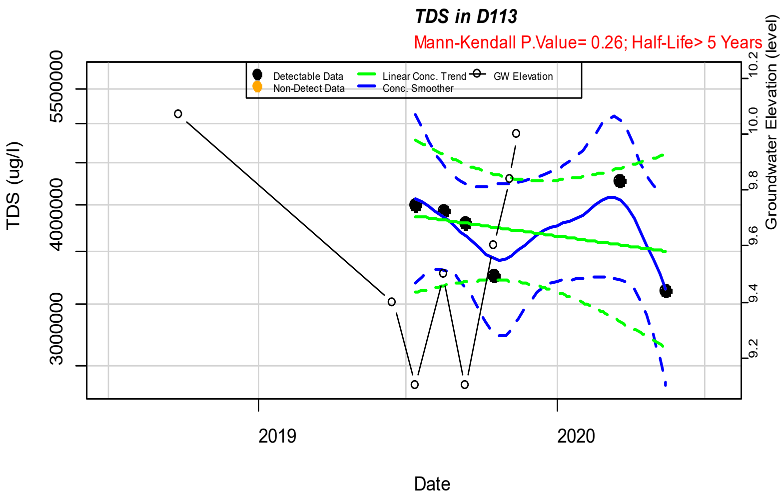
TDS in D106
Mann-Kendall P.Value= 0.452; Half-Life= 1436 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
TDS (ug/l)
Groundwater Elevation (level)
7.0e+06
9.0e+06
1.2e+07
1.4
1.6
1.8
2.0
2.2
2.4
2.6
2019
2020
Date

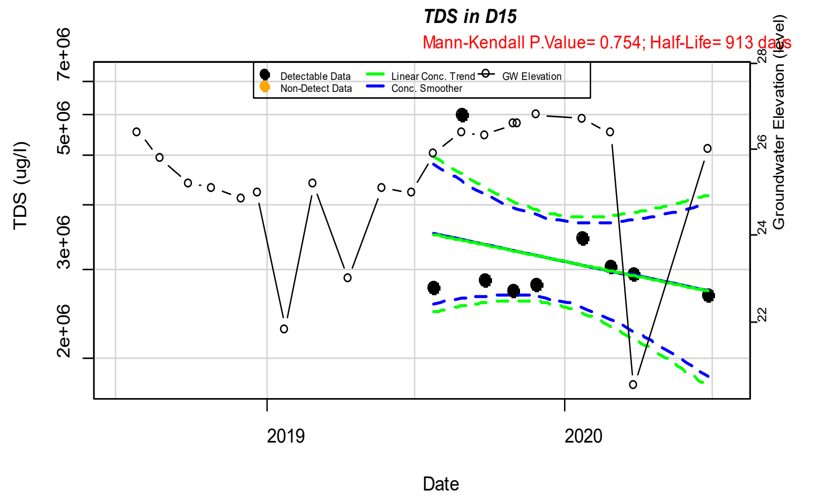


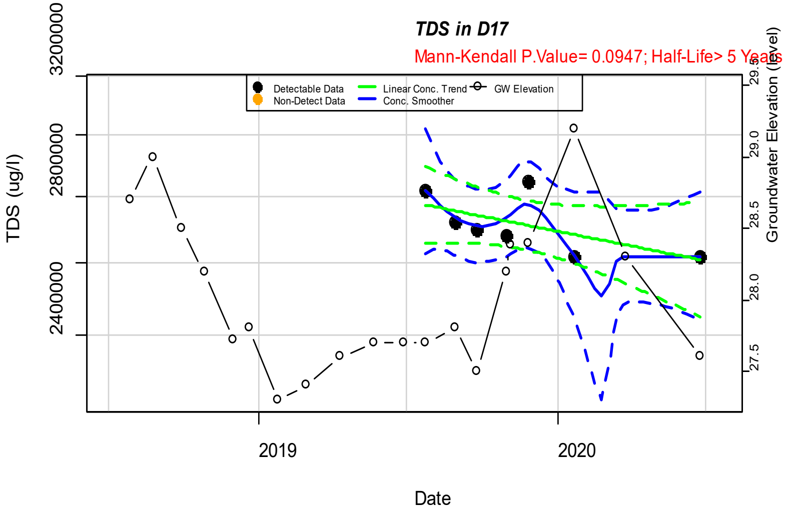
TDS in D107
Mann-Kendall P.Value= 1; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
TDS (ug/l)
Groundwater Elevation (level)
1.0e+07
1.2e+07
1.4e+07
1.0
1.2
1.4
1.6
1.8
2.0
2019
2020
Date

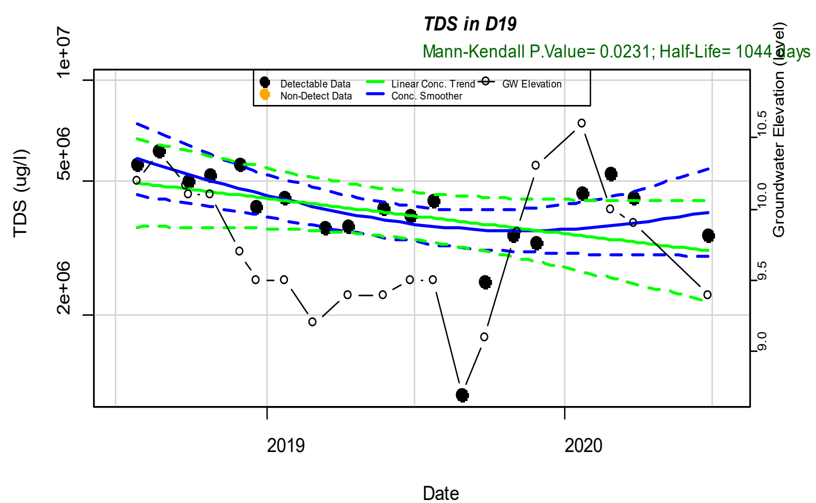


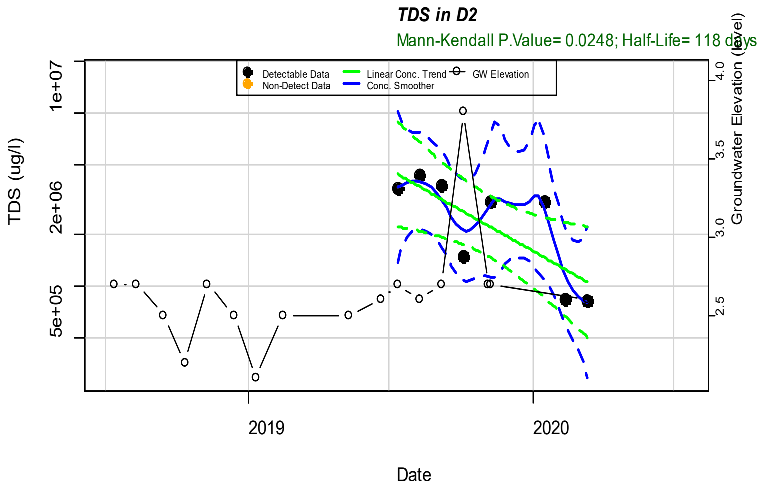
TDS in D11
Mann-Kendall P.Value= 0.675; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
TDS (ug/l)
Groundwater Elevation (level)
4.0e+06
8.0e+06
1.4e+07
25
26
27
28
29
2019
2020
Date

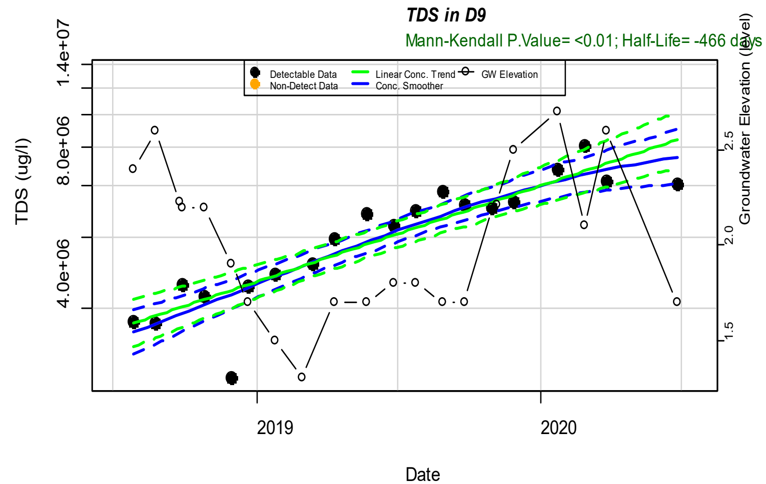

TDS in D113
Mann-Kendall P.Value= 0.26; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
TDS (ug/l)
Groundwater Elevation (level)
Date
2019
2020
3000000
4000000
5500000

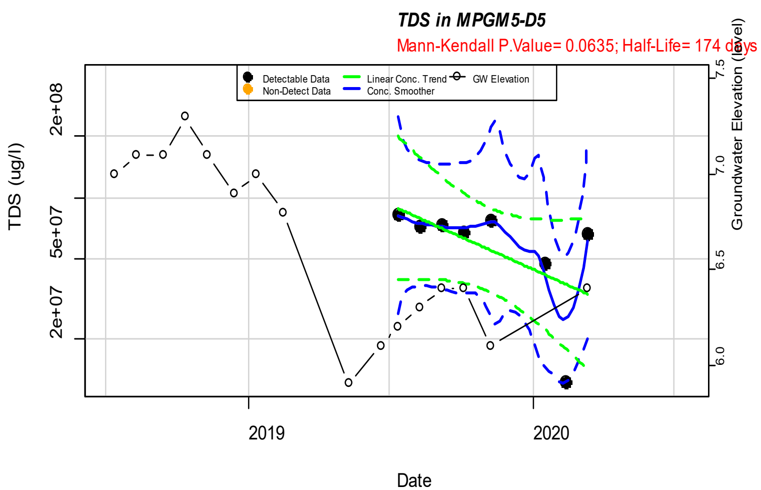

TDS in D15
Mann-Kendall P.Value= 0.754; Half-Life= 913 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
TDS (ug/l)
Groundwater Elevation (level)
Date
2019
2020
2e+06
3e+06
5e+06
7e+06
22
24
26
28

