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FORMER HYDRO ALUMINIUM SMELTER CAPPED WASTE STOCKPILE, 2024 ANNUAL GROUNDWATER MONITORING REPORT

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FORMER HYDRO ALUMINIUM SMELTER, CAPPED WASTE STOCKPILE 2024 ANNUAL GROUNDWATER MONITORING REPORT

[Subject]

Project Name
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Description **2024 Annual Groundwater Monitoring Report for the leachate plume associated with the Capped Waste Stockpile at the former Hydro Aluminium Kurri Kurri Smelter, Loxford, NSW.**

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CONTENTS

FIGURES

TABLES

APPENDICES

Appendix 1
Figures

Appendix 2
Attachments

Appendix 3
Lab Summary tables

Appendix 4
Field Parameter Forms

Appendix 5
Laboratory Reports

Appendix 6
Calibration Certificates

Appendix 7
Mann-Kendall Trend Analysis

ABBREVIATIONS

Abbreviation	Description
AEC 1	Areas of Concern 1
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
ANZG	Australian and New Zealand Guidelines (Water Quality)
CoC	Contaminant of Concern
Conc.	Concentration (in tables and graphs)
DQI	Data Quality Indicator
DQO	Data Quality Objective
CWS	Capped Waste Stockpile
EC	Electrical Conductivity
ECC	Engineered Containment Cell
EPA	Environmental Protection Authority
GME	Groundwater Monitoring Event
Hydro	Hydro Aluminium Kurri Kurri Pty Ltd
ha	hectare
km	kilometre
L	litre
LOR	Limit of Reporting
m	metre
m bgs	Metres below ground surface
µg/L	micrograms per litre
mg/L	milligrams per litre
NATA	National Association of Testing Authorities
NSW	New South Wales
No.	Number of samples (in tables and graphs)
pH	Measure of acidity, hydrogen ion activity
Ramboll	Ramboll Australia Pty Ltd
RPD	Relative Percentage Difference
QA/QC	quality assurance/quality control

EXECUTIVE SUMMARY

Ramboll has completed quarterly monitoring of the leachate plume at the former Hydro Aluminium Kurri Kurri Smelter since July 2013. The source of the leachate plume is a stockpile of aluminium smelter waste known as the Capped Waste Stockpile (CWS). The CWS was remediated via source removal and waste transfer to the newly constructed Engineered Containment Cell (ECC) between May and September 2023 as part of the ECC Construction and Site Remediation Project.

Forty-seven GMEs have been completed within the leachate plume. Each GME included the sampling and analysis of groundwater from a network of 28 shallow and deep wells located on five sections along the length of the leachate plume down-gradient of the CWS. An additional pair of two shallow and deep wells were added to the network in 2016. These wells are located adjacent to Swamp Creek, the nearest surface water receptor. Physico-chemical parameters were recorded, and groundwater samples were collected and analysed for soluble fluoride, total and free cyanide as well as total and dissolved aluminium.

This Annual Report summarising concentrations of fluoride, the key parameter, from the first eight GMEs undertaken following the completion of remedial works in September 2023. This Annual Report also documents pre-remediation trends and post-remediation in shallow wells and the impacted deep well W2D.

Evaluation of post-remediation GME data has identified the following:

- Prior to source removal, there were a range of Mann-Kendall trends, but trends showed increasing fluoride concentrations in impacted wells.
- The leachate plume has only impacted one deep aquifer monitoring well, W2D, which is located adjacent to the former plume source, the CWS. This well has shown an increasing fluoride concentration trend, however pre-remediation data from 2019 to 2023 report similar fluoride concentrations.
- Several wells have been periodically, or permanently dry following source removal confirming recharge via infiltration of stormwater.
- While fluoride concentrations remain elevated in impacted wells, there is conclusive evidence of reduction in eight of the thirteen most impacted wells following source removal.
- The leachate plume is not reaching the nearest surface water receptor of Swamp Creek, as indicated by continued low pH and low soluble fluoride concentrations in sentinel wells.

This Annual Groundwater Monitoring Report is currently prepared to comply with Special Condition E1 in Hydro's Environmental Protection License (EPL) 1548, which indicates:

E1 Groundwater interception and monitoring – Capped Waste Stockpile

E1.1 The licensee is to continue operating the groundwater interception trench and leachate management system for the Capped Waste Stockpile

E1.2 the licensee is to continue the groundwater monitoring program in accordance with the 'Groundwater Water Monitoring Program, Capped Waste Stockpile' plan as provided to the EPA on 15 April 2024

E1.3 The licensee must submit a groundwater monitoring report to the EPA with each Annual Return. This report must include, but need not be limited to:

a) Aquifer characterisation, including aquifer behaviour
b) A trend analysis of monitored parameters in key wells, and
c) Any recommendations arising from a review of groundwater data

The first round of post remediation monitoring commenced in September 2023 following source removal in August 2023, as per Ramboll (2018) Remedial Action Plan, Hydro Aluminium Smelter Kurri Kurri.

Post-remediation monitoring has included bi-monthly groundwater monitoring events beginning in September 2023. Bi-monthly events will continue until December 2025 whereby trend analysis will be completed utilising data collected five years prior to source removal (August 2019 to August 2023) and the two years following source removal. A post-remediation monitoring and validation report is to be prepared once stable or decreasing trends are achieved.

In the event that decreasing or stable trends are not identified following two years of post-remediation monitoring, the Contingency Plan in Table 7-4 of the Remedial Action Plan (Ramboll, 2018) will be enacted. This states that further remedial options will be investigated that are aligned with treatment or management, such as long-term restrictions to groundwater usage through a long term management plan.

Ramboll recommend that the Special Conditions in Hydro's EPL be updated to reflect the current status of the CWS (remediation complete) and that post-remediation monitoring has commenced, as follows:

- Remove Special Condition E1.1 as the interception trenches are no longer in use
- Update Special Condition E1.2 to reflect that Hydro has moved to post-remediation monitoring on a bi-monthly basis for 2024 and 2025 following source removal of the CWS, as per Ramboll (2018) Remedial Action Plan, Hydro Aluminium Smelter Kurri Kurri
- Update Special Condition E1.3 to indicate that Leachate Plume Validation Report should be submitted to the EPA at the completion of post-remediation monitoring to close out remediation of the CWS and associated leachate plume.

As of February 2025, Hydro Aluminium Kurri Kurri Pty Ltd have applied for these updates to their EPL.

1. INTRODUCTION

Ramboll Australia Pty Ltd (Ramboll) was commissioned by Hydro Aluminium Kurri Kurri Pty Ltd (Hydro) to undertake quarterly Groundwater Monitoring Events (GMEs) on a portion of the former Hydro Aluminium Kurri Kurri Smelter, located off Hart Road, Loxford, New South Wales (NSW), Australia.

The portion of the former Smelter subject to the quarterly groundwater monitoring comprises the former smelter waste storage area known as the 'Capped Waste Stockpile' (CWS) and an associated area of leachate impacted groundwater (the leachate plume). The CWS and associated leachate plume were identified as Area of Concern 1 (AEC 1) in the Phase 2 Environmental Site Assessment completed by Environ (now Ramboll) in 2012. The location of the CWS is shown in **Figure 1, Appendix 1**.

Ramboll has completed 10 years of GMEs during remediation planning, receipt of approvals for and construction of an on-site Engineered Containment Cell (ECC) for long-term secure storage of aluminium smelter waste and contaminated soil. Results of previous GMEs completed between July 2013 and December 2022 have been reported in the following reports:

- 'Hydro Aluminium Kurri Kurri Smelter, Capped Waste Stockpile, 12 Month Groundwater Monitoring Report', by Environ (now Ramboll), dated February 2015
- 'Hydro Aluminium Smelter, Capped Waste Stockpile, 2015 Annual Groundwater Monitoring Report' by Ramboll Environ (now Ramboll), dated April 2016
- 'Hydro Aluminium Smelter, Capped Waste Stockpile, 2016-2017 Annual Groundwater Monitoring Report', by Ramboll, dated February 2018
- 'Hydro Aluminium Kurri Kurri Smelter, Capped Waste Stockpile, 2018 Annual Groundwater Monitoring Report', by Ramboll, dated February 2019
- 'Hydro Aluminium Kurri Kurri Smelter, Capped Waste Stockpile, 2019 Annual Groundwater Monitoring Report', by Ramboll, dated February 2020
- 'Hydro Aluminium Kurri Kurri Smelter, Capped Waste Stockpile, 2020 Annual Groundwater Monitoring Report', by Ramboll, dated February 2021
- 'Hydro Aluminium Kurri Kurri Smelter, Capped Waste Stockpile, 2021 Annual Groundwater Monitoring Report', by Ramboll, dated February 2022
- 'Hydro Aluminium Kurri Kurri Smelter, Capped Waste Stockpile, 2022 Annual Groundwater Monitoring Report', by Ramboll, dated February 2023

Following remediation of the former CWS in September 2023, quarterly monitoring of the leachate plume was increased to bi-monthly monitoring beginning in September 2023.

A groundwater monitoring report is to be submitted to the Environmental Protection Agency (EPA) with each Annual Return, in line with Hydro Aluminium's Environmental Protection License (EPL). This report presents the results of groundwater monitoring events completed following remediation of the former CWS, from September 2023 to December 2024. Additionally, this report provides a trend analysis of the five years prior to remediation from August 2019 to August 2023.

1.1 Objective and Scope of Work

The objective of each GME was to:

- Assess the current status of leachate impacts to groundwater occurring from the CWS
- Compare the current status of leachate impacts to historical data to assess changes in groundwater quality.

The objective of this 2024 Groundwater Monitoring Report is to:

- Complete trend analysis of soluble fluoride concentration in key wells incorporating data collected five years prior to source remediation (August 2019 to August 2023) and in the first year following source removal (September 2023 to December 2024).
- Summarise aquifer characterisation and behaviour
- Provide conclusions and recommendations.

The scope of work for each GME included:

- Gauging, purging, and sampling of 28 groundwater monitoring wells on five sections through the plume, including two shallow wells and two deep wells located adjacent to Swamp Creek
- Measurement of groundwater physico-chemical properties during purging, including pH, temperature, electrical conductivity (EC), redox, turbidity and dissolved oxygen
- Laboratory analysis of groundwater samples for soluble fluoride, total and dissolved aluminium, and total and free cyanide

1.2 Update on ECC Construction and Site Remediation Project

The ECC Construction and Site Remediation Project included the following works:

- Construction of the ECC base and lining works
- Material transfer of process waste and contaminated material in interim stockpiles at the Smelter Site to the ECC
- Material transfer of contaminated soil from remaining AECs that require remediation as per Ramboll (2018) Remedial Action Plan, Hydro Aluminium Smelter Kurri Kurri
- Material transfer of contaminated material generated during Final Demolition Works
- Treatment of leachate generated during material transfer through a Temporary Water Treatment Plant (TWTP)
- Construction of ECC capping layers and perimeter access road

Remedial works commenced in 2015 and progressed through the demolition of the Smelter between 2017 and 2020. Contaminated soil that was remediated during this period were stockpiled in interim stockpiles on the Smelter Site. The ECC was constructed between 2021 and 2022. Topsoil and clay capping was removed from the CWS and stockpiled for re-use on the Smelter Site in August 2022. Waste transfer to the ECC occurred between February 2023 and November 2023 and included transfer of contaminated material in interim stockpiles and remediation of remaining AECs including AEC 1 CWS. Remediation of AEC 1 CWS began in May 2023 and was completed in September 2023. Waste transfer was completed by the Remediation Contractor.

During remediation of AEC 1 CWS, leachate entrained within the footprint of the CWS was removed as follows:

- Leachate within waste was mixed with drier material and transferred with waste via truck to the ECC
- Leachate within sand lenses located above clay at the western end and south-eastern corner of the CWS was excavated and relocated to the ECC
- Leachate within deeper sand known to extend to a depth of at least 6 m bgs could not be practicably removed via excavation of sand, this leachate was pumped from a sump excavated into the north-east corner of the CWS and either relocated to the ECC in Intermediate Bulk Containers (IBCs) or pumped to Leachate Dam LD03 for treatment through a Temporary Water Treatment Plant (TWTP)

Leachate within the CWS footprint was removed to the extent practicable. Following leachate removal from within the CWS footprint, the majority of the shallow wells that intersect leachate impacted groundwater have been dry.

1.3 Limitations

Ramboll Australia Pty Ltd (Ramboll) prepared this report in accordance with the scope of work as outlined in our proposal to Hydro Aluminium Kurri Kurri Pty Ltd dated 5 February 2024 and in accordance with our understanding and interpretation of current regulatory standards.

A representative program of sampling and laboratory analyses was undertaken as part of this investigation, based on past and present known uses of the site. While every care has been taken, concentrations of contaminants measured may not be representative of conditions between the locations sampled and investigated. We cannot therefore preclude the presence of materials that may be hazardous. Site conditions may change over time. This report is based on conditions encountered at the Site at the time of the report and Ramboll disclaims responsibility for any changes that may have occurred after this time.

The conclusions presented in this report represent Ramboll's professional judgment based on information made available during this assignment and are true and correct to the best of Ramboll's knowledge as at the date of the assessment.

Ramboll did not independently verify all the written or oral information provided to Ramboll during this investigation. While Ramboll has no reason to doubt the accuracy of the information provided to it, the report is complete and accurate only to the extent that the information provided to Ramboll was itself complete and accurate.

This report does not purport to give legal advice. This advice can only be given by qualified legal advisors.

1.4 User Reliance

This report has been prepared exclusively for Hydro Aluminium Kurri Kurri Pty Ltd and may not be relied upon by any other person or entity without Ramboll's express written permission.

2. BACKGROUND

2.1 Site Background

The former Hydro Aluminium Kurri Kurri Smelter is located approximately 30 kilometres (km) west of the city of Newcastle and 150 km north of Sydney, in NSW, Australia. The former smelter included a 60-hectare (ha) plant area and a 2,000-ha buffer zone.

The CWS is a repository of waste arising during the operations of the aluminium smelter and includes spent pot lining, anodes, scrubber bags, concrete, brick, bulky waste, fines, and other smelter wastes. The CWS is located near the eastern boundary of the smelter footprint and adjacent to the surrounding Hydro owned buffer land.

The CWS was maintained as an uncapped bunded waste repository prior to being capped with clay under development consent in the mid-1990s. At this time, impacts to vegetation in the buffer zone downgradient of the CWS were observed. Leachate from the CWS, caused by rainwater and groundwater coming into contact with the CWS contents, was also known to have impacted on groundwater and investigations commenced to explore the extent of groundwater impact. These investigations identified that leachate impacted groundwater likely originated from the northeast corner of the CWS and extended approximately 300 meters (m) northeast. The CWS and associated leachate impacted groundwater were identified as AEC 1 in the Phase 2 Environmental Site Assessment completed by Environ (now Ramboll) in 2012. The location of AEC 1 is shown in **Figure 1, Appendix 1**.

Ramboll assessed AEC 1 as part of the following investigations:

- 'Phase 2 Environmental Site Assessment, Kurri Kurri Aluminium Smelter', dated 1 November 2012
- 'Environmental Site Assessment, Capped Waste Stockpile, Kurri Kurri Aluminium Smelter', dated 13 December 2012
- 'Plume Delineation Report, Capped Waste Stockpile', dated 6 November 2013.

Following these investigations, a Groundwater Monitoring Programme was developed that included monitoring 24 wells on five cross sections along the length of the plume. A summary of the Plume Delineation Report was included in Section 2.2 of the 12 Month Groundwater Monitoring Report (ENVIRON June 2016) and further information regarding the development of the Program is presented in Section 2.4 of that report.

Interim mitigation measures were taken in 2013, 2016, 2017 and late 2022 to intercept the shallow movement and daylighting of leachate impacted groundwater. Measures involved the installation of passive or active shallow trenches, extending approximately 2 m below the ground surface perpendicular to the plume migration and providing pipe conveyance of the leachate impacted groundwater to the surface.

Planning approval was received for the remediation of the CWS (State Significant Development SSD 6666) in December 2020. As indicated in **Section 1.2**, remediation of the CWS was completed in 2023 and this has removed the source of leachate to the groundwater system. Following source removal, remaining leachate impacted groundwater will be monitored to confirm that remediation is occurring through natural processes following subsequent rainfall.

2.2 Characterisation of the Leachate Plume

A Conceptual Site Model (CSM) was developed following Stage 1 and Stage 2 of the investigations and was included in 12 Month Groundwater Summary Report, 2014 (Environ 2015).

The former smelter and surrounding land generally comprises flat, low lying swampy ground that is at an elevation of between 12 m Australian Height Datum (AHD) and 15 m AHD. The CWS was located within the smelter portion of the site and was approximately 170 m in length by 130 m in width and was up to 11 m high and has until recently been capped with clay and topsoil. The

eastern portion of the site within the buffer zone retains natural bushland vegetation with minor surface filling using refractory bricks along the buffer zone fence line. Two areas of vegetation impact, known as the northern and southern vegetation impact areas are located in the north-eastern portion of the site.

The CWS comprised stockpiled spent pot lining wastes and other wastes including cryolite, alumina, floor sweepings, shot blast dust, cement and pot lining mix. The waste is not leachate generating of itself (i.e., not putrescible) however, the uncapped storage of waste and subsequent infiltration of rainwater through the waste stockpile led to the generation of leachate over a period of approximately 25 years. Prior to capping, the leachate was collected behind bund walls surrounding the spent pot lining stockpile. During capping, leachate was suspected to have been entrapped within the fill in the north-eastern corner of the CWS.

The CWS was capped in 1995 to prevent further infiltration. The suspected burial of leachate during capping and the ongoing contact between waste material and shallow groundwater beneath the CWS is considered to result in the ongoing leachate generation.

Major contaminants in the leachate are sodium (4,800 mg/L to 15,300 mg/L), fluoride (1,100 mg/L to 3,420 mg/L), sulphate (4,000 mg/L to 6,740 mg/L) and cyanide (70 mg/L to 200 mg/L) based on data obtained from leachate ponded within the bunded area of the CWS prior to capping (Reference: Dames & Moore (1992) 'Environmental Impact Statement, Upgrades to Waste Storage Facilities at the Alcan Australia Limited Kurri Kurri Smelter'). Leachate impacted groundwater is observed to be brown in colour.

The leachate plume originates from beneath the eastern side of the CWS where seepage into shallow groundwater within a semi-continuous sand aquifer has occurred. The shallow sand aquifer has been delineated as an elongate and sinuous sand lens approximately 50 m wide and 300 m in length extending to the northeast of the CWS. The shallow sand aquifer is surrounded vertically and horizontally by a discontinuous clay aquitard that has been less impacted by leachate in close proximity to the plume and not been impacted by leachate at a distance from the plume. The configuration of the aquifer is a result of the nature of the deposition of sediments within a former estuary during periods of sea level rise and fall. A schematic cross section of the site is included as **Attachment 1**, **Appendix 2**.

The location of the plume within the semi-continuous shallow sand aquifer constrained by the surrounding discontinuous clay aquitard suggests that the movement of the leachate groundwater plume is limited by the geology. The complex interbedded Quaternary sediments comprise estuarine muds (high plasticity clay), fluvial channel sands (fine grained and coarse-grained sands), sandy levee deposits (clayey sand/sandy clay) and high energy flood deposits (coarse grained quartz sand).

Delineation investigations show that the groundwater plume remains confined within one main sand filled channel which directs flow to the northeast. This finding is consistent with observations of a heavily vegetated area evident in the 1961 historical aerial photograph (**Attachment 2**, **Appendix 2**). The heavy vegetation reflects surface and subsurface drainage lines and likely represents the shallow groundwater table present in the sand filled channel. The 1961 aerial photograph depicts the vegetation extending further to the northeast and connecting with Swamp Creek. Given the correlation between the plume extent and the vegetation, it is reasonable to conclude that the groundwater flow path will continue along the vegetation alignment toward Swamp Creek and that, should the plume migration reach the surface water receptor, the discharge point will occur approximately 750 m to 1,000 m north-east of the plume, as shown in **Attachment 2**, **Appendix 2**. Fate and transport modelling to predict the migration of the plume along this channel has been undertaken, as summarised in **Section 2.4**.

The shallow nature of the semi-continuous sand aquifer results in the exfiltration of leachate impacted groundwater within topographically low areas of the site and following high rainfall events. The impacts of exfiltration are observed on the eastern edge of the plume where dieback

of vegetation has occurred (southern and northern vegetation impact areas). Brown coloured seepage is observed and evaporation of exfiltrated groundwater has left a white salt crust on surface soils in this area. The high electrical conductivity of the exfiltrated groundwater (up to 15,000 µs/cm) exceeds the limit (12,200 µs/cm) at which conditions are generally too saline for plant growth (ANZECC, 2000).

The semi-continuous shallow sand aquifer that is impacted with leachate is characterised by high pH (pH >9), electrical conductivity (>5,000 µS/cm), fluoride (>200 mg/L) and total cyanide (>6 mg/L) concentrations and is brown in colour. Historical data from 1992 to 2014 indicates fluoride concentrations within the leachate plume decreased after the CWS was capped in 1995. Fluoride concentrations near the CWS, the source of the plume, peaked in 1997. Mid-way along the plume, fluoride concentrations peaked around 2000 and at the leading edge, fluoride concentrations peaked between 2004 and 2006, as shown in **Figure 2-1**.

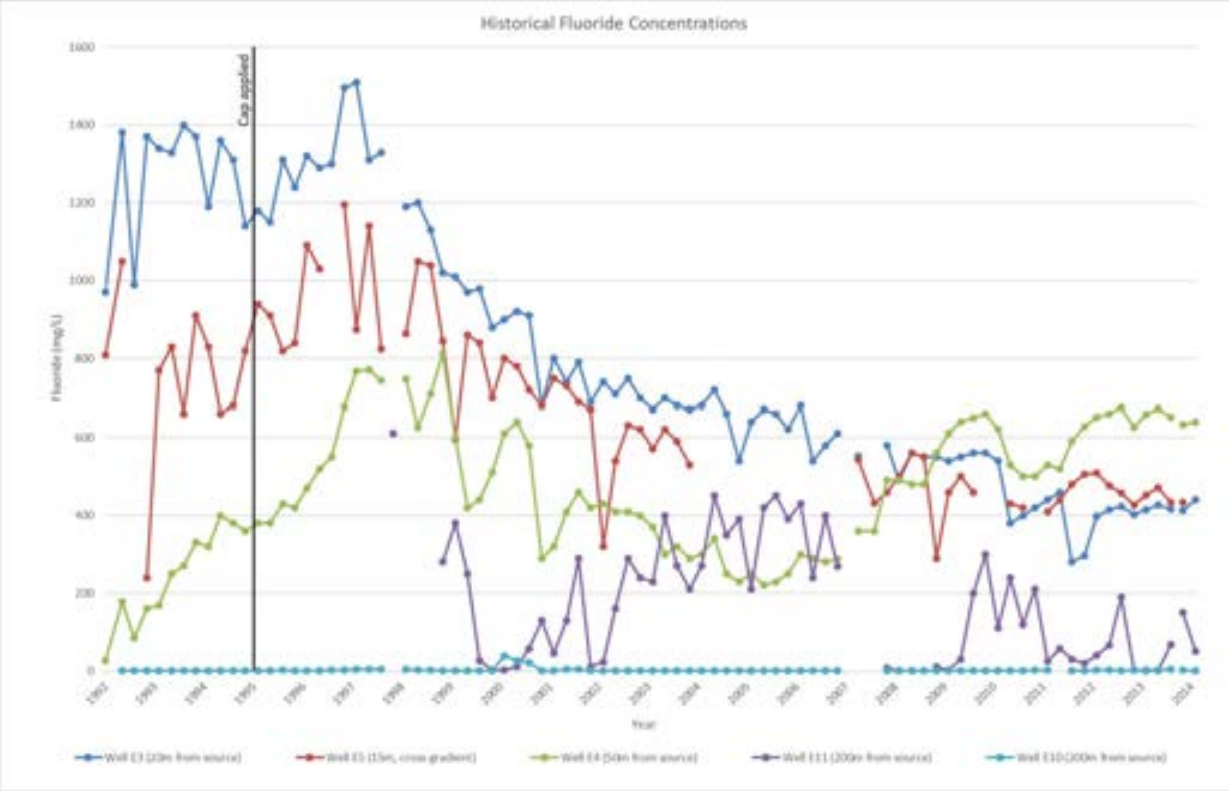


Figure 2-1: Historical Fluoride Concentrations Along the Plume 1992 - 2014

Ex-filtrated leachate impacted groundwater is observed to become overland flow discharging along a surface water flow path to a small dam. During periods of high rainfall, surface water within this dam can flow through a culvert structure to a larger dam which discharges to Swamp Creek. The overland flow path is shown in **Attachment 3**, **Appendix 2**.

Fluoride concentrations at the semi-permanent dam, located between the leachate impacted groundwater plume and Swamp Creek, typically vary between 15 mg/L and 25 mg/L. It is considered that the elevated fluoride concentrations in the semi-permanent dam are due to overland flow of exfiltrated groundwater from their source at the southern and northern vegetation impact areas. Sampling found the fluoride concentrations in Swamp Creek vary between 0.49 mg/L upstream of the smelter and 1.2 mg/L downstream. Adjacent to the semi-permanent dam discharge to Swamp Creek, fluoride concentrations were 1.6 mg/L. The Stage 2 Aquatic Assessment - Ecological Risk Assessment completed by ENVIRON in June 2013 indicated

there is no discernible impact to the aquatic ecology within the semi-permanent dam due to elevated concentrations of fluoride in surface water and sediment.

2.3 Aquifer Characterisation

A sand aquifer within the buffer zone of the former smelter has been impacted by leachate from the CWS. An underlying deep aquifer has also been impacted near the contamination source. The characteristics of this sand aquifer and the underlying deep aquifer are critical to the understanding of the site CSM. Aquifer characteristics have been identified as outlined in **Table 2-1**.

Table 2-1: Aquifer Characteristics

Characteristic	Comment
Aquifer Type	Unconsolidated sediment (estuarine)
Aquifer Depth	Shallow: Approximately 0.3 metres below ground surface (m bgs) to 2.5 m bgs Deep: Approximately 3.5 m bgs to 7 m bgs
Confined/Unconfined	Shallow: Unconfined Deep: Confined by high plasticity clays in some areas
Groundwater Flow Direction	Shallow: North to northeast Deep: Northeast
Recharge Mechanism	Shallow: Infiltration Deep: Infiltration
Porosity	Shallow: Variable due to variable nature of the sediments. High porosity quartz gravels identified at northeast corner of the Capped Waste Stockpile. Mid to low porosity tightly packed sands identified along plume length. Deep: Mid to low porosity poorly sorted, tightly packed fine-grained sand.

The most important characteristic for the movement of leachate through the shallow aquifer is the nature of the materials, particularly the complex and variable nature of the unconsolidated sediments. The nature of the sediments impacts the soil permeability, with high porosity quartz gravels, mid to low porosity tightly packed sands and high plasticity clays with very low porosity, all identified within the unconsolidated estuarine sediments. The leachate from the CWS permeates through mid to high porosity sediments but is retarded by high plasticity clays. Where low porosity and low permeability conditions constrain sub-surface flow, groundwater may discharge at the ground surface coinciding with changes in topography.

2.4 Fate and Transport Modelling

ENVIRON (February 2015) conducted a hydrogeological review and analytical groundwater contaminant transport modelling to assess the fate and transport of the leachate plume within the shallow aquifer. The assessment and modelling included a review of site investigation data and the construction of a conceptual hydrogeological model of AEC 1 CWS and its surrounds.

A one-dimensional model (UK EA Remedial Targets Worksheet) was used to simulate the groundwater flow and contaminant transport conditions to predict contaminant (fluoride) concentrations from the source to the nearest down-gradient receptor (Swamp Creek).

The model was calibrated against observed fluoride concentrations from the existing groundwater monitoring well network to the east and north-east of the capped waste stockpile. The groundwater fluoride concentration at the receptor impact point was then evaluated under the simulated model and compared with the guideline criteria.

The following conclusions were drawn from the results of the modelling:

- Based on the existing hydrogeological conditions and the presence of an ongoing source from the CWS, the model estimated a fluoride concentration of 4.3 mg/L at the receptor distance (1,000 m), compared to the guideline criteria of 1.5 mg/L
- This value is considered a conservative estimate given the model assumes a continuous source, however, historical, more recent, and proposed works are considered to have mitigated the source contribution. Future remedial works are proposed to ultimately remove the source (spent Pot Liner, anodes, scrubber bags, concrete, brick, bulky waste, fines, and other smelter wastes stockpiled within the CWS)
- The model demonstrates sensitivity to a few input parameters including the soil partition coefficient, (Kd). Future studies may include site specific determination of the soil partition coefficient to improve model calibration.

3. LEACHATE MANAGEMENT SYSTEM

Hydro implemented a leachate management system to remove leachate in shallow groundwater that had the potential to daylight and flow over overland flow paths during periods of high rainfall.

The leachate management system included a network of strategically placed leachate interception trenches, as follows:

- Toe of CWS: active leachate interception trench
- Southern vegetation impact area: passive leachate interception trench
- Northern vegetation impact area: passive leachate interception trench

The leachate management system was installed as an interim remedial measure and had been in place since 2013.

Based on source removal of entrained leachate within the CWS in 2023, the improvement in vegetation in the two vegetation impact areas, the lack of overland flow of leachate and the relatively low concentrations of fluoride in water collected in the holding tanks, the following recommendations were made for the leachate management system in the *2023 Groundwater Monitoring Report*:

- The leachate interception trench at the toe of the CWS is no longer required
- The leachate interception trench at the southern vegetation impact area is no longer required
- The leachate interception trench at the northern vegetation impact area can remain in place and the water level in the tank can be monitored throughout 2024 as it is anticipated that the volume of water that will be captured will be less than 10,000 L, which is the size of the tank

4. SAMPLING AND ANALYSIS QUALITY PLAN

4.1 Objective

The objective of each GME is to collect water quality data from the groundwater monitoring network to inform the behaviour of the leachate plume over time and provide data for annual reporting.

The groundwater monitoring network comprises groundwater wells located on five sections along the length of the leachate plume, as follows:

- Section 1: Wells E5, E5D, W7S, W7M, ~~PUMP~~[1], W2S, W2D
- Section 2: Wells E5, E5D, E4, W1S, W1D
- Section 3: Wells A7, W3S, W4S
- Section 4: Wells E11, W5S, W5D, N2
- Section 5: Wells G2, N8, N9, W6S, W6D

Two pairs of shallow and deep wells adjacent to Swamp Creek (F5/G5 and F6/G6) were added to the groundwater monitoring network in 2016. These are sentinel wells that are unimpacted by leachate. The presence of leachate in these wells would indicate potential impact to Swamp Creek, the nearest surface water receptor. The groundwater monitoring network is shown in **Figure 2, Appendix 1**.

4.2 Scope of Works

Post-remediation monitoring commenced in October 2023 following the completion of remedial works in September 2023. Post-remediation GMEs were completed on the following dates:

- September 2023
- November 2023
- February 2024
- April 2024
- June 2024
- August 2024
- October 2024
- December 2024

The scope of works included the following:

- The collection of groundwater samples and measurement of water levels and physico-chemical parameters (including pH, temperature, EC, redox, turbidity and dissolved oxygen) from 28 groundwater wells in the groundwater monitoring network
- Laboratory analysis of groundwater samples for soluble fluoride, total and dissolved aluminium, and total and free cyanide. Dissolved aluminium was included as part of laboratory analysis from June 2018.

4.3 Fieldwork Methodology

The fieldwork methodology for the collection of groundwater samples is outlined in ***Table 4-1***.

[1] This well was destroyed during reinstallation of the interception trench and has not been replaced.

Table 4-1: Field Methodology for Quarterly Groundwater Monitoring

Activity	Details
Well Gauging	Monitoring wells were gauged using a water level meter which was calibrated prior to use.
Well Purging	Monitoring wells were purged prior to sampling by pumping water from the wells until the physico-chemical parameters stabilised.
Decontamination	The majority of the sampling equipment used during low flow sampling was dedicated and disposable, such as the dedicated and disposable sampling tube. Non-disposable sampling equipment, including the interface probe, water quality meter and flexible pump tubing was decontaminated by washing in a Decon®90 solution and rinsing with potable water between sampling locations.
Sample Collection and Storage	Groundwater samples were collected into laboratory-supplied bottles with the appropriate preservative for the analysis undertaken. The bottles were stored in an ice-filled cooler in the field and in transit to the laboratory.
Chain of Custody	Groundwater samples were dispatched to the laboratory under chain of custody conditions.

4.4 Data Quality Objectives

Data quality objectives (DQOs) are outlined in ***Table 4-2***.

Table 4-2: Data Quality Objectives

DQO	Outcome
State the Purpose	To collect on-going monitoring data from a network of wells to understand the temporal and spatial behaviour of the aquifer around leachate impacted groundwater.
Identify the Decision	• Is the data collected from the monitoring well network of sufficient quality to meet the project objectives? • Is the data collected from the monitoring well network of sufficient quality to be comparable between events?
Identify Inputs to the Decision	• Record physico-chemical parameters and collect samples from the groundwater monitoring well network (see **Figure 2, Appendix 1**) over four quarterly GMEs. • Complete analysis of collected groundwater samples for fluoride, total and free cyanide, total and dissolved aluminium; and • Analyse the data and compare results from post and pre-remediation of the former CWS.
Define the Study Boundaries	AEC 1 identified in **Figure 1**, **Appendix 1** plus the surface water receptors identified down gradient of AEC 1, including a semi-permanent dam and Swamp Creek. The investigation relates to groundwater.
Develop a Decision Rule	The statistical parameters of interest are the concentrations of fluoride, cyanide, aluminium, pH and EC identified historically and in the current investigations. The Assessment Criteria outlined in **Section 5** and the historical groundwater concentrations where available for the monitoring wells. The Decision Rules for groundwater are: • Groundwater concentrations were assessed against the acceptance criteria outlined in **Section 5** in combination with a comparison against background criteria where applicable. An evaluation of significance was also undertaken; and • Recommendations were made for further evaluation for concentrations above criteria or background concentrations.
Specify Limits on Decision Errors	As this investigation involves a series of GMEs to monitor the state of a groundwater leachate plume, decision errors relate to the comparability of data between monitoring events. During the 2023 GMEs, 28 wells will be sampled unless found to be dry. This number takes into consideration three damaged wells (W3SA, W4D and W3D). Standard operating procedures, including consistent use of low flow techniques, should be implemented to ensure comparability of data between events. The same primary and secondary laboratories should be used for analysis and laboratory QA/QC should be assessed to ensure comparability between events.
Optimise the Design for Obtaining Data	Low flow sampling techniques will be used to collect groundwater samples to optimise the quality of the samples. Field samples for each round will be collected using the same sampling procedures to ensure comparability between GMEs.

4.5 Data Quality Indicators

Project data quality indicators (DQIs) have been established to set acceptance limits on field and laboratory data collected as part of the quarterly groundwater monitoring program. The data quality indicators are outlined in **Table 4-3.**

Table 4-3 *Data Quality Indicators*

DQI	Field	Laboratory
Completeness – a measure of the amount of useable data from a data collection activity	All critical locations sampled. All samples collected, aside from dry wells. Experienced sampler. Documentation correct.	All critical samples analysed. All analysis completed according to standard operating procedures. Appropriate methods Appropriate Practical Quantitation Limits (PQLs).
Comparability – the confidence that data may be considered equivalent for each sampling and analytical event	Experienced sampler. Climatic conditions appropriate for the type of analyte. Climatic conditions noted during sampling. Same types of samples collected using same sampling methods.	Same analytical methods used. Same sample PQLs. Same NATA accredited laboratories used. Same units.
Representativeness – the confidence that data are representative of each medium present on site.	Appropriate media sampled. Groundwater sampled following stabilisation of physico-chemical parameters	All samples analysed according to standard operating procedures.
Precision – a quantitative measure of the variability of the data.	Collection of intra-laboratory duplicates at a rate of 1 in 10 primary samples. Collection of inter-laboratory duplicate samples at a rate of 1 in 20 primary samples.	Analysis of field duplicate samples, relative percent difference (RPDs) to be less than 30%. Laboratory duplicates analysed, RPDs to be less than 30%.
Accuracy – a quantitative measure of the closeness of the reported data to the “true” value.	Sampling methodologies appropriate and complied with. Collection of rinsate samples from non-disposable sampling equipment.	Analysis of: • Rinsate blanks • Method blanks • Matrix spikes • Surrogate spikes • Laboratory control samples • Reagent blanks. • Results for blank samples to be non-detect. • Results for spike samples to be between 70% and 130%.

5. QUALITY ASSURANCE / QUALITY CONTROL

Eight GMEs were completed between September 2023 and December 2024 as follows: September 2023, November 2023, February 2025, April 2025, June 2024, August 20254, October 2024 and December 2024. A quality assurance/quality control assessment is provided in **Table 5-1** and **Table 5-2**.

Table 5-1: QA/QC Sampling and Analysis Methodology Assessment

Sampling Methodology	Ramboll Assessment
Sampling Pattern and Locations	Prior to the commencement of the GMEs, the leachate plume originating from the CWS was delineated through staged fieldwork and reporting in ENVIRON (2013, revised 2016) 'Plume Delineation Report, Capped Waste Stockpile'. From the delineation work, 19 new groundwater wells were installed along the length of the plume to assist with groundwater monitoring. The five sections are approximately 60 m apart and extend from the toe of the CWS to the leading edge of the leachate plume. Groundwater wells target both the shallow and deep aquifer. Groundwater wells located on five sections were selected for the 2023/2024 GMEs. Each section provides a cross section at different lengths along the known location of the leachate plume. One of the wells, W3SA, was destroyed in the April 2015 storm and has not been replaced. Another well, W4D, was also damaged in this storm but was able to be sampled until the October 2016 GME. This well can no longer be sampled and has not been replaced. A third well, W3D, has been unable to be sampled since December 2020 due to an obstruction within the well casing and is suspected to be damaged. This well has also not been replaced. A fourth well, PUMP, was destroyed during reinstallation of the interception trench in early 2023 and has not been replaced. In 2016, an additional two shallow and deep pairs of wells (F5/G5 and G6/F6) were added to the monitoring network. These wells are sentinel wells located adjacent to Swamp Creek, the nearest surface water receptor.
Sampling Density	Twenty-eight groundwater wells were selected for sampling for the 2023/2024 GMEs on five sections along the length of the leachate plume and adjacent to the nearest surface water receptor. As the leachate plume is approximately 300 m in length, there is one section per 60 m. One primary groundwater sample was collected from each well (unless dry or damaged).
Sample Depths	Both shallow groundwater (the leachate plume) and the deep aquifer were sampled as part of the 2023/2024 GMEs.
Sample Collection Method	For the 2023/2024 GMEs, groundwater samples were collected using low flow methods (peristaltic pump and dedicated LDPE tubing). Groundwater samples were collected directly into laboratory-supplied bottles with field filtration for dissolved aluminium (0.45 µm). Disposable gloves were worn during sample collection.
Decontamination Procedures	Dedicated disposable tubing was used to collect the groundwater samples. A short piece of silicone tubing was retained in the peristaltic pump and used for all wells. This tubing along with all non-disposable sampling equipment (i.e., interface probe, water quality meter) was decontaminated between sampling locations by washing with a solution of Decon®90 and potable water.
Sample Handling and Containers	Samples were placed into laboratory supplied sampling containers, dosed with the correct preservative (where relevant), and immediately placed into a cooler chilled with ice and/or ice bricks while in the field and during transportation to the laboratory.
Detailed Description of Field Screening Protocols	A water quality meter was used to collect field data, including temperature, pH, electrical conductivity, reduction/oxidation potential, turbidity, dissolved oxygen, and total dissolved solids (TDS). These parameters were recorded during purging until they stabilised.

Chain of Custody	Samples were transported to the laboratory under chain of custody conditions. The chain of custody forms was signed by the laboratory on receipt of the samples.

Table 5-2: QA/Q Assessment

Data Quality Indicator	Ramboll Comments
Field Quality Control Samples	Overall, intra-laboratory duplicate samples were analysed at a rate of approximately 11.5% and inter-laboratory duplicate samples were analysed at a rate of approximately 3.8% during the 2023/2024 GMEs. At least one rinsate sample was collected per GME, except for November 2023 and June 2024. A summary of the field quality control samples collected during the 2023/2024 GMEs is outlined below: • September 2023: one intra-laboratory duplicates (D01_20230922), one inter-laboratory duplicate (T01_20230922) and one rinsate (R01_20230922) • November 2023: two intra-laboratory duplicates (D01_20231127, T02_20231127) • February 2024: two intra-laboratory duplicates (D01_20240206 & T0120240206), and two rinsates (R01_20240207 & R02_20240206) • April 2024: two intra-laboratory duplicates (D01_20240409 & T0120240409), and two rinsates (R01_20240409 & R02_20240410) • June 2024: two intra-laboratory duplicates (D01_20240618 & T01_20240618) • August 2024: two intra-laboratory duplicates (D01_20240813 & T01_20240813) and two rinsates (R01_20240815 & R02_20240815) • October 2024: two intra-laboratory duplicates (D01_20241015 & D02_20241014) and two inter-laboratory duplicates (T01_20241015 & T02_20241014) and two rinsates (R01_20241015 & R02_20241015) • December 2024: two intra-laboratory duplicates (D01_20241210 & D02_20241211) and two inter-laboratory duplicates (T01_20241211 & T02_20241211) and one rinsate (R01_20241211)
Field Quality Control Results	Relative percentage differences (RPDs) were calculated for intra-laboratory and inter-laboratory duplicate pairs of samples. RPDs for most analytes were below the criterion (30%) except for: • September 2023: intra-laboratory duplicate pair G2/D01_20230922 RPD for total aluminium (35.3%). Inter-laboratory duplicate pair G2/T01_20230922 RPD for total aluminium (111.1%). • February 2024: intra-laboratory duplicate pair F6/D01_20240206 and F6/20240206 RPD for total aluminium (66.7%). • April 2024: inter-laboratory duplicate pair G2/T01_20240409 RPD for total aluminium (31.6%). • October 2024: intra-laboratory duplicate pair G2/D01_20241015 RPD for total aluminium (45.8%) and fluoride (50%). Inter-laboratory duplicate pair W1D/T02_20241014 RPD for dissolved aluminium (40%) and total aluminium (68.9%) and total cyanide (64.1%) • December 2024: intra-laboratory duplicate pair G2/D01_20241015 RPD for total cyanide (164.1%). inter-laboratory duplicate pair W6D/T01_20241211 RPD for total aluminium (34%) and duplicate pair E5D/T02_20241211 RPD total aluminium (71.3%) There is no criterion for total aluminium. Therefore, these higher RPDs for this analyte are not considered to affect the outcomes of this report. The RPD exceedance reported for dissolved aluminium in inter-laboratory duplicate pair W1D/T02_20241014 was marginally above the acceptance criteria and unlikely to affect the outcomes of this report. RPD exceedances for total cyanide were also marginal and close to the LOR and is also unlikely to affect the outcomes of this report. No exceedances were identified associated with soluble fluoride, the basis of this report. Rinsate sample results were all reported at less than the limit of reporting (<LOR) for the eight GMEs, except for September 2023 and February 2024 which reported a concentration of 0.03 mg/l and 0.02mg/l, respectively, for both total and dissolved aluminium. As dedicated tubing was used for each well and the rinsate was taken from the flow cell for the WQM, this concentration above detection isn't thought to influence the results as purged groundwater does not pass through the flow cell prior to filling sampling bottles.
Equipment Calibration	The water quality meter was calibrated prior to use. Standard practice is to rely on pre-calibration for short sampling periods. Calibration certificates are included in **Appendix 6**.

NATA registered laboratory and NATA endorsed methods	Envirolab was the primary analytical laboratory and ALS was used as the secondary laboratory. The laboratory certificates are NATA stamped.
Analytical methods	Summary analytical methods were included in the laboratory test certificates.
Holding times	Review of laboratory certificates indicated samples were submitted and analysed within appropriate holding times.
Limits of Reporting	LORs for all groundwater analytes were below the assessment criteria.
Laboratory quality control samples	Quality control frequencies were not within specification for total and dissolved metals at the secondary laboratory (ALS).
Laboratory quality control results	The results for laboratory duplicates, laboratory control samples, and surrogates were acceptable, noting that reporting of percentage recovery was not possible in some samples over the four quarters due to high concentrations of elements in the samples however, an acceptable recovery was obtained for the Laboratory Control Sample (LCS).

Ramboll makes the following conclusions regarding the DQIs:

- Completeness: The data for the 2023/2024 post-remediation GMEs is complete as the selected 28 groundwater wells were located and dipped for depth to groundwater during each GME and groundwater samples were collected from wells containing sufficient water to sample.
- Comparability: The groundwater data collected during the eight GMEs is comparable to previous results as the sampling protocols, analysis methods, quality control methods and monitoring well locations are generally consistent between sampling events and with prior events. The eight GMEs were completed by experienced Ramboll environmental scientists.
- Representativeness: The selection of shallow and deep wells on sections along the length of the leachate plume is considered to provide data that is representative of the leachate plume in shallow groundwater and representative of the underlying deep aquifer. Groundwater was sampled following purging to ensure groundwater samples are representative of the aquifer sampled.
- Precision: In the field, Ramboll achieved precision by using standard operating procedures for the collection of groundwater samples and by collecting duplicate and triplicate samples for analysis. Relative Percent Difference (RPD) results for duplicate samples were generally acceptable. Laboratory quality control results indicate precision was achieved at the primary and secondary laboratories.
- Accuracy: In the field, Ramboll achieved accuracy by using Ramboll's standard operating procedures for the collection of groundwater samples. Laboratory quality control results indicate accuracy was achieved at the primary and secondary laboratories.

In general, the DQIs outlined above have been met and Ramboll considers that the data is of suitable quality to meet the project objectives.

6. ASSESSMENT CRITERIA

6.1 Groundwater Assessment Criteria

The assessment criteria adopted for the assessment of groundwater contamination were sourced from the following references:

- NSW DEC (2007) Guidelines for the Assessment and Management of Groundwater Contamination
- ANZECC & ARMCANZ (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality
- ANZG (2018) Guidelines for Fresh and Marine Water Quality
- NHMRC (2008) Guidelines for Managing Risks in Recreational Water
- ENVIRON (March 2013) Tier 2 Ecological Risk Assessment, Kurri Kurri Aluminium Smelter

6.2 Potential Beneficial Uses

NSW DEC (2007) indicates that for assessing groundwater quality, it is first necessary to assess the beneficial uses of groundwater and surface water down gradient of the site.

The closest surface water receptor to the site is a dam and then Swamp Creek located approximately 1.5 km to the north-east of the site within an area of the buffer zone used for farming. This drainage area discharges into Wentworth Swamp, which in turn discharges to the Hunter River approximately 15 km north-east of the site near Maitland.

Surface water acidity/alkalinity within the Swamp Creek is described as generally neutral with pH ranging between 7.0 and 7.8 and conductivity is generally fresh, ranging from 626 µS/cm to 1,520 µS/cm. This surface water body is considered to be a freshwater receptor.

Groundwater is expected to follow a subsurface drainage line through a sand filled channel and flow north east towards Swamp Creek. Water level gauging completed during previous investigations confirmed the groundwater flow direction to the north east.

According to the Office of Industry and Investment, NSW, there are 17 licensed groundwater abstractions (bores) located within the site, which are known to be associated with monitoring of groundwater impact. There are no other licensed groundwater bores within 2 km of the site.

Potential beneficial uses of groundwater down gradient of the site include:

- Discharge into Swamp Creek, which supports aquatic ecosystems, is used for recreational fishing and flows into Wentworth Swamp, which potentially flows into the Hunter River
- Extraction of water from Swamp Creek may also be used for stock watering and/or irrigation.

Drinking water has not been included as a potential beneficial use of water from Swamp Creek for the following reasons:

- Drinking water supply to the local communities is reticulated and originates from Chichester Dam on the Chichester River
- The Kurri Wastewater Treatment Works is located up gradient of the site. The works has a licensed discharge point into Swamp Creek.

6.3 Appropriate Criteria for Groundwater

Based on the review of potential beneficial uses of groundwater and surface water within the closest receptor, the criteria for protection of aquatic ecosystems, irrigation, stock watering and recreational use will be used.

The investigation levels presented in ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality are considered applicable for the protection of aquatic ecosystems of receiving waters. ANZG (2018) advocates a site-specific approach to developing guideline trigger values based on such factors as local biological affects data and the current levels of

disturbance of the ecosystem. The guidelines present 'low risk trigger values' which are defined as concentrations of key performance parameters below which there is a low risk of adverse biological effects. If these trigger values are exceeded, then further action is required which may include further site-specific investigations to assess potential contamination or management and remedial actions.

Low risk trigger values are presented in ANZG (2018) for the protection of 80-99% of species in fresh and marine waters, with trigger values depending on the health of the receiving waters.

Groundwater results will be compared against trigger values for the protection of 95% of freshwater species. A 95% protection of freshwater species was selected due to the indication from the Hunter Catchment Management Trust that declining stream water quality and a reduction in diversity of native plants and animals has occurred in the last ten years.

A guideline for fluoride that is protective of the environment has not been developed in Australia.

A summary of the assessment criteria for groundwater is presented in **Table 6-1**.

Table 6-1: Groundwater Assessment Criteria

Contaminant	95% Protection for Aquatic Ecosystems	Irrigation	Stock Watering	Recreational
Aluminium (mg/L)	0.055	5	5	0.2[d]
Fluoride (mg/L)	No guideline	1	2	1.5[e]
Free Cyanide (mg/L)	0.007	No guideline	No guideline	0.8
pH (pH Units)	6.5 - 8[a]	No guideline	No guideline	6.5 - 8.5[d]
Electrical Conductivity (µS/cm)	No guideline	4,500 – 7,700[b] >12,200[c]	No guideline	No guideline

[a] *Values for lowland rivers from Table 3.3.2 in ANZECC (2000).*
[b] *Values for tolerant crops from Table 4.2.4 in ANZECC (2000).*
[c] *Value from Table 4.2.4 in ANZECC (2000) for where electrical conductivity is 'generally too saline' for plant growth.*
[d] *Aesthetic only, insufficient data to set a guideline value based on health considerations.*
[e] *Value from Ramboll (2023) Tier 1 Screening Human Health Guideline Values, Fluoride and Aluminium*

7. POST-REMEDIATION RESULTS

Parameters that are monitored include pH, fluoride, total and dissolved aluminium and total and free cyanide. The key parameter is fluoride. Results for fluoride as the key parameter is included in this section.

Eight post-remediation GMEs were completed between October 2023 and December 2024. Following source removal of aluminium smelter wastes, associated impacted soil and leachate from the footprint of AEC 1 CWS, a number of shallow monitoring wells have been periodically or permanently dry. Dry monitoring wells in the shallow aquifer confirms the idea that the leachate plume is recharged via infiltration.

Monitoring wells that were dry during post-remediation GMEs are outlined in **Table 7-1**.

Table 7-1 Summary of dry wells identified during GME

Section	Sept 2023	Nov 2023	Feb 2024	April 2024	June 2024	August 2024	October 2024	December 2024
Section 1	W2S, W7S, E5	W2S, W7S, E5	W2S, W7S, E5	W2S, W7S, E5	W2S, W7S	E5, W2S, W7S	W2S, W7S	W2S, W7S
Section 2	W1S	W1S	W1S, E4	W1S, E4				E4
Section 3	W4S, A7	W4S, A7	W3S, W4S	W4S	W4S	A7, W4S	W4S	A7, W4S
Section 4	W5S, E11	W5S, E11	W5S	W5S, E11	W5S	W5S	W5S, E11	W5S
Section 5	W6S	W6S, N9	W6S, N9	W6S, N9	W6S, N9	W6S	W6S	W6S

A summary of fluoride concentration results for the eight GMEs completed in the first year post-remediation (September 2023 to December 2024) are included in **Appendix 3a** and **Appendix 3b**, respectively.

Post remediation groundwater field parameter forms are included in **Appendix 4**, laboratory reports are included in **Appendix 5** and calibration certificates for the groundwater quality meter and interface probe are included in **Appendix 6**.

Soluble fluoride concentrations in shallow and deep wells are summarised in **Table 7-2**.

Table 7-2 Summary of Fluoride Concentrations

CoC	Date	No. of Samples	Minimum Conc. (mg/L)	Maximum Conc. (mg/L)	No. Results Exceeding Criteria		
					Irrigation (>1 mg/L)	Stock Watering (>2 mg/L)	Rec. (>15 mg/L)
Soluble Fluoride	Sept 2023	15	0.1	1100	**8**	**7**	**5**
	Nov 2023	16	<0.1	1100	**7**	**6**	**3**
	Feb 2024	15	<0.1	1200	**7**	**6**	**3**
	April 2024	16	<0.1	1300	**7**	**6**	**4**
	June 2024	19	0.1	1200	**10**	**9**	**6**
	Aug 204	19	0.1	1300	**9**	**9**	**5**
	Oct 2024	20	<0.1	1200	**10**	**10**	**9**
	Dec 2024	19	<0.1	1300	**10**	**10**	**6**

8. PRE AND POST REMEDIATION TREND ANALYSIS

8.1 Shallow Aquifer

A summary of Mann-Kendall Trend Analysis for Shallow and Deep Aquifer monitoring wells is provided below in **Section 7.1** and **Section 7.2** for the five year period prior to remediation and one year following source removal. Mann Kendall Reports have been included as **Appendix 7.** Only monitoring well W2D has been included in the Deep Aquifer analysis in **Section 7.2** as remaining Deep Aquifer wells are not impacted by leachate; however, they have been included in **Appendix 7**.

Now that remediation is complete, trend analysis for fluoride is focussed on pre-remediation trends and post-remediation trends. Pre-remediation trends include assessment of five years of pre-remediation data from 2019 to 2023.

Data from August 2019 to August 2023 (pre-remediation) and from September 2023 to December 2024 (post-remediation) were included for the purpose of Mann-Kendall trend analysis of soluble fluoride within shallow aquifer groundwater monitoring wells. A summary is provided in **Table 8-1**.

The Mann-Kendall trend analysis of soluble fluoride in the shallow aquifer reveals that no monitoring wells exhibit an increasing trend in fluoride concentration. As a result of some wells being periodically or permanently dry, Mann-Kendall trend analysis was unable to be completed on W2S, W7S, E5, W3S, W4S, E11, W5S, and W6S as three or more data points is required. All remaining wells demonstrate a decreasing or stable trend or indicate no trend at all.

Further review of soluble fluoride concentrations at E4 indicates a steady decrease in fluoride concentration from 710 mg/L in September 2023 to 550 mg/L in October 2024 and had run dry in December 2024. Soluble fluoride concentrations at N8, F5 and G6 are within natural fluctuations and pH is not characteristic of leachate impacted groundwater at these locations.

Mann-Kendall trend analysis of soluble fluoride at N9, the well at the leading edge of the plume, shows a stable trend, this follows a decreasing trend prior to source removal indicating the plume is not expanding to the north.

Table 8-1 Mann-Kendall Trend Analysis of Soluble Fluoride – Shallow Aquifer

Well	Pre-Remediation Trend 2019 to 2023	Post-Remediation Trend 2023 to 2024	Soluble Fluoride >Assessment Criteria[1]	Leachate Impacted[2]
Section 1				
~~PUMP~~	~~**Decreasing**~~	Well Destroyed	Well Destroyed	Well Destroyed
W2S	No Trend	Well dry	Well dry	No
W7M	**Stable**	No Trend	**Yes**	**Yes**
W7S	No Trend	Well dry	-	No
E5	**Increasing**	Well dry	**Yes**	**Yes**
Section 2				
E4	**Increasing**	**Decreasing**	**Yes**	**Yes**
W1S	**Decreasing**	No Trend	**Yes**	No
Section 3				
W3S	**Stable**	Well dry	**Yes**	No
W4S	Well dry	Well dry	-	No
A7	**Decreasing**	No Trend	**Yes**	**Yes**

Well	Pre-Remediation Trend 2019 to 2023	Post-Remediation Trend 2023 to 2024	Soluble Fluoride >Assessment Criteria[1]	Leachate Impacted[2]
Section 4				
E11	Decreasing	Well dry	Yes	No
W5S	Well dry	Well dry	-	No
Section 4				
N8	Increasing	No Trend	No	No
N9	Decreasing	**Stable**	Yes	No
W6S	Well dry	Well dry	-	No
Sentinel				
F5	No Trend	**Stable**	No	No
G6	Increasing	**Stable**	No	No

- Indicates not enough available data to provide a trend analysis.
[1]Soluble fluoride exceeded the assessment criteria of either Irrigation, Stock Watering or Recreational during any GME completed in 2023/2024.
[2]Groundwater generally characteristic of leachate impact i.e., pH >9, brown in colour.

8.2 Deep Aquifer

Data associated with monitoring well W2D from August 2019 to August 2023 and September 2023 to December 2024 was included for the purpose of Mann-Kendall trend analysis of soluble fluoride. A summary is provided in **Table 8-2**.

Mann-Kendall trend analysis of soluble fluoride indicates an increasing trend in well W2D (located on Section 1). Further review indicates that for the period of February 2024 to December 2024, fluoride concentrations at W2D have been the highest reported for this well since June 2023, with concentrations ranging from 1,100 mg/L to 1,300 mg/L. Fluoride concentrations have previously been reported at these concentrations through September 2019 to June 2020. The pH values at W2D are characteristic of leachate impact (pH >9) and the groundwater has been described as brown.

Table 8-2: Mann-Kendall Soluble Fluoride Trends - Deep Aquifer W2D

Well	Previous Trend 2019 to 2023	Current Trend 2023 to 2024	Soluble Fluoride >Assessment Criteria[1]	Leachate Impacted[2]
Section 1				
W2D	Stable	**Increasing**	Yes	Yes

[1]Soluble Fluoride exceeded the assessment criteria of either 95% Protection of Aquatic Ecosystems or Recreational during any GME completed in 2023/2024.
[2]Groundwater generally characteristic of leachate impact i.e., pH >9, brown in colour.

9. CONCLUSIONS AND RECOMMENDATIONS

Ramboll has completed quarterly monitoring of the leachate plume at the former Hydro Aluminium Kurri Kurri Smelter since July 2013. The source of the leachate plume is a stockpile of aluminium smelter waste known as the Capped Waste Stockpile (CWS). The CWS was remediated via source removal and waste transfer to the newly constructed Engineered Containment Cell (ECC) between May and September 2023 as part of the ECC Construction and Site Remediation Project.

Forty-seven GMEs have been completed within the leachate plume. Each GME included the sampling and analysis of groundwater from a network of 28 shallow and deep wells located on five sections along the length of the leachate plume down-gradient of the CWS. An additional pair of two shallow and deep wells were added to the network in 2016. These wells are located adjacent to Swamp Creek, the nearest surface water receptor. Physico-chemical parameters were recorded, and groundwater samples were collected and analysed for soluble fluoride, total and free cyanide as well as total and dissolved aluminium.

This Annual Report summarising concentrations of fluoride, the key parameter, from the first eight GMEs undertaken following the completion of remedial works in September 2023. This Annual Report also documents pre-remediation trends and post-remediation in shallow wells and the impacted deep well W2D.

Evaluation of post-remediation GME data has identified the following:

- Prior to source removal, there were a range of Mann-Kendall trends, but trends showed increasing fluoride concentrations in impacted wells.
- The leachate plume has only impacted one deep aquifer monitoring well, W2D, which is located adjacent to the former plume source, the CWS. This well has shown an increasing fluoride concentration trend, however pre-remediation data from 2019 to 2023 report similar fluoride concentrations.
- Several wells have been periodically, or permanently dry following source removal confirming recharge via infiltration of stormwater.
- While fluoride concentrations remain elevated in impacted wells, there is conclusive evidence of reduction in eight of the thirteen most impacted wells following source removal.
- The leachate plume is not reaching the nearest surface water receptor of Swamp Creek, as indicated by continued low pH and low soluble fluoride concentrations in sentinel wells.

This Annual Groundwater Monitoring Report is currently prepared to comply with Special Condition E1 in Hydro's Environmental Protection License (EPL) 1548, which indicates:

E1 Groundwater interception and monitoring – Capped Waste Stockpile

E1.1 The licensee is to continue operating the groundwater interception trench and leachate management system for the Capped Waste Stockpile

E1.2 the licensee is to continue the groundwater monitoring program in accordance with the 'Groundwater Water Monitoring Program, Capped Waste Stockpile' plan as provided to the EPA on 15 April 2024

E1.3 The licensee must submit a groundwater monitoring report to the EPA with each Annual Return. This report must include, but need not be limited to:

d) Aquifer characterisation, including aquifer behaviour
e) A trend analysis of monitored parameters in key wells, and
f) Any recommendations arising from a review of groundwater data

The first round of post remediation monitoring commenced in September 2023 following source removal in August 2023, as per Ramboll (2018) Remedial Action Plan, Hydro Aluminium Smelter Kurri Kurri.

Post-remediation monitoring has included bi-monthly groundwater monitoring events beginning in September 2023. Bi-monthly events will continue until December 2025 whereby trend analysis will be completed utilising data collected five years prior to source removal (August 2019 to August 2023) and the two years following source removal. A post-remediation monitoring and validation report is to be prepared once stable or decreasing trends are achieved.

In the event that decreasing or stable trends are not identified following two years of post-remediation monitoring, the Contingency Plan in Table 7-4 of the Remedial Action Plan (Ramboll, 2018) will be enacted. This states that further remedial options will be investigated that are aligned with treatment or management, such as long term restrictions to groundwater usage through a long term management plan.

Ramboll recommend that the Special Conditions in Hydro's EPL be updated to reflect the current status of the CWS (remediation complete) and that post-remediation monitoring has commenced, as follows:

- Remove Special Condition E1.1 as the interception trenches are no longer in use
- Update Special Condition E1.2 to reflect that Hydro has moved to post-remediation monitoring on a bi-monthly basis for 2024 and 2025 following source removal of the CWS, as per Ramboll (2018) Remedial Action Plan, Hydro Aluminium Smelter Kurri Kurri
- Update Special Condition E1.3 to indicate that Leachate Plume Validation Report should be submitted to the EPA at the completion of post-remediation monitoring to close out remediation of the CWS and associated leachate plume.

As of February 2025, Hydro Aluminium Kurri Kurri Pty Ltd have applied for these updates to their EPL.

10. REFERENCES

ANZG (2018) Guidelines for Fresh and Marine Water Quality

ANZECC (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality

ENVIRON (March 2013) Tier 2 Ecological Risk Assessment, Kurri Kurri Aluminium Smelter

ENVIRON (February 2015) Groundwater Fate and Transport Modelling, Leachate Plume – Capped Waste Stockpile, Hydro Aluminium Smelter Kurri Kurri, NSW

ENVIRON (June 2016) Hydro Aluminium Kurri Kurri Smelter, Capped Waste Stockpile, 12 Month Groundwater Monitoring Report

ENVIRON (September 2016) Plume Delineation Report, Capped Waste Stockpile

GSI (2012) Groundwater Services Inc., GSI Mann-Kendall Toolkit for Constituent Trend Analysis, Version 1.0, November 2012

NHMRC (2008) Guidelines for Managing Risks in Recreational Water

NSW DEC (2007) Guidelines for the Assessment and Management of Groundwater Contamination

Ramboll (April 2016) Hydro Aluminium Smelter, Capped Waste Stockpile, 2015 Annual Groundwater Monitoring Report

APPENDIX 1
FIGURES

Aerial photography by Nearmap, flown 05.12.2022

Legend

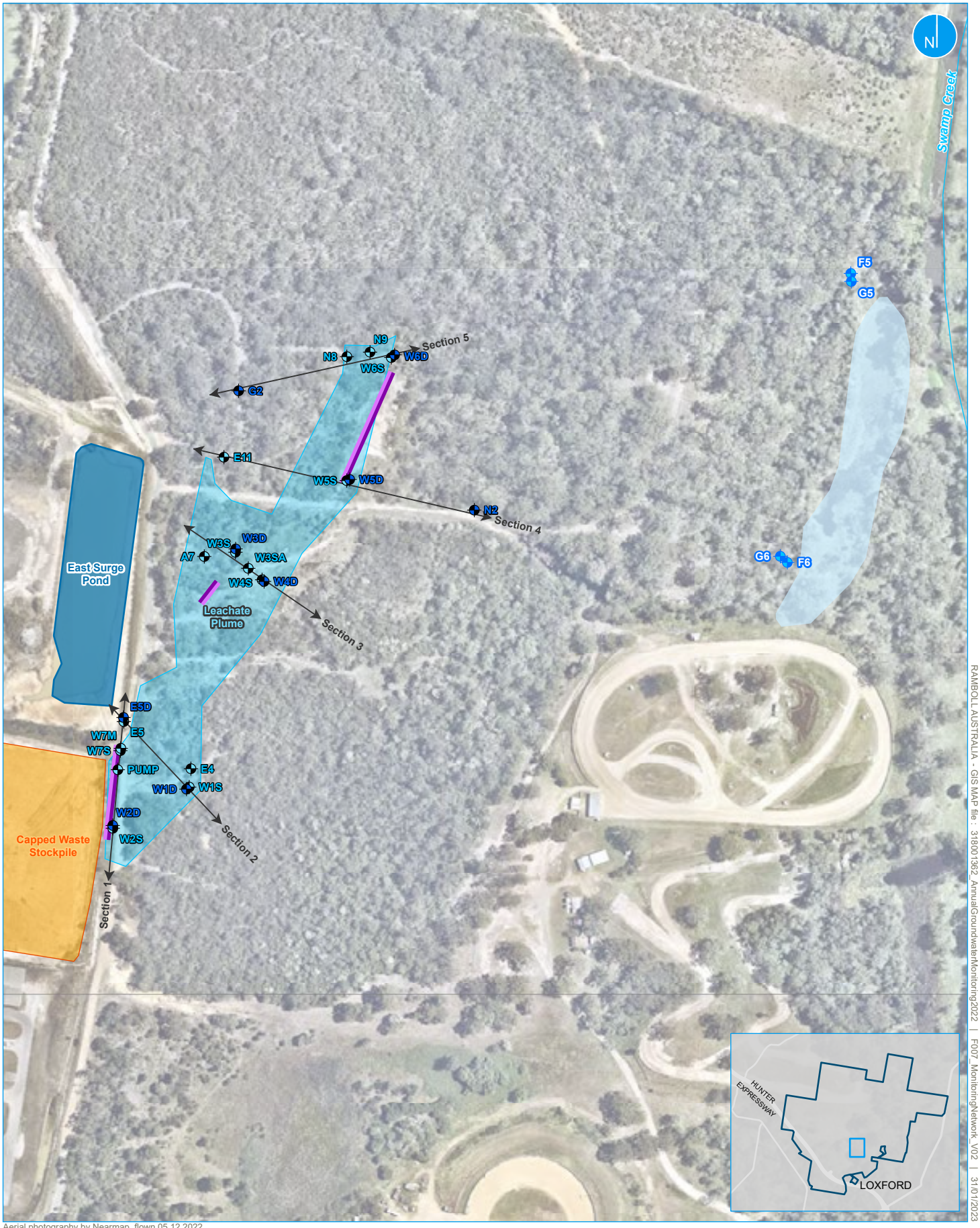
- Leachate Plume
- Capped Waste Stockpile
- East Surge Pond
- Watercourse (NSWSS)
- Waterbody (NSWSS)

0 50 100m

A4
1:5,000

RAMBOLL AUSTRALIA - GIS MAP file : 318001362_AnnualGroundwaterMonitoring2022 | F008_SiteLocationPlan_V01 | 2/02/2023

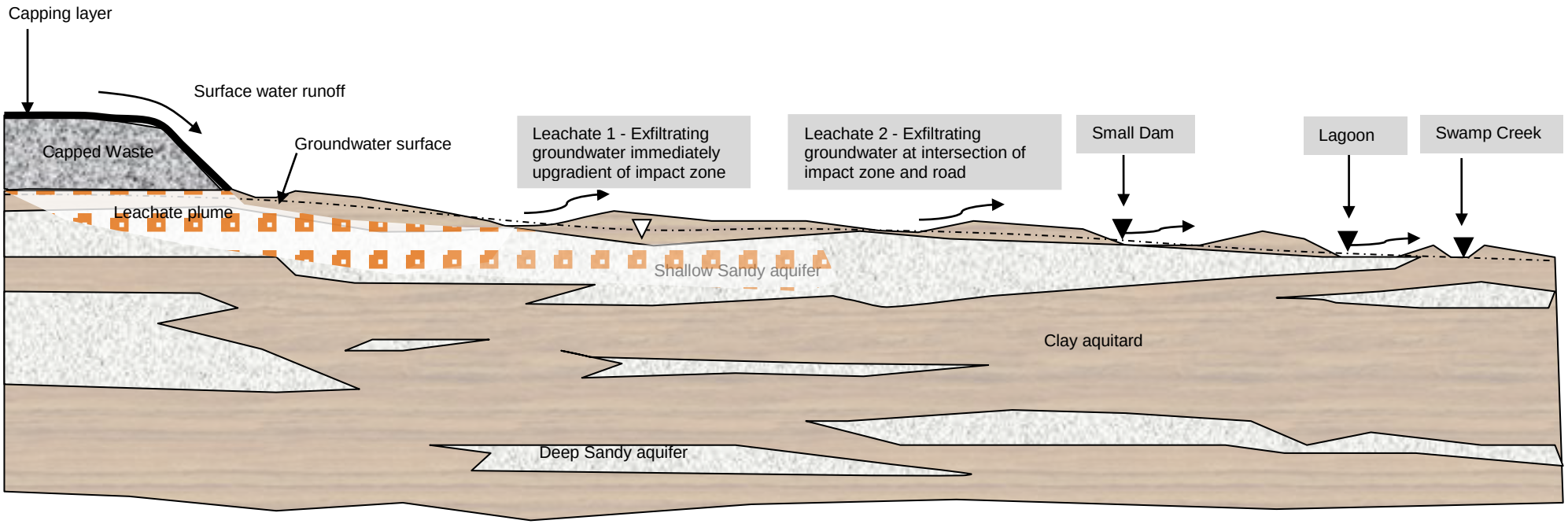
Figure 1 | AEC 1: Site Location Plan, 2024 Annual Groundwater Monitoring Report

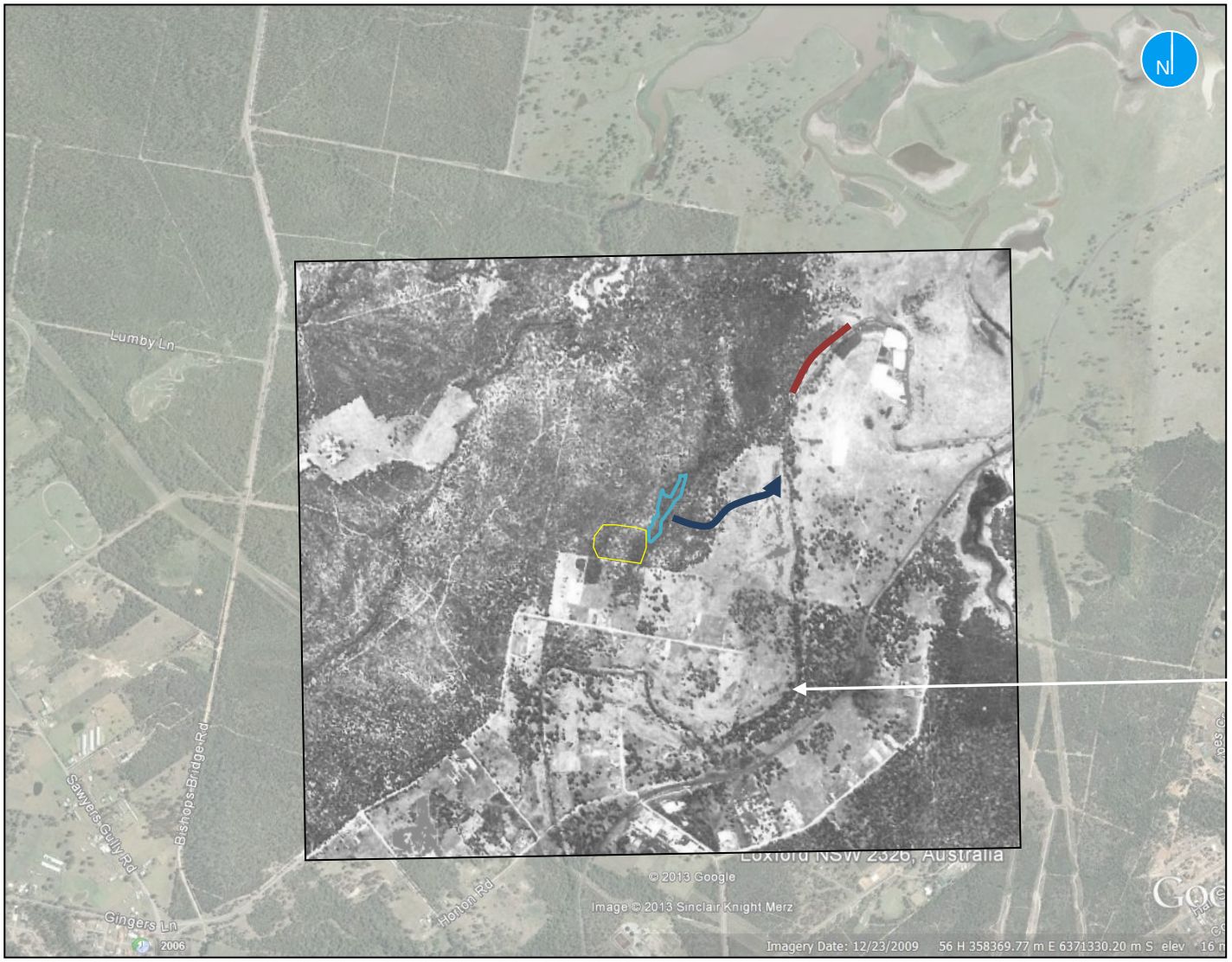


RAMBOLL AUSTRALIA - GIS MAP file - 318001362_AnnualGroundwaterMonitoring2022 | F007_MonitoringNetwork_V02 | 31/01/2023

Figure 2 | Groundwater Monitoring Well Network, 2024 Annual Groundwater Monitoring Report

APPENDIX 2
ATTACHMENTS





RAMBOLL AUSTRALIA - GIS MAP file : 318000664 - 2019 Annual Groundwater Monitoring Report - Attachment 2

RAMBOLL AUSTRALIA - GIS MAP file : 318000664 - 2019 Annual Groundwater Monitoring Report - Attachment 3

13 Topographic Contours mAHD (based on 1m Lidar)

APPENDIX 3
LABORATORY SUMMARY TABLES

				Fluoride
				Fluoride
			LOR	0.1
			Units	mg/l
			Action Levels	
			(ANZECC 2000) IRRIGATION[1]	1
			(ANZECC 2000) STOCK WATERING[2]	2
			(RAMBOLL 2023) RECREATION[3]	1.5
Sample Location	**Date Sampled**	**Sample ID**	**Sample Type**	
A7	7/02/2024	A7_20240207	N	**360**
	10/04/2024	A7_20240410	N	**380**
	17/06/2024	A7_20240617	N	**430**
	15/10/2024	A7_20241015	N	**380**
E11	6/02/2024	E11_20240206	N	**890**
	18/06/2024	E11_20240618	N	**2.0**
	13/08/2024	E11_20240813	N	**110**
	10/12/2024	E11_20241210	N	**76**
E4	21/09/2023	E4_20230921	N	**710**
	28/11/2023	E4_20231128	N	**760**
	17/06/2024	E4_20240617	N	**590**
	15/08/2024	E4_20240815	N	**580**
	15/10/2024	E4_20241015	N	**550**
E5	17/06/2024	E5_20240617	N	**270**
	15/10/2024	E5_20241015	N	**220**
	11/12/2024	E5_20241211	N	**260**
F5	21/09/2023	F5_20230921	N	**0.2**
	27/11/2023	F5_20231127	N	**0.3**
	7/02/2024	F5_20240207	N	**0.3**
	10/04/2024	F5_20240410	N	**0.3**
	17/06/2024	F5_20240617	N	**0.2**
	13/08/2024	F5_20240813	N	**0.2**
	14/10/2024	F5_20241014	N	**0.1**
	10/12/2024	F5_20241210	N	**0.2**
G6	21/09/2023	G6_20230921	N	**0.5**
	27/11/2023	G6_20231127	N	**0.6**
	7/02/2024	G6_20240207	N	**0.7**
	10/04/2024	G6_20240410	N	**0.6**
	17/06/2024	G6_20240617	N	**0.6**
	13/08/2024	G6_20240813	N	**0.6**
	14/10/2024	G6_20241014	N	**0.2**
	10/12/2024	G6_20241210	N	**0.6**
N8	22/09/2023	N8_20230922	N	**0.4**
	27/11/2023	N8_20231127	N	**0.3**
	6/02/2024	N8_20240206	N	**0.5**
	9/04/2024	N8_20240409	N	**0.6**
	18/06/2024	N8_20240618	N	**0.5**
	14/08/2024	N8_20240814	N	**0.6**
	14/10/2024	N8_20241014	N	**0.5**
	10/12/2024	N8_20241210	N	**0.5**
N9	22/09/2023	N9_20230922	N	**92**
	15/10/2024	N9_20241015	N	**70**
	10/12/2024	N9_20241210	N	**60**
W1S	17/06/2024	W1S_20240617	N	**10**
	15/08/2024	W1S_20240815	N	**11**
	15/10/2024	W1S_20241015	N	**57**
W3S	22/09/2023	W3S_20230922	N	**140**
	28/11/2023	W3S_20231128	N	**180**
	9/04/2024	W3S_20240409	N	**210**
	17/06/2024	W3S_20240617	N	**180**
	15/10/2024	W3S_20241015	N	**140**
	11/12/2024	W3S_20241211	N	**110**
W7M	21/09/2023	W7M_20230921	N	**670**
	7/02/2024	W7M_20240207	N	**7.1**
	9/04/2024	W7M_20240409	N	**830**
	18/06/2024	W7M_20240618	N	**670**
	15/08/2024	W7M_20240815	N	**740**
	15/10/2024	W7M_20241015	N	**410**
	11/12/2024	W7M_20241211	N	**770**

Statistical Summary

				Fluoride
				Fluoride
			LOR	0.1
			Units	mg/l
			Action Levels	
			(ANZECC 2000) IRRIGATION[1]	1
			(ANZECC 2000) STOCK WATERING[2]	2
			(RAMBOLL 2023) RECREATION[3]	1.5
Sample Location	**Date Sampled**	**Sample ID**	**Sample Type**	
Number of Results				59
Number of Detects				59
Number of non-Detects				0
Minimum Concentration				0.1
Minimum Detect				0.1
Maximum Concentration				890
Maximum Detect				890
Mean Concentration				202.292
Geometric Average				14.694
Standard Deviation				273.309
Median Average				60
Geometric Standard Deviation				26.708
Number of Guideline Exceedances(Detects Only)				35

Legend:
< value = less than
- Not analysed / not calculated
Sample Type: N - Primary
mg/l = milligrams per litre
EXCEEDS ALL CRITERION

[1]Value from Australian and New Zeland Guidelines for Fresh and Marine Water Quality (ANZECC, 2000) - Table 4.2.1

[2]Value from Australian and New Zeland Guidelines for Fresh and Marine Water Quality (ANZECC, 2000) - 4.3.2

[3]Value from Ramboll (2023) Tier 1 Screening Human Health Guideline Values, Fluoride and Aluminium