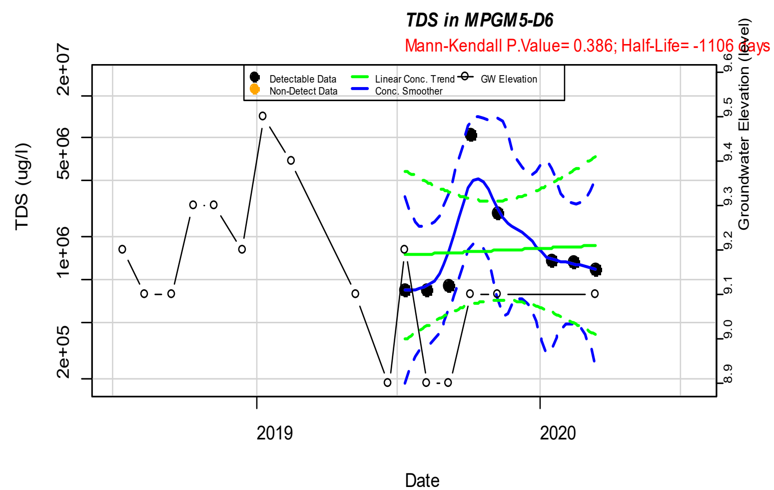

TDS in D17
Mann-Kendall P.Value= 0.0947; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
TDS (ug/l)
Groundwater Elevation (level)
Date
2019
2020
2400000
2800000
3200000
27.5
28.0
28.5
29.0


TDS in D19
Mann-Kendall P.Value= 0.0231; Half-Life= 1044 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
TDS (ug/l)
Groundwater Elevation (level)
Date
2019
2020
2e+06
5e+06
1e+07
9.0
9.5
10.0
10.5


TDS in D2
Mann-Kendall P.Value= 0.0248; Half-Life= 118 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
TDS (ug/l)
5e+05
2e+06
1e+07
Groundwater Elevation (level)
2.5
3.0
3.5
4.0
2019
2020
Date

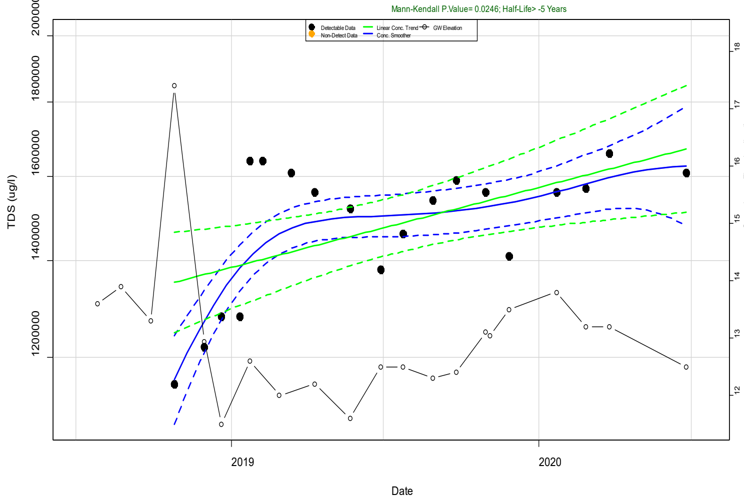

TDS in D9
Mann-Kendall P.Value= <0.01; Half-Life= -466 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
TDS (ug/l)
4.0e+06
8.0e+06
1.4e+07
Groundwater Elevation (level)
1.5
2.0
2.5
2019
2020
Date


TDS in MPGM5-D5
Mann-Kendall P.Value= 0.0635; Half-Life= 174 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
TDS (ug/l)
2e+07
5e+07
2e+08
Groundwater Elevation (level)
6.0
6.5
7.0
7.5
2019
2020
Date


TDS in MPGM5-D6
Mann-Kendall P.Value= 0.386; Half-Life= -1106 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
TDS (ug/l)
2e+05
1e+06
5e+06
2e+07
Groundwater Elevation (level)
8.9
9.0
9.1
9.2
9.3
9.4
9.5
9.6
2019
2020
Date

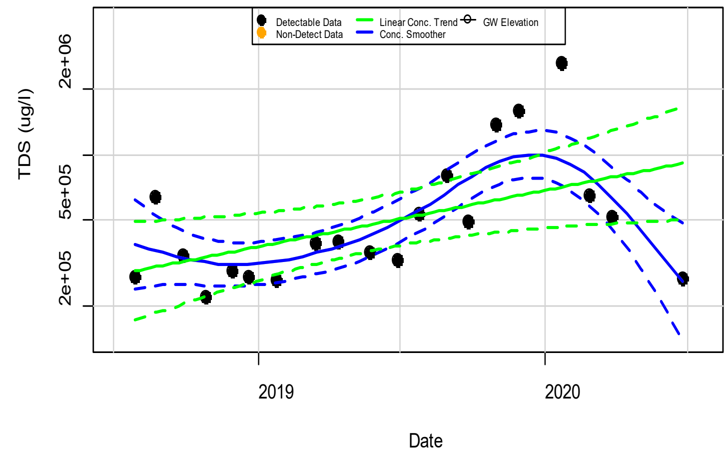
TDS in D16

Mann-Kendall P.Value= 0.0246; Half-Life> -5 Years



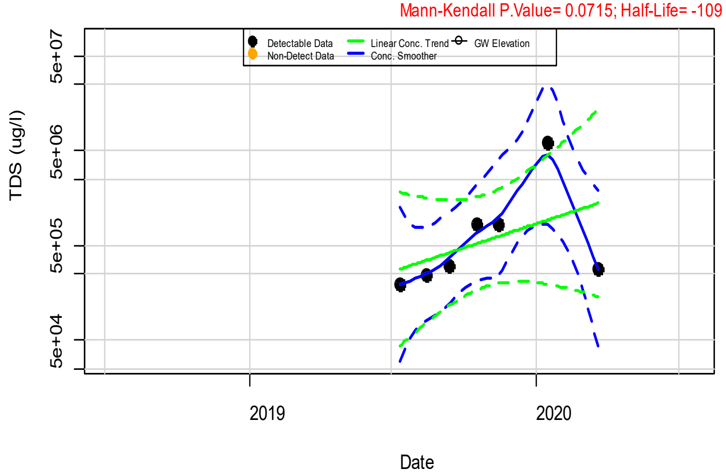
TDS in WX22

Mann-Kendall P.Value= 0.0136; Half-Life= -421 days



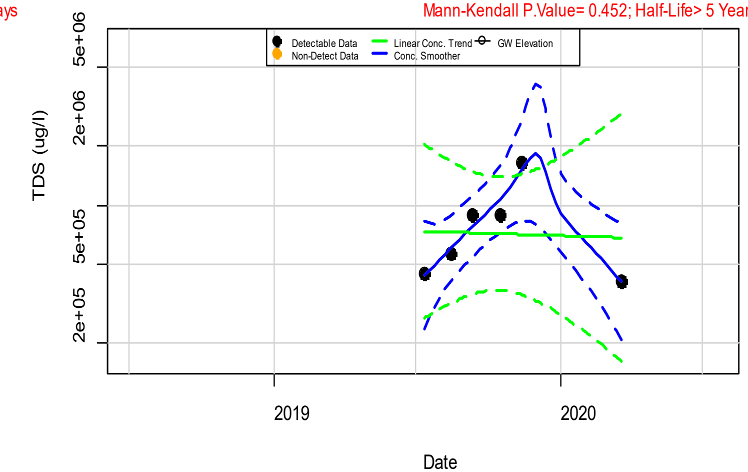
TDS in E

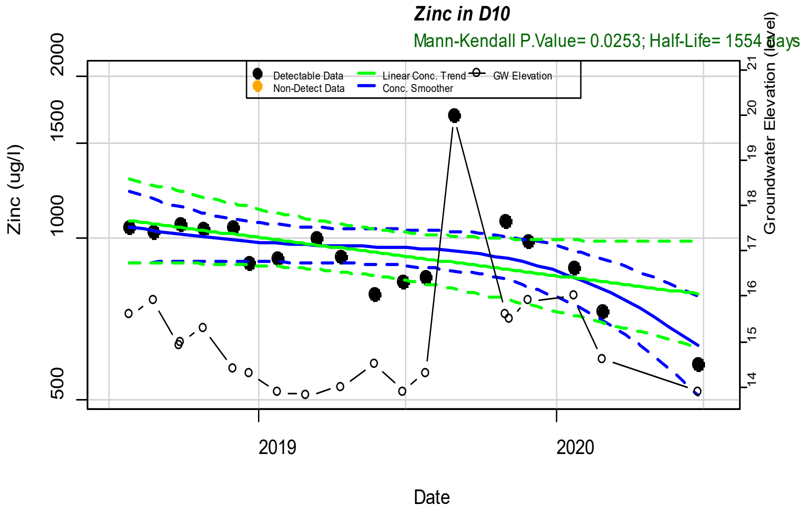
Mann-Kendall P.Value= 0.0715; Half-Life= -109 days