				Fluoride
				Fluoride
			LOR	0.1
			Units	mg/l
			Action Levels	
			(ANZECC 2000) IRRIGATION[1]	1
			(ANZECC 2000) STOCK WATERING[2]	2
			(RAMBOLL 2023) RECREATION[3]	1.5
Sample Location	**Date Sampled**	**Sample ID**	**Sample Type**	
E5D	21/09/2023	E5D_20230921	N	**8.6**
	28/11/2023	E5D_20231128	N	**9.1**
	7/02/2024	E5D_20240207	N	**8**
	9/04/2024	E5D_20240409	N	**7.9**
	17/06/2024	E5D_20240617	N	**8**
	15/08/2024	E5D_20240815	N	**7.5**
	15/10/2024	E5D_20241015	N	**9.1**
	11/12/2024	E5D_20241211	N	**7.3**
F6	21/09/2023	F6_20230921	N	**0.4**
	27/11/2023	F6_20231127	N	**0.5**
	6/02/2024	F6_20240206	N	**0.5**
	10/04/2024	F6_20240410	N	**0.6**
	17/06/2024	F6_20240617	N	**0.6**
	13/08/2024	F6_20240813	N	**0.6**
	14/10/2024	F6_20241014	N	**0.6**
	10/12/2024	F6_20241210	N	**0.5**
G2	22/09/2023	G2_20230922	N	**0.3**
	27/11/2023	G2_20231127	N	**0.3**
	6/02/2024	G2_20240206	N	**0.6**
	9/04/2024	G2_20240409	N	**0.3**
	18/06/2024	G2_20240618	N	**0.4**
	14/08/2024	G2_20240814	N	**0.3**
	14/10/2024	G2_20241014	N	**0.5**
	10/12/2024	G2_20241210	N	**0.3**
G5	21/09/2023	G5_20230921	N	**0.1**
	27/11/2023	G5_20231127	N	**0.4**
	7/02/2024	G5_20240207	N	**0.7**
	10/04/2024	G5_20240410	N	**0.5**
	17/06/2024	G5_20240617	N	**0.1**
	13/08/2024	G5_20240813	N	**0.1**
	14/10/2024	G5_20241014	N	**0.9**
	10/12/2024	G5_20241210	N	**0.1**
N2	21/09/2023	N2_20230921	N	**1.2**
	27/11/2023	N2_20231127	N	**1.2**
	7/02/2024	N2_20240207	N	**1.1**
	10/04/2024	N2_20240410	N	**1.1**
	17/06/2024	N2_20240617	N	**0.8**
	13/08/2024	N2_20240813	N	**0.9**
	14/10/2024	N2_20241014	N	**0.3**
	10/12/2024	N2_20241210	N	**0.7**
W1D	22/09/2023	W1D_20230922	N	**8.3**
	28/11/2023	W1D_20231128	N	**9.4**
	7/02/2024	W1D_20240207	N	**10**
	9/04/2024	W1D_20240409	N	**9.0**
	17/06/2024	W1D_20240617	N	**8.8**
	15/08/2024	W1D_20240815	N	**9.4**
	15/10/2024	W1D_20241015	N	**9.5**
	11/12/2024	W1D_20241211	N	**8.6**
W2D	22/09/2023	W2D_20230922	N	**1100**
	28/11/2023	W2D_20231128	N	**1100**
	7/02/2024	W2D_20240207	N	**1200**
	9/04/2024	W2D_20240409	N	**1300**
	18/06/2024	W2D_20240618	N	**1200**
	15/08/2024	W2D_20240815	N	**1300**
	15/10/2024	W2D_20241015	N	**1200**
	11/12/2024	W2D_20241211	N	**1300**
W5D	21/09/2023	W5D_20230921	N	**0.3**
	27/11/2023	W5D_20231127	N	**0.4**
	7/02/2024	W5D_20240207	N	**0.4**
	9/04/2024	W5D_20240409	N	**0.6**

				Fluoride
				Fluoride
			LOR	0.1
			Units	mg/l
			Action Levels	
			(ANZECC 2000) IRRIGATION[1]	1
			(ANZECC 2000) STOCK WATERING[2]	2
			(RAMBOLL 2023) RECREATION[3]	1.5
Sample Location	**Date Sampled**	**Sample ID**	**Sample Type**	
W5D	17/06/2024	W5D_20240617	N	**0.4**
	13/08/2024	W5D_20240813	N	**0.3**
	14/10/2024	W5D_20241014	N	**0.5**
	11/12/2024	W5D_20241211	N	**0.5**
W6D	22/09/2023	W6D_20230922	N	< 0.1
	27/11/2023	W6D_20231127	N	< 0.1
	7/02/2024	W6D_20240207	N	< 0.1
	9/04/2024	W6D_20240409	N	< 0.1
	18/06/2024	W6D_20240618	N	**0.1**
	14/08/2024	W6D_20240814	N	**0.1**
	14/10/2024	W6D_20241014	N	< 0.1
	10/12/2024	W6D_20241210	N	< 0.1

Statistical Summary

Number of Results	72
Number of Detects	66
Number of non-Detects	6
Minimum Concentration	0.1
Minimum Detect	0.1
Maximum Concentration	1300
Maximum Detect	1300
Mean Concentration	136.943
Geometric Average	1.645
Standard Deviation	383.846
Median Average	0.6
Geometric Standard Deviation	16.89
Number of Guideline Exceedances(Detects Only)	28

Legend:
< value = less than
- Not analysed / not calculated
Sample Type: N - Primary
mg/l = milligrams per litre
EXCEEDS ALL CRITERION

[1]Value from Australian and New Zeland Guidelines for Fresh and Marine Water Quality (ANZECC, 2000) - Table 4.2.1

[2]Value from Australian and New Zeland Guidelines for Fresh and Marine Water Quality (ANZECC, 2000) - 4.3.2

[3]Value from Ramboll (2023) Tier 1 Screening Human Health Guideline Values, Fluoride and Aluminium

				Fluoride
				Fluoride
			LOR	0.1
			Units	mg/l
			Action Levels	
			(ANZECC 2000) IRRIGATION[1]	1
			(ANZECC 2000) STOCK WATERING[2]	2
			(RAMBOLL 2023) RECREATION[3]	1.5
Sample Location	**Date Sampled**	**Sample ID**	**Sample Type**	
A7	24/09/2019	A7_20190924	N	**480**
	11/12/2019	A7_20191211	N	**520**
	18/03/2020	A7_20200318	N	**410**
	18/06/2020	A7_20200618	N	**470**
	23/09/2020	A7_20200923	N	**370**
	9/12/2020	A7_20201209	N	**500**
	25/03/2021	A7_20210325	N	**380**
	16/06/2021	A7_20210616	N	**110**
	21/09/2021	A7_20210921	N	**370**
	2/12/2021	A7_20211202	N	**360**
	18/03/2022	A7_20220318	N	**330**
	16/06/2022	A7_20220616	N	**330**
	21/09/2022	A7_20220921	N	**300**
	21/12/2022	A7_20221221	N	**340**
	24/03/2023	A7_20230324	N	**350**
	22/06/2023	A7_20230622	N	**300**
E11	23/09/2019	E11_20190923	N	**41**
	10/12/2019	E11_20191210	N	**120**
	6/03/2020	E11_20200306	N	**26**
	18/03/2020	E11_20200318	N	**41**
	18/06/2020	E11_20200618	N	**54**
	22/09/2020	E11_20200922	N	**53**
	8/12/2020	E11_20201208	N	**78**
	17/03/2021	E11_20210317	N	**74**
	15/06/2021	E11_20210615	N	**120**
	16/06/2021	E11_20210616	N	**34**
	13/09/2021	E11_20210913	N	**42**
	20/09/2021	E11_20210920	N	**76**
	1/12/2021	E11_20211201	N	**12**
	17/03/2022	E11_20220317	N	**8.3**
	15/06/2022	E11_20220615	N	**11**
	20/09/2022	E11_20220920	N	**7.9**
	20/12/2022	E11_20221220	N	**23**
	24/03/2023	E11_20230324	N	**19**
	22/06/2023	E11_20230622	N	**27**
E4	24/09/2019	E4_20190924	N	**530**
	11/12/2019	E4_20191211	N	**590**
	6/03/2020	E4_20200306	N	**550**
	18/03/2020	E4_20200318	N	**560**
	18/06/2020	E4_20200618	N	**690**
	23/09/2020	E4_20200923	N	**560**
	9/12/2020	E4_20201209	N	**680**
	25/03/2021	E4_20210325	N	**610**
	16/06/2021	E4_20210616	N	**1400**
	13/09/2021	E4_20210913	N	**730**
	21/09/2021	E4_20210921	N	**570**
	2/12/2021	E4_20211202	N	**680**
	18/03/2022	E4_20220318	N	**710**
	16/06/2022	E4_20220616	N	**820**
	21/09/2022	E4_20220921	N	**660**
	21/12/2022	E4_20221221	N	**780**
	24/03/2023	E4_20230324	N	**740**
	22/06/2023	E4_20230622	N	**600**
E5	17/06/2020	E5_20200617	N	**220**
	22/09/2020	E5_20200922	N	**250**
	8/12/2020	E5_20201208	N	**300**
	17/03/2021	E5_20210317	N	**300**
	15/06/2021	E5_20210615	N	**310**
	16/06/2021	E5_20210616	N	**500**
	13/09/2021	E5_20210913	N	**290**

				Fluoride
				Fluoride
			LOR	0.1
			Units	mg/l
			Action Levels	
			(ANZECC 2000) IRRIGATION[1]	1
			(ANZECC 2000) STOCK WATERING[2]	2
			(RAMBOLL 2023) RECREATION[3]	1.5
Sample Location	**Date Sampled**	**Sample ID**	**Sample Type**	
E5	20/09/2021	E5_20210920	N	**230**
	1/12/2021	E5_20211201	N	**320**
	17/03/2022	E5_20220317	N	**360**
	15/06/2022	E5_20220615	N	**410**
	20/09/2022	E5_20220920	N	**360**
	20/12/2022	E5_20221220	N	**420**
	23/03/2023	E5_20230323	N	**380**
F5	24/09/2019	F5_20190924	N	**0.2**
	11/12/2019	F5_20191211	N	< 0.1
	18/03/2020	F5_20200318	N	**0.2**
	18/06/2020	F5_20200618	N	**0.2**
	23/09/2020	F5_20200923	N	**0.1**
	9/12/2020	F5_20201209	N	**0.2**
	25/03/2021	F5_20210325	N	**0.2**
	16/06/2021	F5_20210616	N	**0.3**
	21/09/2021	F5_20210921	N	**0.2**
	2/12/2021	F5_20211202	N	**0.2**
	18/03/2022	F5_20220318	N	**0.2**
	16/06/2022	F5_20220616	N	**0.2**
	21/09/2022	F5_20220921	N	**0.2**
	21/12/2022	F5_20221221	N	**0.2**
	23/03/2023	F5_20230323	N	**0.2**
	23/06/2023	F5_20230623	N	**0.2**
G6	24/09/2019	G6_20190924	N	**0.3**
	11/12/2019	G6_20191211	N	**0.2**
	18/03/2020	G6_20200318	N	**0.2**
	18/06/2020	G6_20200618	N	**0.2**
	22/09/2020	G6_20200922	N	**0.2**
	9/12/2020	G6_20201209	N	**0.2**
	18/03/2021	G6_20210318	N	**0.4**
	16/06/2021	G6_20210616	N	**0.6**
	21/09/2021	G6_20210921	N	**0.4**
	2/12/2021	G6_20211202	N	**0.6**
	18/03/2022	G6_20220318	N	**0.4**
	16/06/2022	G6_20220616	N	**0.5**
	21/09/2022	G6_20220921	N	**0.6**
	21/12/2022	G6_20221221	N	**0.7**
	23/03/2023	G6_20230323	N	**0.7**
	23/06/2023	G6_20230623	N	**0.6**
N8	23/09/2019	N8_20190923	N	**0.4**
	10/12/2019	N8_20191210	N	**0.2**
	17/03/2020	N8_20200317	N	**0.4**
	17/06/2020	N8_20200617	N	**0.4**
	22/09/2020	N8_20200922	N	**0.4**
	8/12/2020	N8_20201208	N	**0.4**
	17/03/2021	N8_20210317	N	**0.5**
	15/06/2021	N8_20210615	N	**0.6**
	20/09/2021	N8_20210920	N	**0.5**
	1/12/2021	N8_20211201	N	**0.5**
	17/03/2022	N8_20220317	N	**0.5**
	15/06/2022	N8_20220615	N	**0.5**
	20/09/2022	N8_20220920	N	**0.6**
	20/12/2022	N8_20221220	N	**0.6**
	24/03/2023	N8_20230324	N	**0.5**
	22/06/2023	N8_20230622	N	**0.6**
	23/09/2019	N9_20190923	N	**160**
	17/03/2020	N9_20200317	N	**140**
	17/06/2020	N9_20200617	N	**130**
	22/09/2020	N9_20200922	N	**57**
	8/12/2020	N9_20201208	N	**110**

				Fluoride
				Fluoride
			LOR	0.1
			Units	mg/l
			Action Levels	
			(ANZECC 2000) IRRIGATION[1]	1
			(ANZECC 2000) STOCK WATERING[2]	2
			(RAMBOLL 2023) RECREATION[3]	1.5
Sample Location	**Date Sampled**	**Sample ID**	**Sample Type**	
N9	17/03/2021	N9_20210317	N	**110**
	15/06/2021	N9_20210615	N	**110**
	20/09/2021	N9_20210920	N	**95**
	1/12/2021	N9_20211201	N	**82**
	17/03/2022	N9_20220317	N	**79**
	15/06/2022	N9_20220615	N	**25**
	20/09/2022	N9_20220920	N	**5.2**
	20/12/2022	N9_20221220	N	**2.9**
	24/03/2023	N9_20230324	N	**38**
	22/06/2023	N9_20230622	N	**48**
PUMP	24/09/2019	PUMP_20190924	N	**400**
	10/12/2019	PUMP_20191210	N	**530**
	17/03/2020	PUMP_20200317	N	**30**
	17/06/2020	PUMP_20200617	N	**17**
	22/09/2020	PUMP_20200922	N	**21**
	8/12/2020	PUMP_20201208	N	**22**
	17/03/2021	PUMP_20210317	N	**24**
	15/06/2021	PUMP_20210615	N	**17**
	20/09/2021	PUMP_20210920	N	**26**
	1/12/2021	PUMP_20211201	N	**17**
	17/03/2022	PUMP_20220317	N	**19**
	15/06/2022	PUMP_20220615	N	**130**
	20/09/2022	PUMP_20220920	N	**150**
	20/12/2022	PUMP_20221220	N	**360**
W1S	23/09/2020	W1S_20200923	N	**17**
	9/12/2020	W1S_20201209	N	**17**
	25/03/2021	W1S_20210325	N	**17**
	16/06/2021	W1S_20210616	N	**15**
	21/09/2021	W1S_20210921	N	**14**
	2/12/2021	W1S_20211202	N	**13**
	18/03/2022	W1S_20220318	N	**13**
	16/06/2022	W1S_20220616	N	**9.8**
	21/09/2022	W1S_20220921	N	**10**
	21/12/2022	W1S_20221221	N	**12**
	24/03/2023	W1S_20230324	N	**10**
	22/06/2023	W1S_20230622	N	**8.8**
W2S	17/06/2020	W2S_20200617	N	**20**
	22/09/2020	W2S_20200922	N	**20**
	8/12/2020	W2S_20201208	N	**66**
	17/03/2021	W2S_20210317	N	**72**
	15/06/2021	W2S_20210615	N	**57**
	1/12/2021	W2S_20211201	N	**24**
	17/03/2022	W2S_20220317	N	**37**
	15/06/2022	W2S_20220615	N	**25**
	20/09/2022	W2S_20220920	N	**29**
	20/12/2022	W2S_20221220	N	**53**
W3S	24/09/2019	W3S_20190924	N	**170**
	18/03/2020	W3S_20200318	N	**150**
	18/06/2020	W3S_20200618	N	**150**
	23/09/2020	W3S_20200923	N	**97**
	9/12/2020	W3S_20201209	N	**100**
	25/03/2021	W3S_20210325	N	**130**
	16/06/2021	W3S_20210616	N	**270**
	21/09/2021	W3S_20210921	N	**110**
	2/12/2021	W3S_20211202	N	**230**
	18/03/2022	W3S_20220318	N	**290**
	16/06/2022	W3S_20220616	N	**300**
	20/09/2022	W3S_20220920	N	**240**
	20/12/2022	W3S_20221220	N	**180**
	24/03/2023	W3S_20230324	N	**200**

				Fluoride
				Fluoride
			LOR	0.1
			Units	mg/l
			Action Levels	
			(ANZECC 2000) IRRIGATION[1]	1
			(ANZECC 2000) STOCK WATERING[2]	2
			(RAMBOLL 2023) RECREATION[3]	1.5
Sample Location	**Date Sampled**	**Sample ID**	**Sample Type**	
	22/06/2023	W3S_20230622	N	**130**
W4S	18/06/2020	W4S_20200618	N	**76**
	25/03/2021	W4S_20210325	N	**81**
	16/06/2021	W4S_20210616	N	**120**
W5S	18/06/2020	W5S_20200618	N	**34**
	22/09/2020	W5S_20200922	N	**34**
	17/03/2021	W5S_20210317	N	**39**
	1/12/2021	W5S_20211201	N	**24**
W6S	20/09/2022	W6S_20220920	N	**110**
W7M	24/09/2019	W7M_20190924	N	**800**
	10/12/2019	W7M_20191210	N	**830**
	17/03/2020	W7M_20200317	N	**810**
	17/06/2020	W7M_20200617	N	**440**
	22/09/2020	W7M_20200922	N	**290**
	8/12/2020	W7M_20201208	N	**580**
	17/03/2021	W7M_20210317	N	**630**
	15/06/2021	W7M_20210615	N	**490**
	20/09/2021	W7M_20210920	N	**350**
	1/12/2021	W7M_20211201	N	**360**
	17/03/2022	W7M_20220317	N	**400**
	15/06/2022	W7M_20220615	N	**710**
	20/09/2022	W7M_20220920	N	**480**
	20/12/2022	W7M_20221220	N	**850**
	23/03/2023	W7M_20230323	N	**680**
	23/06/2023	W7M_20230623	N	**560**
W7S	17/06/2020	W7S_20200617	N	**17**
	22/09/2020	W7S_20200922	N	**22**
	15/06/2021	W7S_20210615	N	**24**
	1/12/2021	W7S_20211201	N	**33**
	17/03/2022	W7S_20220317	N	**27**
	15/06/2022	W7S_20220615	N	**16**
	20/09/2022	W7S_20220920	N	**18**

Statistical Summary

Number of Results	216
Number of Detects	214
Number of non-Detects	2
Minimum Concentration	< 0.1
Minimum Detect	0.1
Maximum Concentration	1400
Maximum Detect	1400
Mean Concentration	189.887
Geometric Average	∞
Standard Deviation	249.338
Median Average	55.5
Geometric Standard Deviation	16.216
Number of Guideline Exceedances(Detects Only)	164

Legend:
< value = less than
- Not analysed / not calculated
Sample Type: N - Primary
mg/l = milligrams per litre
EXCEEDS ALL CRITERION

[1]Value from Australian and New Zeland Guidelines for Fresh and Marine Water Quality (ANZECC, 2000) - Table 4.2.1

[2]Value from Australian and New Zeland Guidelines for Fresh and Marine Water Quality (ANZECC, 2000) - 4.3.2

[3]Value from Ramboll (2023) Tier 1 Screening Human Health Guideline Values, Fluoride and Aluminium

				Fluoride
				Fluoride
			LOR	0.1
			Units	mg/l
			Action Levels	
			(ANZECC 2000) IRRIGATION[1]	1
			(ANZECC 2000) STOCK WATERING[2]	2
			(RAMBOLL 2023) RECREATION[3]	1.5
Sample Location	**Date Sampled**	**Sample ID**	**Sample Type**	
E5D	24/09/2019	E5D_20190924	N	**8.3**
	10/12/2019	E5D_20191210	N	**9.4**
	17/03/2020	E5D_20200317	N	**9.8**
	17/06/2020	E5D_20200617	N	**7.7**
	22/09/2020	E5D_20200922	N	**7.3**
	8/12/2020	E5D_20201208	N	**7.8**
	17/03/2021	E5D_20210317	N	**9.1**
	15/06/2021	E5D_20210615	N	**8.3**
	20/09/2021	E5D_20210920	N	**7.6**
	1/12/2021	E5D_20211201	N	**7.9**
	17/03/2022	E5D_20220317	N	**10**
	15/06/2022	E5D_20220615	N	**9.1**
	20/09/2022	E5D_20220920	N	**8.8**
	20/12/2022	E5D_20221220	N	**8.6**
	23/03/2023	E5D_20230323	N	**9.5**
	23/06/2023	E5D_20230623	N	**8.7**
F6	24/09/2019	F6_20190924	N	**0.5**
	11/12/2019	F6_20191211	N	**0.4**
	18/03/2020	F6_20200318	N	**0.6**
	18/06/2020	F6_20200618	N	**0.5**
	22/09/2020	F6_20200922	N	**0.4**
	9/12/2020	F6_20201209	N	**0.6**
	18/03/2021	F6_20210318	N	**0.5**
	16/06/2021	F6_20210616	N	**0.7**
	21/09/2021	F6_20210921	N	**0.4**
	2/12/2021	F6_20211202	N	**0.6**
	18/03/2022	F6_20220318	N	**0.5**
	16/06/2022	F6_20220616	N	**0.4**
	21/09/2022	F6_20220921	N	**0.4**
	21/12/2022	F6_20221221	N	**0.5**
	23/03/2023	F6_20230323	N	**0.6**
	23/06/2023	F6_20230623	N	**0.5**
G2	23/09/2019	G2_20190923	N	**0.3**
	10/12/2019	G2_20191210	N	**0.3**
	17/03/2020	G2_20200317	N	**0.3**
	17/06/2020	G2_20200617	N	**0.3**
	22/09/2020	G2_20200922	N	**0.2**
	8/12/2020	G2_20201208	N	**0.2**
	17/03/2021	G2_20210317	N	**0.4**
	15/06/2021	G2_20210615	N	**0.3**
	20/09/2021	G2_20210920	N	**0.3**
	1/12/2021	G2_20211201	N	**0.5**
	17/03/2022	G2_20220317	N	**0.3**
	15/06/2022	G2_20220615	N	**0.4**
	20/09/2022	G2_20220920	N	**0.3**
	20/12/2022	G2_20221220	N	**0.3**
	24/03/2023	D02_20230324	N	**0.4**
	24/03/2023	G2_20230324	N	**0.4**
	22/06/2023	G2_20230622	N	**0.3**
G5	24/09/2019	G5_20190924	N	**0.2**
	11/12/2019	G5_20191211	N	**0.1**
	18/03/2020	G5_20200318	N	**0.2**
	18/06/2020	G5_20200618	N	< 0.1
	23/09/2020	G5_20200923	N	< 0.1
	9/12/2020	G5_20201209	N	< 0.1
	25/03/2021	G5_20210325	N	< 0.1
	16/06/2021	G5_20210616	N	**1**
	21/09/2021	G5_20210921	N	< 0.1
	2/12/2021	G5_20211202	N	**0.3**
	18/03/2022	G5_20220318	N	**0.1**
	16/06/2022	G5_20220616	N	**0.3**
	21/09/2022	G5_20220921	N	**0.2**
	21/12/2022	G5_20221221	N	**0.2**
	23/03/2023	G5_20230323	N	**0.5**
	23/06/2023	G5_20230623	N	**0.1**
	24/09/2019	N2_20190924	N	**1.0**

				Fluoride
				Fluoride
			LOR	0.1
			Units	mg/l
			Action Levels	
			(ANZECC 2000) IRRIGATION[1]	1
			(ANZECC 2000) STOCK WATERING[2]	2
			(RAMBOLL 2023) RECREATION[3]	1.5
Sample Location	**Date Sampled**	**Sample ID**	**Sample Type**	
N2	10/12/2019	N2_20191210	N	**0.4**
	18/03/2020	N2_20200318	N	**0.9**
	18/06/2020	N2_20200618	N	**0.7**
	22/09/2020	N2_20200922	N	**0.8**
	9/12/2020	N2_20201209	N	**0.8**
	17/03/2021	N2_20210317	N	**0.8**
	16/06/2021	N2_20210616	N	**1.1**
	20/09/2021	N2_20210920	N	**0.9**
	1/12/2021	N2_20211201	N	**0.9**
	18/03/2022	N2_20220318	N	**0.7**
	16/06/2022	N2_20220616	N	**3.7**
	20/09/2022	N2_20220920	N	**4.3**
	20/12/2022	N2_20221220	N	**3.0**
	24/03/2023	N2_20230324	N	**2.0**
	23/06/2023	N2_20230623	N	**1.4**
W1D	24/09/2019	W1D_20190924	N	**4.4**
	11/12/2019	W1D_20191211	N	**41**
	18/03/2020	W1D_20200318	N	**4.1**
	18/06/2020	W1D_20200618	N	**3.8**
	23/09/2020	W1D_20200923	N	**8.5**
	9/12/2020	W1D_20201209	N	**9.2**
	25/03/2021	W1D_20210325	N	**11**
	16/06/2021	W1D_20210616	N	**11**
	21/09/2021	W1D_20210921	N	**9.7**
	2/12/2021	W1D_20211202	N	**10**
	18/03/2022	W1D_20220318	N	**12**
	16/06/2022	W1D_20220616	N	**8.8**
	21/09/2022	W1D_20220921	N	**9.7**
	21/12/2022	W1D_20221221	N	**10**
	24/03/2023	W1D_20230324	N	**10**
	22/06/2023	W1D_20230622	N	**8.8**
W2D	24/09/2019	W2D_20190924	N	**1300**
	10/12/2019	W2D_20191210	N	**1400**
	6/03/2020	W2D_20200306	N	**1100**
	17/03/2020	W2D_20200317	N	**1300**
	17/06/2020	W2D_20200617	N	**1100**
	22/09/2020	W2D_20200922	N	**800**
	8/12/2020	W2D_20201208	N	**1000**
	17/03/2021	W2D_20210317	N	**1000**
	15/06/2021	W2D_20210615	N	**860**
	16/06/2021	W2D_20210616	N	**1100**
	13/09/2021	W2D_20210913	N	**1100**
	20/09/2021	W2D_20210920	N	**880**
	1/12/2021	W2D_20211201	N	**1000**
	17/03/2022	W2D_20220317	N	**970**
	15/06/2022	W2D_20220615	N	**1100**
	20/09/2022	W2D_20220920	N	**840**
	20/12/2022	W2D_20221220	N	**1100**
	23/03/2023	W2D_20230323	N	**1100**
	23/06/2023	W2D_20230623	N	**930**
W3D	24/09/2019	W3D_20190924	N	**0.2**
	11/12/2019	W3D_20191211	N	**0.1**
	18/03/2020	W3D_20200318	N	**0.2**
	18/06/2020	W3D_20200618	N	**0.1**
	23/09/2020	W3D_20200923	N	**0.1**
	9/12/2020	W3D_20201209	N	**0.1**
W5D	24/09/2019	W5D_20190924	N	**0.4**
	10/12/2019	W5D_20191210	N	**0.1**
	18/03/2020	W5D_20200318	N	**0.4**
	18/06/2020	W5D_20200618	N	**0.3**
	22/09/2020	W5D_20200922	N	**0.5**
	9/12/2020	W5D_20201209	N	**0.3**
	17/03/2021	W5D_20210317	N	**0.4**
	16/06/2021	W5D_20210616	N	**0.7**
	21/09/2021	W5D_20210921	N	**0.3**
	1/12/2021	W5D_20211201	N	**0.5**

				Fluoride
				Fluoride
			LOR	0.1
			Units	mg/l
			Action Levels	
			(ANZECC 2000) IRRIGATION[1]	1
			(ANZECC 2000) STOCK WATERING[2]	2
			(RAMBOLL 2023) RECREATION[3]	1.5
Sample Location	**Date Sampled**	**Sample ID**	**Sample Type**	
W6D	17/03/2022	W5D_20220317	N	**0.8**
	15/06/2022	W5D_20220615	N	**0.4**
	20/09/2022	W5D_20220920	N	**0.4**
	20/12/2022	W5D_20221220	N	**0.4**
	24/03/2023	W5D_20230324	N	**0.4**
	22/06/2023	W5D_20230622	N	**0.4**
	23/09/2019	W6D_20190923	N	< 0.1
	10/12/2019	W6D_20191210	N	< 0.1
	17/03/2020	W6D_20200317	N	< 0.1
	17/06/2020	W6D_20200617	N	< 0.1
	22/09/2020	W6D_20200922	N	< 0.1
	8/12/2020	W6D_20201208	N	< 0.1
	17/03/2021	W6D_20210317	N	**0.1**
	15/06/2021	W6D_20210615	N	< 0.1
	20/09/2021	W6D_20210920	N	< 0.1
	1/12/2021	W6D_20211201	N	**0.1**
	17/03/2022	W6D_20220317	N	< 0.1
	15/06/2022	W6D_20220615	N	< 0.1
	20/09/2022	W6D_20220920	N	< 0.1
	20/12/2022	W6D_20221220	N	< 0.1
	24/03/2023	W6D_20230324	N	**0.1**
	22/06/2023	W6D_20230622	N	< 0.1

Statistical Summary	
Number of Results	157
Number of Detects	139
Number of non-Detects	18
Minimum Concentration	0.1
Minimum Detect	0.1
Maximum Concentration	1400
Maximum Detect	1400
Mean Concentration	129.622
Geometric Average	1.549
Standard Deviation	347.536
Median Average	0.5
Geometric Standard Deviation	18.79
Number of Guideline Exceedances(Detects Only)	58

Legend:
< value = less than
- Not analysed / not calculated
Sample Type: N - Primary
mg/l = milligrams per litre
EXCEEDS ALL CRITERION

[1]Value from Australian and New Zeland Guidelines for Fresh and Marine Water Quality (ANZECC, 2000) - Table 4.2.1
[2]Value from Australian and New Zeland Guidelines for Fresh and Marine Water Quality (ANZECC, 2000) - 4.3.2
[3]Value from Ramboll (2023) Tier 1 Screening Human Health Guideline Values, Fluoride and Aluminium

APPENDIX 4
FIELD PARAMETER FORMS

A7

1-Well Integrity

Date	09/22/2023	Time	11:37
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	Y
Remarks	Insufficient water for sampling		

2-Initial Observations

Date	09/22/2023	Time	11:38
Remarks	Insufficient water for sampling		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/22/23	11:38												Insuffici water for samplin

4-Final Observations

Date	09/22/2023	Time	11:38
Remarks	Insufficient water for sampling		

5-Sample Summary

Date	09/22/2023	Time	11:38
Remarks	Insufficient water for sampling		

E11

1-Well Integrity

Date	09/22/2023	Time	10:19
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	Y
Depth to Water (m)	3.37	Well Depth (m)	3.83
Water Column in Well	0.45		
Remarks	Well can be considered dry - thick mud only/unable to sample		

2-Initial Observations

Date	09/22/2023	Time	10:23
Remarks	Well can be considered dry - thick mud only/unable to sample		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/22/23	10:23												Well can be conside dry - thick mud only/ unable to sample

4-Final Observations

Date	09/22/2023	Time	10:23
Remarks	Well can be considered dry - thick mud only/unable to sample		

5-Sample Summary

Date	09/22/2023	Time	10:23
Remarks	Well can be considered dry - thick mud only/unable to sample		

E4

1-Well Integrity

Date	09/21/2023	Time	13:23
Well Dry?	N	Weather Conditions	Sunny, Warm, High Winds
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	2.52	Well Depth (m)	3.38
Water Column in Well	0.85		
Remarks			

2-Initial Observations

Date	09/21/2023	Time	13:31
Purge Start Time	13:31	Color	pale brown yellow clear
Odor	no odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/21/23	13:32	0.14	500		2.60	26.92	10.2	2530	0.2	1570	-224		
09/21/23	13:35	0.14	0.42		2.63	26.66	10.2	2520	0.2	1560	-236		
09/21/23	13:38	0.14	0.42		2.65	26.46	10.2	2510	0.1	1560	-243		

4-Final Observations

Date	09/21/2023	Time	13:43
End purge time	13:37	Color	clear brown yellow
Odor	sulfidic odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	09/21/2023	Time	13:44
Did Well Dewater?	No		
Remarks	Final depth 2.67mbTOC		

Photos

E5

1-Well Integrity

Date	09/21/2023	Time	14:33
Well Dry?	N		
Remarks	Insufficient water for sampling		

2-Initial Observations

Date	09/21/2023	Time	14:33
Remarks	Insufficient water for sampling		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/21/23	14:33												Insuffici water for samplin

4-Final Observations

Date	09/21/2023	Time	14:33
Remarks	Insufficient water for sampling		

5-Sample Summary

Date	09/21/2023	Time	14:33
Remarks	Insufficient water for sampling		

E5D

1-Well Integrity

Date	09/21/2023	Time	14:34
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	Sunny, Warm, High Winds	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	2.19
Well Depth (m)	5.37	Water Column in Well	3.18
Remarks			

2-Initial Observations

Date	09/21/2023	Time	14:45
Purge Start Time	14:41	Color	Dark yellow clear
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/21/23	14:45	0.14	500		2.21	23.39	7.8	8530	0.6	5370	65		
09/21/23	14:48	0.14	0.42		2.27	23.41	7.8	8520	0.5	5370	63		
09/21/23	14:51	0.14	0.42		2.34	23.41	7.8	8520	0.4	5360	62		

4-Final Observations

Date	09/21/2023	Time	14:48
End purge time	14:48	Color	dark yellow clear
Odor	no odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	09/21/2023	Time	14:48
Did Well Dewater?	No		
Remarks			

Photos

F5

1-Well Integrity

Date	09/21/2023	Time	10:32
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	Partly Sunny, Warm	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	3.17
Well Depth (m)	17.39	Water Column in Well	14.22
Remarks			

2-Initial Observations

Date	09/21/2023	Time	10:42
Purge Start Time	10:42	Color	pale grey brown slightly turbid
Odor	no odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/21/23	10:47	0.14	500		3.17	24.63	5.0	6360	0.3	4000	157		
09/21/23	10:50	0.14	0.42		3.19	24.64	5.0	6350	0.3	4000	159		
09/21/23	10:53	0.14	0.42		3.26	24.65	4.9	6350	0.3	4000	162		

4-Final Observations

Date	09/21/2023	Time	10:51
Color	slightly turbid pale grey brown	Odor	no odour
Sheen/Product	NO		
Remarks			

5-Sample Summary

Date	09/21/2023	Time	10:51
Did Well Dewater?	No		
Remarks	Final depth 3.27mbTOC		

Photos

F6

1-Well Integrity

Date	09/21/2023	Time	09:58
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	Partly Cloudy, Warm	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	4.47
Well Depth (m)	15.56	Water Column in Well	11.09
Remarks			

2-Initial Observations

Date	09/21/2023	Time	09:58
Purge Start Time	10:08	Color	clear colourless
Odor	no odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/21/23	09:59	0.14	500		4.47	24.2	6.8	5380	3.9	3390	-76		
09/21/23	10:02	0.14	0.42		4.51	24.22	6.9	5360	3.8	3380	-83		
09/21/23	10:05	0.14	0.42		4.55	24.22	6.9	5350	3.8	3370	-85		

4-Final Observations

Date	09/21/2023	Time	09:59
End purge time	10:14	Color	clear colourless
Odor	no odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	09/21/2023	Time	10:14
Did Well Dewater?	No		
Remarks	Final depth to water 4.56mbtoc		

Photos

G2

1-Well Integrity

Date	09/22/2023	Time	09:21
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	High Winds, Partly Cloudy, Warm	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	8.6
Well Depth (m)	13.52	Water Column in Well	4.92
Remarks			

2-Initial Observations

Date	09/22/2023	Time	09:26
Purge Start Time	09:26	Color	clear colourless
Odor	no odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/22/23	09:39	0.14	500		8.67	18.14	6.4	8650	0.0	5440	10	6.6	
09/22/23	09:42	0.14	0.42		8.71	18.15	6.4	8660	0.0	5450	11	8.0	
09/22/23	09:45	0.14	0.42		8.73	18.15	6.3	8660	0.0	5460	12	6.3	

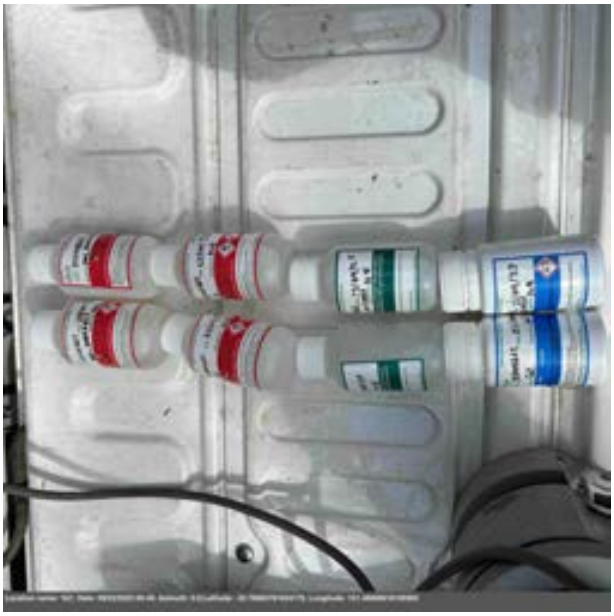
4-Final Observations

Date	09/22/2023	Time	09:43
End purge time	09:43	Color	clear colourless
Odor	no odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	09/22/2023	Time	09:43
Did Well Dewater?	No	QC Sample ID	DO1_20230922
Remarks			

Photos



G5

1-Well Integrity

Date	09/21/2023	Time	10:40
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	Sunny, Warm	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	3.20
Well Depth (m)	11.34	Water Column in Well	8.14
Remarks			

2-Initial Observations

Date	09/21/2023	Time	11:03
Purge Start Time	11:03	Color	clear colourless
Odor	no odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/21/23	11:10	0.14	500		3.25	26.97	6.1	2230	0.6	1430	77		
09/21/23	11:13	0.14	0.42		3.37	27.05	6.0	2230	0.6	1430	76		
09/21/23	11:16	0.14	0.42		3.40	27.09	6.0	2230	0.4	1430	78		

4-Final Observations

Date	09/21/2023	Time	11:12
End purge time	11:12	Color	clear colourless
Odor	no odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	09/21/2023	Time	11:13
Did Well Dewater?	No		
Remarks			

Photos

G6

1-Well Integrity

Date	09/21/2023	Time	09:38
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	Sunny, Warm	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	3.88
Well Depth (m)	5.89	Water Column in Well	2.01
Remarks			

2-Initial Observations

Date	09/21/2023	Time	09:50
Purge Start Time	09:50	Color	clear colourless
Odor	sulfidic odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/21/23	09:50	0.14	500		3.88	24.01	4.7	5020	0.6	3170	161		
09/21/23	09:53	0.14	0.42		3.83	23.95	4.5	5020	0.7	3160	163		
09/21/23	09:56	0.14	0.42		3.76	23.93	4.5	5020	1.1	3160	164		
09/21/23	09:59	0.14	0.42		3.75	23.92	4.5	5020	1.2	3170	164		

4-Final Observations

Date	09/21/2023	Time	09:54
End purge time	09:55	Color	clear colourless
Odor	sulfidic odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	09/21/2023	Time	09:55
Did Well Dewater?	No		

Remarks

Photos

N2

1-Well Integrity

Date	09/21/2023	Time	14:59
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	High Winds, Sunny, Warm	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	4.18
Well Depth (m)	5.62	Water Column in Well	1.44
Remarks			

2-Initial Observations

Date	09/21/2023	Time	15:05
Purge Start Time	15:05	Color	clear colourless
Odor	no odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/21/23	15:10	0.41	500		4.22	18.23	5.3	4670	4.4	2990	346		
09/21/23	15:13	0.14	0.42		4.25	18.04	4.9	4670	4.2	2990	387		
09/21/23	15:16	0.14	0.42		4.30	18.00	4.9	4670	4.4	2990	399		
09/21/23	15:19	0.14	0.42		4.33	18.00	4.9	4670	4.3	2990	407		

4-Final Observations

Date	09/21/2023	Time	15:15
Color	clear colourless	Odor	no odour
Sheen/Product	NO		
Remarks			

5-Sample Summary

Date	09/21/2023	Time	15:15
Did Well Dewater?	No		

Remarks

Photos

N8

1-Well Integrity

Date	09/22/2023	Time	08:50
Weather Conditions	High Winds, Partly Cloudy, Warm	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	3.79
Well Depth (m)	5.20	Water Column in Well	1.41
Remarks			

2-Initial Observations

Date	09/22/2023	Time	08:56
Purge Start Time	08:56	Color	cloudy brown yellow
Odor	no odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/22/23	08:58	0.14	500		3.88	18.64	7.1	1280	0.0	7940	-90	449	
09/22/23	09:01	0.14	0.42		3.90	18.60	7.1	1280	0.0		7950	473	
09/22/23	09:04	0.14	0.42		3.92	18.56	7.0	1280	0.0	7970	-91	461	

4-Final Observations

Date	09/22/2023	Time	09:04
Color	cloudy yellow brown	Odor	no odour
Sheen/Product	NO		
Remarks			

5-Sample Summary

Date	09/22/2023	Time	09:05
Did Well Dewater?	No		
Remarks			

Photos

N9

1-Well Integrity

Date	09/22/2023	Time	08:20
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	High Winds, Partly Cloudy, Warm	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	2.68
Well Depth (m)	2.80	Water Column in Well	0.11
Remarks			