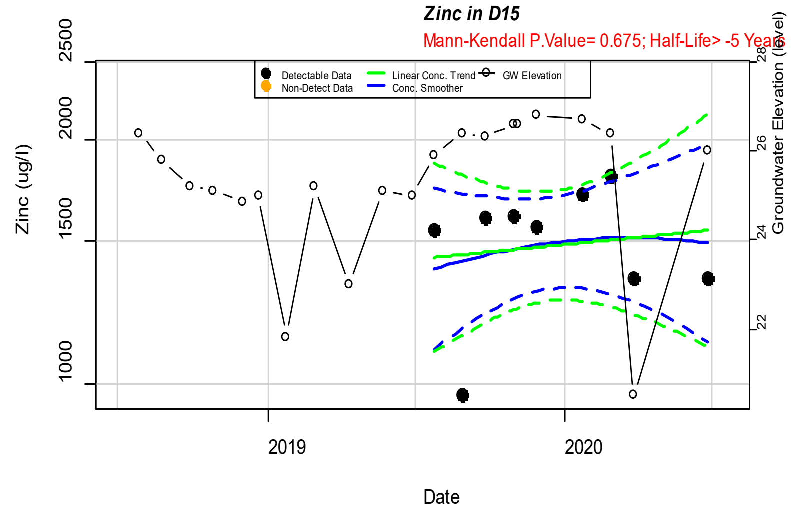


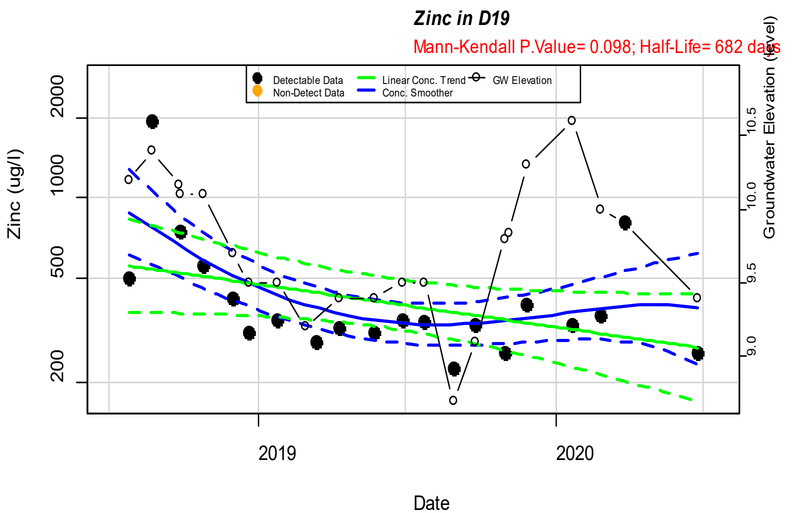
TDS in G

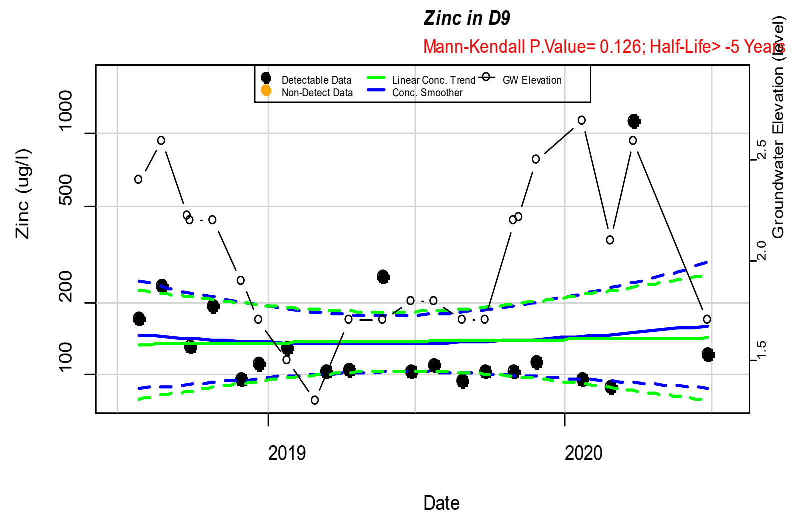
Mann-Kendall P.Value= 0.452; Half-Life> 5 Years



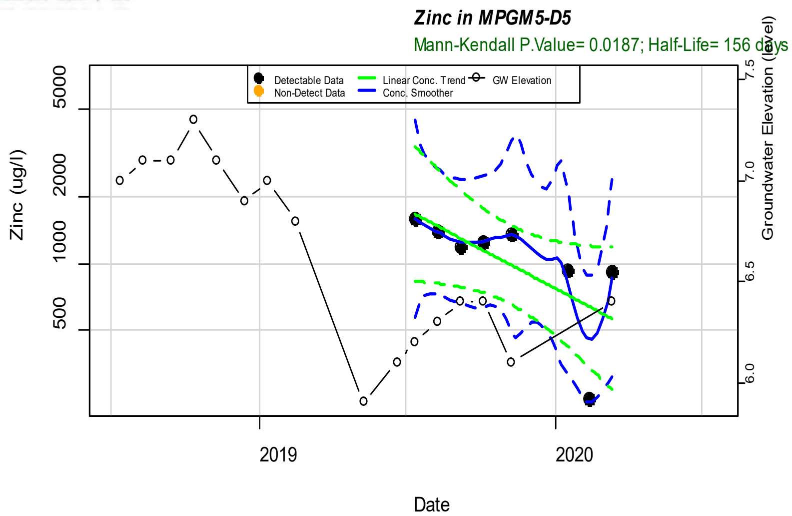

Zinc in D10
Mann-Kendall P.Value= 0.0253; Half-Life= 1554 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Zinc (ug/l)
500
1000
1500
2000
Groundwater Elevation (level)
14
15
16
17
18
19
20
21
2019
2020
Date


Zinc in D15
Mann-Kendall P.Value= 0.675; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Zinc (ug/l)
1000
1500
2000
2500
Groundwater Elevation (level)
22
24
26
28
2019
2020
Date

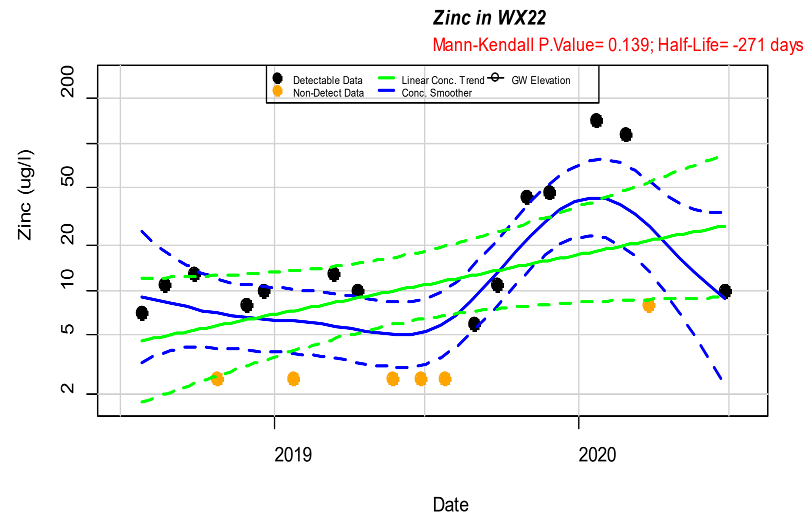

Zinc in D19
Mann-Kendall P.Value= 0.098; Half-Life= 682 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Zinc (ug/l)
200
500
1000
2000
Groundwater Elevation (level)
9.0
9.5
10.0
10.5
2019
2020
Date


Zinc in D9
Mann-Kendall P.Value= 0.126; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Zinc (ug/l)
100
200
500
1000
Groundwater Elevation (level)
1.5
2.0
2.5
2019
2020
Date

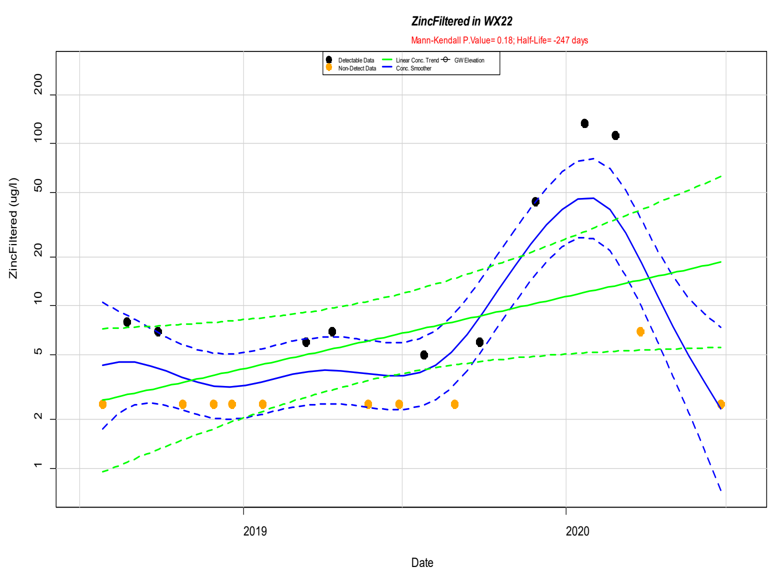
ERM



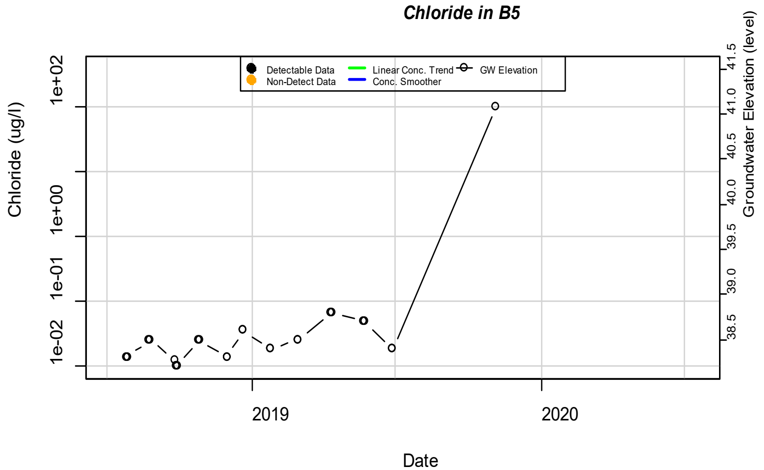
Zinc in MPGM5-D5
Mann-Kendall P.Value= 0.0187; Half-Life= 156 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Zinc (ug/l)
5000
2000
1000
500
Groundwater Elevation (level)
7.5
7.0
6.5
6.0
2019
2020
Date