2-Initial Observations

Date	09/22/2023	Time	08:24
Purge Start Time	08:24	Color	Dark brown turbid
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/22/23	08:25	0.14	500			18.15	8.9	14400	2.3	8900	-142	1000	Well purged dry, after 1 round of parame taken, flow was stopped and readings sample from flow cell were taken

4-Final Observations

Date	09/22/2023	Time	08:33
Color	dark brown turbid	Odor	no odour
Sheen/Product	NO		
Remarks			

5-Sample Summary

Date	09/22/2023	Time	08:33
Did Well Dewater?	Yes		
Remarks	not field filtered due to high turbidity		

Photos

W1D

1-Well Integrity

Date	09/22/2023	Time	10:40
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	High Winds, Partly Sunny, Warm	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	2.67
Well Depth (m)	10.38	Water Column in Well	7.71
Remarks			

2-Initial Observations

Date	09/22/2023	Time	10:54
Purge Start Time	10:52	Color	clear yellow orange
Odor	no odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/22/23	10:55	0.14	500		2.72	19.50	7.9	1650	0.0	10300	60	28.4	
09/22/23	10:58	0.14	0.42		2.76	19.51	8.0	1660	0.0	10300	56	29.5	
09/22/23	11:01	0.14	0.42		2.78	19.54	8.0	1670	0.0	10300	51	28.5	

4-Final Observations

Date	09/22/2023	Time	10:58
End purge time	10:58	Color	clear orange yellow
Odor	no odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	09/22/2023	Time	10:58
Did Well Dewater?	No		
Remarks			

Photos

W1S

1-Well Integrity

Date	09/21/2023	Time	13:51
Remarks	Insufficient water for sampling		

2-Initial Observations

Date	09/21/2023	Time	13:53
Remarks	Insufficient water for sampling		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/21/23	13:54												Insuffici water for samplin

4-Final Observations

Date	09/21/2023	Time	13:54
Remarks	Insufficient water for sampling		

5-Sample Summary

Date	09/21/2023	Time	13:54
Remarks	Insufficient water for sampling		

W2D

1-Well Integrity

Date	09/22/2023	Time	11:10
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	High Winds, Partly Cloudy	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	2.59
Well Depth (m)	6.37	Water Column in Well	3.78
Remarks			

2-Initial Observations

Date	09/22/2023	Time	11:12
Purge Start Time	11:12	Color	clear brown yellow
Odor	no odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/22/23	11:21	0.14	500		2.64	18.76	10.6	4290	0.0	2620	-146	22.0	
09/22/23	11:24	0.14	0.42		2.66	18.72	10.6	4290	0.0	2620	-141	20.3	
09/22/23	11:27	0.14	0.42		2.73	18.68	10.6	4290	0.0	2610	-140	18.5	

4-Final Observations

Date	09/22/2023	Time	11:23
Color	clear brown yellow	Odor	no odour
Sheen/Product	NO		
Remarks			

5-Sample Summary

Date	09/22/2023	Time	11:23
Did Well Dewater?	No		
Remarks			

Photos

W2S

1-Well Integrity

Date	09/22/2023	Time	11:09
Well Dry?	Y	Depth to Water (m)	2.37
Well Depth (m)	2.37	Water Column in Well	0.0
Remarks	Well dry		

2-Initial Observations

Date	09/22/2023	Time	11:10
Remarks	Well dry		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/22/23	11:10												Well dry

4-Final Observations

Date	09/22/2023	Time	11:10
Remarks	Well dry		

5-Sample Summary

Date	09/22/2023	Time	11:10
Remarks	Well dry		

W3S

1-Well Integrity

Date	09/22/2023	Time	11:49
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Depth to Water (m)	2.00	Well Depth (m)	2.53
Water Column in Well	0.52		
Remarks			

2-Initial Observations

Date	09/22/2023	Time	11:57
Purge Start Time	11:55	Color	cloudy brown yellow
Odor	no odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/22/23	12:00	0.14	500		2.04	19.02	8.4	13600	0.0	8400	261	206	
09/22/23	12:03	0.14	0.42		2.05	19.01	8.3	13500	0.0	8360	261	139	
09/22/23	12:06	0.14	0.42		2.10	19.00	8.3	13500	0.0	8340	261	118	

4-Final Observations

Date	09/22/2023	Time	12:03
End purge time	12:03	Color	cloudy brown yellow
Odor	no odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	09/22/2023	Time	12:03
Did Well Dewater?	No		
Remarks			

Photos

W4S

1-Well Integrity

Date	09/22/2023	Time	10:33
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	Y
Remarks	Well dry		

2-Initial Observations

Date	09/22/2023	Time	10:33
Remarks	Well dry		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/22/23	10:33												Well dry

4-Final Observations

Date	09/22/2023	Time	10:33
Remarks	Well dry		

5-Sample Summary

Date	09/22/2023	Time	10:33
Remarks	Well dry		

W5D

1-Well Integrity

Date	09/21/2023	Time	08:48
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	Warm, Partly Cloudy	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	5.41
Well Depth (m)	10.62	Water Column in Well	5.2
Remarks			

2-Initial Observations

Date	09/21/2023	Time	08:51
Purge Start Time	08:59	Sheen/Product	NA
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/21/23	09:10	0.14	500		5.42	23.60	6.7	3790	0.7	2430	20		
09/21/23	09:13	0.14	0.42		6.04	23.43	6.6	3800	0.6	2430	20		
09/21/23	09:16	0.14	0.42		6.06	23.36	6.6	3800	0.6	2430	20		

4-Final Observations

Date	09/21/2023	Time	09:13
End purge time	09:18	Color	slightly turbid pale yellow brown
Odor	no odour	Sheen/Product	NO
Remarks	Final depth to water 6.08mbTOC		

5-Sample Summary

Date	09/21/2023	Time	09:13
Did Well Dewater?	No		
Remarks			

Photos

W5S

1-Well Integrity

Date	09/21/2023	Time	08:42
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	Y
Weather Conditions	Partly Cloudy, Warm		
Remarks			

2-Initial Observations

Date	09/21/2023	Time	08:48
Sheen/Product	NA		
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/21/23	08:48												Well dry

4-Final Observations

Date	09/21/2023	Time	08:48
Sheen/Product	NA		
Remarks			

5-Sample Summary

Date	09/21/2023	Time	08:48
Did Well Dewater?	NA		
Remarks	Well dry		

W6D

1-Well Integrity

Date	09/22/2023	Time	07:40
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	High Winds, Sunny, Warm	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	5.36
Well Depth (m)	8.77	Water Column in Well	3.4
Remarks			

2-Initial Observations

Date	09/22/2023	Time	07:55
Purge Start Time	07:55	Color	Turbid brown/grey
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/22/23	07:55	0.14	500		5.41	18.07	6.5	1420	0.3	908	28	1000	
09/22/23	07:58	0.14	0.42		5.42	18.07	6.3	1420	0.2	907	40	1000	
09/22/23	08:01	0.14	0.42		5.30	18.09	6.3	1410	0.2	900	60	1000	
09/22/23	08:04	0.14	0.42		5.34	18.10	6.3	1410	0.3	899	64	1000	

4-Final Observations

Date	09/22/2023	Time	08:01
End purge time	08:01	Color	cloudy pale yellow brown
Odor	no odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	09/22/2023	Time	08:01
Did Well Dewater?	No		

Remarks

Photos

W6S

1-Well Integrity

Date	09/22/2023	Time	08:12
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	Y
Remarks	Well dry		

2-Initial Observations

Date	09/22/2023	Time	08:13
Remarks	Well dry		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/22/23	08:13												Well dry

4-Final Observations

Date	09/22/2023	Time	08:13
Remarks	Well dry		

5-Sample Summary

Date	09/22/2023	Time	08:13
Remarks	Well dry		

W7M

1-Well Integrity

Date	09/21/2023	Time	14:02
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	Sunny, Warm, High Winds	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	2.87
Well Depth (m)	3.76	Water Column in Well	0.88
Remarks			

2-Initial Observations

Date	09/21/2023	Time	14:10
Purge Start Time	14:07	Color	clear brown
Odor	no odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/21/23	14:13	0.14	500		2.92	26.26	10.2	1900	0.1	1170	-247		
09/21/23	14:16	0.14	0.42		2.98	26.18	10.4	1900	0.0	1180	-247		
09/21/23	14:13	0.14	-0.42		3.06	26.09	10.4	1900	0.0	1180	-250		3 minute intervals ditched due to risk of purging well dry

4-Final Observations

Date	09/21/2023	Time	14:16
End purge time	14:16	Color	brown clear
Odor	no odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	09/21/2023	Time	14:19
Did Well Dewater?	No		
Remarks			

Photos

W7S

1-Well Integrity

Date	09/21/2023	Time	14:01
Well Dry?	Y		
Remarks	Well dry		

2-Initial Observations

Date	09/21/2023	Time	14:03
Remarks	Well dry		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
09/21/23	14:03												Well dry

4-Final Observations

Date	09/21/2023	Time	14:03
Remarks	Well dry		

5-Sample Summary

Date	09/21/2023	Time	14:03
Remarks	Well dry		

A7

1-Well Integrity

Date	11/28/2023	Time	09:07
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Depth to Water (m)	4.23
Well Depth (m)	4.29	Water Column in Well	0.06
Remarks	Insufficient water for sampling		

2-Initial Observations

Date	11/28/2023	Time	10:35
Remarks	Insufficient water for sampling		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/28/23	10:35												Insuffici water for samplin

4-Final Observations

Date	11/28/2023	Time	10:35
Remarks	tInsufficient water for sampling		

5-Sample Summary

Date	11/28/2023	Time	10:36
Remarks	Insufficient water for sampling		

E11

1-Well Integrity

Date	11/27/2023	Time	12:31
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	Y
Depth to Water (m)	3.05	Well Depth (m)	3.05
Water Column in Well	0.0		
Remarks	Thick grey silt		

2-Initial Observations

Date	11/27/2023	Time	12:32
Remarks	Insufficient water for sampling		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/28/23	09:45												Insuffici water for samplin

4-Final Observations

Date	11/28/2023	Time	09:45
Remarks	Insufficient water for sampling		

5-Sample Summary

Date	11/28/2023	Time	09:45
Remarks	Insufficient water for sampling		

E4

1-Well Integrity

Date	11/28/2023	Time	11:15
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Depth to Water (m)	2.79	Well Depth (m)	3.41
Water Column in Well	0.62		
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/28/23	11:38					22.78	9.8	2710	0.0	1680	-198	759	

4-Final Observations

Remarks

5-Sample Summary

Remarks

E5

1-Well Integrity

Date	11/28/2023	Time	09:44
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	Y
Well Depth (m)	2.57		
Remarks	Well dry		

2-Initial Observations

Date	11/28/2023	Time	09:44
Sheen/Product	NA		
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/28/23	09:44												Well dry

4-Final Observations

Date	11/28/2023	Time	09:44
Sheen/Product	NA		
Remarks	Well dry		

5-Sample Summary

Date	11/28/2023	Time	09:44
Remarks	Well dry		

E5D

1-Well Integrity

Date	11/28/2023	Time	09:19
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Depth to Water (m)	2.42	Well Depth (m)	5.44
Remarks			

2-Initial Observations

Date	11/28/2023	Time	09:21
Purge Start Time	09:24		
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/28/23	09:32	0.14	500		2.44	21.66	7.2	1350	0.0	8370	-79	851	
11/28/23	09:35	0.14	0.42		2.47	21.69	7.2	1350	0.0	8370	-80	845	
11/28/23	09:38	0.14	0.42		2.53	21.66	7.2	1350	0.0	8360	-79	840	

4-Final Observations

Date	11/28/2023	Time	09:38
Color	Cloudy yellow	Odor	No odour
Sheen/Product	NO		
Remarks			

5-Sample Summary

Date	11/28/2023	Time	09:39
Did Well Dewater?	No		
Remarks	Final depth to water 2.58mbtoc		

F5

1-Well Integrity

Date	11/27/2023	Time	13:41
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Depth to Water (m)	3.34	Well Depth (m)	7.36
Water Column in Well	4.02		
Remarks			

2-Initial Observations

Date	11/27/2023	Time	13:53
Purge Start Time	13:47	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/27/23	13:54	0.14	500		3.37	24.07	4.3	9540	0.0	6010	183	0.5	
11/27/23	13:57	0.14	0.42		3.41	24.11	4.3	9540	0.0	6010	182	0.4	
11/27/23	14:00	0.14	0.42		3.43	24.10	4.3	9580	0.0	6040	181	0.6	

4-Final Observations

Date	11/27/2023	Time	13:56
Color	Clear colourless	Odor	No odour
Sheen/Product	NO		
Remarks			

5-Sample Summary

Date	11/27/2023	Time	13:56
Did Well Dewater?	No		
Remarks			

F6

1-Well Integrity

Date	11/27/2023	Time	14:37
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Depth to Water (m)	4.65	Well Depth (m)	15.48
Remarks			

2-Initial Observations

Date	11/27/2023	Time	14:44
Purge Start Time	14:42	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/27/23	14:44	0.14	500		4.69	24.34	6.5	8620	3.1	5420	-15	2.9	
11/27/23	14:47	0.14	0.42		4.78	24.13	6.9	8590	2.7	5410	-24	1.1	
11/27/23	14:50	0.14	0.42		4.80	24.03	7.0	8590	2.7	5420	-22	1.1	
11/27/23	14:53	0.14	0.42		4.84	23.86	7.1	8620	2.7	5430	-18	1.0	
11/27/23	14:56	0.14	500		4.86	23.72	7.1	8660	2.7	5450	-11	0.7	

4-Final Observations

Date	11/27/2023	Time	14:46
End purge time	14:50	Color	Clear colourless
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	11/27/2023	Time	14:46
Did Well Dewater?	No		
Remarks			

G2

1-Well Integrity

Date	11/27/2023	Time	11:52
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Depth to Water (m)	8.14	Well Depth (m)	13.36
Water Column in Well	5.21		
Remarks			

2-Initial Observations

Date	11/27/2023	Time	11:55
Purge Start Time	11:57	Color	
Sheen/Product	NO		
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/27/23	12:00	0.14	500		8.14	27.47	6.8	5320	0.5	3340	78	53.6	
11/27/23	12:03	0.14	0.42		8.23	26.90	6.5	5260	0.0	3310	81	51.5	
11/27/23	12:06	0.14	0.42		8.30	26.32	6.3	5220	0.0	3290	84	51.3	
11/27/23	12:09	0.14	0.42		8.34	25.85	6.3	5250	0.0	3310	84	52.2	
11/27/23	12:12	0.14	0.42		8.39	25.66	6.2	5230	0.0	3300	85	53.3	

4-Final Observations

Date	11/27/2023	Time	12:11
Color	Slightly cloudy yellow brown	Odor	No odour
Sheen/Product	NO		
Remarks			

5-Sample Summary

Date	11/27/2023	Time	12:12
Did Well Dewater?	No	QC Sample ID	D01_20231127, T01_20231127

Remarks

G5

1-Well Integrity

Date	11/27/2023	Time	13:58
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Depth to Water (m)	3.33	Well Depth (m)	11.27
Water Column in Well	7.93		
Remarks			

2-Initial Observations

Date	11/27/2023	Time	14:04
Purge Start Time	14:04	Color	
Sheen/Product	NO		
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/27/23	14:06	0.14	500		3.35	20.35	6.1	1600	0.0	1010	18	1.3	
11/27/23	14:09	0.14	0.42		3.37	20.44	6.2	1510	0.0	956	11	1.0	
11/27/23	14:12	0.14	0.42		3.41	20.45	6.2	1370	0.0	876	5	0.7	

4-Final Observations

Date	11/27/2023	Time	14:07
Color	Clear colourless	Odor	No odour
Sheen/Product	NO		
Remarks			

5-Sample Summary

Date	11/27/2023	Time	14:10
Did Well Dewater?	No		
Remarks	Final depth 4.06mbtoc		

G6

1-Well Integrity

Date	11/27/2023	Time	14:18
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Depth to Water (m)	4.21	Well Depth (m)	6.16
Water Column in Well	1.95		
Remarks			

2-Initial Observations

Date	11/27/2023	Time	14:19
Purge Start Time	14:26	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/27/23	14:26	0.14	500		4.23	23.37	4.0	7600	0.0	4880	166	0.4	
11/27/23	14:29	0.14	0.42		4.26	22.92	4.0	7810	0.0	4930	164	0.3	
11/27/23	14:32	0.14	0.42		4.27	22.50	4.0	7910	0.0	4990	160	0.3	

4-Final Observations

Date	11/27/2023	Time	14:27
End purge time	14:30	Color	Clear colourless
Odor	Sulphidic odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	11/27/2023	Time	14:30
Did Well Dewater?	No		
Remarks	Final depth to water 4.26mbtoc		

N2

1-Well Integrity

Date	11/27/2023	Time	13:11
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Depth to Water (m)	4.37	Well Depth (m)	5.62
Water Column in Well	1.25		
Remarks			

2-Initial Observations

Date	11/27/2023	Time	13:17
Purge Start Time	13:17	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/27/23	13:19	0.14	500		4.41	21.07	4.2	6700	4.4	4220	388	365	
11/27/23	13:22	0.14	0.42		4.45	20.77	4.0	6720	4.2	4230	410	256	
11/27/23	13:25	0.14	0.42		4.47	20.71	4.0	6720	4.1	4230	426	231	
11/27/23	13:28	0.14	0.42		4.50	20.65	4.0	6730	4.1	4240	428	251	

4-Final Observations

Date	11/27/2023	Time	13:28
Color	Clear colourless	Odor	No odour
Sheen/Product	NO		
Remarks			

5-Sample Summary

Date	11/27/2023	Time	13:29
Did Well Dewater?	No		
Remarks			

N8

1-Well Integrity

Date	11/27/2023	Time	11:25
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Depth to Water (m)	3.73	Well Depth (m)	5.17
Water Column in Well	1.44		
Remarks			

2-Initial Observations

Date	11/27/2023	Time	11:28
Purge Start Time	11:28	Color	Slightly cloudy yellow brown
Odor	Sulphidic odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/27/23	11:34	0.14	500		3.77	29.91	6.8	8150	0.1	5120	-101	70.1	
11/27/23	11:37	0.14	0.42		3.80	30.67	6.9	7980	0.0	5030	-105	68.1	
11/27/23	11:40	0.14	0.42		3.82	30.86	6.9	7960	0.0	5010	-107	68.1	

4-Final Observations

Date	11/27/2023	Time	11:38
Color	Cloudy brown yellow	Odor	Sulphidic odour
Sheen/Product	NO		
Remarks			

5-Sample Summary

Date	11/27/2023	Time	11:39
Did Well Dewater?	No		
Remarks	Final depth to water 4.34mbtoc		

N9

1-Well Integrity

Date	11/27/2023	Time	11:23
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Well Dry?	Y
Depth to Water (m)	2.85	Well Depth (m)	2.85
Water Column in Well	0.0		
Remarks	Well dry		

2-Initial Observations

Date	11/28/2023	Time	09:46
Remarks	Well dry		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/28/23	09:46												Well dry

4-Final Observations

Date	11/28/2023	Time	09:46
Remarks	Well dry		

5-Sample Summary

Date	11/28/2023	Time	09:46
Remarks	Well dry		

W1D

1-Well Integrity

Date	11/28/2023	Time	08:33
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Depth to Water (m)	2.55	Well Depth (m)	10.40
Remarks			

2-Initial Observations

Date	11/28/2023	Time	08:34
Purge Start Time	08:34	Color	
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/28/23	08:38	0.14	500		2.57	20.26	7.6	1290	0.5	8000	-94	91.5	
11/28/23	08:41	0.14	0.42		2.61	20.34	7.5	1280	0.0	7940	-102	125	
11/28/23	08:44	0.14	0.42		2.65	20.34	7.5	1280	0.0	7920	-107	115	

4-Final Observations

Date	11/28/2023	Time	08:41
End purge time	08:47		
Remarks			

5-Sample Summary

Date	11/28/2023	Time	08:47
Remarks	Final depth 3.21mbtoc		

W1S

1-Well Integrity

Date	11/28/2023	Time	08:16
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Depth to Water (m)	2.09	Well Depth (m)	2.42
Water Column in Well	0.33		
Remarks			

2-Initial Observations

Date	11/28/2023	Time	08:21
Purge Start Time	08:21	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/28/23	08:21	0.14	500		2.10	21.42	7.7	13.4	1.2	8320	-98	1000	

4-Final Observations

Date	11/28/2023	Time	08:26
End purge time	08:25	Color	Cloudy brown
Odor	No odour	Sheen/Product	YES
Remarks			

5-Sample Summary

Date	11/28/2023	Time	08:27
Did Well Dewater?	Yes		
Remarks	Only one set of parameters taken due to well dewatering		

W2D

1-Well Integrity

Date	11/28/2023	Time	10:06
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Depth to Water (m)	2.84	Well Depth (m)	6.36
Remarks			

2-Initial Observations

Date	11/28/2023	Time	10:08
Purge Start Time	10:08	Color	Clear brown
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/28/23	10:22		0.14	500	2.94	22.05	10.2	3460	0.0	2110	-220	12.8	

4-Final Observations

Date	11/28/2023	Time	10:22
End purge time	10:22	Color	
Remarks			

5-Sample Summary

Date	11/28/2023	Time	10:23
Did Well Dewater?	No		
Remarks	One set of parameters taken due to leak in flow cell		

W2S

1-Well Integrity

Date	11/28/2023	Time	10:04
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	Y
Depth to Water (m)	2.37	Well Depth (m)	2.37
Remarks	Well dry		

2-Initial Observations

Date	11/28/2023	Time	10:05
Remarks	Well dry		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/28/23	10:05												Well dry

4-Final Observations

Date	11/28/2023	Time	10:05
Remarks	Well dry		

5-Sample Summary

Date	11/28/2023	Time	10:05
Remarks	Well dry		

W3S

1-Well Integrity

Date	11/28/2023	Time	10:45
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Depth to Water (m)	2.16	Well Depth (m)	2.53
Water Column in Well	0.37		
Remarks			

2-Initial Observations

Date	11/28/2023	Time	10:48
Purge Start Time	10:49	Color	Clear yellow brown
Odor	No odour		
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/28/23	11:00	0.14	500		2.24	21.54	8.4	1130	4.0	7030	259	96.8	

4-Final Observations

Date	11/28/2023	Time	11:01
Sheen/Product	NO		
Remarks			

5-Sample Summary

Date	11/28/2023	Time	11:01
Did Well Dewater?	No		
Remarks	One set of parameters taken due to leak in flow cell		

W4S

1-Well Integrity

Date	11/28/2023	Time	10:37
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	Y
Depth to Water (m)	1.11	Well Depth (m)	1.11
Water Column in Well	0.0		
Remarks	Well dry		

2-Initial Observations

Date	11/28/2023	Time	10:37
Remarks	Well dry		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/28/23	10:37												Well dry

4-Final Observations

Date	11/28/2023	Time	10:37
Remarks	Well dry		

5-Sample Summary

Date	11/28/2023	Time	10:38
Remarks	Well dry		

W5D

1-Well Integrity

Date	11/27/2023	Time	12:36
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Well Dry?	N	Depth to Water (m)	5.5
Well Depth (m)	10.62	Water Column in Well	5.11
Remarks			

2-Initial Observations

Date	11/27/2023	Time	12:38
Purge Start Time	12:41	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/27/23	12:39	0.14	500		5.60	21.82	6.4	5980	3.2	3760	131	17.1	
11/27/23	12:42	0.14	0.42		5.65	21.42	6.3	5970	2.4	3770	136	17.2	
11/27/23	12:45	0.14	0.42		5.69	21.03	6.3	5980	2.2	3770	137	20.3	

4-Final Observations

Date	11/27/2023	Time	12:59
Color	Clear colourless	Odor	No odour
Sheen/Product	NO		
Remarks			

5-Sample Summary

Date	11/27/2023	Time	13:03
Did Well Dewater?	No		
Remarks	Final depth 6.86mbtoc		

W5S

1-Well Integrity

Date	11/27/2023	Time	12:35
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	Y
Remarks	Well dry		

2-Initial Observations

Date	11/28/2023	Time	09:46
Remarks	Well dry		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/28/23	09:47												Well dry

4-Final Observations

Date	11/28/2023	Time	09:47
Remarks	Well dry		

5-Sample Summary

Date	11/28/2023	Time	09:47
Remarks	Well dry		

W6D

1-Well Integrity

Date	11/27/2023	Time	10:56
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	Sunny, Hot	Sampling Method	Low Flow - Peristaltic Pump
Depth to Water (m)	5.38	Well Depth (m)	8.80
Water Column in Well	3.42		
Remarks			

2-Initial Observations

Date	11/27/2023	Time	11:06
Purge Start Time	11:04	Color	Clear colourless
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/27/23	11:06	0.14	500		5.38	30.05	6.3	1170	2.6	745	173	70.6	
11/27/23	11:09	0.14	0.42		5.40	30.12	6.0	1130	2.3	720	181	68.6	
11/27/23	11:12	0.14	0.42		5.41	30.12	5.9	1110	2.1	711	184	66.6	
11/27/23	11:15	0.14	0.42		5.41	30.10	5.8	1090	2.0	698	186	68.3	
11/27/23	11:14	0.14	-0.14		5.53	30.09	5.8	1070	2.0	680	188	65.1	

4-Final Observations

Date	11/27/2023	Time	11:15
End purge time	11:17	Color	Clear colourless
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	11/27/2023	Time	11:20

Did Well Dewater?	No
Remarks	Final depth to water 5.63

W6S

1-Well Integrity

Date	11/27/2023	Time	10:54
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	Y
Depth to Water (m)	3.00	Well Depth (m)	3.11
Water Column in Well	0.11		
Remarks	Well dry		

2-Initial Observations

Date	11/27/2023	Time	10:55
Remarks	Well dry		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/27/23	10:55												Well dry

4-Final Observations

Date	11/27/2023	Time	10:55
Remarks	Well dry		

5-Sample Summary

Date	11/28/2023	Time	09:47
Remarks	Well dry		

W7M

1-Well Integrity

Date	11/28/2023	Time	09:55
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Depth to Water (m)	3.25	Well Depth (m)	3.81
Remarks	Insufficient water for sampling		

2-Initial Observations

Date	11/28/2023	Time	09:57
Remarks	Insufficient water for sampling		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/28/23	09:57												Insuffici water for samplin

4-Final Observations

Date	11/28/2023	Time	09:57
Remarks	Insufficient water for sampling		

5-Sample Summary

Date	11/28/2023	Time	09:57
Remarks	Insufficient water for sampling		

W7S

1-Well Integrity

Date	11/28/2023	Time	09:54
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	Y
Depth to Water (m)	2.30	Well Depth (m)	2.30
Water Column in Well	0.0		
Remarks	Well dry		

2-Initial Observations

Date	11/28/2023	Time	09:54
Remarks	Well dry		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
11/28/23	09:54												Well dry

4-Final Observations

Date	11/28/2023	Time	09:54
Remarks	Well dry		

5-Sample Summary

Date	11/28/2023	Time	09:55
Remarks	Well dry		

A7

1-Well Integrity

Date	02/06/2024	Time	15:32
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Rain, Cloudy
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	2.66	Well Depth (m)	4.29
Water Column in Well	1.63		
Remarks			

2-Initial Observations

Date	02/07/2024	Time	11:47
Purge Start Time	11:59	Color	Cloudy yellow
Odor	Swampy	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
02/07/24	12:02					19.09	9.4	18900	0.39	11.7	-269		
02/07/24	12:03					19.1	9.44	18900	0.31	11.7	-277		
02/07/24	12:04					19.1	9.44	18900	0.1	11.7	-265		

4-Final Observations

Date	02/07/2024	Time	12:04
End purge time	12:07	Color	Cloudy yellow
Odor	No odour	Sheen/Product	NO
Remarks	Final DTW=2.81		

5-Sample Summary

Date	02/07/2024	Time	12:07
Sample ID	A7		

Remarks

Photos

E11

1-Well Integrity

Date	02/06/2024	Time	12:04
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Cloudy, Hot
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	3.68	Well Depth (m)	4.76
Water Column in Well	1.08		
Remarks			

2-Initial Observations

Date	02/06/2024	Time	12:10
Purge Start Time	12:14	Color	Black
Odor	Swampy	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
02/06/24	12:27					28.17	8.72	8080	0.27	5.04	-178		Only one set of parame possible

4-Final Observations

Date	02/06/2024	Time	12:27
End purge time	12:27	Color	Black
Odor	Swampy	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	02/06/2024	Time	12:35

Sample ID E11

Remarks

Photos

E4

1-Well Integrity

Date	02/06/2024	Time	15:32
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Weather Conditions	Cloudy, Rain	Well Depth (m)	3.4
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Remarks

Photos

E5

1-Well Integrity

Date	02/06/2024	Time	15:32
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	Y	Well Depth (m)	2.57
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Remarks

Photos

E5D

1-Well Integrity

Date	02/06/2024	Time	15:32
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Cloudy, Rain
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	2.56	Well Depth (m)	5.44
Water Column in Well	2.88		
Remarks			

2-Initial Observations

Date	02/07/2024	Time	13:10
Purge Start Time	13:12	Color	Cloudy yellow
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
02/07/24	13:15					19.37	7.24	7720	2.01	4.85	-140		
02/07/24	13:16					19.37	7.26	7750	1.58	4.89	-127		
02/07/24	13:17					19.38	7.36	7810	1.31	4.92	-114		
02/07/24	13:18					19.4	7.4	7810	1.13	4.92	-102		

4-Final Observations

Date	02/07/2024	Time	13:19
End purge time	13:19	Color	Cloudy yellow
Odor	No odour	Sheen/Product	NO
Remarks	Final DTW=2.72		

5-Sample Summary

Date	02/07/2024	Time	13:18

GWM APAC

Site: Hydro Quarterly Groundwater Monitoring
Hart Rd, Loxford
Client: Norsk Hydro

Did Well Dewater?	No	Sample ID	E5D
Remarks			

Photos

F5

1-Well Integrity

Date	02/06/2024	Time	15:32
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Cloudy, Rain
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	3.6	Well Depth (m)	7.38
Water Column in Well	3.78		
Remarks			

2-Initial Observations

Date	02/07/2024	Time	12:43
Purge Start Time	12:43	Color	Clear
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
02/07/24	12:43					19.34	4.62	10600	0.37	6.58	131		
02/07/24	12:44					19.34	4.6	10600	0.29	6.59	131		
02/07/24	12:45					19.34	4.59	10600	0.29	6.6	131		

4-Final Observations

Date	02/07/2024	Time	12:46
End purge time	12:47	Color	Clear
Odor	No odour	Sheen/Product	NO
Remarks	Final DTW=3.99		

5-Sample Summary

Date	02/07/2024	Time	12:47
Did Well Dewater?	No	Sample ID	F5

Remarks

Photos

F6

1-Well Integrity

Date	02/06/2024	Time	12:57
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	No
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	No
Well Dry?	N	Weather Conditions	Cloudy, Hot
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	4.81	Well Depth (m)	15.46
Water Column in Well	10.65		
Remarks			

2-Initial Observations

Date	02/07/2024	Time	13:11
Purge Start Time	09:31	Color	Clear
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
02/07/24	09:31					18.6	7.47	9440	0.76	5.94	112		
02/07/24	09:33					18.58	7.41	9410	0.7	5.92	114		
02/07/24	09:35					18.57	7.36	9360	0.63	5.88	116		
02/07/24	09:37					18.58	7.3	9300	0.59	5.86	118		

4-Final Observations

Date	02/07/2024	Time	09:35
End purge time	09:38	Color	Clear
Odor	No odour	Sheen/Product	NO
Remarks	Final DTW=5.67		

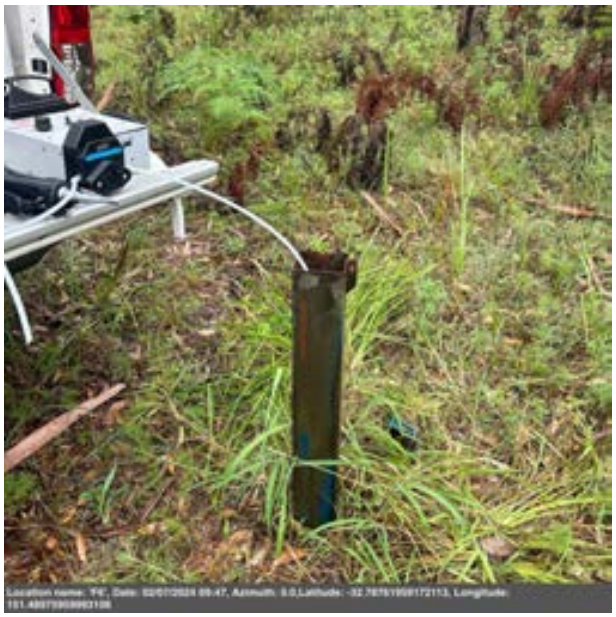
5-Sample Summary

Date	02/07/2024	Time	09:35

Sample ID F6 QC Sample ID

Remarks

Photos



G2

1-Well Integrity

Date	02/06/2024	Time	11:28
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Cloudy, Hot
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	8.17	Well Depth (m)	13.34
Water Column in Well	5.17		
Remarks			

2-Initial Observations

Date	02/06/2024	Time	11:31
Purge Start Time	11:35	Color	Cloudy
Odor	Swampy	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
02/06/24	11:37					28.45	6.67	5100	0.41	3.21	25		
02/06/24	11:39					28.18	6.57	5090	0.39	3.21	26		
02/06/24	11:41					28.14	6.4	5090	0.38	3.2	27		
02/06/24	11:44					28.1	6.3	5090	0.37	3.2	28		
02/06/24	11:45					28.04	6.25	5090	0.34	3.21	28		
02/06/24	11:47					27.97	6.23	5090	0.31	3.2	29		
02/06/24	11:49					27.92	6.23	5070	0.26	3.2	30		

4-Final Observations

Date	02/06/2024	Time	11:50
End purge time	11:50	Color	Cloudy
Odor	Swampy	Sheen/Product	NO

Remarks	Final DTW=8.24

5-Sample Summary

Date	02/06/2024	Time	11:47
Did Well Dewater?	No	Sample ID	G2
Remarks			

Photos

G5

1-Well Integrity

Date	02/06/2024	Time	15:32
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Cloudy, Rain
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	3.57	Well Depth (m)	11.3
Remarks			

2-Initial Observations

Date	02/07/2024	Time	12:18
Purge Start Time	12:20	Color	Clear
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
02/07/24	12:25					19.2	8.05	1040	0.73	0.665	-105		
02/07/24	12:27					19.22	8.01	1040	0.55	0.666	-106		
02/07/24	12:29					19.25	7.9	1040	0.48	0.666	-107		
02/07/24	12:30					19.25	7.7	1040	0.4	0.666	-107		
02/07/24	12:31					19.25	7.5	1040	0.42	0.662	-104		
02/07/24	12:33					19.26	7.49	1030	0.28	0.656	-103		

4-Final Observations

Date	02/07/2024	Time	12:34
End purge time	12:34	Color	Clear
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	02/07/2024	Time	12:34
Did Well Dewater?	No	Sample ID	G5
Remarks			

Photos

G6

1-Well Integrity

Date	02/06/2024	Time	15:33
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Cloudy, Rain
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	4.41	Well Depth (m)	6.15
Water Column in Well	1.74		
Remarks			

2-Initial Observations

Date	02/07/2024	Time	10:03
Purge Start Time	10:02	Color	Clear
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
02/07/24	10:04					18.33	4.8	8030	1.76	5.29	156		
02/07/24	10:06					18.31	4.78	8340	1.61	5.27	160		
02/07/24	10:08					18.31	4.7	8370	1.52	5.27	160		

4-Final Observations

Date	02/07/2024	Time	10:10
End purge time	10:10	Color	Clear
Odor	Sulfur	Sheen/Product	NO
Remarks	Final DTW=4.3		

5-Sample Summary

Date	02/07/2024	Time	10:10
Did Well Dewater?	No	Sample ID	G6

Remarks

Photos

N2

1-Well Integrity

Date	02/06/2024	Time	15:33
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Cloudy, Rain
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	4.58	Well Depth (m)	5.64
Water Column in Well	1.06		
Remarks			

2-Initial Observations

Date	02/07/2024	Time	10:35
Purge Start Time	10:33	Color	Clear
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
02/07/24	10:35					18.37	3.9	7430	1.83	4.67	384	4.62	
02/07/24	10:37					18.38	3.94	7140	2.03	4.5	395		
02/07/24	10:39					18.38	4.02	7150	2.18	4.49	402		

4-Final Observations

Date	02/07/2024	Time	10:39
End purge time	10:41	Color	Clear
Odor	No odour	Sheen/Product	NO
Remarks	Final STW=5.6		

5-Sample Summary

Date	02/07/2024	Time	10:39
Did Well Dewater?	Yes	Sample ID	N2

Remarks

Photos

N8

1-Well Integrity

Date	02/06/2024	Time	10:57
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	No
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Cloudy, Hot
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	3.9	Well Depth (m)	5.19
Water Column in Well	1.29		
Remarks			

2-Initial Observations

Date	02/06/2024	Time	11:02
Color	Cloudy yellow	Odor	Swampy
Sheen/Product	NO		
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
02/06/24	11:07					22.1	6.33	9800	0.34	6.23	-122		
02/06/24	11:10					22.8	6.4	10100	0.32	6.31	-120		
02/06/24	11:12					22.37	6.4	10200	0.33	6.35	-121		

4-Final Observations

Date	02/06/2024	Time	11:11
End purge time	11:11	Color	Cloudy yellow
Odor	Swampy	Sheen/Product	NO
Remarks	Final DTW=4.16		

5-Sample Summary

Date	02/06/2024	Time	11:12
Sample ID	N8		

Remarks

Photos

N9

1-Well Integrity

Date	02/06/2024	Time	10:55
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	No
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	Y	Weather Conditions	Cloudy, Hot
Well Depth (m)	2.83		
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Remarks

W1D

1-Well Integrity

Date	02/06/2024	Time	15:33
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Cloudy, Rain
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	2.72	Well Depth (m)	10.42
Remarks			

2-Initial Observations

Date	02/07/2024	Time	13:52
Purge Start Time	13:53	Color	Yello
Odor	Sulfur	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
02/07/24	13:56					20.02	7.63	11600	1.42	7.33	-85		
02/07/24	14:57					19.98	7.49	12100	0.96	7.23	-85		
02/07/24	13:58					20	7.52	12000	1.14	7.39	-86		
02/07/24	14:01					19.97	7.47	11600	0.82	7.02	-86		

4-Final Observations

Date	02/07/2024	Time	14:01
End purge time	14:01	Color	Yellow
Odor	Sulfur	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	02/07/2024	Time	14:01
Did Well Dewater?	No	Sample ID	W1D

Remarks

Photos

W1S

1-Well Integrity

Date	02/06/2024	Time	15:33
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	Y	Well Depth (m)	2.42
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Remarks

Photos

W2D

1-Well Integrity

Date	02/06/2024	Time	15:33
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Cloudy, Rain
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	2.75	Well Depth (m)	6.37
Remarks			

2-Initial Observations

Date	02/07/2024	Time	14:14
Purge Start Time	14:14	Color	Brown
Odor	Sulfur	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
02/07/24	14:19					19.87	10.25	16600	1.08	10.9	-225		
02/07/24	14:20					19.87	10.24	17600	1.28	10.8	-219		
02/07/24	14:20					19.87	10.24	17500	1.14	10.8	-217		

4-Final Observations

Date	02/07/2024	Time	14:20
End purge time	14:21	Color	Brown
Odor	Sulfur	Sheen/Product	NO
Remarks	Final DTW=3.45		

5-Sample Summary

Date	02/07/2024	Time	14:21
Sample ID	W2D		

Remarks

Photos

W2S

1-Well Integrity

Date	02/06/2024	Time	15:33
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	Y	Well Depth (m)	2.37
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Remarks

Photos

W3S

1-Well Integrity

Date	02/06/2024	Time	15:33
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	Y	Weather Conditions	Cloudy, Rain
Sampling Type		Well Depth (m)	2.51
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Remarks

Photos

W4S

1-Well Integrity

Date	02/06/2024	Time	15:33
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	Y	Weather Conditions	Cloudy, Rain
Well Depth (m)	1.11		
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Remarks

Photos

W5D

1-Well Integrity

Date	02/06/2024	Time	15:33
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Cloudy, Rain
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	5.7	Well Depth (m)	10.62
Water Column in Well	4.92		
Remarks			

2-Initial Observations

Date	02/07/2024	Time	11:07
Purge Start Time	11:16	Color	Clear
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
02/07/24	11:18					18.89	6.19	5000	2.3	3.2	146		
02/07/24	11:19					18.89	6.2	5100	2.49	3.22	144		
02/07/24	11:22					18.89	6.21	5140	2.26	3.24	141		

4-Final Observations

Date	02/07/2024	Time	11:22
End purge time	11:22	Color	Clear
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	02/07/2024	Time	11:22
Did Well Dewater?	No	Sample ID	W5D

Remarks

Photos

W5S

1-Well Integrity

Date	02/06/2024	Time	15:33
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	Y	Weather Conditions	Cloudy, Rain
Well Depth (m)	1.28		
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Remarks

Photos

W6D

1-Well Integrity

Date	02/06/2024	Time	09:16
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Cloudy, Hot, Rain
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	5.49	Well Depth (m)	7.8
Water Column in Well	2.31		
Remarks			

2-Initial Observations

Date	02/06/2024	Time	09:19
Purge Start Time	10:36	Color	Clear
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
02/06/24	10:37					24.17	5.79	0.968	0.77	0.619	121		
02/06/24	10:39					24.1	5.71	0.964	0.68	0.616	125		
02/06/24	10:41					24.2	5.66	0.961	0.59	0.614	128		
02/06/24	10:43					24.22	5.62	0.957	0.52	0.612	131		

4-Final Observations

Date	02/06/2024	Time	10:43
End purge time	10:44	Color	Clear
Odor	No odour	Sheen/Product	NO
Remarks	Final DTW=5.87		

5-Sample Summary

Date	02/06/2024	Time	10:44

Did Well Dewater?	No	Sample ID	W6D
Remarks			

Photos

W6S

1-Well Integrity

Date	02/06/2024	Time	09:11
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	Y	Weather Conditions	Hot, Cloudy, Rain
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Well Depth (m)	3.11		
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Remarks

Photos

W7M

1-Well Integrity

Date	02/06/2024	Time	15:33
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	Y	Weather Conditions	Cloudy, Rain
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	3.0	Well Depth (m)	3.81
Remarks			

2-Initial Observations

Date	02/07/2024	Time	13:29
Purge Start Time	13:29	Color	Yellow
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
02/07/24	13:32					19.74	10.14	26600	0.6	16.4	-201		
02/07/24	13:34					19.77	10.14	26400	0.29	16.4	-218		
02/07/24	13:35					19.81	10.13	26300	0.15	16.3	-231		

4-Final Observations

Date	02/07/2024	Time	13:35
End purge time	13:35	Color	Yellow
Odor	No odour	Sheen/Product	NO
Remarks	Final DTW=3.41		

5-Sample Summary

Date	02/07/2024	Time	13:35
Sample ID	W7M		

Remarks

Photos

W7S

1-Well Integrity

Date	02/06/2024	Time	15:33
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	Y	Well Depth (m)	2.79
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Remarks

Photos

A7

1-Well Integrity

Date	04/10/2024	Time	10:37
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Partly Cloudy
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	2.43	Well Depth (m)	4.29
Water Column in Well	1.86		
Remarks			

2-Initial Observations

Date	04/10/2024	Time	12:52
Purge Start Time	12:52	Color	Yellow
Odor	Sulphur	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
04/10/24	12:52					21.7	10.04	19700	0	12.2	-248		
04/10/24	12:52					21.76	10.04	19700	0	12.2	-252		
04/10/24	12:53					21.81	10.04	19700	0	12.2	-255		

4-Final Observations

Date	04/10/2024	Time	12:53
End purge time	12:55	Color	Yellow
Odor	Sulphur	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	04/10/2024	Time	12:53
Did Well Dewater?	No	Sample ID	A7

Remarks Final dtw = 2.72

Photos

E11

1-Well Integrity

Date	04/09/2024	Time	11:19
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	Y	Weather Conditions	Partly Sunny
Sampling Method		Sampling Type	
Depth to Water (m)		Well Depth (m)	3.72
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Remarks

Photos

E4

1-Well Integrity

Date	04/09/2024	Time	13:27
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	No
		Protective casing or sleeve around well in good condition (if no comment)	Yes
Water in the well box	No		
Well Dry?	Y	Weather Conditions	Partly Sunny
Well Depth (m)	3.4		
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Remarks

E5

1-Well Integrity

Date	04/09/2024	Time	10:18
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	Y	Weather Conditions	Partly Sunny
Well Depth (m)	2.58		
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Remarks

Photos

E5D

1-Well Integrity

Date	04/09/2024	Time	14:11
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Partly Cloudy
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	2.44	Well Depth (m)	5.45
Remarks			

2-Initial Observations

Date	04/09/2024	Time	14:18
Purge Start Time	14:18	Color	Slightly yellow
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
04/09/24	14:18					22.95	7.26	14200	0	8.8	-92		
04/09/24	14:19					22.98	7.25	14200	0	8.8	-93		
04/09/24	14:20					22.98	7.23	14200	0	8.8	-93		

4-Final Observations

Date	04/09/2024	Time	14:20
End purge time	14:20	Color	Slightly yellow
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	04/09/2024	Time	14:22
Did Well Dewater?	No	Sample ID	E5D

Remarks	Final dtw = 2.69

Photos

F5

1-Well Integrity

Date	04/10/2024	Time	10:38
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Cloudy, Cold, High Winds
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	3.52	Well Depth (m)	7.38
Remarks			

2-Initial Observations

Date	04/10/2024	Time	11:29
Purge Start Time	11:27	Color	Clear
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
04/10/24	11:29					19.27	4.12	11200	0	6.93	164		
04/10/24	11:30					19.28	4.11	11200	0	6.94	163		
04/10/24	11:30					19.3	4.11	11200	0	6.94	163		

4-Final Observations

Date	04/10/2024	Time	11:31
End purge time	11:32	Color	Clear
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	04/10/2024	Time	11:31
Did Well Dewater?	No	Sample ID	F5

Remarks Final dtw = 3.8

Photos

F6

1-Well Integrity

Date	04/10/2024	Time	12:02
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	No
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Cold, Cloudy, High Winds
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	4.92	Well Depth (m)	15.5
Water Column in Well	10.58		
Remarks			

2-Initial Observations

Date	04/10/2024	Time	12:03
Purge Start Time	12:09	Color	Clear
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
04/10/24	12:09					19.19	7.11	9870	0.26	6.2	-36		
04/10/24	12:11					19.19	7.11	9870	0.25	6.2	-38		
04/10/24	12:12					19.05	7.14	9890	0.2	6.23	-39		

4-Final Observations

Date	04/10/2024	Time	12:11
End purge time	12:13	Color	Clear
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	04/10/2024	Time	12:11
Did Well Dewater?	No	Sample ID	F6

Remarks Final dtw = 5.67

Photos

G2

1-Well Integrity

Date	04/09/2024	Time	11:28
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Partly Sunny
Sampling Type	Low Flow	Depth to Water (m)	8.22
Well Depth (m)	13.36		
Remarks			

2-Initial Observations

Date	04/09/2024	Time	11:29
Purge Start Time	11:37	Color	Clear
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
04/09/24	11:42					20.77	6.66	6060	0.09	3.82	-30		
04/09/24	11:43					20.72	6.57	6070	0.05	3.83	-29		
04/09/24	11:43					20.72	6.48	6070	0.05	3.83	-29		
04/09/24	11:45					20.67	6.45	6080	0	3.83	-28		

4-Final Observations

Date	04/09/2024	Time	11:46
End purge time	11:44	Color	Clear
Odor	No odour		
Remarks			

5-Sample Summary

Date	04/09/2024	Time	11:44
Did Well Dewater?	No	Sample ID	G2

QC Sample ID	D01_20240409, T01_20240409
Remarks	Final dtw = 8.32

Photos

G5

1-Well Integrity

Date	04/10/2024	Time	11:34
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Cloudy, Cold, High Winds
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	3.48	Well Depth (m)	11.33
Water Column in Well	7.85		
Remarks			

2-Initial Observations

Date	04/10/2024	Time	11:46
Purge Start Time	11:46	Color	Clear
Odor	Sulphur	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
04/10/24	11:46					19.51	6.3	1430	0	0.911	-55		
04/10/24	11:47					19.56	6.32	1380	0	0.88	-61		
04/10/24	11:48					19.56	6.36	1360	0	0.867	-65		
04/10/24	11:48					19.6	6.42	1330	0	0.847	-71		

4-Final Observations

Date	04/10/2024	Time	11:48
End purge time	11:48	Color	Clear
Odor	Sulphur	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	04/10/2024	Time	11:48

Did Well Dewater?	No	Sample ID	G5
Remarks	Final dtw = 4.0		

Photos

G6

1-Well Integrity

Date	04/10/2024	Time	12:19
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Well Dry?	N
Weather Conditions	Partly Sunny, High Winds	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	4.5
Well Depth (m)	6.16	Water Column in Well	1.66
Remarks			

2-Initial Observations

Date	04/10/2024	Time	12:21
Purge Start Time	12:28	Color	Clear
Odor	Sulphur	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
04/10/24	12:28					19.05	3.84	8890	0	5.6	148		
04/10/24	12:29					19.05	3.8	8890	0	5.6	150		
04/10/24	12:29					19.05	3.77	8890	0	5.6	151		

4-Final Observations

Date	04/10/2024	Time	12:30
End purge time	12:30	Color	Clear
Odor	Strong Sulphur	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	04/10/2024	Time	12:30
Did Well Dewater?	No	Sample ID	G6
Remarks	Final dtw = 4.7		

Photos

N2

1-Well Integrity

Date	04/10/2024	Time	11:04
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Cloudy, High Winds
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	4.6	Well Depth (m)	5.62
Remarks			

2-Initial Observations

Date	04/10/2024	Time	11:11
Purge Start Time	11:09	Color	Cloudy
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
04/10/24	11:11					19.18	3.9	7920	0.1	4.99	303		
04/10/24	11:12					19.24	3.91	7900	0.16	4.97	310		
04/10/24	11:13					19.26	3.87	7890	0.17	4.97	313		

4-Final Observations

Date	04/10/2024	Time	11:13
End purge time	11:14	Color	Cloudy
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	04/10/2024	Time	11:13
Did Well Dewater?	No	Sample ID	N2

Remarks Final dtw = 5.28

Photos

N8

1-Well Integrity

Date	04/09/2024	Time	12:37
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	No
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Partly Sunny
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	3.95	Well Depth (m)	5.18
Water Column in Well	1.23		
Remarks			

2-Initial Observations

Date	04/09/2024	Time	12:38
Purge Start Time	12:42	Color	Cloudy yellow
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
04/09/24	12:43					22.18	6.72	11000	0	6.85	-124		
04/09/24	12:45					22.21	6.73	11000	0	6.82	-127		
04/09/24	12:47					22.24	6.76	11000	0	6.83	-128		

4-Final Observations

Date	04/09/2024	Time	12:47
End purge time	12:48	Color	Cloudy yellow
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	04/09/2024	Time	12:47
Sample ID	N8		

Remarks Final dtw = 4.08

Photos

N9

1-Well Integrity

Date	04/09/2024	Time	12:33
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	No
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	Y	Weather Conditions	Partly Sunny
Well Depth (m)	2.83		
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Remarks

Photos

W1D

1-Well Integrity

Date	04/09/2024	Time	14:28
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Partly Cloudy
Sampling Method	Low Flow - Peristaltic Pump	Depth to Water (m)	2.85
Well Depth (m)	10.4		
Remarks			

2-Initial Observations

Date	04/09/2024	Time	14:40
Purge Start Time	14:34	Color	Slightly yellow
Odor	Sulphur	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
04/09/24	14:40					21.13	7.26	12700	0.33	7.87	-85		
04/09/24	14:40					21.12	7.25	12700	0.34	7.86	-84		
04/09/24	14:42					21.08	7.22	12700	0.33	7.83	-83		

4-Final Observations

Date	04/09/2024	Time	14:41
End purge time	14:42	Color	Slightly yellow
Odor	Sulphur	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	04/09/2024	Time	14:41
Did Well Dewater?	No	Sample ID	W1D

Remarks Final dtw = 3.04

Photos

W1S

1-Well Integrity

Date	04/09/2024	Time	10:24
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	Y	Weather Conditions	Partly Sunny
Well Depth (m)	2.42		
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Remarks

Photos

W2D

1-Well Integrity

Date	04/09/2024	Time	13:32
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Partly Sunny
Sampling Method	Low Flow - Peristaltic Pump	Depth to Water (m)	2.32
Well Depth (m)	6.37	Water Column in Well	4.05
Remarks			

2-Initial Observations

Date	04/09/2024	Time	13:33
Purge Start Time	13:35	Color	Brown
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
04/09/24	13:35					22.48	10.78	38600	0.0	23.6	-281		
04/09/24	13:36					22.59	10.78	38700	0	23.6	-291		
04/09/24	13:37					22.68	10.78	38700	0	23.6	-298		

4-Final Observations

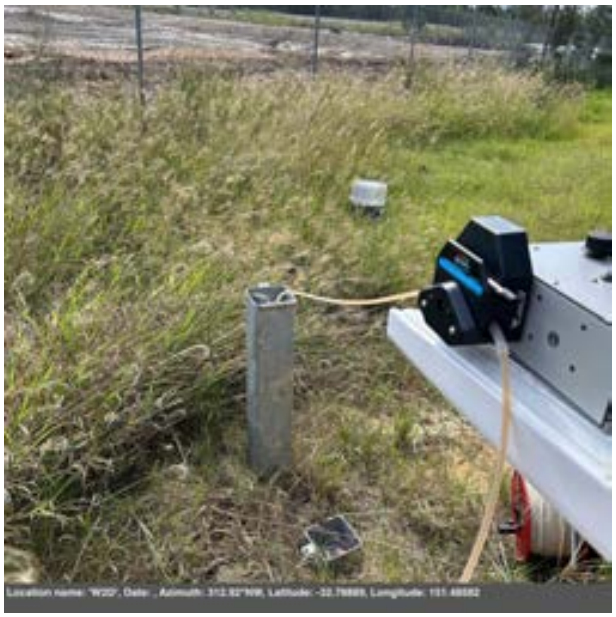
Date	04/09/2024	Time	13:40
End purge time	13:40	Color	Brown
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	04/09/2024	Time	13:41
Did Well Dewater?	No	Sample ID	W2D

Remarks Final dtw = 2.4

Photos



W2S

1-Well Integrity

Date	04/09/2024	Time	10:04
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	Y	Weather Conditions	Partly Sunny
Well Depth (m)	2.37		
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Remarks

Photos

W3S

1-Well Integrity

Date	04/09/2024	Time	10:46
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Partly Sunny
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	1.45	Well Depth (m)	2.52
Water Column in Well	1.07		
Remarks			

2-Initial Observations

Date	04/09/2024	Time	10:48
Purge Start Time	10:48	Color	Black
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
04/09/24	10:49				1.45	22.62	8.54	13800	0.18	8.55	28		

4-Final Observations

Date	04/09/2024	Time	10:51
End purge time	10:51	Color	Cloudy yellow
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	04/09/2024	Time	10:51
Did Well Dewater?	Yes	Sample ID	W3S
Remarks			

Photos

W4S

1-Well Integrity

Date	04/09/2024	Time	10:30
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	Y	Weather Conditions	Partly Sunny
Well Depth (m)	1.12		
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Remarks

Photos

W5D

1-Well Integrity

Date	04/09/2024	Time	14:53
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Partly Cloudy
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	5.63	Well Depth (m)	10.63
Remarks			

2-Initial Observations

Date	04/09/2024	Time	15:00
Purge Start Time	15:00	Color	Clear
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
04/09/24	15:00					22.2	8	5950	1.77	3.75	62		
04/09/24	15:01					22.26	7.94	5940	1.56	3.75	65		
04/09/24	15:02					22.28	7.8	5950	1.5	3.74	66		
04/09/24	15:01					22.33	7.68	5940	1.4	3.74	68		

4-Final Observations

Date	04/09/2024	Time	15:02
End purge time	15:04	Color	Clear
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	04/09/2024	Time	15:04
Did Well Dewater?	No	Sample ID	W5D

Remarks Finalists =5.9

Photos

W5S

1-Well Integrity

Date	04/09/2024	Time	11:03
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	Y	Weather Conditions	Partly Sunny
Well Depth (m)	1.27		
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Remarks

Photos

W6D

1-Well Integrity

Date	04/09/2024	Time	12:00
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Partly Sunny
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	5.55	Well Depth (m)	8.85
Remarks			

2-Initial Observations

Date	04/09/2024	Time	12:02
Purge Start Time	12:07	Color	Cloudy
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
04/09/24	12:09					20.74	5.55	1170	0	0.747	108		
04/09/24	12:10					20.48	5.52	1150	0	0.732	108		
04/09/24	12:11					20.37	5.5	1140	0	0.726	109		

4-Final Observations

Date	04/09/2024	Time	12:10
End purge time	12:12	Color	Cloudy
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	04/09/2024	Time	12:11
Did Well Dewater?	No	Sample ID	W6D

Remarks	Final dtw = 5.8

Photos

W6S

1-Well Integrity

Date	04/09/2024	Time	12:17
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	Y	Weather Conditions	Partly Sunny
Sampling Method		Sampling Type	
Well Depth (m)	3.1		
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Remarks

Photos

W7M

1-Well Integrity

Date	04/09/2024	Time	13:47
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Partly Sunny
Sampling Method	Low Flow - Peristaltic Pump	Depth to Water (m)	2.8
Well Depth (m)	3.8		
Remarks			

2-Initial Observations

Date	04/09/2024	Time	13:53
Purge Start Time	13:53	Color	Brown
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
04/09/24	13:53					22.94	10.54	26400	0	16.4	-291		
04/09/24	13:54					22.96	10.54	26200	0	16.2	-297		
04/09/24	13:55					22.95	10.54	26000	0	16.1	-300		

4-Final Observations

Date	04/09/2024	Time	13:54
End purge time	13:56	Color	Brown
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	04/09/2024	Time	13:55
Sample ID	W7M		

Remarks Final dtw = 3.42

Photos

W7S

1-Well Integrity

Date	04/09/2024	Time	10:08
Type of well head	Stick Up	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	Y	Weather Conditions	Partly Sunny
Well Depth (m)	2.29		
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Remarks

Photos

A7

1-Well Integrity

Date	06/17/2024	Time	14:28
Well Integrity		Type of well head	Stick Up
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	N	Free Product?	No
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Cloudy, Cold	Sampling Method	Low Flow - Peristaltic Pump
Volume Units	ml	Water Quality Meter	Horiba
Sampling Type	Low Flow	Casing Material	PVC
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	1.87
Well Depth (m)	4.28	Water Column in Well	2.41
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	06/17/2024	Time	14:30
Purge Start Time	14:31	Color	Yellow, brown
Odor	Sulphuric odor	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
06/17/24	14:33				1.87	16.88	9.84	1750	0.0	1090	-275		
06/17/24	14:35				1.87	16.96	9.85	1770	0.0	1100	-288		
06/17/24	14:35				1.87	17.00	9.85	1780	0.0	1100	-298		

4-Final Observations

Date	06/17/2024	Time	14:36
End purge time	14:39	Color	Yellow, brown
Odor	Sulphuric odor	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	06/17/2024	Time	14:37
Did Well Dewater?	No	Sample Date	06/17/2024
Sample Time	14:39	Sample ID	A7
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks			

Photos

E11

1-Well Integrity

Date	06/18/2024	Time	10:08
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	N	Free Product?	No
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Cold, Clear	Sampling Method	Low Flow - Peristaltic Pump
Volume Units	ml	Water Quality Meter	Horiba
Sampling Type	Low Flow	Casing Material	PVC
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	3.1
Well Depth (m)	4.74	Water Column in Well	1.64
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	06/18/2024	Time	10:24
Purge Start Time	10:24	Color	Brown, gray
Odor	No odor	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
06/18/24	10:28				3.1	15.93	7.42	1400	0.0	08940	-67		
06/18/24	10:30				3.1	15.93	7.31	1390	0.0	8880	-64		
06/18/24	10:32				3.1	15.95	7.24	1380	0.0	8850	-62		
06/18/24	10:34				3.1	15.95	7.16	1380	0.0	8820	-59		
06/18/24	10:36				3.1	15.95	7.11	1380	0.0	8800	-59		
06/18/24	10:38				3.1	15.95	7.05	1370	0.0	8790	-56		
06/18/24	10:40				3.1	15.95	7.00	1370	0.0	8790	-56		
06/18/24	10:42				3.1	15.95	6.96	1370	0.0	8770	-55		

4-Final Observations

Date	06/18/2024	Time	10:44
End purge time	10:44	Color	Brown, grey
Odor	No odor	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	06/18/2024	Time	10:40
Did Well Dewater?	No	Sample Date	06/18/2024
Sample Time	10:44	Sample ID	E11
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks			

Photos


HORIBA
SINGLE-MEASUREMENT
15.95 ℃
0.68 ppt
6.93 pH
0.0 σt
-55 ORPmV
0.00 m
1.37 mS/cm
0.00 mg/L DO
0.877 g/L TDS
Press MEAS to collect data.
WATER QUALITY MONITOR


11

E4

1-Well Integrity

Date	06/17/2024	Time	15:30
Well Integrity		Type of well head	Stick Up
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	Yes
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	N	Free Product?	No
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Cloudy, Cold	Sampling Method	Low Flow - Peristaltic Pump
Volume Units	ml	Water Quality Meter	Horiba
Sampling Type	Low Flow	Casing Material	PVC
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	1.6
Well Depth (m)	3.38	Water Column in Well	1.78
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	06/17/2024	Time	15:31
Purge Start Time	15:33	Color	Yellow
Odor	Sulphuric odor	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
06/17/24	15:36					16.77	10.12	2070	0.0	1290	-430		
06/17/24	15:38					16.82	10.13	2080	0.0	1290	-433		
06/17/24	15:40					16.84	10.13	2080	0.0	1290	-433		

4-Final Observations

Date	06/17/2024	Time	15:40
End purge time	15:45	Color	Yellow, brown
Odor	Sulphuric odor	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	06/17/2024	Time	15:40
Did Well Dewater?	No	Sample Date	06/17/2024
Sample Time	15:45	Sample ID	E4
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks			

Photos

E5

1-Well Integrity

Date	06/17/2024	Time	16:04
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	N	Free Product?	No
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Cold, Clear	Sampling Method	Low Flow - Peristaltic Pump
Volume Units	ml	Water Quality Meter	Horiba
Sampling Type	Low Flow	Casing Material	PVC
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	1.72
Well Depth (m)	2.57	Water Column in Well	0.85
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	06/17/2024	Time	16:04
Purge Start Time	16:06	Color	Yellow brown
Odor	No odor	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
06/17/24	16:07					17.41	9.06	15500	0	9630	-189		
06/17/24	16:08					17.41	9.09	15500	0	9620	-190		
06/17/24	16:08					17.41	9.11	15500	0	9630	-190		

4-Final Observations

Date	06/17/2024	Time	16:09
End purge time	16:09	Color	Yellow brown
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	06/17/2024	Time	16:09
Did Well Dewater?	No	Sample Date	06/17/2024
Sample Time	16:10	Sample ID	E5
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks			

E5D

1-Well Integrity

Date	06/17/2024	Time	15:52
Well Integrity		Type of well head	Stick Up
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	N	Free Product?	No
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Cloudy, Cold	Sampling Method	Low Flow - Peristaltic Pump
Volume Units	ml	Water Quality Meter	Horiba
Sampling Type	Low Flow	Casing Material	PVC
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	2.5
Well Depth (m)	5.44	Water Column in Well	2.94
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	06/17/2024	Time	15:57
Purge Start Time	15:58	Color	Clear, no colour
Odor	No odor	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
06/17/24	16:00					18.42	7.70	1220	0.0	7570	-153		
06/17/24	16:02					18.51	7.58	1220	0.0	7570	-149		
06/17/24	16:04					18.56	7.52	1220	0.0	7560	-147		
06/17/24	16:06					18.56	7.50	1220	0.0	7560	-145		

4-Final Observations

Date	06/17/2024	Time	16:06
End purge time	16:07	Color	Clear, no colour
Odor	No odor	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	06/17/2024	Time	16:01
Did Well Dewater?	No	Sample Date	06/17/2024
Sample Time	16:07	Sample ID	E5D
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks			

Photos


HORIBA
SINGLE MEASUREMENT
18.43 °C
6.96 ppt
7.42 pH
4.0 σt
-139 ORP mV
0.00 m
12.2 mS/cm
0.00 mg/L DO
7.56 g/L TDS
Press MEAS to collect data.
WATER QUALITY MONITOR
MEAS


ESD

F5

1-Well Integrity

Date	06/17/2024	Time	12:00
Well Integrity		Type of well head	Stick Up
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	N	Free Product?	No
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Cold, Clear	Sampling Method	Low Flow - Peristaltic Pump
Volume Units		Water Quality Meter	Horiba
Sampling Type	Low Flow	Casing Material	PVC
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	3.6
Well Depth (m)	7.34	Water Column in Well	3.74
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	06/17/2024	Time	12:03
Purge Start Time	12:06	Color	Clear, no colour
Odor	No odor	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
06/17/24	12:09				3.6	17.53	4.12	9450	0.0	5960	224		
06/17/24	12:11				3.6	17.63	4.08	9500	0.0	5990	226		
06/17/24	12:13				3.6	17.70	4.04	9540	0.0	6020	226		

4-Final Observations

Date	06/17/2024	Time	12:12
End purge time	12:14	Color	Clear
Odor	No odou	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	06/17/2024	Time	12:12
Did Well Dewater?		Sample Date	06/17/2024
Sample Time	12:14	Sample ID	F5
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks			

Photos

F6

1-Well Integrity

Date	06/17/2024	Time	12:25
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	N	Free Product?	No
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Cold, Clear	Sampling Method	Low Flow - Peristaltic Pump
Volume Units		Water Quality Meter	Horiba
Sampling Type	Low Flow	Casing Material	PVC
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	4.39
Well Depth (m)	15.46	Water Column in Well	11.07
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	06/17/2024	Time	12:30
Purge Start Time	12:30	Color	Clear, no colour
Odor	No odor	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
06/17/24	12:30				4.39	17.44	6.45	8530	0.51	5380	-20		
06/17/24	12:36				4.39	17.47	6.68	8530	0.19	5380	-23		
06/17/24	12:37				4.39	17.60	6.77	8510	0.00	5360	-24		
06/17/24	12:38				4.39	17.60	6.83	8510	0.00	5360	-24		
06/17/24	12:37				4.39	17.60	6.83	8510	0.00	5360	-24		

4-Final Observations

Date	06/17/2024	Time	12:40
End purge time	12:43	Color	No colour, clear
Odor	No odor	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	06/17/2024	Time	12:44
Did Well Dewater?	No	Sample Date	06/17/2024
Sample Time	12:44	Sample ID	F6
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks			

Photos

G2

1-Well Integrity

Date	06/18/2024	Time	11:17
Well Integrity		Type of well head	Stick Up
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	N	Free Product?	No
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Cold, Clear	Sampling Method	Low Flow - Peristaltic Pump
Volume Units	ml	Water Quality Meter	Horiba
Sampling Type	Low Flow	Casing Material	PVC
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	8
Well Depth (m)	13.30	Water Column in Well	5.3
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	06/18/2024	Time	09:46
Purge Start Time	11:20	Color	Clear, no colour
Odor	No odor	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
06/18/24	11:20				8.0	17.95	6.29	5190	0.0	3270	44		
06/18/24	11:22				8.0	18	6.29	5200	0.0	3270	42		
06/18/24	11:24				8.0	18.03	6.29	5200	0.0	3270	41		

4-Final Observations

Date	06/18/2024	Time	11:23
End purge time	11:26	Color	Clear, no colour
Odor	No odor	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	06/18/2024	Time	11:24
Did Well Dewater?	No	Sample Date	06/18/2024
Sample Time	11:24	Sample ID	G2
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks			

Photos

G5

1-Well Integrity

Date	06/17/2024	Time	11:31
Well Integrity		Type of well head	Stick Up
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	N	Free Product?	No
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Cloudy, Cold	Sampling Method	Low Flow - Peristaltic Pump
Volume Units	ml	Water Quality Meter	Horiba
Sampling Type	Low Flow	Casing Material	PVC
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	2.68
Well Depth (m)	11.26	Water Column in Well	
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	06/17/2024	Time	11:39
Purge Start Time	11:46	Color	Clear, no colour
Odor	No odor	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
06/17/24	11:48				2.68	17.59	5.77	5310	0.17	3360	57		
06/17/24	11:50				2.68	17.62	5.38	5390	0.0	3390	64		
06/17/24	11:52				2.68	17.65	5.26	5440	0	3420	68		
06/17/24	11:52				2.68	17.65	5.26	5430	0	3430	68		

4-Final Observations

Date	06/17/2024	Time	11:53
End purge time	11:59	Color	Clear, no colour
Odor	No odor	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	06/17/2024	Time	11:59
Did Well Dewater?	No	Sample Date	06/17/2024
Sample Time	11:59	Sample ID	G5
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks			

Photos

G6

1-Well Integrity

Date	06/17/2024	Time	12:47
Well Integrity		Type of well head	Stick Up
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	N	Free Product?	No
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Cold, Clear	Sampling Method	Low Flow - Peristaltic Pump
Volume Units		Water Quality Meter	Horiba
Sampling Type	Low Flow	Casing Material	PVC
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	4.54
Well Depth (m)	6.15	Water Column in Well	1.61
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	06/17/2024	Time	12:54
Purge Start Time	12:54	Color	No colour, clear
Odor	Sulphuric odor	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
06/17/24	12:57				4.54	17.74	3.96	7660	0.0	4820	107		
06/17/24	12:59				4.54	17.82	3.79	7650	0.0	4820	108		
06/17/24	13:00				4.54	17.82	3.73	7650	0.0	4820	108		
06/17/24	13:02				4.54	17.82	3.70	7650	0.0	4820	108		

4-Final Observations

Date	06/17/2024	Time	13:00
End purge time	13:06	Color	Clear, no colour
Odor	Sulphuric smell	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	06/17/2024	Time	13:06
Did Well Dewater?	No	Sample Date	06/17/2024
Sample Time	13:06	Sample ID	G6
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks			

Photos


HORIBA
17.88
4.22 ppt
3.69 pH
2.0
111 ORPmV
0.00
2.65 mS/cm
0.00 mg/L DO
4.82 g/L TDS

N2

1-Well Integrity

Date	06/17/2024	Time	13:11
Well Integrity		Type of well head	Stick Up
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)		Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	N	Free Product?	No
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Cold, Clear	Sampling Method	Low Flow - Peristaltic Pump
Volume Units		Water Quality Meter	Horiba
Sampling Type	Low Flow	Casing Material	PVC
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	4.43
Well Depth (m)	5.64	Water Column in Well	1.21
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	06/17/2024	Time	13:14
Purge Start Time	13:16	Color	No colour, clear
Odor	No odor	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
06/17/24	13:18				4.43	17.51	3.70	6330	0.72	3990	231		
06/17/24	13:20				4.43	17.59	3.68	6350	0.48	4000	237		
06/17/24	13:22				4.43	17.6	3.66	6370	0.41	4010	250		
06/17/24	13:24				4.43	17.63	3.62	6370	0.42	3990	268		
06/17/24	13:26				4.43	17.63	3.62	6370	0.42	3990	268		

4-Final Observations

Date	06/17/2024	Time	13:23
End purge time	13:30	Color	No colour, clear
Odor	No odor	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	06/17/2024	Time	13:30
Did Well Dewater?	Yes	Sample Date	06/17/2024
Sample Time	13:31	Sample ID	N2
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks			

Photos


HORIBA
7.65 °C
3.60 pH
280 ORP mV
6.26 mS/cm
0.45 mg/L DO
3.94 g/L TDS
Press MEAS to collect data


N2

N8

1-Well Integrity

Date	06/18/2024	Time	09:04
Well Integrity		Type of well head	Stick Up
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	N	Free Product?	No
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Cold, Clear	Sampling Method	Low Flow - Peristaltic Pump
Volume Units	ml	Water Quality Meter	Horiba
Sampling Type	Low Flow	Casing Material	PVC
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	3.19
Well Depth (m)	5.19	Water Column in Well	2.0
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	06/18/2024	Time	09:05
Purge Start Time	09:18	Color	Yellow
Odor	No odor	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
06/18/24	09:20				3.19	16.09	6.73	9330	0.0	5900	-119		
06/18/24	09:22				3.19	16.24	6.78	9350	0.0	5890	-120		
06/18/24	09:24				3.19	16.51	6.80	9340	0.0	5880	-121		

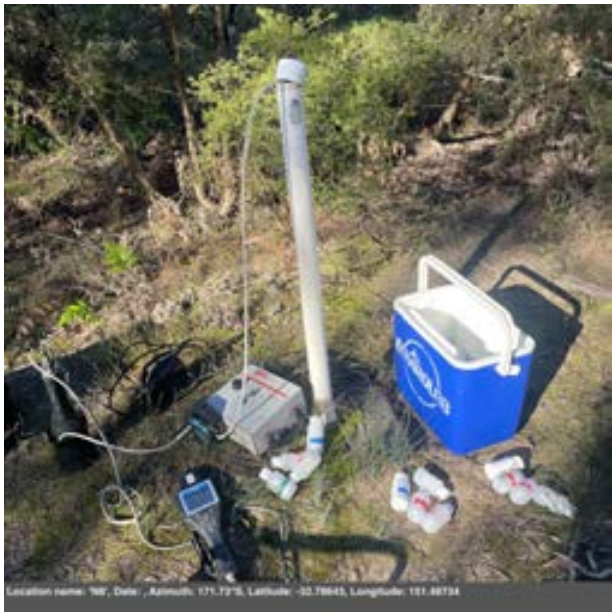
4-Final Observations

Date	06/18/2024	Time	09:30
End purge time	09:30	Color	Yellow, brown
Odor	No odor	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	06/18/2024	Time	09:37
Did Well Dewater?	No	Sample Date	06/18/2024
Sample Time	09:35	Sample ID	N8
QC Sample ID	D01_20240618, T01_20240618	Analysis	
Sample Preservation		Bottles	
Remarks			

Photos



N9

1-Well Integrity

Date	06/17/2024	Time	10:39
Well Integrity		Type of well head	Stick Up
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	Y	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Clear, Cold	Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	
Well Depth (m)		Water Column in Well	
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks	Well dry		

2-Initial Observations

Date		Time	
Purge Start Time		Color	
Odor		Sheen/Product	
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Date		Time	
End purge time		Color	
Odor		Sheen/Product	
Remarks			

5-Sample Summary

Date		Time	
Did Well Dewater?		Sample Date	
Sample Time		Sample ID	
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks			

Photos

W1D

1-Well Integrity

Date	06/17/2024	Time	15:07
Well Integrity		Type of well head	Stick Up
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	N	Free Product?	No
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Cold, Clear	Sampling Method	Low Flow - Peristaltic Pump
Volume Units	ml	Water Quality Meter	Horiba
Sampling Type	Low Flow	Casing Material	PVC
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	1.5
Well Depth (m)	10.4	Water Column in Well	
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	06/17/2024	Time	15:16
Purge Start Time	15:16	Color	Yellow, brown
Odor	No odor	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
06/17/24	15:18					17.22	7.19	1120	0.0	6920	-16		
06/17/24	15:20					17.44	7.18	1120	0.0	6930	-11		
06/17/24	15:22					17.51	7.18	1120	0.0	6930	-8		

4-Final Observations

Date	06/17/2024	Time	15:25
End purge time	15:25	Color	Yellow, brown
Odor	No odor	Sheen/Product	
Remarks			

5-Sample Summary

Date	06/17/2024	Time	15:25
Did Well Dewater?	No	Sample Date	06/17/2024
Sample Time	15:25	Sample ID	W1D
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks			

Photos

W1S

1-Well Integrity

Date	06/17/2024	Time	14:55
Well Integrity		Type of well head	Stick Up
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	N	Free Product?	No
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Cloudy, Cold	Sampling Method	Low Flow - Peristaltic Pump
Volume Units	ml	Water Quality Meter	Horiba
Sampling Type	Low Flow	Casing Material	PVC
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	1.77
Well Depth (m)	2.41	Water Column in Well	
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	06/17/2024	Time	15:00
Purge Start Time	14:58	Color	Light brown
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
06/17/24	15:00					16.34	7.75	1270	0.0	7.90	-161		
06/17/24	15:02					16.34	7.72	1270	0.0	7910	-155		
06/17/24	15:03					16.20	7.74	1270	0.0	7900	-150		

4-Final Observations

Date	06/17/2024	Time	15:04
End purge time	15:10	Color	Yellow, brown
Odor	No odor	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	06/17/2024	Time	15:10
Did Well Dewater?	Yes	Sample Date	06/17/2024
Sample Time	15:10	Sample ID	W1S
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks			

Photos

W2D

1-Well Integrity

Date	06/18/2024	Time	08:00
Well Integrity		Type of well head	Stick Up
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	N	Free Product?	No
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Cold, Clear	Sampling Method	Low Flow - Peristaltic Pump
Volume Units	ml	Water Quality Meter	Horiba
Sampling Type	Low Flow	Casing Material	PVC
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	1.42
Well Depth (m)	6.35	Water Column in Well	4.93
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	06/18/2024	Time	08:02
Purge Start Time	08:02	Color	Yellow, brown
Odor	No odor	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
06/18/24	08:03				1.42	15.46	10.68	3380	0.0	2060	-322		
06/18/24	08:06				1.42	15.65	10.68	3380	0.0	2060	-325		
06/18/24	08:07				1.42	15.76	10.67	3370	0.0	2060	-337		

4-Final Observations

Date	06/18/2024	Time	08:07
End purge time	08:09	Color	Brown, yellow
Odor	No odor	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	06/18/2024	Time	08:10
Did Well Dewater?	No	Sample Date	06/18/2024
Sample Time	08:08	Sample ID	W2D
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks			

Photos

W2S

1-Well Integrity

Date	06/17/2024	Time	10:12
Well Integrity		Type of well head	Stick Up
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	Y	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Cold, High Winds	Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	
Well Depth (m)		Water Column in Well	
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks	Well dry		

2-Initial Observations

Date		Time	
Purge Start Time		Color	
Odor		Sheen/Product	
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Date		Time	
End purge time		Color	
Odor		Sheen/Product	
Remarks			

5-Sample Summary

Date		Time	
Did Well Dewater?		Sample Date	
Sample Time		Sample ID	
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks			

Photos

W3S

1-Well Integrity

Date	06/17/2024	Time	14:08
Well Integrity		Type of well head	Stick Up
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	N	Free Product?	No
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Cloudy, Cold	Sampling Method	Low Flow - Peristaltic Pump
Volume Units	ml	Water Quality Meter	Horiba
Sampling Type	Low Flow	Casing Material	PVC
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	1.26
Well Depth (m)	2.51	Water Column in Well	
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	06/17/2024	Time	14:09
Purge Start Time	14:12	Color	Yellow
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
06/17/24	14:12					15.84	7.71	1070	0.0	6540	185		
06/17/24	14:16					15.72	7.76	1020	0.0	6250	188		
06/17/24	14:17					15.77	7.86	1060	0.0	5530	195		
06/17/24	14:19					15.43	8.06	8880	0.0	5600	197		
06/17/24	14:20					15.36	8.09	9000	0.0	5710	198		
06/17/24	14:21					15.36	8.08	9330	0.0	5710	196		

4-Final Observations

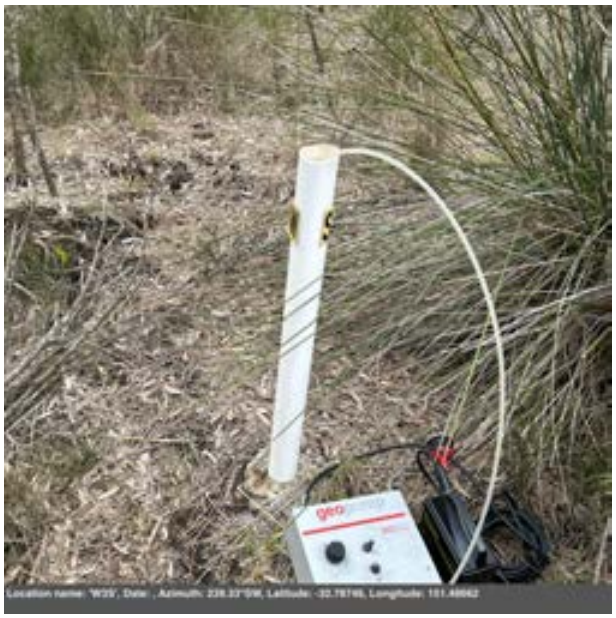
Date	06/17/2024	Time	14:22
End purge time	14:22	Color	Yellow, brown
Odor	No odor	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	06/17/2024	Time	14:22
Did Well Dewater?	No	Sample Date	06/17/2024
Sample Time	14:22	Sample ID	W3S
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks			