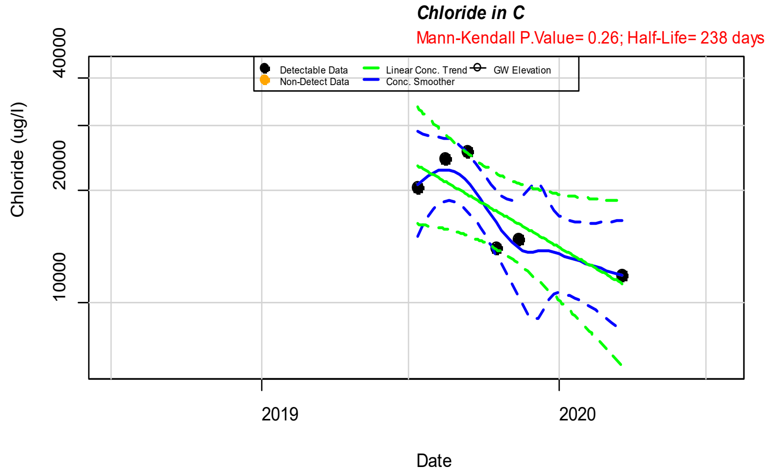


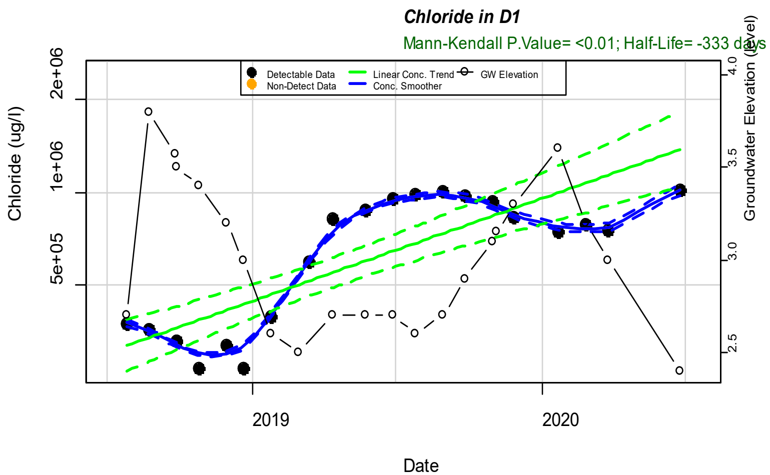
Zinc in WX22
Mann-Kendall P.Value= 0.139; Half-Life= -271 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Zinc (ug/l)
200
50
20
10
5
2
2019
2020
Date

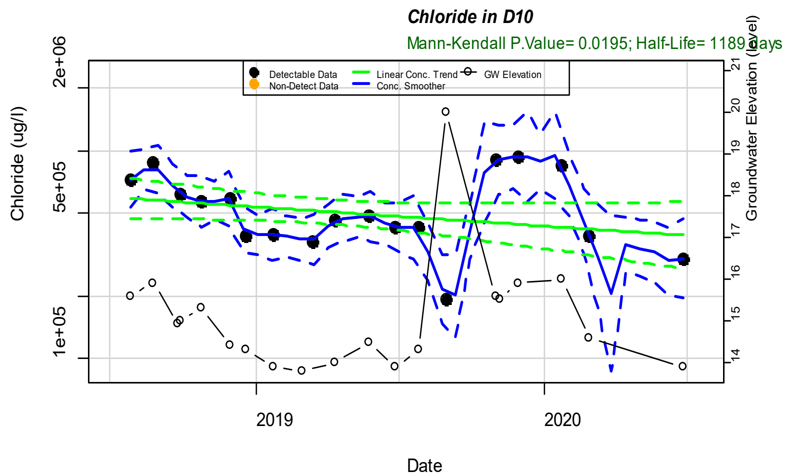


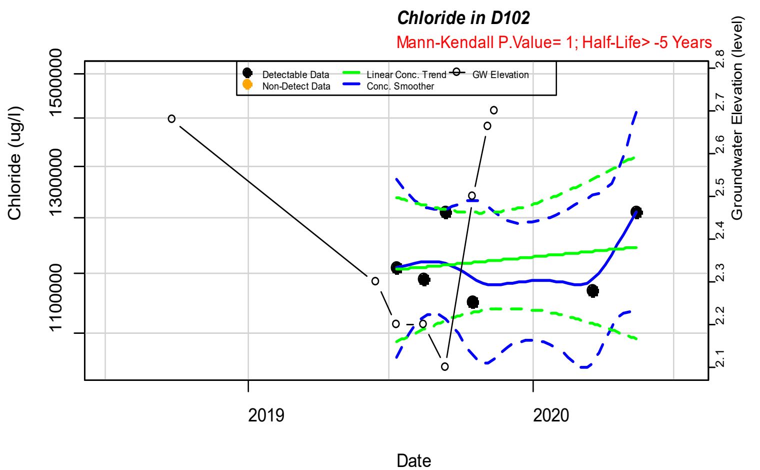
ZincFiltered in WX22
Mann-Kendall P.Value= 0.18; Half-Life= -247 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
ZincFiltered (ug/l)
200
100
50
20
10
5
2
1
2019
2020
Date

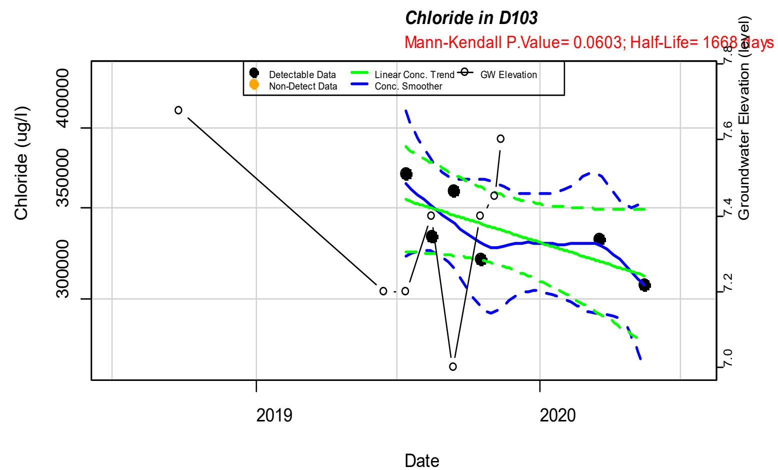

Chloride in B5
Chloride (ug/l)
Groundwater Elevation (level)
Date
2019
2020
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation

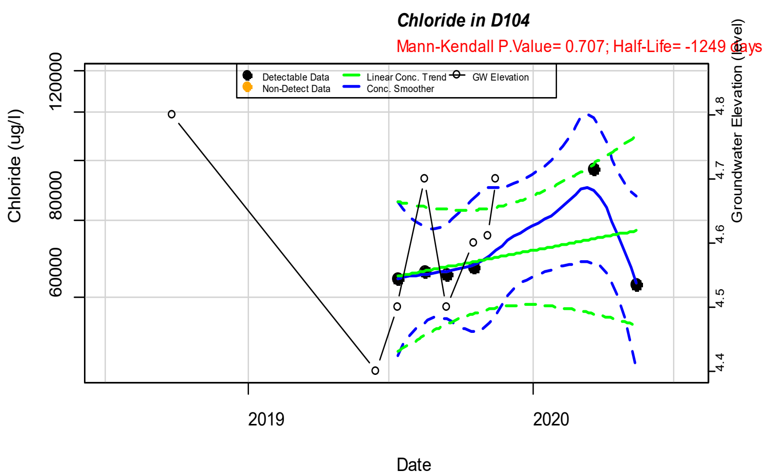

Chloride in C
Mann-Kendall P.Value= 0.26; Half-Life= 238 days
Chloride (ug/l)
Date
2019
2020
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation

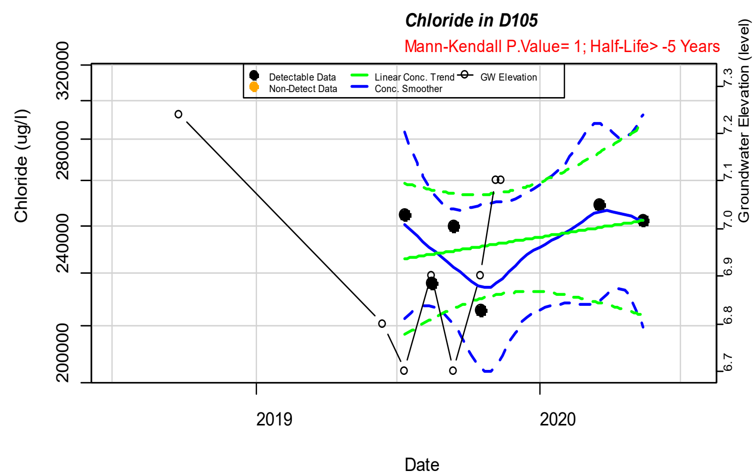

Chloride in D1
Mann-Kendall P.Value= <0.01; Half-Life= -333 days
Chloride (ug/l)
Groundwater Elevation (level)
Date
2019
2020
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation

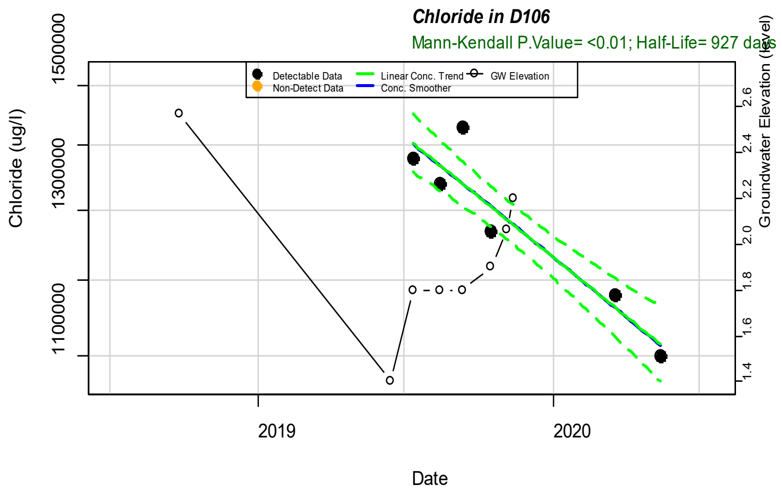

Chloride in D10
Mann-Kendall P.Value= 0.0195; Half-Life= 1189 days
Chloride (ug/l)
Groundwater Elevation (level)
Date
2019
2020
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation


Chloride in D102
Mann-Kendall P.Value= 1; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
Groundwater Elevation (level)
Date
2019
2020

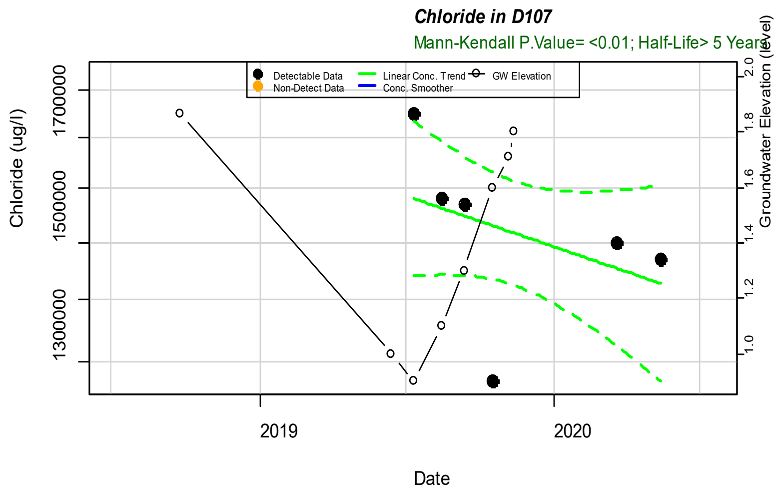

Chloride in D103
Mann-Kendall P.Value= 0.0603; Half-Life= 1668 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
Groundwater Elevation (level)
Date
2019
2020


Chloride in D104
Mann-Kendall P.Value= 0.707; Half-Life= -1249 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
Groundwater Elevation (level)
Date
2019
2020

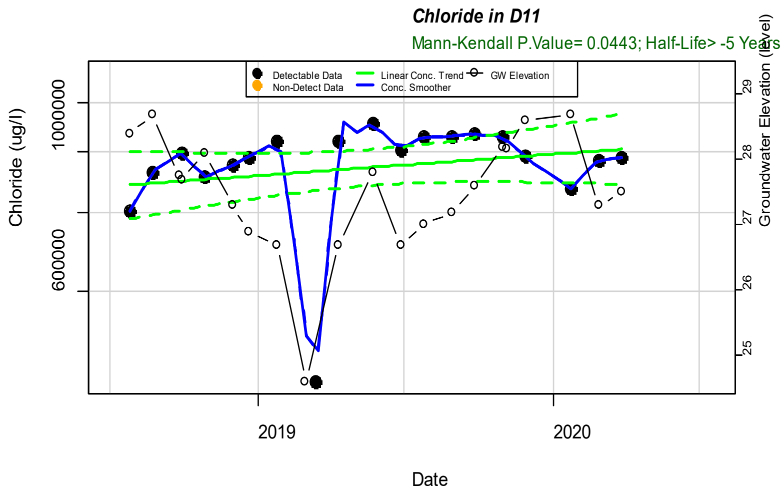

Chloride in D105
Mann-Kendall P.Value= 1; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
Groundwater Elevation (level)
Date
2019
2020



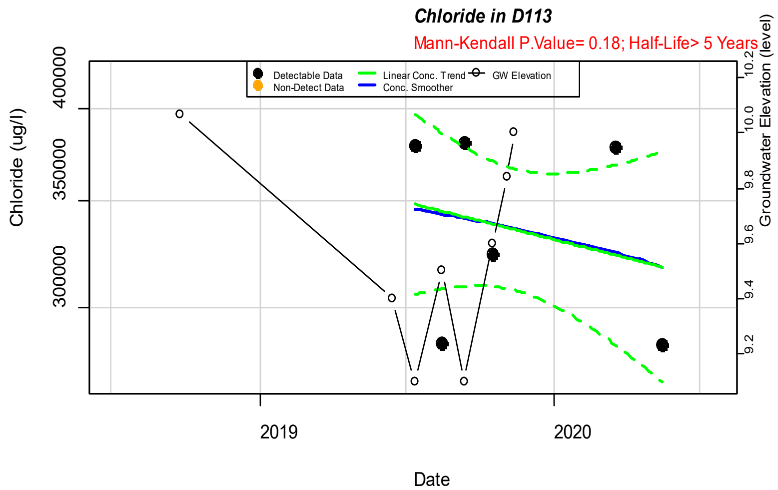
Chloride in D106
Mann-Kendall P.Value= <0.01; Half-Life= 927 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
Groundwater Elevation (level)
Date



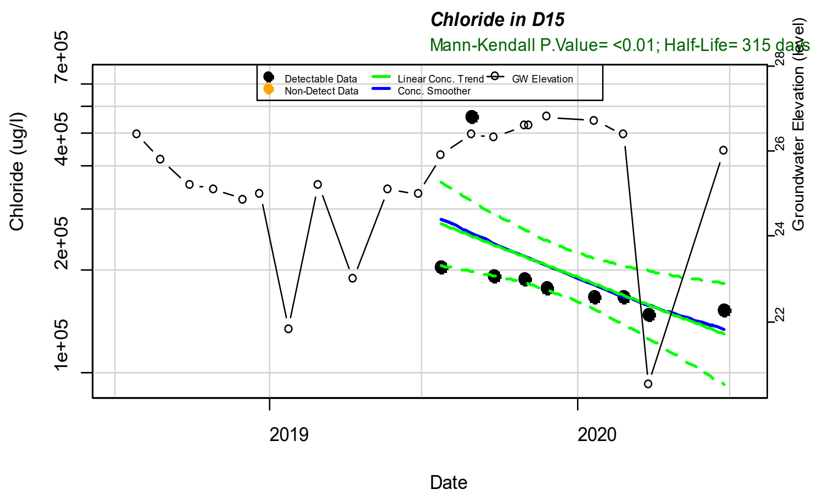
Chloride in D107
Mann-Kendall P.Value= <0.01; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
Groundwater Elevation (level)
Date

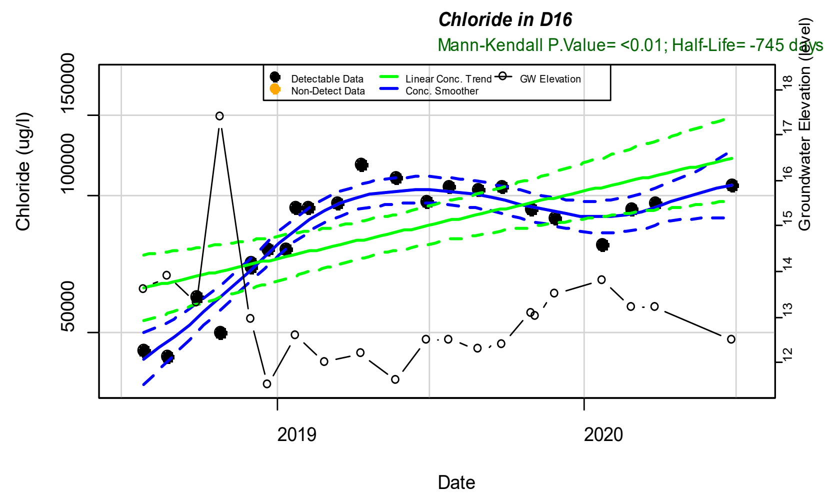


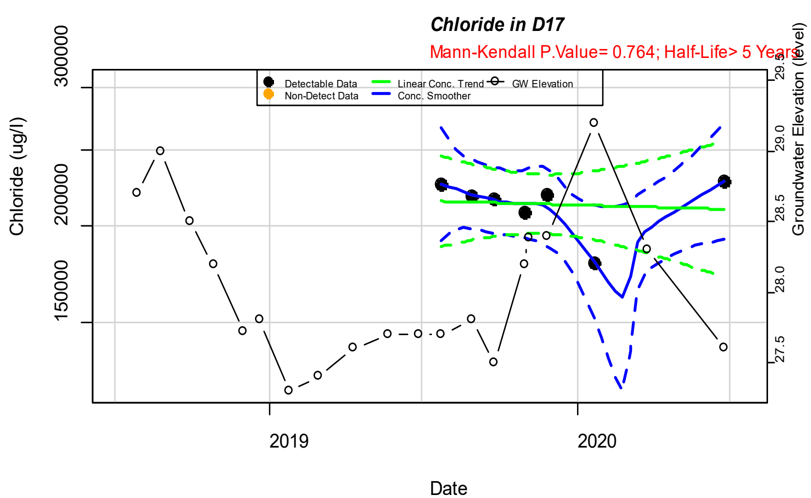
Chloride in D11
Mann-Kendall P.Value= 0.0443; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
Groundwater Elevation (level)
Date