Photos


HORIBA
SINGLE MEASUREMENT
15.45 °C
8.02 pH
194 ORPmV
9.67 mS/cm
0.46 mg/L DO
6.09 g/L TDS
WATER QUALITY MONITOR
MEAS
LIGHT



W4S

1-Well Integrity

Date	06/17/2024	Time	10:22
Well Integrity		Type of well head	Stick Up
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	Y	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Cold, Clear	Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	
Well Depth (m)		Water Column in Well	
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks	Well dry		

2-Initial Observations

Date		Time	
Purge Start Time		Color	
Odor		Sheen/Product	
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Date		Time	
End purge time		Color	
Odor		Sheen/Product	
Remarks			

5-Sample Summary

Date		Time	
Did Well Dewater?		Sample Date	
Sample Time		Sample ID	
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks			

Photos

W5D

1-Well Integrity

Date	06/17/2024	Time	13:39
Well Integrity		Type of well head	Stick Up
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	N	Free Product?	No
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Clear, Cold	Sampling Method	Low Flow - Peristaltic Pump
Volume Units		Water Quality Meter	Horiba
Sampling Type	Low Flow	Casing Material	PVC
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	4.7
Well Depth (m)	10.26	Water Column in Well	5.56
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	06/17/2024	Time	13:41
Purge Start Time	13:46	Color	No colour, clear
Odor	No odor	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
06/17/24	13:41				4.7	18.34	5.97	4330	1.67	2770	103		

4-Final Observations

Date	06/17/2024	Time	13:49
End purge time	13:49	Color	Clear
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	06/17/2024	Time	13:49
Did Well Dewater?	No	Sample Date	06/17/2024
Sample Time	13:52	Sample ID	W5D
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks	Kink in well, tubing unable to move past		

Photos

W5S

1-Well Integrity

Date	06/17/2024	Time	10:33
Well Integrity		Type of well head	Stick Up
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	Y	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Clear, Cold	Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	
Well Depth (m)		Water Column in Well	
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks	Well dry		

2-Initial Observations

Date		Time	
Purge Start Time		Color	
Odor		Sheen/Product	
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Date _____ Time _____

End purge time _____ Color _____

Odor _____ Sheen/Product _____

Remarks _____

5-Sample Summary

Date _____ Time _____

Did Well Dewater? _____ Sample Date _____

Sample Time _____ Sample ID _____

QC Sample ID _____ Analysis _____

Sample Preservation _____ Bottles _____

Remarks _____

Photos

W6D

1-Well Integrity

Date	06/18/2024	Time	08:27
Well Integrity		Type of well head	Stick Up
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	N	Free Product?	No
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Cold, Clear	Sampling Method	Low Flow - Peristaltic Pump
Volume Units	ml	Water Quality Meter	Horiba
Sampling Type	Low Flow	Casing Material	PVC
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	5.49
Well Depth (m)	8.77	Water Column in Well	
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	06/18/2024	Time	08:31
Purge Start Time	08:34	Color	Clear, no colour
Odor	No odor	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
06/18/24	08:38				5.49	15.86	8.12	09750	2.31	06180	66		
06/18/24	08:39				5.49	15.94	7.77	9590	2.06	6120	68		
06/18/24	08:40				5.49	15.94	7.60	9520	1.94	6070	71		
06/18/24	08:40				5.49	16.04	7.4	9420	1.66	6020	76		
06/18/24	08:41				5.49	16.04	7.05	9420	1.63	6020	76		
06/18/24	08:42				5.49	16.13	6.94	9270	1.41	5910	77		
06/18/24	08:43				5.49	16.13	6.74	9270	1.29	5860	77		
06/18/24	08:43				5.49	16.43	5.76	08780	0.0	05620	70		
06/18/24	08:49				5.49	16.43	5.3	8770	0.0	5610	70		
06/18/24	08:50				5.49	16.43	5.71	8760	0.0	5600	69		
06/18/24	08:50				5.49	16.43	5.70	8750	0.0	5600	69		
06/18/24	08:50				5.49	16.43	5.69	8740	0.0	5590	68		

4-Final Observations

Date	06/18/2024	Time	08:54
End purge time	08:54	Color	Clear, no colour
Odor	No odor	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	06/18/2024	Time	08:54
Did Well Dewater?	No	Sample Date	06/18/2024
Sample Time	08:54	Sample ID	W6D
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks			

Photos


GPS
HORIBA
SINGLE MEASUREMENT
16.45 °C
5.67 pH
68 ORP mV
0.873 mS/cm
0.00 mg/L DO
0.559 g/L TDS
0.43
0.0
0.00

W6S

1-Well Integrity

Date	06/17/2024	Time	10:35
Well Integrity		Type of well head	Stick Up
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	Y	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Clear, Cold	Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	
Well Depth (m)		Water Column in Well	
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks	Well dry		

2-Initial Observations

Date		Time	
Purge Start Time		Color	
Odor		Sheen/Product	
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Date		Time	
End purge time		Color	
Odor		Sheen/Product	
Remarks			

5-Sample Summary

Date		Time	
Did Well Dewater?		Sample Date	
Sample Time		Sample ID	
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks			

Photos

W7M

1-Well Integrity

Date	06/18/2024	Time	07:41
Well Integrity		Type of well head	Stick Up
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	N	Free Product?	No
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Cold, Clear	Sampling Method	Low Flow - Peristaltic Pump
Volume Units	ml	Water Quality Meter	Horiba
Sampling Type	Low Flow	Casing Material	PVC
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	1.87
Well Depth (m)	3.76	Water Column in Well	1.89
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	06/18/2024	Time	07:43
Purge Start Time	07:43	Color	Yellow, brown
Odor	No odor	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
06/18/24	07:48				1.87	15.40	10.51	2510	0.0	1540	-306		
06/18/24	07:50				1.87	15.67	10.49	2390	0.0	1470	-310		
06/18/24	07:49				1.87	15.84	10.47	2270	0.0	1400	-311		
06/18/24	07:50				1.87	15.84	10.47	2200	0.0	1400	-311		
06/18/24	07:50				1.87	16.03	10.44	2120	0.0	1300	-310		
06/18/24	07:51				1.87	16.08	10.43	2070	0.0	1270	-308		
06/18/24	07:52				1.87	16.08	10.43	2020	0.0	1240	-305		
06/18/24	07:53				1.87	16.08	10.43	1990	0.0	1240	-305		
06/18/24	07:53				1.87	16.10	10.41	1980	0.0	1230	-302		

4-Final Observations

Date	06/18/2024	Time	07:54
End purge time	07:57	Color	Yellow, brown
Odor	No odor	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	06/18/2024	Time	07:54
Did Well Dewater?	No	Sample Date	06/18/2024
Sample Time	07:57	Sample ID	W7M
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks			

Photos


HORIBA
SINGLE MEASUREMENT
SITE:
16.10 °C
11.65
10.41 pH
8.0
-303 ORP mV
0.00
19.7 mS/cm
0.00 mg/L DO
12.2 g/L TDS
Press MEAS to collect data.
WATER QUALITY MONITOR
MEAS
LIGHT

W7S

1-Well Integrity

Date	06/17/2024	Time	10:13
Well Integrity		Type of well head	Stick Up
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW		Groundwater Elevation	
Depth Installed		Depth Measured	
Well Dry?	Y	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Cold, High Winds	Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	
Well Depth (m)		Water Column in Well	
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date		Time	
Purge Start Time		Color	
Odor		Sheen/Product	
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Date		Time	
End purge time		Color	
Odor		Sheen/Product	
Remarks			

5-Sample Summary

Date		Time	
Did Well Dewater?		Sample Date	
Sample Time		Sample ID	
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks			

Photos

A7

1-Well Integrity

Date	08/13/2024	Time	14:19
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	Y
Depth to Water (m)	4.27	Well Depth (m)	4.27
Remarks	Dry		

2-Initial Observations

Date	08/13/2024	Time	14:19
Remarks	Dry		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/13/24	14:19												Dry

4-Final Observations

Date	08/13/2024	Time	14:19
Remarks	Dry		

5-Sample Summary

Date	08/13/2024	Time	14:20
Did Well Dewater?	Yes		
Remarks	Dry		

E11

1-Well Integrity

Date	08/13/2024	Time	13:21
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	Partly Sunny	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	2.48
Well Depth (m)	4.11	Water Column in Well	1.63
Remarks			

2-Initial Observations

Date	08/13/2024	Time	13:23
Purge Start Time	13:21	Color	Slightly turbid, pale brown yellow
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/13/24	13:24	0.14			2.74	18.0	8.7	4025	21.8		152.4		
08/13/24	13:27	0.14	0.42		2.76	18.2	8.7	4019	21.0		157.4		
08/13/24	13:30	0.14				18.2	8.7	4015	21.0		173.9		

4-Final Observations

Date	08/13/2024	Time	13:32
End purge time	13:38	Color	Clear pale brown yellow
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	08/13/2024	Time	13:38
Did Well Dewater?	No	Sample ID	E11
Remarks	Final depth to water 2.67mbTOC		

Photos

E4

1-Well Integrity

Date	08/15/2024	Time	13:56
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Depth to Water (m)	1.64	Well Depth (m)	3.42
Remarks			

2-Initial Observations

Date	08/15/2024	Time	13:57
Purge Start Time	13:51	Color	Clear brown
Odor	Sulfidic odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/15/24	13:57	0.14			1.64	15.6	10.0	21507	-0.5		-430.8		
08/15/24	14:00	0.14	0.42		1.69	15.6	10.0	21502	-0.5		-432.5		
08/15/24	14:03	0.14	0.42		1.70	15.5	10.0	21491	-0.5		-435.5		

4-Final Observations

Date	08/15/2024	Time	13:59
Color	Clear brown	Odor	Sulfidic odour
Sheen/Product	NO		
Remarks			

5-Sample Summary

Date	08/15/2024	Time	14:00
Did Well Dewater?	No	Sample ID	E4
Remarks	Final depth to water 1.71mbTOC		

Photos

E5

1-Well Integrity

Date	08/15/2024	Time	12:22
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	Y
Depth to Water (m)	2.57	Well Depth (m)	2.56
Remarks	Dry		

2-Initial Observations

Date	08/15/2024	Time	12:22
Remarks	Dry		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/15/24	12:23												Dry

4-Final Observations

Date	08/15/2024	Time	12:23
Remarks	Dry		

5-Sample Summary

Date	08/15/2024	Time	12:23
Did Well Dewater?	Yes		
Remarks	Dry		

E5D

1-Well Integrity

Date	08/15/2024	Time	12:41
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	Rain, Cloudy	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	1.89
Well Depth (m)	5.57	Water Column in Well	3.68
Remarks			

2-Initial Observations

Date	08/15/2024	Time	12:51
Purge Start Time	12:55	Color	Clear colourless
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/15/24	12:56	0.14				17.2	7.0	12566	5.8		26.9		
08/15/24	12:59	0.14	0.42		2.8	17.2	7.0	12556	6.1		26.5		
08/15/24	13:02	0.14			2.13	17.2	7.0	12550	8.8		26.2		

4-Final Observations

Date	08/15/2024	Time	13:01
End purge time	13:05	Color	Clear brown yellow
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	08/15/2024	Time	13:02
Did Well Dewater?	No	Sample ID	E5D
Remarks	Final depth to water 1.14mbTOC		

Photos

F5

1-Well Integrity

Date	08/13/2024	Time	11:07
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	Cloudy	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	3.5
Well Depth (m)	7.35	Water Column in Well	3.85
Remarks			

2-Initial Observations

Date	08/13/2024	Time	11:08
Purge Start Time	11:06	Color	Clear colourless
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/13/24	11:08	0.14				16.8	3.8	10349	3.3		115.8		
08/13/24	11:11	0.14	0.42		3.35	16.8	3.8	10354	3.5		124.5		
08/13/24	11:14	0.14	0.42		3.36	16.9	3.8	10353	5.1		131.2		
08/13/24	11:17	0.14	0.42		3.39	17.0	3.8	10352	5.8		133.9		

4-Final Observations

Date	08/13/2024	Time	11:20
Color	Clear colourless	Odor	No odour
Sheen/Product	NO		
Remarks			

5-Sample Summary

Date	08/13/2024	Time	11:20
Did Well Dewater?	No	Sample ID	F5

Remarks: Final depth to water 3.40mbTOC

Photos

F6

1-Well Integrity

Date	08/13/2024	Time	09:44
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	Cloudy, Rain	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	4.51
Well Depth (m)	15.47	Water Column in Well	10.96
Remarks			

2-Initial Observations

Date	08/13/2024	Time	09:49
Purge Start Time	09:48	Color	Clear colourless
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/13/24	09:49	0.14			4.67	17.7	7.3	8953	42.2		113.0		
08/13/24	09:51	0.14	0.28		4.80	17.8	7.3	8989	38.4		109.2		
08/13/24	09:54	0.14	0.42		4.84	17.8	7.3	8996	38.2		107.5		
08/13/24	09:57	0.14	0.42		4.92	17.8	7.3	9001	38.2		106.5		

4-Final Observations

Date	08/13/2024	Time	09:49
End purge time	10:01	Color	Clear colourless
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	08/13/2024	Time	10:01
Did Well Dewater?	No	Sample ID	F6

Remarks: Final depth to water 5.01mbTOC

Photos

The resource of this report item is not reachable.

G2

1-Well Integrity

Date	08/14/2024	Time	10:24
Well Dry?	N	Weather Conditions	Cloudy, Rain
Sampling Method	Low Flow - Peristaltic Pump	Sampling Type	Low Flow
Depth to Water (m)	8.58	Well Depth (m)	9.98
Water Column in Well	1.4		
Remarks			

2-Initial Observations

Date	08/14/2024	Time	10:25
Purge Start Time	10:24	Color	Clear colourless
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/14/24	10:29	0.14			8.24	17.6	6.0	5424	5.6		18.2		
08/14/24	10:32	0.14	0.42		8.27	17.6	6.0	5434	5.3		9.2		
08/14/24	10:35	0.14	0.42		8.25	17.6	6.0	5440	5.7		1.9		
08/14/24	10:38	0.14	0.42			17.6	5.9	5439	6.1		-3.4		

4-Final Observations

Date	08/14/2024	Time	10:32
End purge time	10:42	Color	Clear colourless
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	08/14/2024	Time	10:40
Did Well Dewater?	No	Sample ID	G2
Remarks	Final depth to water 8.7mbTOC		

Photos

G5

1-Well Integrity

Date	08/13/2024	Time	11:32
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	Cloudy	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	2.98
Well Depth (m)	11.26	Water Column in Well	8.28
Remarks			

2-Initial Observations

Date	08/13/2024	Time	11:35
Purge Start Time	11:38	Color	Clear colourless
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/13/24	11:40	0.14			3.30	18.0	5.3	5999	3.8		45.4		
08/13/24	11:43	0.14	0.42		3.37	18.1	5.2	5998	3.7		37.4		
08/13/24	11:47	0.14	0.56			18.1	5.2	5995	3.6		34.2		

4-Final Observations

Date	08/13/2024	Time	11:45
End purge time	11:51	Color	Clear colourless
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	08/13/2024	Time	11:51
Did Well Dewater?	No	Sample ID	G5
Remarks	Final depth to water 3.58mbTOC		

Photos

G6

1-Well Integrity

Date	08/13/2024	Time	10:07
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	Cloudy	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	4.13
Well Depth (m)	6.24	Water Column in Well	2.11
Remarks			

2-Initial Observations

Date	08/13/2024	Time	10:08
Purge Start Time	10:06	Color	Clear colourless
Odor	Sulphidic odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/13/24	10:16	0.14			4.4	17.9	3.6	8290	6.0		-39.3		
08/13/24	10:16	0.14	0.0		4.17	17.9	3.6	8269	5.5		-40.3		
08/13/24	10:19	0.14	0.42		4.19	17.9	3.6	8264	5.7		-41.2		

4-Final Observations

Date	08/13/2024	Time	10:08
Color	Clear colourless	Odor	Sulphidic odour
Sheen/Product	NO		
Remarks			

5-Sample Summary

Date	08/13/2024	Time	10:18
Did Well Dewater?	No	Sample ID	G6
QC Sample ID	D01_20240813, T01_20240813		

Remarks: Final depth to water 4.12mnTOC

Photos

N2

1-Well Integrity

Date	08/13/2024	Time	08:46
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	Cloudy	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	4.44
Well Depth (m)	5.65	Water Column in Well	1.21
Remarks			

2-Initial Observations

Date	08/13/2024	Time	08:49
Purge Start Time	09:20	Color	Started off chocolatey, turned pale brown, turbid
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/13/24	09:21	0.14			4.65	17.1	3.4	6738	71.9		159.6		
08/13/24	09:24	0.14	0.42		4.77	17.1	3.4	6752	62.9		172.9		
08/13/24	09:27	0.14	0.42		4.80	17.0	3.4	6760	61.6		182.7		
08/13/24	09:30	0.14	0.42		4.86	16.9	3.4	6764	61.1		195.3		

4-Final Observations

Date	08/13/2024	Time	09:25
End purge time	09:29	Color	Clear colourless
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	08/13/2024	Time	09:29
Did Well Dewater?		Sample ID	

	No	N2
Remarks	Final depth to water 4.95mbTOC	

Photos

N8

1-Well Integrity

Date	08/14/2024	Time	10:56
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	Cloudy, Rain	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	3.00
Well Depth (m)	5.24		
Remarks			

2-Initial Observations

Date	08/14/2024	Time	10:59
Purge Start Time	10:57	Color	Cloudy Brown yellow
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/14/24	11:08	0.14			3.66	16.4	6.9	10117	14.4		-21.4		
08/14/24	11:11	0.14	0.42		3.69	16.4	6.9	10093	17.4		-31.8		
08/14/24	11:14	0.14	0.42		3.70	16.4	6.9	10094	18.5		-38.5		

4-Final Observations

Date	08/14/2024	Time	11:11
End purge time	11:14	Color	Cloudy brown yellow
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	08/14/2024	Time	11:11
Did Well Dewater?	No	Sample ID	N8
Remarks	Final depth to water 3.68mbTOC		

Photos

N9

1-Well Integrity

Date	08/14/2024	Time	12:20
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	Cloudy, Rain	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	1.74
Well Depth (m)	2.94	Water Column in Well	1.2
Remarks			

2-Initial Observations

Date	08/14/2024	Time	12:21
Purge Start Time	12:20	Color	Clear pale brown yellow
Odor	Sulfidic odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/14/24	12:24	0.14			2.14	15.6	8.4	3857	34.8		-167.8		
08/14/24	12:27	0.14	0.42		2.18	15.6	8.4	3765	31.5		-149.4		
08/14/24	12:30	0.14	0.42		2.18	15.6	8.4	3746	29.8		-145.6		

4-Final Observations

Date	08/14/2024	Time	12:31
End purge time	12:31	Color	Clear pale brown yellow
Odor	Sulfidic odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	08/14/2024	Time	12:31
Did Well Dewater?	No	Sample ID	N9
Remarks	Final depth to water 2.18mbTOC		

Photos

W1D

1-Well Integrity

Date	08/15/2024	Time	14:14
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Depth to Water (m)	1.51	Well Depth (m)	11.46
Remarks			

2-Initial Observations

Date	08/15/2024	Time	14:18
Purge Start Time	14:17	Color	Clear pale brown yellow
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/15/24	14:18	0.14			1.52	16.1	7.5	12562	3.0		-149.9		
08/15/24	14:21	0.14	0.42		1.52	16.1	7.5	12560	3.0		-148.2		
08/15/24	14:24	0.14	0.42		1.54	16.1	7.5	12658	3.4		-145.2		

4-Final Observations

Date	08/15/2024	Time	14:24
End purge time	14:24	Color	Clear brown yellow
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	08/15/2024	Time	14:24
Did Well Dewater?	No	Sample ID	W1D
Remarks	Final depth to water 1.55mbToc		

Photos

W1S

1-Well Integrity

Date	08/15/2024	Time	14:05
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Depth to Water (m)	1.62	Well Depth (m)	2.44
Water Column in Well	0.82		
Remarks			

2-Initial Observations

Date	08/15/2024	Time	14:06
Purge Start Time	14:05	Color	Clear pale brown yellow
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/15/24	14:07	0.14				14.9	7.9	13615	17.5		-182.6		
08/15/24	14:10	0.14	0.42		1.90	14.9	7.9	13618	15.7		-179.5		
08/15/24	14:13	0.14	0.42		1.91	14.9	7.9	13601	15.1		-176.6		

4-Final Observations

Date	08/15/2024	Time	14:11
End purge time	14:17	Color	Clear pale brown yellow
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	08/15/2024	Time	14:14
Did Well Dewater?	No	Sample ID	W1S
Remarks	Final depth to water 1.92mbTOC		

Photos

W2D

1-Well Integrity

Date	08/15/2024	Time	13:27
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Depth to Water (m)	1.42	Well Depth (m)	6.32
Water Column in Well	4.9		
Remarks			

2-Initial Observations

Date	08/15/2024	Time	13:31
Purge Start Time	13:31	Color	Clear brown yellow
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/15/24	13:36	0.14			1.72	17.1	10.2	35595	-0.4		-327.3		
08/15/24	13:39	0.14	0.42		1.67	17.1	10.2	35619	-0.5		-334.6		
08/15/24	13:42	0.14	0.42		1.69	17.2	10.2	35585	-0.5		-339.1		

4-Final Observations

Date	08/15/2024	Time	13:56
End purge time	13:56	Color	Clear brown yellow
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	08/15/2024	Time	13:57
Did Well Dewater?	No	Sample ID	W2D
Remarks			

Photos

W2S

1-Well Integrity

Date	08/15/2024	Time	12:26
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	Y
Depth to Water (m)	2.37	Well Depth (m)	2.37
Remarks	Dry		

2-Initial Observations

Date	08/15/2024	Time	12:27
Remarks	Dry		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/15/24	12:27												Dry

4-Final Observations

Date	08/15/2024	Time	12:27
Remarks	Dry		

5-Sample Summary

Date	08/15/2024	Time	12:27
Did Well Dewater?	Yes		
Remarks	Dry		

W3S

1-Well Integrity

Date	08/14/2024	Time	13:38
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Depth to Water (m)	1.23	Well Depth (m)	2.56
Remarks			

2-Initial Observations

Date	08/14/2024	Time	13:39
Purge Start Time	13:37	Color	Clear brown yellow
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/14/24	13:39	0.14			1.36	14.5	7.6	10606	3.9		108.7		
08/14/24	13:42	0.14	0.42		1.42	14.5	7.7	10377	3.6		117.8		
08/14/24	13:45	0.14	0.42		1.46	14.4	7.7	9935	4.8		129.3		
08/14/24	13:48	0.14	0.42		1.52	14.4	8.0	9816	5.6		139.1		
08/14/24	13:51	0.14	0.42		1.56	14.4	8.0	9595	6.2		143.6		
08/14/24	13:54	0.14	0.42		1.57	14.4	8.0	9432	7.1		145.9		

4-Final Observations

Date	08/14/2024	Time	13:44
Color	Clear yellow brown	Odor	No odour
Remarks			

5-Sample Summary

Date	08/14/2024	Time	13:45
Did Well Dewater?	No	Sample ID	w3s
Remarks	Final depth to water 1.68mbTOC		

Photos

W4S

1-Well Integrity

Date	08/13/2024	Time	14:13
Well Dry?	Y	Well Depth (m)	1.11
Remarks	Dry		

2-Initial Observations

Date	08/13/2024	Time	14:15
Remarks	Dry		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/13/24	14:15												Dry

4-Final Observations

Date	08/13/2024	Time	14:15
Remarks	Dry		

5-Sample Summary

Date	08/13/2024	Time	14:15
Did Well Dewater?	Yes		
Remarks	Dry		

W5D

1-Well Integrity

Date	08/13/2024	Time	12:31
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	Cloudy	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	5.70
Well Depth (m)	10.54	Water Column in Well	4.84
Remarks			

2-Initial Observations

Date	08/13/2024	Time	12:35
Purge Start Time	12:35	Color	Clear colourless
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/13/24	12:48	0.14			6.35	19.4	5.9	6013	5.4		42.2		
08/13/24	12:51	0.14	0.42		6.40	19.3	5.9	5984	3.8		42.6		
08/13/24	12:54	0.14	0.42		6.67	19.2	5.9	5974	3.7		42.5		

4-Final Observations

Date	08/13/2024	Time	12:53
Color	Pale brown, slightly turbid	Odor	No odour
Sheen/Product	NO		
Remarks			

5-Sample Summary

Date	08/13/2024	Time	12:58
Did Well Dewater?	No	Sample ID	W5D
Remarks	Final depth to water 6.76mbTOC		

Photos

W5S

1-Well Integrity

Date	08/13/2024	Time	13:00
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	Y
Weather Conditions	Cloudy	Depth to Water (m)	1.30
Well Depth (m)	1.30		
Remarks			

2-Initial Observations

Date	08/13/2024	Time	13:03
Remarks	Dry		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/13/24	13:03												Dry

4-Final Observations

Date	08/13/2024	Time	13:04
Remarks	Dry		

5-Sample Summary

Date	08/13/2024	Time	13:04
Did Well Dewater?	Yes		
Remarks	Dry		

Photos

W6D

1-Well Integrity

Date	08/14/2024	Time	12:46
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	Cloudy, Rain	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	5.56
Well Depth (m)	5.94	Water Column in Well	0.38
Remarks			

2-Initial Observations

Date	08/14/2024	Time	12:47
Purge Start Time	12:44	Color	Clear colourless
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/14/24	12:47	0.14				17.4	5.5	1102	67.0		31.7		
08/14/24	12:50	0.14	0.42		5.67	17.4	5.5	1102	65.9		37.8		
08/14/24	12:53	0.14	0.42		5.72	17.3	5.4	1076	55.7		52.7		

4-Final Observations

Date	08/14/2024	Time	12:51
End purge time	12:54	Color	Clear colourless
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	08/14/2024	Time	12:54
Did Well Dewater?	No	Sample ID	W6D
Remarks	Final depth to water 5.75mbTOC		

Photos

W6S

1-Well Integrity

Date	08/14/2024	Time	11:24
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	Y
Depth to Water (m)	3.08	Well Depth (m)	3.11
Water Column in Well	0.03		
Remarks			

2-Initial Observations

Date	08/14/2024	Time	11:26
Remarks	Dry		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/14/24	11:26												Dry

4-Final Observations

Date	08/14/2024	Time	11:26
Remarks	Dry		

5-Sample Summary

Date	08/14/2024	Time	11:26
Remarks	Dry		

W7M

1-Well Integrity

Date	08/15/2024	Time	13:14
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Depth to Water (m)	2.36	Well Depth (m)	5.74
Remarks			

2-Initial Observations

Date	08/15/2024	Time	13:14
Purge Start Time	13:10	Color	Clear brown
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/15/24	13:15	0.14			2.37	16.7	9.9	23363	0.5		-305.1		
08/15/24	13:18	0.14	0.42		2.37	16.6	9.9	22449	0.4		-305.3		
08/15/24	13:21	0.14	0.42		2.39	16.6	9.9	22100	0.5		-305.7		

4-Final Observations

Date	08/15/2024	Time	13:15
Color	Clear brown	Odor	No odour
Sheen/Product	NO		
Remarks			

5-Sample Summary

Date	08/15/2024	Time	13:17
Did Well Dewater?	No	Sample ID	W7M
Remarks	Final depth to water 2.40mbTOC		

Photos

W7S

1-Well Integrity

Date	08/15/2024	Time	13:00
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	Y
Depth to Water (m)	2.3	Well Depth (m)	2.3
Water Column in Well	0.0		
Remarks	Dry		

2-Initial Observations

Date	08/15/2024	Time	12:25
Remarks	Dry		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
08/15/24	12:25												Dry

4-Final Observations

Date	08/15/2024	Time	12:25
Remarks	Dry		

5-Sample Summary

Date	08/15/2024	Time	12:25
Did Well Dewater?	Yes		
Remarks	Dry		

A7

1-Well Integrity

Date	10/15/2024	Time	12:29
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	2.04	Groundwater Elevation	
Depth Installed		Depth Measured	4.32
Well Dry?	N	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	2.04
Well Depth (m)	4.32	Water Column in Well	2.28
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/15/2024	Time	12:30
Purge Start Time	12:30	Color	Turbid, pale yellow brown
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/15/24	12:42	0.14	500		2.07	17.28	10.1	21800	0.8	13500	-163	188	
10/15/24	12:45	0.14	0.42		2.10	17.12	10.2	21900	0.2	13600	-169	147	
10/15/24	12:48	0.14	0.42		2.16	16.99	10.2	22100	0.0	13700	-172	63.0	

4-Final Observations

Date	10/15/2024	Time	12:50
End purge time	12:50	Color	
Odor		Sheen/Product	
Remarks			

5-Sample Summary

Date	10/15/2024	Time	12:50
Did Well Dewater?	No	Sample Date	10/15/2024
Sample Time	12:50	Sample ID	A7
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks	Final depth to water 2.22mbTOC		

Photos

E11

1-Well Integrity

Date	10/14/2024	Time	12:36
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	3.86	Groundwater Elevation	
Depth Installed		Depth Measured	3.90
Well Dry?	Y	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	3.86
Well Depth (m)	3.90	Water Column in Well	0.04
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/14/2024	Time	12:38
Purge Start Time		Color	
Odor		Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/14/24	12:38												Well dry

4-Final Observations

Date	10/14/2024	Time	12:38
End purge time		Color	
Odor		Sheen/Product	NO
Remarks	Well dry		

5-Sample Summary

Date	10/14/2024	Time	12:38
Did Well Dewater?	Yes	Sample Date	
Sample Time		Sample ID	
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks	Well dry		

Photos

E4

1-Well Integrity

Date	10/15/2024	Time	09:24
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	1.96	Groundwater Elevation	
Depth Installed		Depth Measured	3.41
Well Dry?	N	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	1.96
Well Depth (m)	3.41	Water Column in Well	1.45
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/15/2024	Time	09:24
Purge Start Time	09:48	Color	Clear, yellow
Odor	Sulfidic odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/15/24	09:51	0.14	500		2.26	17.04	10.4	25300	14.6	15800	-342	100	
10/15/24	09:54	0.14	0.42		2.26	17.04	10.4	25900	15.7	16100	-355	99.2	
10/15/24	09:57	0.14	0.42		1.27	17.03	10.4	26300	16.7	16300	-365	99.1	

4-Final Observations

Date	10/15/2024	Time	09:58
End purge time	09:58	Color	Clear, brown yellow
Odor	Sulfidic odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	10/15/2024	Time	09:58
Did Well Dewater?	No	Sample Date	10/15/2024
Sample Time	09:59	Sample ID	E4
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks	Final depth to water 2.33mbTOC		

Photos

E5

1-Well Integrity

Date	10/15/2024	Time	11:57
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	1.80	Groundwater Elevation	
Depth Installed		Depth Measured	2.60
Well Dry?	N	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	1.80
Well Depth (m)	2.60	Water Column in Well	0.8
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/15/2024	Time	12:03
Purge Start Time	12:02	Color	Clear, pale yellow
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/15/24	12:03	0.14				20.28	9.3	10500	0.0	6510	1	0.0	
10/15/24	12:08	0.14	0.7			20.25	9.3	10500	0.0	6480	2	0.0	
10/15/24	12:11	0.14	500			20.24	9.3	10400	0.0	6400	3	0	

4-Final Observations

Date	10/15/2024	Time	12:10
End purge time		Color	Clear, pale yellow
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	10/15/2024	Time	12:10
Did Well Dewater?	No	Sample Date	10/15/2024
Sample Time	12:10	Sample ID	E5
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks	Final depth to water 2.16mbTOC		

Photos

E5D

1-Well Integrity

Date	10/15/2024	Time	11:44
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	2.83	Groundwater Elevation	
Depth Installed		Depth Measured	5.44
Well Dry?	N	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	2.83
Well Depth (m)	5.44	Water Column in Well	2.61
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/15/2024	Time	11:45
Purge Start Time	11:45	Color	Clear, pale yellow
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/15/24	11:49	0.14	500			19.92	9.5	9	8.0	6	-19	26.3	
10/15/24	11:52	0.14	0.42			19.95	9.4	9	8.0	6	-16	65.3	
10/15/24	11:55	0.14	0.42			19.97	9.3	9	8.0	6	-13	68.2	
10/15/24	11:58	0.14	500			19.99	9.3	9	8.0	6	-10	67.2	

4-Final Observations

Date	10/15/2024	Time	11:52
End purge time		Color	Clear, pale yellow
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	10/15/2024	Time	11:52
Did Well Dewater?	No	Sample Date	10/15/2024
Sample Time		Sample ID	
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks	Final depth to water 2.13mbTOC		

Photos

F5

1-Well Integrity

Date	10/14/2024	Time	11:40
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	3.03	Groundwater Elevation	
Depth Installed		Depth Measured	7.38
Well Dry?	N	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	3.03
Well Depth (m)	7.38	Water Column in Well	
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/14/2024	Time	11:41
Purge Start Time	11:40	Color	
Odor		Sheen/Product	
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/14/24	11:48	0.14	500			21.05	4.0	1150	0.0	7140	268	3.7	
10/14/24	11:51	0.14	0.42			21.05	4.0	1150	0.0	7130	268	4.5	
10/14/24	11:54	0.14	0.42			21.06	4.0	1150	0.0	7140	268	3.6	

4-Final Observations

Date	10/14/2024	Time	11:52
End purge time		Color	Clear, colourless
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	10/14/2024	Time	11:52
Did Well Dewater?	No	Sample Date	10/14/2024
Sample Time	11:52	Sample ID	F5
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks	Final depth to water 3.44mbTOC		

Photos

F6

1-Well Integrity

Date	10/14/2024	Time	11:01
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	4.41	Groundwater Elevation	
Depth Installed		Depth Measured	15.54
Well Dry?	N	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	4.41
Well Depth (m)	15.54	Water Column in Well	11.13
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/14/2024	Time	11:06
Purge Start Time	11:09	Color	
Odor		Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/14/24	11:11	0.14	500		4.60	20.96	7.1	9630	2.7	6020	61	2.9	
10/14/24	11:14	0.14	0.42		4.75	20.97	7.1	9550	2.5	6030	62	3.3	
10/14/24	11:17	0.14	0.42		4.80	20.98	7.1	9510	2.3	6010	64	3.3	

4-Final Observations

Date	10/14/2024	Time	11:14
End purge time		Color	Clear, colourless
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	10/14/2024	Time	11:15
Did Well Dewater?	No	Sample Date	10/14/2024
Sample Time	11:19	Sample ID	F6
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks	Final depth to water 5.11mbTOC		

Photos

G2

1-Well Integrity

Date	10/14/2024	Time	13:14
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	7.97	Groundwater Elevation	
Depth Installed		Depth Measured	13.31
Well Dry?	N	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	7.97
Well Depth (m)	13.31	Water Column in Well	5.34
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/14/2024	Time	13:20
Purge Start Time	13:18	Color	Pale brown
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/14/24	13:26	0.14	500			21.67	6.1	6250	0.0	3940	67	142	
10/14/24	13:29	0.14	0.42			21.67	6.1	6250	0.0	3940	66	120	
10/14/24	13:32	0.14	500			21.67	6.1	6250	0.0	3940	65	118	

4-Final Observations

Date	10/14/2024	Time	13:28
End purge time		Color	Clear, colourless
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	10/14/2024	Time	13:28
Did Well Dewater?	No	Sample Date	10/14/2024
Sample Time	13:31	Sample ID	G2
QC Sample ID	D01_20241014, T01_20241014	Analysis	
Sample Preservation		Bottles	
Remarks	Final depth to water 7.20mbTOC		

Photos

G5

1-Well Integrity

Date	10/14/2024	Time	11:55
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	3.16	Groundwater Elevation	
Depth Installed		Depth Measured	11.44
Well Dry?	N	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	3.16
Well Depth (m)	11.44	Water Column in Well	
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/14/2024	Time	11:55
Purge Start Time	11:56	Color	Clear, colourless
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/14/24	12:00	0.14	500		3.20	21.13	5.1	7260	0.0	4570	126	0.0	
10/14/24	12:03	0.14	0.42		3.22	21.11	5.1	7230	0.0	4550	122	0.0	
10/14/24	12:06	0.14	0.42		3.32	21.08	5.1	7190	0.0	4520	118	0.0	

4-Final Observations

Date	10/14/2024	Time	12:02
End purge time		Color	Clear, colourless
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	10/14/2024	Time	12:02
Did Well Dewater?	No	Sample Date	10/14/2024
Sample Time	12:02	Sample ID	G5
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks	Final depth to water 3.52mbTOC		

Photos

G6

1-Well Integrity

Date	10/14/2024	Time	11:22
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	4.43	Groundwater Elevation	
Depth Installed		Depth Measured	6.70
Well Dry?	N	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	4.43
Well Depth (m)	6.70	Water Column in Well	2.27
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/14/2024	Time	11:22
Purge Start Time	11:22	Color	
Odor		Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/14/24	11:23	0.14	500		4.43	20.75	4.1	9300	4.0	5850	249	0.0	
10/14/24	11:26	0.14	0.42		4.43	20.78	4.0	9320	3.6	5880	237	0.0	
10/14/24	11:29	0.14	0.42		4.45	20.80	4.0	9370	3.1	5910	225	0.0	
10/14/24	11:32	0.14	0.42		4.45	20.82	3.9	9400	2.5	5920	213	0.0	

4-Final Observations

Date	10/14/2024	Time	11:31
End purge time		Color	Clear, colourless
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	10/14/2024	Time	11:32
Did Well Dewater?	No	Sample Date	10/14/2024
Sample Time	11:34	Sample ID	G6
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks	Final depth to water 4.47mbTOC		

Photos


HORIBA
SINGLE MEASUREMENT
20.83
3.88
211
9.43
0.0
2.72
25.9
5.94
5.28
2.2
0.15

N2

1-Well Integrity

Date	10/14/2024	Time	12:18
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	4.29	Groundwater Elevation	
Depth Installed		Depth Measured	5.64
Well Dry?	N	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	4.29
Well Depth (m)	5.64	Water Column in Well	1.35
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/14/2024	Time	12:19
Purge Start Time	12:18	Color	Clear, colourless
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/14/24	12:20	0.14	500		4.50	20.93	4.1	7860	6.4	4950	262	1000	
10/14/24	12:23	0.14	0.42			20.92	3.9	7860	6.7	4950	282	1000	
10/14/24	12:26	0.14	0.42			20.89	3.8	7880	6.8	4960	300	1000	
10/14/24	12:29	0.14	0.42			20.88	3.7	7780	8.1	4890	319	1000	

4-Final Observations

Date	10/14/2024	Time	12:25
End purge time	12:26	Color	Turbid, pale brown
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	10/14/2024	Time	12:29
Did Well Dewater?	Yes	Sample Date	10/14/2024
Sample Time	12:29	Sample ID	N2
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks	Final depth to water 4.60mbTOC		

Photos

N8

1-Well Integrity

Date	10/14/2024	Time	14:09
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	3.15	Groundwater Elevation	
Depth Installed		Depth Measured	5.20
Well Dry?	N	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	3.15
Well Depth (m)	5.20	Water Column in Well	2.05
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/14/2024	Time	14:10
Purge Start Time	14:10	Color	
Odor		Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/14/24	14:14	0.14	500			21.55	7.7	8760	0.2	5520	-24	258	
10/14/24	14:15	0.14	0.14			21.55	7.8	8630	0.0	5990	-23	271	
10/14/24	14:16	0.14	0.14			21.51	7.4	1150	0.0	7170	-50	285	
10/14/24	14:19	0.14	0.42			21.47	7.3	9340	0.0	5710	-78	269	
10/14/24	14:22	0.14	0.42			21.46	7.6	1050	0.0	7010	-64	264	
10/14/24	14:25	0.14	0.42			21.45	7.4	1150	0.0	7100	-62	261	
10/14/24	14:28	0.14	0.42			21.42	7.3	1140	0.0	7090	-64	257	
10/14/24	14:31	0.14	0.42			21.41	7.2	1140	0.0	7090	-67	248	
10/14/24	14:34	0.14	500			21.40	7.2	1140	0.0	7090	-68	248	

4-Final Observations

Date	10/14/2024	Time	14:22
End purge time	14:25	Color	Yellow brown, clear
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	10/14/2024	Time	14:26
Did Well Dewater?	No	Sample Date	10/14/2024
Sample Time	14:26	Sample ID	N8
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks	Final depth to water 3.72mbTOC		

Photos

N9

1-Well Integrity

Date	10/15/2024	Time	08:16
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	2.30	Groundwater Elevation	
Depth Installed		Depth Measured	2.85
Well Dry?	N	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	2.30
Well Depth (m)	2.85	Water Column in Well	0.55
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/15/2024	Time	08:22
Purge Start Time	08:22	Color	Turbid, brown
Odor	Sulfidic odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/15/24	08:22	0.14	500			16.56	10.3	2610	0.3	1670	-136	461	
10/15/24	08:25	0.14	0.42			16.59	10.2	2590	0.0	1650	-137	445	
10/15/24	08:28	0.14	0.42			16.59	10.2	2590	0.0	1650	-138	452	

4-Final Observations

Date	10/15/2024	Time	08:24
End purge time		Color	Turbid, brown
Odor	Sulfidic odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	10/15/2024	Time	08:25
Did Well Dewater?	No	Sample Date	10/15/2024
Sample Time	08:25	Sample ID	N9
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks	Final depth to water 2.56mbTOC		

Photos


HORIBA
SINGLE MEASUREMENT
16.61
10.10
-132
2.58
453
0.00
WATER QUALITY MONITOR
MEAS
ENTER
LIGHT

W1D

1-Well Integrity

Date	10/15/2024	Time	10:20
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	1.66	Groundwater Elevation	
Depth Installed		Depth Measured	10.40
Well Dry?	N	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	1.66
Well Depth (m)	10.40	Water Column in Well	8.74
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/15/2024	Time	10:23
Purge Start Time	10:23	Color	Clear, pale yellow
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/15/24	10:29	0.14	500			17.88	8.4	15900	1.4	9840	-154	35.4	
10/15/24	10:31	0.14	0.28			17.88	8.3	15800	0.6	9820	-154	7.2	
10/15/24	10:34	0.14	0.42			17.89	8.2	15800	0.1	9810	-154	6.4	
10/15/24	10:37	0.14	500			17.90	8.2	15800	0.0	9790	-155	6.8	

4-Final Observations

Date	10/15/2024	Time	10:42
End purge time	10:40	Color	Clear, yellow brown
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	10/15/2024	Time	10:42
Did Well Dewater?	No	Sample Date	10/15/2024
Sample Time	10:42	Sample ID	W1D
QC Sample ID	D02_20241015, T02_20241015	Analysis	
Sample Preservation		Bottles	
Remarks	Final depth to water 2.85mbTOC		

Photos

W1S

1-Well Integrity

Date	10/15/2024	Time	10:01
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	1.60	Groundwater Elevation	
Depth Installed		Depth Measured	2.44
Well Dry?	N	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	1.60
Well Depth (m)	2.44	Water Column in Well	
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/15/2024	Time	10:08
Purge Start Time	10:07	Color	Clear, brown
Odor	Sulfidic odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/15/24	10:09	0.14	500			17.17	10.1	20300	5.9	12400	-322	481	
10/15/24	10:12	0.14	500			17.19	10.0	19300	6.1		11900	425	
10/15/24	10:15	0.14	0.42			17.20	9.9	18800	6.2	11600	-328	342	
10/15/24	10:18	0.14	0.42			17.23	9.7	18300	6.5	11300	-327	287	
10/15/24	10:21	0.14	0.42			17.27	9.5	17900	7.1	11100	-325	240	
10/15/24	10:24	0.14	0.42			17.29	9.4	17600	7.7	10900	-321	206	
10/15/24	10:27	0.14	0.42			17.32	9.3	17500	7.9	10800	-317	186	
10/15/24	10:30	0.14	0.42			17.35	9.3	17400	8.0	10700	-314	155	

4-Final Observations

Date	10/15/2024	Time	10:19
End purge time	10:20	Color	Clear, pale yellow brown
Odor	Sulfidic odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	10/15/2024	Time	10:19
Did Well Dewater?	No	Sample Date	10/15/2024
Sample Time	10:20	Sample ID	W1S
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks	Final depth to water 2.34mbTOC		

Photos

W2D

1-Well Integrity

Date	10/15/2024	Time	10:51
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	1.77	Groundwater Elevation	
Depth Installed		Depth Measured	6.33
Well Dry?	N	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	1.77
Well Depth (m)	6.33	Water Column in Well	4.56
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/15/2024	Time	10:53
Purge Start Time	10:55	Color	Clear, brown yellow
Odor	Sulfidic odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/15/24	11:03	0.14	500			18.70	10.4	36700	0.7	22400	-218	3.5	
10/15/24	11:06	0.14	0.42			18.81	10.4	36500	1.4	22300	-227	2.9	
10/15/24	11:09	0.14	0.42			18.84	10.4	36600	1.5	22300	-227	2.6	

4-Final Observations

Date	10/15/2024	Time	11:09
End purge time	11:10	Color	Clear, dark brown yellow
Odor	Sulfidic odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	10/15/2024	Time	11:10
Did Well Dewater?	No	Sample Date	10/15/2024
Sample Time	11:10	Sample ID	W2D
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks	Final depth to water 2.89mbTOC		

Photos

W2S

1-Well Integrity

Date	10/15/2024	Time	11:13
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	2.37	Groundwater Elevation	
Depth Installed		Depth Measured	2.37
Well Dry?	Y	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	2.37
Well Depth (m)	2.37	Water Column in Well	0.0
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/15/2024	Time	11:14
Purge Start Time		Color	
Odor		Sheen/Product	
Remarks	Well dry		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/15/24	11:14												Well dry

4-Final Observations

Date	10/15/2024	Time	11:14
End purge time		Color	
Odor		Sheen/Product	
Remarks	Well dry		

5-Sample Summary

Date	10/15/2024	Time	11:14
Did Well Dewater?		Sample Date	
Sample Time		Sample ID	
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks	Well dry		

Photos

W3S

1-Well Integrity

Date	10/15/2024	Time	08:37
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	1.16	Groundwater Elevation	
Depth Installed		Depth Measured	1.54
Well Dry?	N	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	1.16
Well Depth (m)	1.54	Water Column in Well	0.38
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/15/2024	Time	08:38
Purge Start Time	08:41	Color	Turbid, yellow brown
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/15/24	08:44	0.14	500		1.23	16.96	8.8	10700	0.0	6640	87	6.0	
10/15/24	08:47	0.14	0.42		1.32	19.96	8.8	10600	0.0	6590	96	4.5	
10/15/24	08:50	0.14	0.42		1.41	16.97	8.8	10600	0.0	6550	107	9.1	

4-Final Observations

Date	10/15/2024	Time	08:54
End purge time	08:52	Color	Clear, brown yellow
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	10/15/2024	Time	08:54
Did Well Dewater?	No	Sample Date	10/15/2024
Sample Time	08:54	Sample ID	W3S
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks	Final depth to water 1.68mbTOC		

Photos


HORIBA
SINGLE MEASUREMENT
16.98 °C
8.77 pH
109 ORP
10.5 mg/L
6.4 %DO
0.00 mg/L
0.0 %
6.53 mS/cm TDS
5.93 mS
3.4 ppt
0.10 m
WATER QUALITY MONITOR
MEAS
LIGHT

W4S

1-Well Integrity

Date	10/15/2024	Time	08:57
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	1.12	Groundwater Elevation	
Depth Installed		Depth Measured	1.12
Well Dry?	N	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	1.12
Well Depth (m)	1.12	Water Column in Well	
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/15/2024	Time	08:59
Purge Start Time		Color	
Odor		Sheen/Product	
Remarks	Well dry		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/15/24	08:59												Well dry

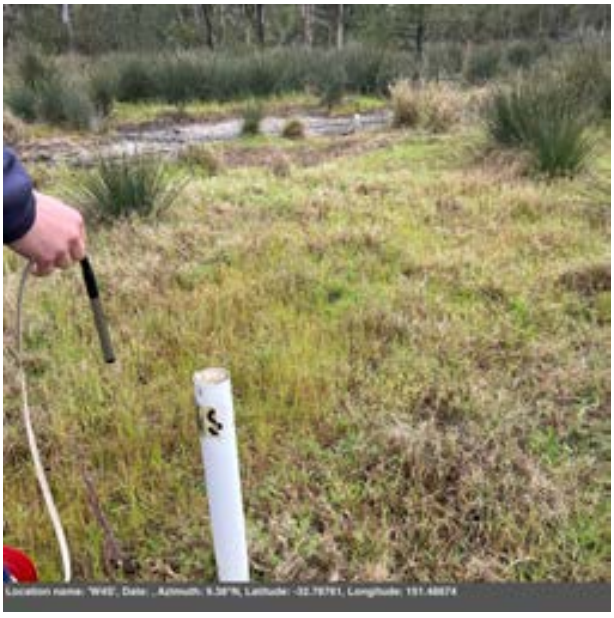
4-Final Observations

Date	10/15/2024	Time	09:00
End purge time		Color	
Odor		Sheen/Product	
Remarks	Well dry		

5-Sample Summary

Date	10/15/2024	Time	09:00
Did Well Dewater?		Sample Date	
Sample Time		Sample ID	
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks	Well dry		

Photos



W5D

1-Well Integrity

Date	10/14/2024	Time	10:32
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)		Well Secured on initial inspection	
Is Well ID Visible?		Water in the well box	
Protective casing or sleeve around well in good condition (if no comment)		Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	5.33	Groundwater Elevation	
Depth Installed		Depth Measured	10.63
Well Dry?	N	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	5.33
Well Depth (m)	10.63	Water Column in Well	5.3
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/14/2024	Time	10:42
Purge Start Time	10:39	Color	Slightly turbid, colourless
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/14/24	10:43	0.14	500		6.20	20.74	7.4	6660	0.0	4190	-14	1000	
10/14/24	10:46	0.14	0.42		6.20	20.74	7.3	6600	0.0	4160	-8	942	
10/14/24	10:49	0.14	0.42		6.21	20.75	7.3	6570	0.0	4140	-3	792	

4-Final Observations

Date	10/14/2024	Time	10:52
End purge time		Color	
Odor		Sheen/Product	NO
Remarks			

5-Sample Summary

Date	10/16/2024	Time	13:34
Did Well Dewater?	No	Sample Date	10/16/2024
Sample Time		Sample ID	W5D
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks			

Photos

W5S

1-Well Integrity

Date	10/14/2024	Time	10:27
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	1.25	Groundwater Elevation	
Depth Installed		Depth Measured	1.25
Well Dry?	Y	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions	Cloudy, Warm	Sampling Method	Low Flow - Peristaltic Pump
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	1.25
Well Depth (m)	1.25	Water Column in Well	0.0
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks	Well dry		

2-Initial Observations

Date	10/14/2024	Time	10:30
Purge Start Time		Color	
Odor		Sheen/Product	NO
Remarks	Well dry		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/14/24	11:18												Well dry

4-Final Observations

Date	10/14/2024	Time	11:18
End purge time		Color	
Odor		Sheen/Product	
Remarks	Well dry		

5-Sample Summary

Date	10/14/2024	Time	11:18
Did Well Dewater?	Yes	Sample Date	
Sample Time		Sample ID	
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks	Well dry		

W6D

1-Well Integrity

Date	10/14/2024	Time	13:45
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	5.40	Groundwater Elevation	
Depth Installed		Depth Measured	8.82
Well Dry?	N	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	5.40
Well Depth (m)	8.82	Water Column in Well	3.42
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/14/2024	Time	13:46
Purge Start Time		Color	
Odor		Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/14/24	13:46	0.14	500			21.57	5.9	920	4.7	587	174	143	
10/14/24	13:49	0.14	0.42			21.52	5.8	914	5.0	586	186	147	
10/14/24	13:52	0.14	0.42			21.49	5.8	907	5.4	580	191	150	

4-Final Observations

Date	10/14/2024	Time	13:57
End purge time		Color	Clear, colourless
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	10/14/2024	Time	13:57
Did Well Dewater?	No	Sample Date	10/14/2024
Sample Time	13:03	Sample ID	W6D
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks	Final depth to water 5.54mbTOC		

Photos

W6S

1-Well Integrity

Date	10/14/2024	Time	13:43
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	3.11	Groundwater Elevation	
Depth Installed		Depth Measured	3.11
Well Dry?	Y	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	3.11
Well Depth (m)	3.11	Water Column in Well	
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/14/2024	Time	13:44
Purge Start Time		Color	
Odor		Sheen/Product	NA
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/14/24	13:45												Well dry

4-Final Observations

Date	10/14/2024	Time	13:45
End purge time		Color	
Odor		Sheen/Product	
Remarks	Well dry		

5-Sample Summary

Date	10/14/2024	Time	13:45
Did Well Dewater?	Yes	Sample Date	10/14/2024
Sample Time	13:45	Sample ID	W6S
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks	Well dry		

Photos

W7M

1-Well Integrity

Date	10/15/2024	Time	11:27
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	2.13	Groundwater Elevation	
Depth Installed		Depth Measured	3.81
Well Dry?	N	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	2.13
Well Depth (m)	3.81	Water Column in Well	1.68
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/15/2024	Time	11:28
Purge Start Time	11:30	Color	Clear, pale yellow brown
Odor	No odour	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/15/24	11:31	0.14	500		2.13	18.91	10.3	13700	0.0	8470	-59	1.6	
10/15/24	11:34	0.14	0.42		2.20	18.96	10.3	13500	0.0	8360	-48	0.7	
10/15/24	11:37	0.14	0.42		2.25	19.00	10.2	13500	0.0	8350	-47	0.8	

4-Final Observations

Date	10/15/2024	Time	11:33
End purge time		Color	Clear, pale yellow brown
Odor	No odour	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	10/15/2024	Time	11:33
Did Well Dewater?	No	Sample Date	10/15/2024
Sample Time	11:40	Sample ID	W7M
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks	Final depth to water 2.70mbTOC		

Photos

W7S

1-Well Integrity

Date	10/15/2024	Time	11:21
Well Integrity		Type of well head	
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	NA
Protective casing or sleeve around well in good condition (if no comment)	NA	Any cleanup performed (explain)	
Any repairs/replacement (explain)		Gauging	
PID		Reference Elevation	
DTW	2.31	Groundwater Elevation	
Depth Installed		Depth Measured	2.31
Well Dry?	Y	Free Product?	
NAPL Start Depth		NAPL End Depth	
NAPL Thickness		Wellhead	
Weather Conditions		Sampling Method	
Volume Units		Water Quality Meter	
Sampling Type		Casing Material	
Casing Diameter (mm)		Screen Interval	
Pump Intake Depth		Depth to Water (m)	2.31
Well Depth (m)	2.31	Water Column in Well	0.0
Volume in Well		Correction	
Total Volume to Remove		Coordinates	
Remarks			

2-Initial Observations

Date	10/15/2024	Time	11:36
Purge Start Time		Color	
Odor		Sheen/Product	NO
Remarks	Well dry		

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
10/15/24	11:36												Well dry

4-Final Observations

Date	10/15/2024	Time	11:36
End purge time		Color	
Odor		Sheen/Product	NO
Remarks	Well dry		

5-Sample Summary

Date	10/15/2024	Time	11:36
Did Well Dewater?	No	Sample Date	10/16/2024
Sample Time		Sample ID	W7S
QC Sample ID		Analysis	
Sample Preservation		Bottles	
Remarks	Well dry		

Photos

E11

1-Well Integrity

Date	12/10/2024	Time	12:18
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Well Dry?	N
Weather Conditions	Hot	Sampling Method	Low Flow - Peristaltic Pump
Depth to Water (m)	3.12	Well Depth (m)	4.64
Water Column in Well	1.52	Correction	0.72
Remarks			

2-Initial Observations

Date	12/10/2024	Time	12:19
Purge Start Time	12:19	Color	Dark brown with many suspended solids
Odor		Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
12/10/24	12:22	180			3.24	22.9	9.76	12300	1.57	7530	-217		
12/10/24	12:24	180	360.0		3.32	21.59	9.76	11400	0.32	7020	-221		
12/10/24	12:26	180	360.0		3.42	21.57	9.71	10600	0.1	6530	-221		
12/10/24	12:29	180	540.0		3.50	21.49	9.52	9670	0	6060	-217		
12/10/24	12:32	180	540.0		3.27	21.22	9.26	9060	0	5700	-199		
12/10/24	12:34	180	360.0		3.27	20.88	9.17	8840	0	5550	-199		
12/10/24	12:36	180	360.0		3.27	20.53	9.11	8400	0	5280	-197		
12/10/24	12:37	180	180.0		3.27	20.62	9.07	8140	0	5010	-197		

4-Final Observations

Date	12/10/2024	Time	12:43
Color	Water became slightly clearer by sampling with less suspended solids. Final depth 3.27	Odor	No

Sheen/Product	NO
Remarks	

5-Sample Summary

Date	12/10/2024	Time	12:43
Did Well Dewater?	No	Sample ID	E11
Remarks			

Photos

E5

1-Well Integrity

Date	12/11/2024	Time	11:45
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	Yes
Protective casing or sleeve around well in good condition (if no comment)	Yes	Well Dry?	N
Weather Conditions	Hot	Sampling Method	Low Flow - Peristaltic Pump
Depth to Water (m)	2.08	Well Depth (m)	2.59
Water Column in Well	0.51		
Remarks			

2-Initial Observations

Date	12/11/2024	Time	11:54
Color	Clear but brown	Odor	No
Sheen/Product	NO		
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
12/11/24	11:54	120			2.42	26.55	9.7	16900	1.2	10400	183		
12/11/24	11:56	120	240.0		2.47	26.79	9.76	16500	1.12	10100	190		
12/11/24	11:59	120	360.0		2.47	27	9.81	15900	1.09	9710	199		
12/11/24	11:01	120	-6960.0		2.52	27.78	9.85	15300	1.04	9430	201		
12/11/24	12:04	120	7560.0		2.57	27.78	9.86	15100	1.08	9360	201		

4-Final Observations

Date	12/11/2024	Time	12:04
End purge time	12:04	Color	Clear with a brown colour
Odor	No		
Remarks	Final depth 2.57		

5-Sample Summary

Date	12/11/2024	Time	12:04

Did Well Dewater?	No	Sample ID	E5
Remarks			

Photos

E5D

1-Well Integrity

Date	12/11/2024	Time	10:55
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Weather Conditions	Hot
Depth to Water (m)	1.77	Well Depth (m)	5.43
Water Column in Well	3.66	Correction	0.77
Remarks			

2-Initial Observations

Date	12/11/2024	Time	10:57
Color	Clear with a brown colour	Odor	No
Sheen/Product	NO		
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
12/11/24	10:59	140			2.04	24.65	7.92	15700	1.20	9760	-90		
12/11/24	11:03	140	560.0		2.12	24.07	7.41	15700	0.66	9760	-89		
12/11/24	11:05	140	280.0		2.17	23.64	7.25	15800	0.45	9780	-87		
12/11/24	11:07	140	280.0		2.21	23.1	7.18	15800	0.35	9820	-87		
12/11/24	11:09	140	280.0		2.21	22.44	7.13	15900	0.25	9870	-88		

4-Final Observations

Date	12/11/2024	Time	11:15
Color	Clean with a brown colour		
Remarks			

5-Sample Summary

Date	12/11/2024	Time	11:15
Did Well Dewater?	No	Sample ID	E5D
QC Sample ID	D02_20241211, T02_20241211		

Remarks Final depth 2.52

Photos

F5

1-Well Integrity

Date	12/10/2024	Time	09:39
Type of well head		Is well accessible? (add comment/picture)	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Well Dry?	N
Weather Conditions	Cloudy	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type	Low Flow	Depth to Water (m)	3.17
Well Depth (m)	7.29	Water Column in Well	4.12
Correction	0.4		
Remarks			

2-Initial Observations

Date	12/10/2024	Time	09:44
Purge Start Time	09:44	Color	Clear
Odor	No	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
12/10/24	09:48	100			3.42	22.69	3.43	11800	2.65	7550	271		
12/10/24	09:52	100	400.0		3.57	21.27	3.4	12800	2.1		218		
12/10/24	09:55	100	300.0		3.68	21.11	3.49	12800	0.04		176		
12/10/24	09:57	100	200.0		3.74	20.76	3.49	12900	0.88	7970	163		
12/10/24	09:59	100	200.0		3.74	20.36	3.46	13000	1.51	8080	152		

4-Final Observations

Date	12/10/2024	Time	09:56
End purge time	10:02	Color	Clear
Odor	No	Sheen/Product	NO
Remarks	Final depth 3.74		

5-Sample Summary

Remarks

Photos

F6

1-Well Integrity

Date	12/10/2024	Time	10:28
Groundwater Elevation		Well Depth (m)	
Water Column in Well		Date	12/10/2024
Time	10:32	Is well accessible? (add comment/picture)	Yes
Well Secured on initial inspection	Yes	Is Well ID Visible?	Yes
Water in the well box	No	Protective casing or sleeve around well in good condition (if no comment)	Yes
Well Dry?	N	Weather Conditions	Hot
Sampling Method	Low Flow - Peristaltic Pump	Depth to Water (m)	4.44
Well Depth (m)	15.47	Water Column in Well	11.03
Correction	0.65		
Remarks			

2-Initial Observations

Date	12/10/2024	Time	10:34
Purge Start Time	10:31	Color	Clear
Odor	No	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
12/10/24	10:34	180			4.97	26.83	6.66	10100	0.2		-32		
12/10/24	10:37	160	480.0		5.22	26.47	7.05	10100	0.14		-16		
12/10/24	10:39	160	320.0		5.42	26.47	7.12	10100	0.92		-1		
12/10/24	10:41	160	320.0		5.68	26.13	7.16	10100	0.31		11		
12/10/24	10:43	160	320.0		5.68	25.99	7.2	10200	0.29		16		

4-Final Observations

Date	12/10/2024	Time	10:48
Color	Clear	Odor	No
Sheen/Product	NO		

Remarks

5-Sample Summary

Date	12/10/2024	Time	10:48
Did Well Dewater?	No	Sample ID	F6
Remarks			

Photos

G2

1-Well Integrity

Date	12/10/2024	Time	13:28
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Well Dry?	N
Weather Conditions	Partly Cloudy	Sampling Method	Low Flow - Peristaltic Pump
Depth to Water (m)	7.97	Well Depth (m)	13.42
Water Column in Well	5.45	Volume in Well	
Correction	0.68		
Remarks			

2-Initial Observations

Date	12/10/2024	Time	13:37
Purge Start Time	13:37	Color	Clear
Odor	No	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
12/10/24	13:45				8.01	27.72	6.62	7030	1.28	4430	-17		
12/10/24	13:47				8.04	26.74	6.24	7060	0.99	4450	6		
12/10/24	13:50				8.07	25.64	6.1	7060	0.73	4450	13		
12/10/24	13:52				8.07	24.95	6.05	7050	0.57	4450	15		
12/10/24	13:54				8.07	26.02	6.03	6830	0.46	4280	16		
12/10/24	13:56				8.07	27.08	6.01	6690	0.41	4210	17		

4-Final Observations

Date	12/10/2024	Time	14:06
End purge time	14:06	Color	Some slight brown turbidity
Odor	No	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	12/10/2024	Time	14:06
Did Well Dewater?	No	Sample ID	G2
Remarks			

Photos

G5

1-Well Integrity

Date	12/10/2024	Time	10:07
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Well Dry?	N	Weather Conditions	Cloudy
Sampling Method	Low Flow - Peristaltic Pump	Depth to Water (m)	3.12
Well Depth (m)	11.29	Water Column in Well	8.17
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
12/10/24	10:07				3.52	22.96	4.89	7490	0.35		-7		
12/10/24	10:10				3.75	22.98	5.09	7370	0.02		-19		
12/10/24	10:13	160			3.94	23.01	5.1	7290	0		-16		
12/10/24	10:15	160			4.1	23.07	5.11	7240	0		-14		
12/10/24	10:17	160			4.31	23.19	5.14	7200	0		-14		

4-Final Observations

Date	12/10/2024	Time	10:22
End purge time	10:22	Color	Clear
Odor	No	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	12/10/2024	Time	10:22
Did Well Dewater?	No	Sample ID	G5
Remarks			

Photos

G6

1-Well Integrity

Date	12/10/2024	Time	10:50
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	No
Well Dry?	N	Weather Conditions	Partly Cloudy
Sampling Method	Low Flow - Peristaltic Pump	Depth to Water (m)	4.52
Well Depth (m)	6.53	Water Column in Well	2.01
Remarks			

2-Initial Observations

Date	12/10/2024	Time	10:51
Color	Clear	Odor	Sulphuric odor
Sheen/Product	NO		
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
12/10/24	10:54	180			4.59	25.94	3.81	9670	1.32	6120	287		
12/10/24	10:57	180	540.0		4.6	25.84	2.78	9570	0.25	6040	212		
12/10/24	10:59	180	360.0		4.6	25.74	2.87	9740	0.01	6140	147		
12/10/24	11:02	180	540.0		4.6	25.58	2.89	9800	0	6180	129		
12/10/24	11:03	180	180.0		4.62	25.5	2.91	9830	0	6200	122		

4-Final Observations

Date	12/10/2024	Time	11:07
End purge time	11:07	Color	No
Odor	Sulphuric	Sheen/Product	NO
Remarks	Final depth 4.62		

5-Sample Summary

Date	12/10/2024	Time	11:07
Did Well Dewater?	No	Sample ID	G6
Remarks			

Photos

N2

1-Well Integrity

Date	12/10/2024	Time	11:11
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Weather Conditions	Partly Cloudy
Sampling Method	Low Flow - Peristaltic Pump	Depth to Water (m)	4.26
Well Depth (m)	5.63	Water Column in Well	1.37
Remarks			

2-Initial Observations

Date	12/10/2024	Time	11:13
Purge Start Time	11:13	Color	Turbid brown
Odor	No		
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
12/10/24	11:13				4.71	20.77	4.91	9290	0.47	5860	22		
12/10/24	11:21	140			4.97	19.95	5.06	9340	0.14	5880	16		
12/10/24	11:25	140	560.0		5.17	21.41	5.09	9270	0.57	5850	19		
12/10/24	11:27	140			5.37	20.67	5.05	9320	1.13	5880	33		
12/10/24	11:30	140	420.0		5.48	20.38	5.06	9330	0.67	5880	16		

4-Final Observations

Date	12/10/2024	Time	11:30
Color	Slightly turbid brown	Odor	No
Sheen/Product	NO		
Remarks			

5-Sample Summary

Date	12/10/2024	Time	11:31
Did Well Dewater?	No	Sample ID	N2

Remarks

Photos

N8

1-Well Integrity

Date	12/10/2024	Time	14:49
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	NA	Weather Conditions	Hot
Sampling Method	Low Flow - Peristaltic Pump	Depth to Water (m)	3.39
Well Depth (m)	5.21	Water Column in Well	1.82
Correction	0.99		
Remarks			

2-Initial Observations

Date	12/10/2024	Time	14:52
Purge Start Time	14:52	Color	Turbid light brown
Odor	No		
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
12/10/24	14:55	180			3.85	23.31	6.23	11900	1.12	7380	-106		
12/10/24	14:58	180	540.0		4.27	21.9	6.57	11700	0.55	7250	-103		
12/10/24	15:02	180	720.0		4.48	22.08	6.55	11700	0.39	7250	-97		
12/10/24	15:04	180	360.0		4.6	22.60	6.56	11600	0.32	7190	-95		
12/10/24	15:07	180	540.0		4.76	22.79	6.58	11600	0.26	7190	-96		
12/10/24	15:10	180	540.0		4.83	22.87	6.62	11600	0.21	7190	-98		

4-Final Observations

Date	12/10/2024	Time	14:58
Color	Water stayed turbid light brown	Odor	No
Sheen/Product	NO		
Remarks			

5-Sample Summary

Date	12/10/2024	Time	15:15
Did Well Dewater?	No	Sample ID	N8
Remarks			

Photos

N9

1-Well Integrity

Date	12/10/2024	Time	14:39
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	Yes
Protective casing or sleeve around well in good condition (if no comment)	Yes	Well Dry?	N
Weather Conditions	Hot	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type		Depth to Water (m)	2.57
Well Depth (m)	2.84	Water Column in Well	0.27
Correction	0.74		
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Date	12/10/2024	Time	14:46
Color	Sediment present and turbid	Odor	No
Sheen/Product	NO		
Remarks			

5-Sample Summary

Date	12/10/2024	Time	14:46
Did Well Dewater?	No		
Remarks	Only took sample as well went dry before readings could be taken		

Photos

W1D

1-Well Integrity

Date	12/11/2024	Time	14:08
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Well Dry?	N
Weather Conditions	Hot	Depth to Water (m)	1.82
Well Depth (m)	10.36	Water Column in Well	8.54
Volume in Well		Correction	0.42
Remarks			

2-Initial Observations

Date	12/11/2024	Time	14:18
Purge Start Time	14:20	Color	Clear with a brown colour
Odor	No	Sheen/Product	NO
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
12/11/24	14:31	140			2.60	22.67	7.64	16700	0.87	10400	-141		
12/11/24	14:33	140	280.0		2.68	22.74	7.67	16700	0.61	10400	-139		
12/11/24	14:35	140	280.0		2.68	22.74	7.68	16700	0.61	10400	-130		

4-Final Observations

Date	12/11/2024	Time	14:41
End purge time	14:41	Color	Clear but brown/orange
Odor	No	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	12/11/2024	Time	14:41
Did Well Dewater?	No		
Remarks	Final depth 3.29		

Photos

W1S

1-Well Integrity

Date	12/11/2024	Time	15:05
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	No	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Well Dry?	N
Weather Conditions	Hot	Sampling Method	Low Flow - Peristaltic Pump
Depth to Water (m)	2.24	Well Depth (m)	2.42
Volume in Well		Correction	0.54
Remarks			

2-Initial Observations

Date	12/11/2024	Time	15:07
Color	Clear but brown orange	Odor	No
Sheen/Product	NO		
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Date	12/11/2024	Time	15:07
End purge time	15:07	Color	Clear but brown orange
Odor	No	Sheen/Product	NO
Remarks	Well went dry before readings		

5-Sample Summary

Date	12/11/2024	Time	15:07
Did Well Dewater?	Yes	Sample ID	W1S
Remarks			

Photos

W2D

1-Well Integrity

Date	12/11/2024	Time	09:03
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Well Dry?	Y
Well Depth (m)	2.05	Water Column in Well	6.23
Correction	0.65		
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Remarks

W2S

1-Well Integrity

Date	12/11/2024	Time	08:59
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Well Dry?	Y
Weather Conditions	Hot	Well Depth (m)	2.29
Correction	0.76		
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
12/11/24	09:12	180				20.56	11.17	45200	0.76	27500	-329		
12/11/24	09:15	180	540.0		2.47	21	11.18	45200	0.34	25800	-338		
12/11/24	09:18	140	420.0		3.67	21.29	11.18	37600	0.15	23000	-320		
12/11/24	09:28	140	1400.0		4.37	20.42	11.22	44700	0.07	27300	-310		

4-Final Observations

Remarks

5-Sample Summary

Remarks

Photos

W3S

1-Well Integrity

Date	12/11/2024	Time	12:32
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Well Dry?	N
Weather Conditions	Hot	Sampling Method	Low Flow - Peristaltic Pump
Depth to Water (m)	1.87	Well Depth (m)	2.48
Water Column in Well	0.61	Correction	0.67
Remarks			

2-Initial Observations

Date	12/11/2024	Time	12:48
Color	Clear with brown colour	Odor	No
Sheen/Product	NO		
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
12/11/24	12:48	140			2.18	24.34	7.62	13800	0.81	8530	143		
12/11/24	12:50	140	280.0		2.38	23.55	7.51	13700	0.70	8450	151		

4-Final Observations

Date	12/11/2024	Time	12:59
End purge time	12:59	Color	Clear but brown
Odor	No	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	12/11/2024	Time	12:59
Did Well Dewater?	Yes	Sample ID	W3S
Remarks	Well went dry		

Photos

W4S

1-Well Integrity

Date	12/11/2024	Time	13:55
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	Y
Well Depth (m)	1.13		
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Date	12/11/2024	Time	13:57
Remarks	Well dry		

5-Sample Summary

Remarks

Photos

W5D

1-Well Integrity

Date	12/11/2024	Time	13:07
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	NA	Well Dry?	N
Weather Conditions	Hot	Sampling Method	Low Flow - Peristaltic Pump
Sampling Type		Depth to Water (m)	5.30
Well Depth (m)	10.58	Correction	1.08
Remarks			

2-Initial Observations

Date	12/11/2024	Time	13:15
Color	Turbid brown	Odor	No
Sheen/Product	NO		
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
12/11/24	13:20	180			6.28	25.42	6.88	7970	0.99	5020	-36		
12/11/24	13:22	180	360.0		6.38	25.37	6.46	7860	0.86	4950	-20		
12/11/24	13:24	180	360.0		6.48	25.69	6.24	7850	0.88	4940	-16		
12/11/24	13:26	180	360.0		6.59	25.89	6.16	7850	0.74	4930	-13		
12/11/24	13:28	100	360.0		6.69	26.34	6.11	7800	0.76	4910	-9		
12/11/24	13:30	100	200.0		6.69	26.86	6.10	7770	0.79	4890	-5		

4-Final Observations

Date	12/11/2024	Time	13:34
End purge time	13:42	Color	Water was slightly turbid by sampling
Odor	No	Sheen/Product	NO
Remarks	Final depth 6.76		

GWM APAC

Site: Hydro Quarterly Groundwater Monitoring
Hart Rd, Loxford
Client: Norsk Hydro

5-Sample Summary

Date	12/11/2024	Time	13:43
Did Well Dewater?	No	Sample ID	W5D
Remarks			

Photos

W5S

1-Well Integrity

Date	12/11/2024	Time	13:04
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Well Dry?	Y
Well Depth (m)	1.27	Water Column in Well	
Volume in Well		Correction	
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Remarks

Photos

W6D

1-Well Integrity

Date	12/10/2024	Time	14:10
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Well Dry?	N
Weather Conditions	Partly Cloudy	Depth to Water (m)	5.17
Well Depth (m)	8.80	Water Column in Well	3.63
Correction	0.67		
Remarks			

2-Initial Observations

Date	12/10/2024	Time	14:14
Color	Clear	Odor	No
Sheen/Product	NO		
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
12/10/24	14:14	140			5.82	23.83	5.74	840	2.03	537	168		
12/10/24	14:20	140	560.0		5.82	23.47	5.16	820	1.74	525	199		
12/10/24	14:20	140	0.0		5.87	23.27	5.11	817	1.68	523	197		
12/10/24	14:22	140	280.0		5.87	22.46	5.16	829	1.72	531	200		

4-Final Observations

Date	12/10/2024	Time	14:24
End purge time	14:34	Color	Water became turbid by the time of sampling final depth 5.87
Odor	No	Sheen/Product	NO
Remarks			

5-Sample Summary

Date	12/10/2024	Time	14:24
Did Well Dewater?		Sample ID	

	No	W6D
QC Sample ID	D0120241210, T01_20241210	
Remarks		

Photos

W6S

1-Well Integrity

Date	12/10/2024	Time	14:26
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Well Dry?	Y		
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Remarks

Photos

W7M

1-Well Integrity

Date	12/11/2024	Time	10:17
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Well Dry?	N
Sampling Method	Low Flow - Peristaltic Pump	Depth to Water (m)	2.45
Well Depth (m)	3.72	Water Column in Well	1.27
Correction	0.53		
Remarks			

2-Initial Observations

Date	12/11/2024	Time	10:18
Purge Start Time	10:22	Color	Coca Cola
Odor	No		
Remarks			

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks
12/11/24	10:25				2.98	23.37	10.98	35700	0.32	21500	-266		
12/11/24	10:32	180			3.49	23.15	10.88	25500	0.58	15600	-218		
12/11/24	10:34	180	360.0		3.49	22.92	10.76	24000	0.34	14900	-216		

4-Final Observations

Date	12/11/2024	Time	10:38
End purge time	10:38	Color	Coca Cola
Odor	No	Sheen/Product	NO
Remarks	Well went dry		

5-Sample Summary

Date	12/11/2024	Time	10:38
Did Well Dewater?	Yes	Sample ID	W7M
Remarks	Well went dry after 3 readings		

Photos

W7S

1-Well Integrity

Date	12/11/2024	Time	10:40
Is well accessible? (add comment/picture)	Yes	Well Secured on initial inspection	Yes
Is Well ID Visible?	Yes	Water in the well box	No
Protective casing or sleeve around well in good condition (if no comment)	Yes	Well Dry?	Y
Weather Conditions	Hot	Depth to Water (m)	
Well Depth (m)	2.29		
Remarks			

2-Initial Observations

Remarks

3-Field Parameters

Date	Time	Flow Rate (ml/min)	Purge Volume (ml)	Cuml Vol Purged (ml)	Depth to Water (m btoc)	Temp (C)	pH	Spec Cond (uS/cm)	Dissolve Oxygen (mg/L)	TDS (mg/L)	ORP (mV)	Turbidity (NTU)	Remarks

4-Final Observations

Remarks

5-Sample Summary

Date	12/11/2024	Time	10:42
Remarks	Well dry		

Photos

APPENDIX 5
LABORATORY REPORTS

COC 25/9 9:46.