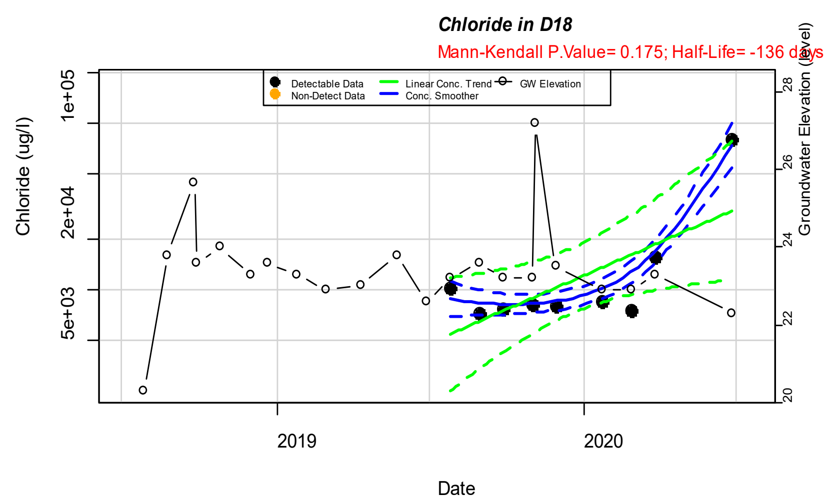


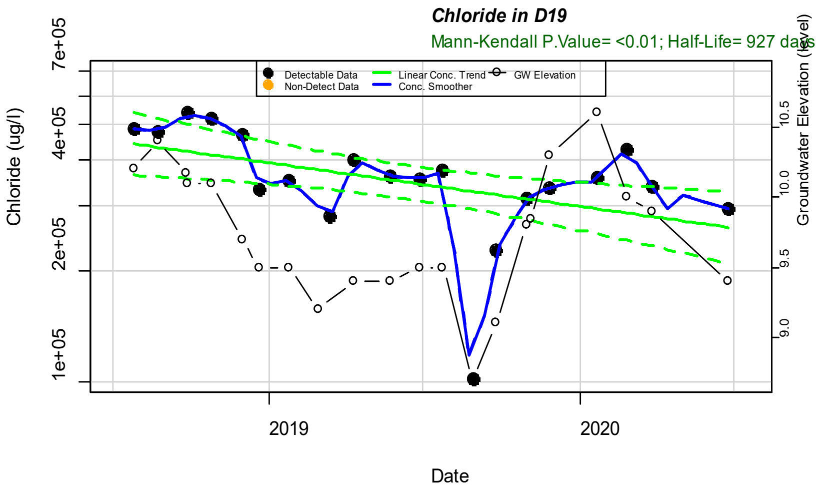
Chloride in D113
Mann-Kendall P.Value= 0.18; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
Groundwater Elevation (level)
Date

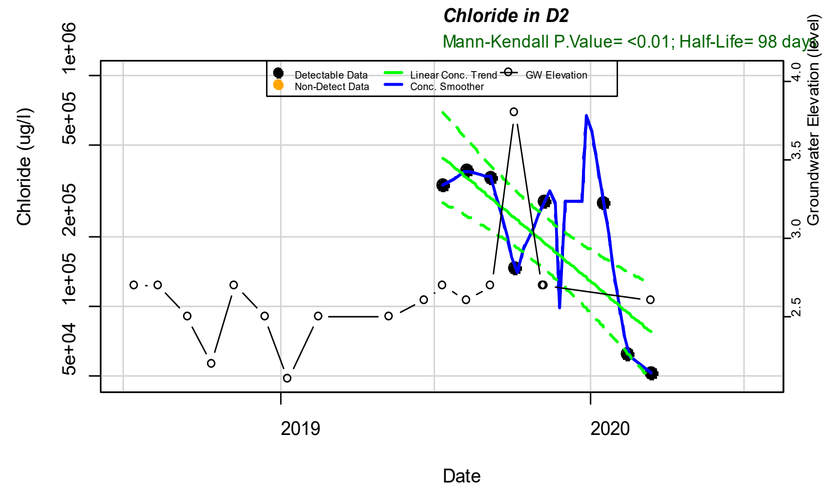

Chloride in D15
Mann-Kendall P.Value= <0.01; Half-Life= 315 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
Groundwater Elevation (level)
Date
7e+05
4e+05
2e+05
1e+05
2019
2020
28
26
24
22

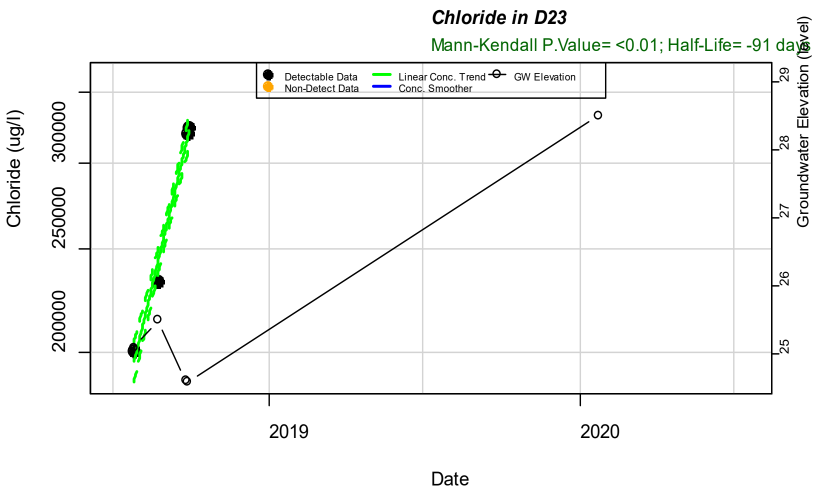

Chloride in D16
Mann-Kendall P.Value= <0.01; Half-Life= -745 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
Groundwater Elevation (level)
Date
150000
100000
50000
2019
2020
18
17
16
15
14
13
12

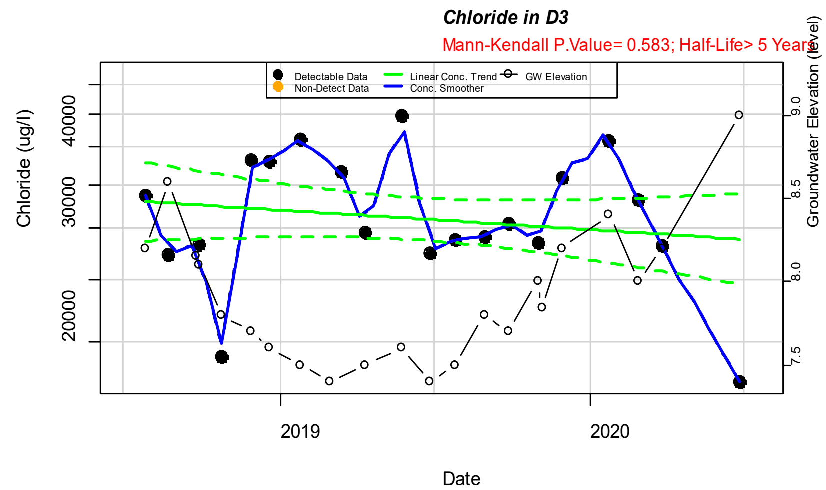

Chloride in D17
Mann-Kendall P.Value= 0.764; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
Groundwater Elevation (level)
Date
300000
200000
150000
2019
2020
29.5
29.0
28.5
28.0
27.5

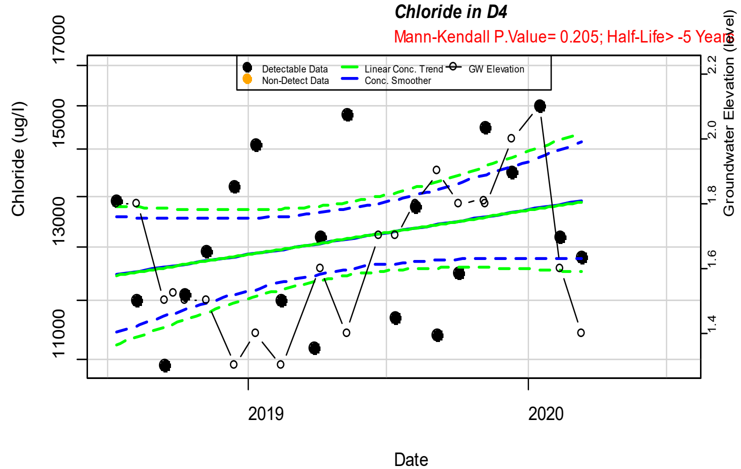

Chloride in D18
Mann-Kendall P.Value= 0.175; Half-Life= -136 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
Groundwater Elevation (level)
Date
1e+05
2e+04
5e+03
2019
2020
28
26
24
22
20

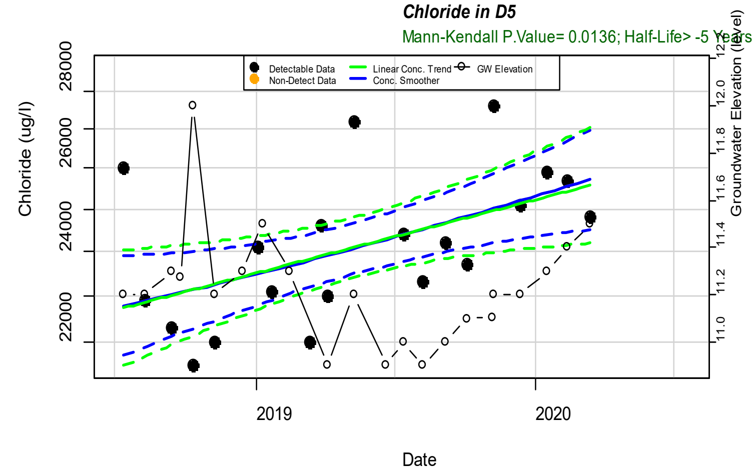

Chloride in D19
Mann-Kendall P.Value= <0.01; Half-Life= 927 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
Groundwater Elevation (level)
Date
2019
2020

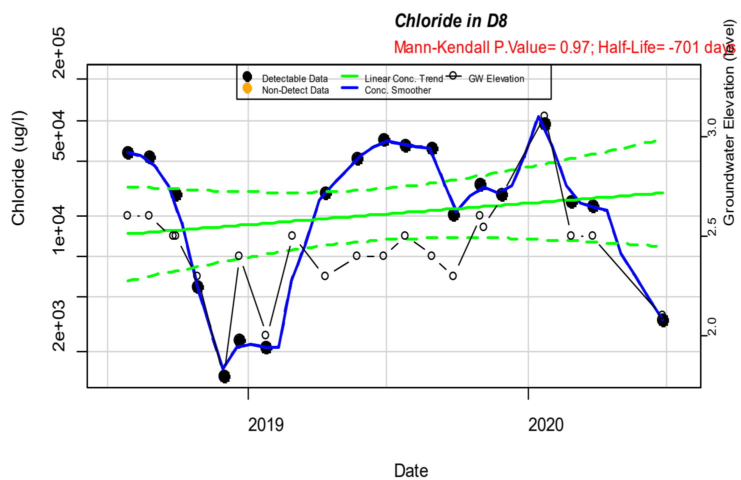

Chloride in D2
Mann-Kendall P.Value= <0.01; Half-Life= 98 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
Groundwater Elevation (level)
Date
2019
2020

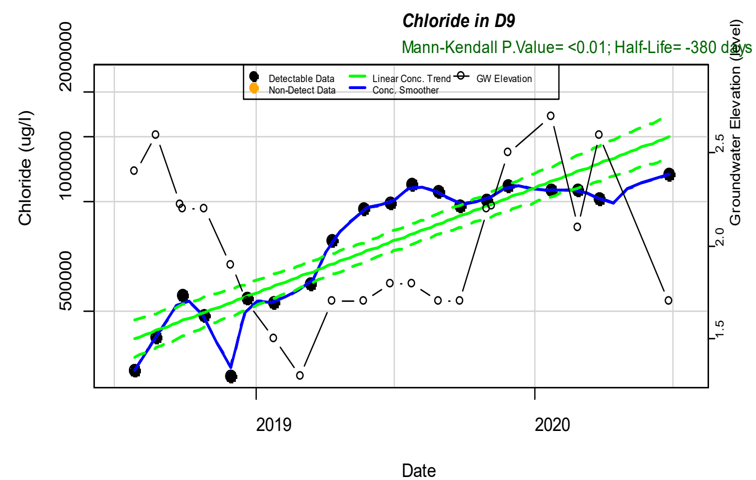

Chloride in D23
Mann-Kendall P.Value= <0.01; Half-Life= -91 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
Groundwater Elevation (level)
Date
2019
2020


Chloride in D3
Mann-Kendall P.Value= 0.583; Half-Life> 5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
Groundwater Elevation (level)
Date
2019
2020


Chloride in D4
Mann-Kendall P.Value= 0.205; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
11000
13000
15000
17000
Groundwater Elevation (level)
1.4
1.6
1.8
2.0
2.2
2019
2020
Date

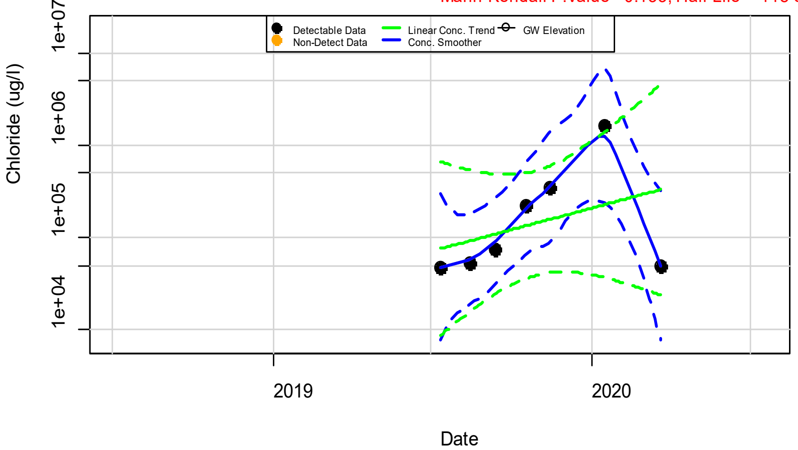

Chloride in D5
Mann-Kendall P.Value= 0.0136; Half-Life> -5 Years
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
22000
24000
26000
28000
Groundwater Elevation (level)
11.0
11.2
11.4
11.6
11.8
12.0
12.2
2019
2020
Date


Chloride in D8
Mann-Kendall P.Value= 0.97; Half-Life= -701 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
2e+03
1e+04
5e+04
2e+05
Groundwater Elevation (level)
2.0
2.5
3.0
2019
2020
Date


Chloride in D9
Mann-Kendall P.Value= <0.01; Half-Life= -380 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
500000
1000000
2000000
Groundwater Elevation (level)
1.5
2.0
2.5
2019
2020
Date

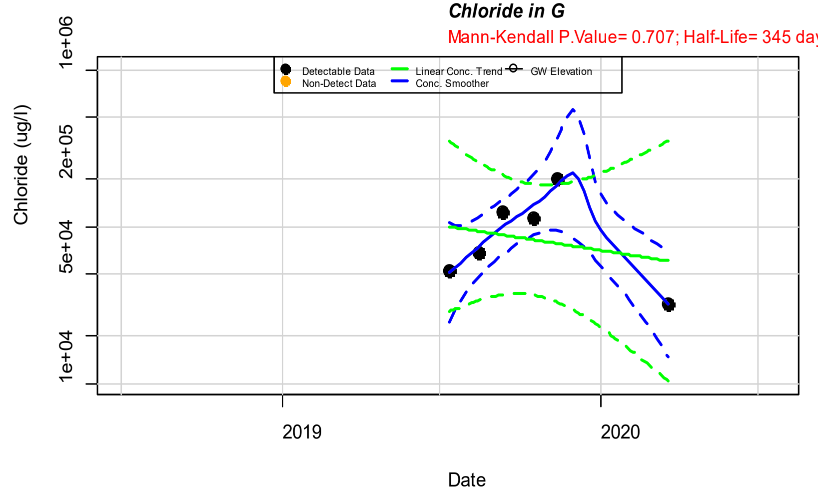
Chloride in E

Mann-Kendall P.Value= 0.133; Half-Life= -118 days



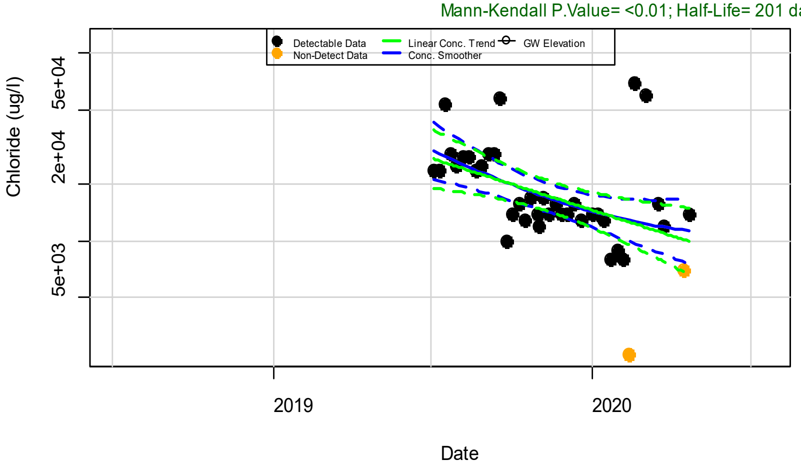
Chloride in G

Mann-Kendall P.Value= 0.707; Half-Life= 345 days



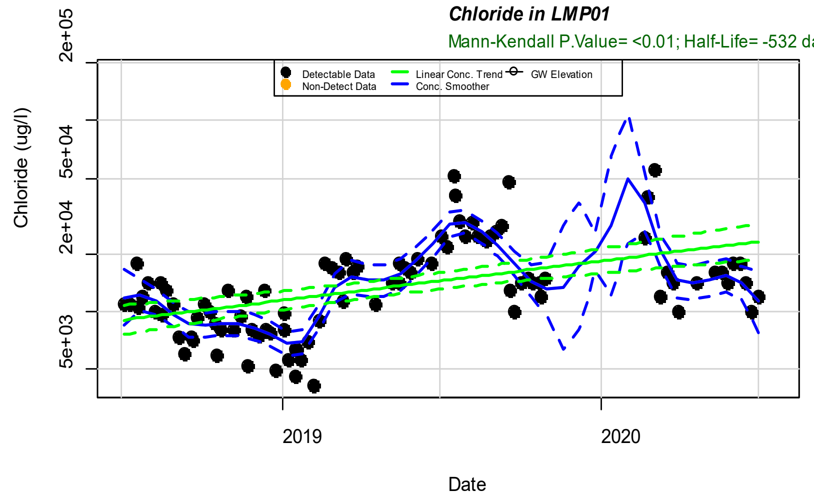
Chloride in LDP01

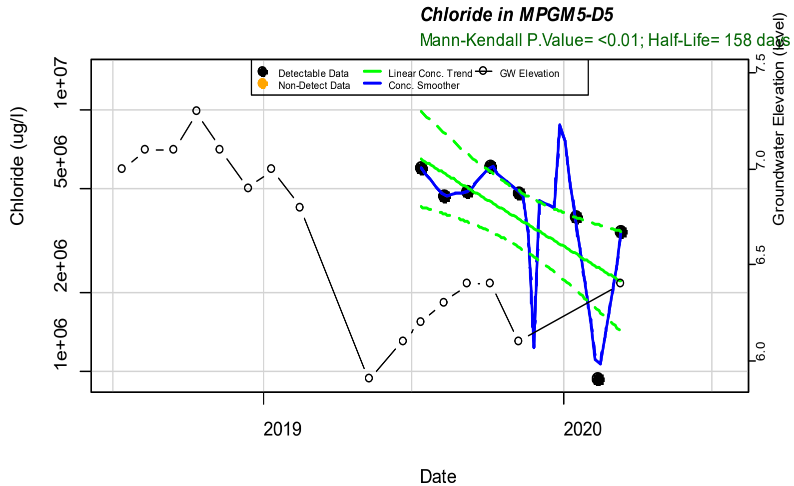
Mann-Kendall P.Value= <0.01; Half-Life= 201 days

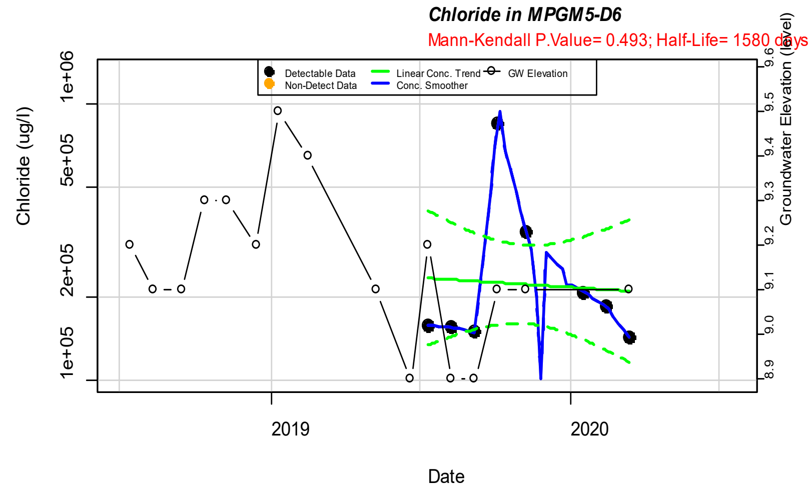


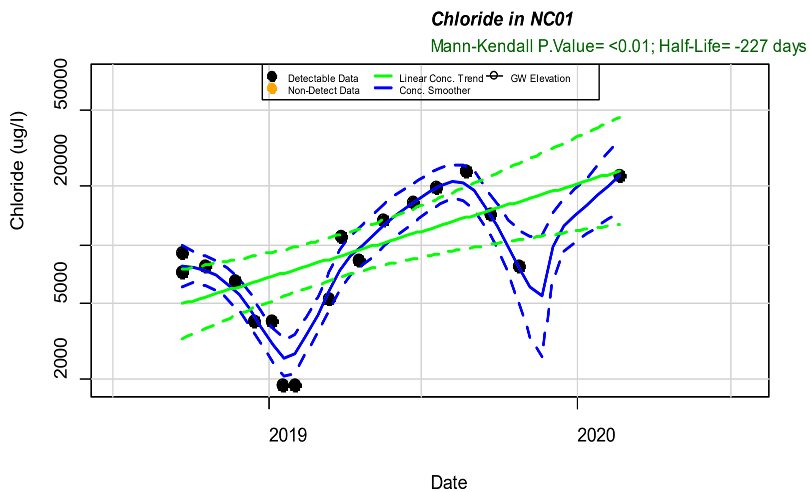
Chloride in LMP01

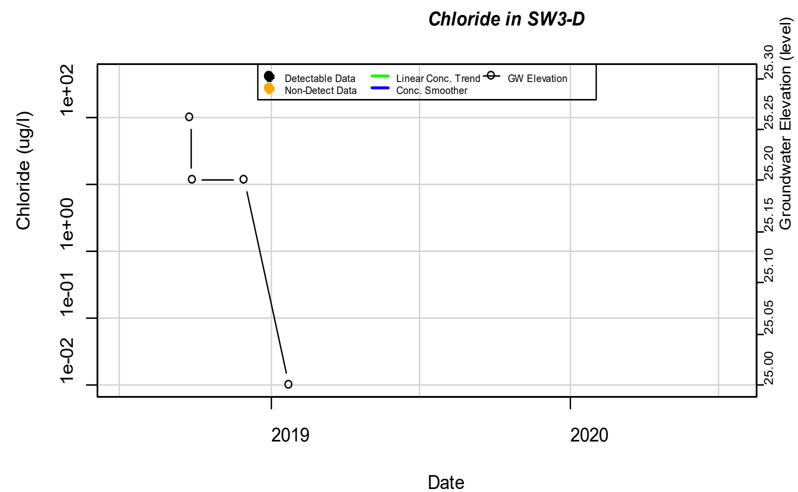
Mann-Kendall P.Value= <0.01; Half-Life= -532 days

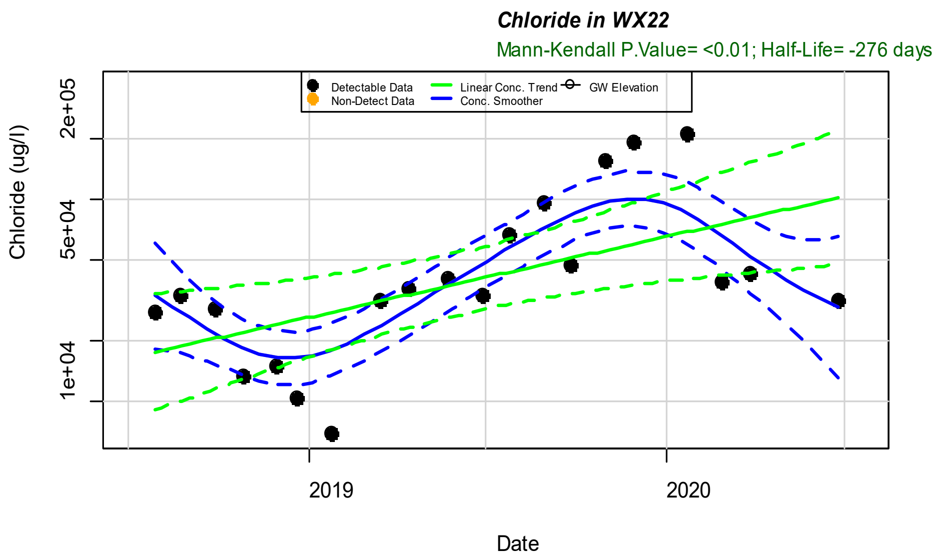



Chloride in MPGM5-D5
Mann-Kendall P.Value= <0.01; Half-Life= 158 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
1e+07
5e+06
2e+06
1e+06
Groundwater Elevation (level)
7.5
7.0
6.5
6.0
2019
2020
Date


Chloride in MPGM5-D6
Mann-Kendall P.Value= 0.493; Half-Life= 1580 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
1e+06
5e+05
2e+05
1e+05
Groundwater Elevation (level)
9.6
9.5
9.4
9.3
9.2
9.1
9.0
8.9
2019
2020
Date


Chloride in NC01
Mann-Kendall P.Value= <0.01; Half-Life= -227 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
50000
20000
5000
2000
2019
2020
Date


Chloride in SW3-D
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
1e+02
1e+00
1e-01
1e-02
Groundwater Elevation (level)
25.30
25.25
25.20
25.15
25.10
25.05
25.00
2019
2020
Date



Chloride in WX22
Mann-Kendall P.Value= <0.01; Half-Life= -276 days
Detectable Data
Non-Detect Data
Linear Conc. Trend
Conc. Smoother
GW Elevation
Chloride (ug/l)
2e+05
5e+04
1e+04
2019
2020
Date

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