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP

Client: Ramboll	Client Project Name / Number / Site etc (ie report title): Hydro Groundwater Plume Monitoring - 318001662	Envirolab Services 12 Ashley St, Chatswood, NSW 2067 Phone: 02 9910 6200 Fax :02 9910 6201 E-mail: ahie@envirolabservices.com.au Contact: Aileen Hie
Contact person: Jake Bourke		
Project Mgr: Kirsty Greenfield	PO No.:	
Sampler: Jake Bourke	Envirolab Quote No. :	
Address: Level 2 Suite 18, 50 Glebe Road, The Junction	Date results required: Or choose: standard / same day / 1 day / 2 day / 3 day *Note: Inform lab in advance if urgent turnaround is required - surcharge applies*	Envirolab Services WA t/a MPL 16-18 Hayden Crt, Myaree WA 6154 Phone: 08 9317 2505 Fax :08 9317 4163 E-mail: lab@mpl.com.au Contact: Joshua Lim
Phone: (02) 49625444 Mob: 0467 580 473	Lab comments: Highly contaminated	
Fax:		
Email: jkirsch@ramboll.com; jbourke@ramboll.com		

Sample information					Tests Required												Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Soluble Fluoride	Total Cyanide	Free Cyanide	Total Aluminium	Dissolved Aluminium								Provide as much information about the sample as you can
1	E4	21/09/2023		WATER	X	X	X	X	X								
2	E5D	21/09/2023		WATER	X	X	X	X	X								
3	F5	21/09/2023		WATER	X	X	X	X	X								
4	F6	21/09/2023		WATER	X	X	X	X	X								
5	G5	21/09/2023		WATER	X	X	X	X	X								
6	G6	21/09/2023		WATER	X	X	X	X	X								
7	N2	21/09/2023		WATER	X	X	X	X	X								
8	W5D	21/09/2023		WATER	X	X	X	X	X								
9	W7M	21/09/2023		WATER	X	X	X	X	X								

ENVIROLAB GROUP
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 337410

Date Received: 27/9/23
Time Received: 1455
Received By: KW
Temp: Cool/Ambient 2°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

Relinquished by (company):	Ramboll	Received by (company):	ELS SYD
Print Name:	Matilda Englert	Print Name:	Kaity Wong
Date & Time:	21/09/2023	Date & Time:	27/9/23 1455
Signature:		Signature:	

Lab use only:
Samples Received: Cool or Ambient (circle one)
Temperature Received at: 2°C (if applicable)
Transported by: Hand delivered / courier

ENVIROLAB GROUP

Client: Ramboll	Client Project Name / Number / Site etc (ie report title): Hydro Groundwater Plume Monitoring - 318001662	Envirolab Services 12 Ashley St, Chatswood, NSW 2067 Phone: 02 9910 6200 Fax :02 9910 6201 E-mail: ahie@envirolabservices.com.au Contact: Aileen Hie
Contact person: Matilda Englert	PO No.:	
Project Mgr: Kirsty Greenfield	Envirolab Quote No. :	
Sampler: Matilda Englert	Date results required:	
Address: Level 2 Suite 18, 50 Glebe Road, The Junction	Or choose: standard / same day / 1 day / 2 day / 3 day	Envirolab Services WA t/a MPL 16-18 Hayden Crt, Myaree WA 6154
Phone: (02) 49625444 Mob: 0467 580 473	*Note: Inform lab in advance if urgent turnaround is required - surcharge applies*	Phone: 08 9317 2505 Fax :08 9317 4163
Fax:	Lab comments: Highly contaminated	E-mail: lab@mpl.com.au
Email: jkirsch@ramboll.com; jbourke@ramboll.com		Contact: Joshua Lim

Sample information					Tests Required													Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Soluble Fluoride	Total Cyanide	Free Cyanide	Total Aluminium	Dissolved Aluminium	HOLD								Provide as much information about the sample as you can
10	G2		22/09/2023	WATER	X	X	X	X	X									
11	N8		22/09/2023	WATER	X	X	X	X	X									
12	N9		22/09/2023	WATER	X	X	X	X	X									Metals not field filtered
13	W1D		22/09/2023	WATER	X	X	X	X	X									
14	W2D		22/09/2023	WATER	X	X	X	X	X									
15	W3S		22/09/2023	WATER	X	X	X	X	X									#334100
16	W6D		22/09/2023	WATER	X	X	X	X	X									27/9 KW
17	D01_20230922		22/09/2023	WATER	X	X	X	X	X									
18	T01_20230922		22/09/2023	WATER	X	X	X	X	X									
19	R01_20230922		22/09/2023	WATER	X	X	X	X	X									

Relinquished by (company):	Ramboll	Received by (company):	*Lab use only:*
Print Name:	Matilda Englert	Print Name:	Samples Received: Cool or Ambient (circle one)
Date & Time:	22/09/2023	Date & Time:	Temperature Received at: (if applicable)
Signature:		Signature:	Transported by: Hand delivered / courier

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Ramboll Australia Pty Ltd
Attention	J Kirsch

Sample Login Details

Your reference	Hydro Groundwater Plume Monitoring - 318001662
Envirolab Reference	334100
Date Sample Received	27/09/2023
Date Instructions Received	27/09/2023
Date Results Expected to be Reported	05/10/2023

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	19 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	2
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	Fluoride, F	Total Cyanide	Free Cyanide in Water	HM in water - dissolved	HM in water - total
E4	✓	✓	✓	✓	✓
E5D	✓	✓	✓	✓	✓
F5	✓	✓	✓	✓	✓
F6	✓	✓	✓	✓	✓
G5	✓	✓	✓	✓	✓
G6	✓	✓	✓	✓	✓
N2	✓	✓	✓	✓	✓
W5D	✓	✓	✓	✓	✓
W7M	✓	✓	✓	✓	✓
G2	✓	✓	✓	✓	✓
N8	✓	✓	✓	✓	✓
N9	✓	✓	✓	✓	✓
W1D	✓	✓	✓	✓	✓
W2D	✓	✓	✓	✓	✓
W3S	✓	✓	✓	✓	✓
W6D	✓	✓	✓	✓	✓
D01_20230922	✓	✓	✓	✓	✓
T01_20230922	✓	✓	✓	✓	✓
R01_20230922	✓	✓	✓	✓	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 334100

Client Details

Client	Ramboll Australia Pty Ltd
Attention	J Kirsch
Address	PO Box 560, North Sydney, NSW, 2060

Sample Details

Your Reference	**Hydro Groundwater Plume Monitoring - 318001662**
Number of Samples	19 Water
Date samples received	27/09/2023
Date completed instructions received	27/09/2023

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	05/10/2023
Date of Issue	05/10/2023

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Diego Bigolin, Inorganics Supervisor
Loren Bardwell, Development Chemist

Authorised By
Nancy Zhang, Laboratory Manager

Miscellaneous Inorganics						
Our Reference		334100-1	334100-2	334100-3	334100-4	334100-5
Your Reference	UNITS	E4	E5D	F5	F6	G5
Date Sampled		21/09/2023	21/09/2023	21/09/2023	21/09/2023	21/09/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	28/09/2023	28/09/2023	28/09/2023	28/09/2023	28/09/2023
Date analysed	-	28/09/2023	28/09/2023	28/09/2023	28/09/2023	28/09/2023
Fluoride, F	mg/L	710	8.6	0.2	0.4	0.1
Total Cyanide	mg/L	170	0.065	<0.004	<0.004	<0.004
Free Cyanide in Water	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004

Miscellaneous Inorganics						
Our Reference		334100-6	334100-7	334100-8	334100-9	334100-10
Your Reference	UNITS	G6	N2	W5D	W7M	G2
Date Sampled		21/09/2023	21/09/2023	21/09/2023	21/09/2023	22/09/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	28/09/2023	28/09/2023	28/09/2023	28/09/2023	28/09/2023
Date analysed	-	28/09/2023	28/09/2023	28/09/2023	28/09/2023	28/09/2023
Fluoride, F	mg/L	0.5	1.2	0.3	670	0.3
Total Cyanide	mg/L	<0.004	0.030	<0.004	100	<0.004
Free Cyanide in Water	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004

Miscellaneous Inorganics						
Our Reference		334100-11	334100-12	334100-13	334100-14	334100-15
Your Reference	UNITS	N8	N9	W1D	W2D	W3S
Date Sampled		22/09/2023	22/09/2023	22/09/2023	22/09/2023	22/09/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	28/09/2023	28/09/2023	28/09/2023	28/09/2023	28/09/2023
Date analysed	-	28/09/2023	28/09/2023	28/09/2023	28/09/2023	28/09/2023
Fluoride, F	mg/L	0.4	92	8.3	1,100	140
Total Cyanide	mg/L	0.17	6.0	220	16	110
Free Cyanide in Water	mg/L	<0.004	<0.004	<0.004	0.12	0.018

Miscellaneous Inorganics				
Our Reference		334100-16	334100-17	334100-19
Your Reference	UNITS	W6D	D01_20230922	R01_20230922
Date Sampled		22/09/2023	22/09/2023	22/09/2023
Type of sample		Water	Water	Water
Date prepared	-	28/09/2023	28/09/2023	28/09/2023
Date analysed	-	28/09/2023	28/09/2023	28/09/2023
Fluoride, F	mg/L	<0.1	0.3	<0.1
Total Cyanide	mg/L	0.11	<0.004	<0.004
Free Cyanide in Water	mg/L	<0.004	<0.004	<0.004

HM in water - dissolved						
Our Reference		334100-1	334100-2	334100-3	334100-4	334100-5
Your Reference	UNITS	E4	E5D	F5	F6	G5
Date Sampled		21/09/2023	21/09/2023	21/09/2023	21/09/2023	21/09/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	28/09/2023	28/09/2023	28/09/2023	28/09/2023	28/09/2023
Date analysed	-	28/09/2023	28/09/2023	28/09/2023	28/09/2023	28/09/2023
Aluminium-Dissolved	µg/L	300	20	2,400	70	140

HM in water - dissolved						
Our Reference		334100-6	334100-7	334100-8	334100-9	334100-10
Your Reference	UNITS	G6	N2	W5D	W7M	G2
Date Sampled		21/09/2023	21/09/2023	21/09/2023	21/09/2023	22/09/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	28/09/2023	28/09/2023	28/09/2023	28/09/2023	28/09/2023
Date analysed	-	28/09/2023	28/09/2023	28/09/2023	28/09/2023	28/09/2023
Aluminium-Dissolved	µg/L	17,000	3,600	<10	260	<10

HM in water - dissolved						
Our Reference		334100-11	334100-12	334100-13	334100-14	334100-15
Your Reference	UNITS	N8	N9	W1D	W2D	W3S
Date Sampled		22/09/2023	22/09/2023	22/09/2023	22/09/2023	22/09/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	28/09/2023	28/09/2023	28/09/2023	28/09/2023	28/09/2023
Date analysed	-	28/09/2023	28/09/2023	28/09/2023	28/09/2023	28/09/2023
Aluminium-Dissolved	µg/L	40	360	60	480	230

HM in water - dissolved				
Our Reference		334100-16	334100-17	334100-19
Your Reference	UNITS	W6D	D01_20230922	R01_20230922
Date Sampled		22/09/2023	22/09/2023	22/09/2023
Type of sample		Water	Water	Water
Date prepared	-	28/09/2023	28/09/2023	28/09/2023
Date analysed	-	28/09/2023	28/09/2023	28/09/2023
Aluminium-Dissolved	µg/L	610	<10	30

HM in water - total						
Our Reference		334100-1	334100-2	334100-3	334100-4	334100-5
Your Reference	UNITS	E4	E5D	F5	F6	G5
Date Sampled		21/09/2023	21/09/2023	21/09/2023	21/09/2023	21/09/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	28/09/2023	28/09/2023	28/09/2023	28/09/2023	28/09/2023
Date analysed	-	29/09/2023	29/09/2023	29/09/2023	29/09/2023	29/09/2023
Aluminium-Total	µg/L	2,400	400	3,100	300	180

HM in water - total						
Our Reference		334100-6	334100-7	334100-8	334100-9	334100-10
Your Reference	UNITS	G6	N2	W5D	W7M	G2
Date Sampled		21/09/2023	21/09/2023	21/09/2023	21/09/2023	22/09/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	28/09/2023	28/09/2023	28/09/2023	28/09/2023	28/09/2023
Date analysed	-	29/09/2023	29/09/2023	29/09/2023	29/09/2023	29/09/2023
Aluminium-Total	µg/L	18,000	5,000	1,000	3,200	70

HM in water - total						
Our Reference		334100-11	334100-12	334100-13	334100-14	334100-15
Your Reference	UNITS	N8	N9	W1D	W2D	W3S
Date Sampled		22/09/2023	22/09/2023	22/09/2023	22/09/2023	22/09/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	28/09/2023	28/09/2023	28/09/2023	28/09/2023	28/09/2023
Date analysed	-	29/09/2023	29/09/2023	29/09/2023	29/09/2023	29/09/2023
Aluminium-Total	µg/L	920	35,000	210	530	7,200

HM in water - total				
Our Reference		334100-16	334100-17	334100-19
Your Reference	UNITS	W6D	D01_20230922	R01_20230922
Date Sampled		22/09/2023	22/09/2023	22/09/2023
Type of sample		Water	Water	Water
Date prepared	-	28/09/2023	28/09/2023	28/09/2023
Date analysed	-	29/09/2023	29/09/2023	29/09/2023
Aluminium-Total	µg/L	3,000	100	30

Method ID	Methodology Summary
Inorg-014	Cyanide - free, total, weak acid dissociable by segmented flow analyser (in line dialysis with colourimetric finish). Solids/Filters and sorbents are extracted in a caustic media prior to analysis. Impingers are pH adjusted as required prior to analysis. Cyanides amenable to Chlorination - samples are analysed untreated and treated with hypochlorite to assess the potential for chlorination of cyanide forms. Based on APHA latest edition, 4500-CN_G,H.
Inorg-026	Fluoride determined by ion selective electrode (ISE) in accordance with APHA latest edition, 4500-F-C.
Metals-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Salt forms (e.g. FeO, PbO, ZnO) are determinined stoichiometrically from the base metal concentration.

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	334100-2
Date prepared	-			28/09/2023	1	28/09/2023	28/09/2023		28/09/2023	28/09/2023
Date analysed	-			28/09/2023	1	28/09/2023	28/09/2023		28/09/2023	28/09/2023
Fluoride, F	mg/L	0.1	Inorg-026	<0.1	1	710	740	4	93	#
Total Cyanide	mg/L	0.004	Inorg-014	<0.004	1	170	170	0	102	[NT]
Free Cyanide in Water	mg/L	0.004	Inorg-014	<0.004	1	<0.004	<0.004	0	100	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	334100-19
Date prepared	-			[NT]	11	28/09/2023	28/09/2023		[NT]	28/09/2023
Date analysed	-			[NT]	11	28/09/2023	28/09/2023		[NT]	28/09/2023
Fluoride, F	mg/L	0.1	Inorg-026	[NT]	11	0.4	0.4	0	[NT]	[NT]
Total Cyanide	mg/L	0.004	Inorg-014	[NT]	11	0.17	0.17	0	[NT]	98
Free Cyanide in Water	mg/L	0.004	Inorg-014	[NT]	11	<0.004	<0.004	0	[NT]	92

QUALITY CONTROL: HM in water - dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	334100-2
Date prepared	-			28/09/2023	1	28/09/2023	28/09/2023		28/09/2023	28/09/2023
Date analysed	-			28/09/2023	1	28/09/2023	28/09/2023		28/09/2023	28/09/2023
Aluminium-Dissolved	µg/L	10	Metals-022	<10	1	300	310	3	101	91

QUALITY CONTROL: HM in water - dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	28/09/2023	28/09/2023		[NT]	[NT]
Date analysed	-			[NT]	11	28/09/2023	28/09/2023		[NT]	[NT]
Aluminium-Dissolved	µg/L	10	Metals-022	[NT]	11	40	40	0	[NT]	[NT]

QUALITY CONTROL: HM in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	334100-2
Date prepared	-			28/09/2023	1	28/09/2023	28/09/2023		28/09/2023	28/09/2023
Date analysed	-			29/09/2023	1	29/09/2023	29/09/2023		29/09/2023	29/09/2023
Aluminium-Total	µg/L	10	Metals-022	<10	1	2400	2100	13	105	#

QUALITY CONTROL: HM in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	28/09/2023	28/09/2023		[NT]	[NT]
Date analysed	-			[NT]	11	29/09/2023	29/09/2023		[NT]	[NT]
Aluminium-Total	µg/L	10	Metals-022	[NT]	11	920	1100	18	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

MISC_INORG: FLUORIDE # Percent recovery for the matrix spike is not possible to report as the high concentration of analytes in sample 334100-2 have caused interference.

8 HM in water - total - # Percent recovery is not applicable due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

ENVIROLAB GROUP

Client: Ramboll	Client Project Name / Number / Site etc (ie report title): Hydro Groundwater Plume Monitoring - 318001662	Envirolab Services 12 Ashley St, Chatswood, NSW 2067 Phone: 02 9910 6200 Fax :02 9910 6201 E-mail: ahie@envirolabservices.com.au Contact: Aileen Hie
Contact person: Matilda Englert		
Project Mgr: Kirsty Greenfield	PO No.:	
Sampler: Matilda Englert	Envirolab Quote No. :	
Address: Level 2 Suite 18, 50 Glebe Road, The Junction	Date results required:	
	Or choose: standard / same day / 1 day / 2 day / 3 day	Envirolab Services WA t/a MPL 16-18 Hayden Crt, Myaree WA 6154
Phone: (02) 49625444 Mob: 0457 580 473	*Note: Inform lab in advance if urgent turnaround is required - surcharge applies*	Phone: 08 9317 2505 Fax :08 9317 4163
Fax:	Lab comments: Highly contaminated	E-mail: lab@mpl.com.au
Email: jkirsch@ramboll.com; jbourke@ramboll.com		Contact: Joshua Lim

Sample Information					Tests Required							Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Soluble Fluoride	Total Cyanide	Free Cyanide	Total Aluminium	Dissolved Aluminium	HOLD		Provide as much information about the sample as you can
10	G2		22/09/2023	WATER	X	X	X	X	X			
11	N8		22/09/2023	WATER	X	X	X	X	X			
12	N9		22/09/2023	WATER	X	X	X	X	X			Metals not field filtered
13	W1D		22/09/2023	WATER	X	X	X	X	X			
14	W2D		22/09/2023	WATER	X	X	X	X	X			
15	W3S		22/09/2023	WATER	X	X	X	X	X			#337100
16	W6D		22/09/2023	WATER	X	X	X	X	X			27/9 KW
17	D01_20230922		22/09/2023	WATER	X	X	X	X	X			
(1) 18 ~~50~~	T01_20230922		22/09/2023	WATER	X	X	X	X	X			
19	R01_20230922		22/09/2023	WATER	X	X	X	X	X			
	Relinquished by ELS SYD											
	Grace											
	29/09/23 1130											

Environmental Division
Sydney
Work Order Reference
ES2333605

Telephone : +61-2-8784 8555

Relinquished by (company):	Ramboll	Received by (company):	ALS
Print Name:	Matilda Englert	Print Name:	LUCAS
Date & Time:	22/09/2023	Date & Time:	29/9/23 1430
Signature:		Signature:	

Lab use only:
Samples Received: Cool or Ambient (circle one)
Temperature Received at: (if applicable)
Transported by: Hand delivered / courier

Anna Bui

From: Jake Bourke <jbourke@ramboll.com>
Sent: Thursday, 28 September 2023 4:43 PM
To: Anna Bui; Jordyn Kirsch
Subject: RE: Sample Receipt for 334100 Hydro Groundwater Plume Monitoring - 318001662

Hi there,

Could you please forward sample T01_20230922 to ALS for analysis?

Relinquished by ELS SYD
Grace Zhang
29/09/23 1130

Kind regards
Jake Bourke

Consultant

jbourke@ramboll.com

Ramboll Australia Pty Ltd.
ACN 095 437 442
ABN 49 095 437 442

Classification: Confidential

From: Anna Bui <ABui@envirolab.com.au>
Sent: Wednesday, 27 September 2023 8:07 PM
To: Jake Bourke <jbourke@ramboll.com>; Jordyn Kirsch <jkirsch@ramboll.com>
Subject: Sample Receipt for 334100 Hydro Groundwater Plume Monitoring - 318001662

Please refer to attached for:
a copy of the COC/paperwork received from you
a copy of our Sample Receipt Advice (SRA)
Please open and read the SRA as it contains important information.
Please let the lab know immediately if there are any issues.

Results will be available by 6.30pm on the date indicated.

PLEASE NOTE COMBO PRICES WILL ONLY APPLY IF COMBOS ARE SELECTED ON COC.

We have a new reporting format and would welcome your feedback. Sydney@envirolab.com.au

Please note that subcontracted testing or non routine testing may take significantly longer than just the standard 5 day TAT, contact the lab to get an approximate due date.

Enquiries should be made directly to:
customerservice@envirolab.com.au

Regards

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2333605**

Client	: **RAMBOLL AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: JORDYN KIRSCH	Contact	: Customer Services ES
Address	: EASTPOINT COMPLEX SUITE 19B, LEVEL 2 50 GLEBE ROAD THE JUNCTION NSW 2291	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jkirsch@ramboll.com	E-mail	: ALSEnviro.Sydney@ALSGlobal.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: Hydro Groundwater Plume Monitoring - 318001662	Page	: 1 of 2
Order number	: ----	Quote number	: EB2017ENVIAUS0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	:		

Dates

Date Samples Received	: 29-Sep-2023 14:30	Issue Date	: 05-Oct-2023
Client Requested Due Date	: 09-Oct-2023	Scheduled Reporting Date	: **09-Oct-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 11 - Ice Bricks present
Receipt Detail	: FOAM ESKY	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EG020F Dissolved Metals by ICP/MS	WATER - EG020T Total Metals by ICP/MS (including digestion)	WATER - EK025SF Free CN By Segmented Flow Analyser	WATER - EK026SF Total Cyanide by Segmented Flow Analyser	WATER - EK040-P Fluoride (Auto Titrator)
ES2333605-001	22-Sep-2023 00:00	T01_20230922	✓	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	AsiaPac-Accounts@Ramboll.com

JAKE BOURKE

- *AU Certificate of Analysis - NATA (COA)	Email	JBOURKE@ramboll.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	JBOURKE@ramboll.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	JBOURKE@ramboll.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	JBOURKE@ramboll.com
- Chain of Custody (CoC) (COC)	Email	JBOURKE@ramboll.com
- EDI Format - EQUIS_ENVIRON (EQUIS_ENVIRON)	Email	JBOURKE@ramboll.com
- EDI Format - XTab (XTAB)	Email	JBOURKE@ramboll.com

JORDYN KIRSCH

- *AU Certificate of Analysis - NATA (COA)	Email	jkirsch@ramboll.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	jkirsch@ramboll.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	jkirsch@ramboll.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	jkirsch@ramboll.com
- Chain of Custody (CoC) (COC)	Email	jkirsch@ramboll.com
- EDI Format - EQUIS_ENVIRON (EQUIS_ENVIRON)	Email	jkirsch@ramboll.com
- EDI Format - XTab (XTAB)	Email	jkirsch@ramboll.com

CERTIFICATE OF ANALYSIS

Work Order	: **ES2333605**	Page	: 1 of 2
Client	: **RAMBOLL AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: JORDYN KIRSCH	Contact	: Customer Services ES
Address	: EASTPOINT COMPLEX SUITE 19B, LEVEL 2 50 GLEBE ROAD THE JUNCTION NSW 2291	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: Hydro Groundwater Plume Monitoring - 318001662	Date Samples Received	: 29-Sep-2023 14:30
Order number	: ----	Date Analysis Commenced	: 05-Oct-2023
C-O-C number	: ----	Issue Date	: 09-Oct-2023 16:57
Sampler	: ----		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				*Sample ID*	**T01_20230922**	**----**	**----**	**----**	**----**
				Sampling date / time	22-Sep-2023 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**ES2333605-001**	--------	--------	--------	--------
					Result	----	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		<0.01	**----**	**----**	**----**	**----**
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		**0.02**	**----**	**----**	**----**	**----**
EK025SF: Free CN by Segmented Flow Analyser									
Free Cyanide	----	0.004	mg/L		<0.004	**----**	**----**	**----**	**----**
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	0.004	mg/L		<0.004	**----**	**----**	**----**	**----**
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.4**	**----**	**----**	**----**	**----**

QUALITY CONTROL REPORT

Work Order	: **ES2333605**	Page	: 1 of 3
Client	: **RAMBOLL AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: JORDYN KIRSCH	Contact	: Customer Services ES
Address	: EASTPOINT COMPLEX SUITE 19B, LEVEL 2 50 GLEBE ROAD THE JUNCTION NSW 2291	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: Hydro Groundwater Plume Monitoring - 318001662	Date Samples Received	: 29-Sep-2023
Order number	: ----	Date Analysis Commenced	: 05-Oct-2023
C-O-C number	: ----	Issue Date	: 09-Oct-2023
Sampler	: ----		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5342030)									
ES2333605-001	T01_20230922	EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 5342038)									
ES2333556-038	Anonymous	EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK025SF: Free CN by Segmented Flow Analyser (QC Lot: 5342152)									
ES2333605-001	T01_20230922	EK025SF: Free Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK026SF: Total CN by Segmented Flow Analyser (QC Lot: 5342153)									
WN2311969-002	Anonymous	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
ES2333605-001	T01_20230922	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 5341784)									
ES2334202-002	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	1.0	1.1	0.0	0% - 50%
ES2334202-009	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	1.0	1.1	0.0	0% - 50%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 5342030)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	93.7	80.0	116
EG020T: Total Metals by ICP-MS (QCLot: 5342038)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	98.2	82.0	120
EK025SF: Free CN by Segmented Flow Analyser (QCLot: 5342152)								
EK025SF: Free Cyanide	----	0.004	mg/L	<0.004	0.2 mg/L	108	88.0	128
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 5342153)								
EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.2 mg/L	107	73.0	133
EK040P: Fluoride by PC Titrator (QCLot: 5341784)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	94.6	82.0	116

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK025SF: Free CN by Segmented Flow Analyser (QCLot: 5342152)							
ES2333605-001	T01_20230922	EK025SF: Free Cyanide	----	0.2 mg/L	109	70.0	130
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 5342153)							
ES2333605-001	T01_20230922	EK026SF: Total Cyanide	57-12-5	0.2 mg/L	106	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 5341784)							
ES2334202-001	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	88.9	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2333605**	Page	: 1 of 4
Client	: **RAMBOLL AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: JORDYN KIRSCH	Telephone	: +61-2-8784 8555
Project	: Hydro Groundwater Plume Monitoring - 318001662	Date Samples Received	: 29-Sep-2023
Site	: ----	Issue Date	: 09-Oct-2023
Sampler	: ----	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
	0				
Matrix Spikes (MS)					
Dissolved Metals by ICP-MS - Suite A	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	0	3	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
T01_20230922	**22-Sep-2023**	**----**	----	----	**06-Oct-2023**	20-Mar-2024	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)							
T01_20230922	**22-Sep-2023**	**06-Oct-2023**	20-Mar-2024	✓	**06-Oct-2023**	20-Mar-2024	✓
EK025SF: Free CN by Segmented Flow Analyser							
Opaque plastic bottle - NaOH (EK025SF)							
T01_20230922	**22-Sep-2023**	**----**	----	----	**06-Oct-2023**	06-Oct-2023	✓
EK026SF: Total CN by Segmented Flow Analyser							
Opaque plastic bottle - NaOH (EK026SF)							
T01_20230922	**22-Sep-2023**	**----**	----	----	**06-Oct-2023**	06-Oct-2023	✓
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P)							
T01_20230922	**22-Sep-2023**	**----**	----	----	**05-Oct-2023**	20-Oct-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Free CN by Segmented Flow Analyser	EK025SF	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Free CN by Segmented Flow Analyser	EK025SF	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Free CN by Segmented Flow Analyser	EK025SF	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Free CN by Segmented Flow Analyser	EK025SF	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	0	3	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Free CN by Segmented Flow Analyser	EK025SF	WATER	In house: Referenced to ASTM D7237, APHA 4500-CN-C&O and ISO 14403: Using an automated segmented flow analyser, a sample at high pH (sodium hydroxide preserved) is buffered to pH 6.0. The hydrogen cyanide present passes across a gas dialysis membrane into an acceptor stream consisting of 0.01 M sodium hydroxide. The acceptor stream mixes with a buffer at pH 5.2 and reacts with chloramine-T to form cyanogen chloride. Cyanogen chloride reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour, measured at 600nm. This method is compliant with NEPM Schedule B(3)
Total Cyanide by Segmented Flow Analyser	EK026SF	WATER	In house: Referenced to APHA 4500-CN C&O / ASTM D7511 / ISO 14403. Sodium hydroxide preserved samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM Schedule B(3)
Fluoride by Auto Titrator	EK040P	WATER	In house: Referenced to APHA 4500-F C: CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP

Client: Ramboll	**Client Project Name / Number / Site etc (ie report title):** Hydro Groundwater Plume Monitoring - 318001662	**Envirolab Services** 12 Ashley St, Chatswood, NSW 2067 Phone: 02 9910 6200 Fax :02 9910 6201 E-mail: ahie@envirolabservices.com.au Contact: Aileen Hie	
Contact person: Jake Bourke			
Project Mgr: Kirsty Greenfield	**PO No.:**		
Sampler: Jake Bourke	**Envirolab Quote No. :**		
Address: Level 2 Suite 18, 50 Glebe Road,	**Date results required:**	**Envirolab Services WA t/a MPL** 16-18 Hayden Crt, Myaree WA 6154 Phone: 08 9317 2505 Fax :08 9317 4163 E-mail: lab@mpl.com.au Contact: Joshua Lim	
The Junction			
	Or choose: standard / same day / 1 day / 2 day / 3 day		
Phone: (02) 49625444 **Mob:** 0467 580 473	*Note: Inform lab in advance if urgent turnaround is required - surcharge applies*		
Fax:	**Lab comments:** Highly contaminated		
Email: jkirsch@ramboll.com; jbourke@ramboll.com			

Sample information					Tests Required														Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Soluble Fluoride	Total Cyanide	Free Cyanide	Total Aluminium	Dissolved Aluminium					Extra	P-L+	DL			Provide as much information about the sample as you can
1	D01_20231127		27/11/2023	WATER	X	X	X	X	X										
2	T01_20231127		27/11/2023	WATER	X	X	X	X	X				13	W1S					
3	F6		27/11/2023	WATER	X	X	X	X	X				14	W2D					
4	G5		27/11/2023	WATER	X	X	X	X	X				15	W2D					
5	G6		27/11/2023	WATER	X	X	X	X	X				16	E4					
6	W5D		27/11/2023	WATER	X	X	X	X	X				17	E5D					
7	G2		27/11/2023	WATER	X	X	X	X	X										
8	N2		27/11/2023	WATER	X	X	X	X	X										
9	N8		27/11/2023	WATER	X	X	X	X	X										
10	W6D		27/11/2023	WATER	X	X	X	X	X										
11	F5		27/11/2023	WATER	X	X	X	X	X										
12	W3S		27/11/2023	WATER	X	X	X	X	X										

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 339103

Date Received: 30/11/23
Time Received: 1030
Received By: Pal
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Relinquished by (company):	Ramboll	**Received by (company):** ELS	***Lab use only:***
Print Name:	Matilda Englert	**Print Name:** Pal	**Samples Received:** Cool or Ambient (circle one)
Date & Time:	27/11/2023	**Date & Time:** 30/11/23 1030	**Temperature Received at:** 14 (if applicable)
Signature:		**Signature:**	**Transported by:** Hand delivered / courier

ENVIROLAB GROUP

Client: Ramboll	Client Project Name / Number / Site etc (ie report title): Hydro Groundwater Plume Monitoring - 318001662	Envirolab Services 12 Ashley St, Chatswood, NSW 2067 Phone: 02 9910 6200 Fax :02 9910 6201 E-mail: ahie@envirolabservices.com.au Contact: Aileen Hie
Contact person: Matilda Englert	PO No.:	
Project Mgr: Kirsty Greenfield	Envirolab Quote No. :	
Sampler: Matilda Englert	Date results required:	
Address: Level 2 Suite 18, 50 Glebe Road, The Junction	Or choose: standard / same day / 1 day / 2 day / 3 day	Envirolab Services WA t/a MPL 16-18 Hayden Crt, Myaree WA 6154 Phone: 08 9317 2505 Fax :08 9317 4163 E-mail: lab@mpl.com.au Contact: Joshua Lim
Phone: (02) 49625444 Mob: 0467 580 473	*Note: Inform lab in advance if urgent turnaround is required - surcharge applies*	
Fax:	Lab comments: Highly contaminated	
Email: jkirsch@ramboll.com; jbourke@ramboll.com		

Sample information					Tests Required													Comments
Envirolab Sample ID	Client Sample ID or information	Oepth	Oate sampled	Type of sample	Soluble Fluoride	Total Cyanide	Free Cyanide	Total Aluminium	Dissolved Aluminium	HOLD								Provide as much information about the sample as you can
13	W2D		28/11/2023	WATER	X	X	X	X	X									
14	E5D		28/11/2023	WATER	X	X	X	X	X									
15	W1D		28/11/2023	WATER	X	X	X	X	X									
16~~DUP~~	W1S		28/11/2023	WATER	X	X	X	X	X									
NIL	W2S		28/11/2023	WATER	X	X	X	X	X									
17	E4		28/11/2023	WATER	X	X	X	X	X									

Relinquished by (company): Ramboll	Received by (company): ELS	*Lab use only:* 339103,
Print Name: Matilda Englert	Print Name: Paul	Samples Received: Cool or Ambient (circle one)
Date & Time: 28/11/2023	Date & Time: 30/11/23 1030	Temperature Received at: (if applicable)
Signature:	Signature:	Transported by: Hand delivered / courier

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 339103

Client Details

Client	Ramboll Australia Pty Ltd
Attention	J Kirsch
Address	PO Box 560, North Sydney, NSW, 2060

Sample Details

Your Reference	**Hydro Groundwater Plume Monitoring - 318001662**
Number of Samples	17 Water
Date samples received	30/11/2023
Date completed instructions received	30/11/2023

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	07/12/2023
Date of Issue	07/12/2023

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Diego Bigolin, Inorganics Supervisor
Loren Bardwell, Development Chemist

Authorised By
Nancy Zhang, Laboratory Manager

HM in water - dissolved						
Our Reference		339103-1	339103-2	339103-3	339103-4	339103-5
Your Reference	UNITS	D01_20231127	T01_20231127	F6	G5	G6
Date Sampled		27/11/2023	27/11/2023	27/11/2023	27/11/2023	27/11/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	05/12/2023	05/12/2023	05/12/2023	05/12/2023	05/12/2023
Date analysed	-	05/12/2023	05/12/2023	05/12/2023	05/12/2023	05/12/2023
Aluminium-Dissolved	µg/L	<10	<10	<10	90	20,000

HM in water - dissolved						
Our Reference		339103-6	339103-7	339103-8	339103-9	339103-10
Your Reference	UNITS	W5D	G2	N2	N8	W6D
Date Sampled		27/11/2023	27/11/2023	27/11/2023	27/11/2023	27/11/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	05/12/2023	05/12/2023	05/12/2023	05/12/2023	05/12/2023
Date analysed	-	05/12/2023	05/12/2023	05/12/2023	05/12/2023	05/12/2023
Aluminium-Dissolved	µg/L	<10	<10	4,000	40	<10

HM in water - dissolved						
Our Reference		339103-11	339103-12	339103-13	339103-14	339103-15
Your Reference	UNITS	F5	W3S	W2D	E5D	W1D
Date Sampled		27/11/2023	27/11/2023	28/11/2023	28/11/2023	28/11/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	05/12/2023	05/12/2023	05/12/2023	05/12/2023	05/12/2023
Date analysed	-	05/12/2023	05/12/2023	05/12/2023	05/12/2023	05/12/2023
Aluminium-Dissolved	µg/L	2,500	340	430	10	80

HM in water - dissolved			
Our Reference		339103-16	339103-17
Your Reference	UNITS	W1S	E4
Date Sampled		28/11/2023	28/11/2023
Type of sample		Water	Water
Date prepared	-	05/12/2023	05/12/2023
Date analysed	-	05/12/2023	05/12/2023
Aluminium-Dissolved	µg/L	130	260

HM in water - total						
Our Reference		339103-1	339103-2	339103-3	339103-4	339103-5
Your Reference	UNITS	D01_20231127	T01_20231127	F6	G5	G6
Date Sampled		27/11/2023	27/11/2023	27/11/2023	27/11/2023	27/11/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023
Date analysed	-	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023
Aluminium-Total	µg/L	180	160	<10	130	18,000

HM in water - total						
Our Reference		339103-6	339103-7	339103-8	339103-9	339103-10
Your Reference	UNITS	W5D	G2	N2	N8	W6D
Date Sampled		27/11/2023	27/11/2023	27/11/2023	27/11/2023	27/11/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023
Date analysed	-	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023
Aluminium-Total	µg/L	200	180	4,500	1,600	450

HM in water - total						
Our Reference		339103-11	339103-12	339103-13	339103-14	339103-15
Your Reference	UNITS	F5	W3S	W2D	E5D	W1D
Date Sampled		27/11/2023	27/11/2023	28/11/2023	28/11/2023	28/11/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023
Date analysed	-	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023
Aluminium-Total	µg/L	2,700	7,700	420	2,000	490

HM in water - total			
Our Reference		339103-16	339103-17
Your Reference	UNITS	W1S	E4
Date Sampled		28/11/2023	28/11/2023
Type of sample		Water	Water
Date prepared	-	06/12/2023	06/12/2023
Date analysed	-	06/12/2023	06/12/2023
Aluminium-Total	µg/L	6,100	11,000

Miscellaneous Inorganics						
Our Reference		339103-1	339103-2	339103-3	339103-4	339103-5
Your Reference	UNITS	D01_20231127	T01_20231127	F6	G5	G6
Date Sampled		27/11/2023	27/11/2023	27/11/2023	27/11/2023	27/11/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023
Date analysed	-	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023
Free Cyanide in Water	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
Total Cyanide	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
Fluoride, F	mg/L	0.3	0.3	0.5	0.4	0.6

Miscellaneous Inorganics						
Our Reference		339103-6	339103-7	339103-8	339103-9	339103-10
Your Reference	UNITS	W5D	G2	N2	N8	W6D
Date Sampled		27/11/2023	27/11/2023	27/11/2023	27/11/2023	27/11/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023
Date analysed	-	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023
Free Cyanide in Water	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
Total Cyanide	mg/L	<0.004	<0.004	0.013	0.53	<0.004
Fluoride, F	mg/L	0.4	0.3	1.2	0.3	<0.1

Miscellaneous Inorganics						
Our Reference		339103-11	339103-12	339103-13	339103-14	339103-15
Your Reference	UNITS	F5	W3S	W2D	E5D	W1D
Date Sampled		27/11/2023	27/11/2023	28/11/2023	28/11/2023	28/11/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023
Date analysed	-	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023
Free Cyanide in Water	mg/L	<0.004	0.29	0.15	<0.004	<0.004
Total Cyanide	mg/L	<0.004	32	220	0.90	0.82
Fluoride, F	mg/L	0.3	180	1,100	9.1	9.4

Miscellaneous Inorganics			
Our Reference		339103-16	339103-17
Your Reference	UNITS	W1S	E4
Date Sampled		28/11/2023	28/11/2023
Type of sample		Water	Water
Date prepared	-	01/12/2023	01/12/2023
Date analysed	-	01/12/2023	01/12/2023
Free Cyanide in Water	mg/L	<0.004	0.21
Total Cyanide	mg/L	0.94	170
Fluoride, F	mg/L	8.7	760

Method ID	Methodology Summary
Inorg-014	Cyanide - free, total, weak acid dissociable by segmented flow analyser (in line dialysis with colourimetric finish). Solids/Filters and sorbents are extracted in a caustic media prior to analysis. Impingers are pH adjusted as required prior to analysis. Cyanides amenable to Chlorination - samples are analysed untreated and treated with hypochlorite to assess the potential for chlorination of cyanide forms. Based on APHA latest edition, 4500-CN_G,H.
Inorg-026	Fluoride determined by ion selective electrode (ISE) in accordance with APHA latest edition, 4500-F-C.
Metals-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Salt forms (e.g. FeO, PbO, ZnO) are determinined stoichiometrically from the base metal concentration.

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W6	339103-2
Date prepared	-			05/12/2023	1	05/12/2023	05/12/2023		05/12/2023	05/12/2023
Date analysed	-			05/12/2023	1	05/12/2023	05/12/2023		05/12/2023	05/12/2023
Aluminium-Dissolved	µg/L	10	Metals-022	<10	1	<10	<10	0	89	83

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	05/12/2023	05/12/2023		[NT]	[NT]
Date analysed	-			[NT]	11	05/12/2023	05/12/2023		[NT]	[NT]
Aluminium-Dissolved	µg/L	10	Metals-022	[NT]	11	2500	2400	4	[NT]	[NT]

QUALITY CONTROL: HM in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	339103-2
Date prepared	-			06/12/2023	1	06/12/2023	06/12/2023		06/12/2023	06/12/2023
Date analysed	-			06/12/2023	1	06/12/2023	06/12/2023		06/12/2023	06/12/2023
Aluminium-Total	µg/L	10	Metals-022	<10	1	180	160	12	112	#

QUALITY CONTROL: HM in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	06/12/2023	06/12/2023		[NT]	[NT]
Date analysed	-			[NT]	11	06/12/2023	06/12/2023		[NT]	[NT]
Aluminium-Total	µg/L	10	Metals-022	[NT]	11	2700	2700	0	[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	339103-2
Date prepared	-			01/12/2023	1	01/12/2023	01/12/2023		01/12/2023	01/12/2023
Date analysed	-			01/12/2023	1	01/12/2023	01/12/2023		01/12/2023	01/12/2023
Free Cyanide in Water	mg/L	0.004	Inorg-014	<0.004	1	<0.004	<0.004	0	98	96
Total Cyanide	mg/L	0.004	Inorg-014	<0.004	1	<0.004	<0.004	0	100	89
Fluoride, F	mg/L	0.1	Inorg-026	<0.1	1	0.3	0.3	0	100	104

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	10	01/12/2023	06/12/2023		[NT]	[NT]
Date analysed	-			[NT]	10	01/12/2023	06/12/2023		[NT]	[NT]
Free Cyanide in Water	mg/L	0.004	Inorg-014	[NT]	10	<0.004	[NT]		[NT]	[NT]
Total Cyanide	mg/L	0.004	Inorg-014	[NT]	10	<0.004	[NT]		[NT]	[NT]
Fluoride, F	mg/L	0.1	Inorg-026	[NT]	10	<0.1	<0.1	0	[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	01/12/2023	01/12/2023		[NT]	[NT]
Date analysed	-			[NT]	11	01/12/2023	01/12/2023		[NT]	[NT]
Free Cyanide in Water	mg/L	0.004	Inorg-014	[NT]	11	<0.004	<0.004	0	[NT]	[NT]
Total Cyanide	mg/L	0.004	Inorg-014	[NT]	11	<0.004	<0.004	0	[NT]	[NT]
Fluoride, F	mg/L	0.1	Inorg-026	[NT]	11	0.3	[NT]		[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

8 HM in water - total - # Percent recovery is not applicable due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 343577

Client Details

Client	Ramboll Australia Pty Ltd
Attention	J Bourke
Address	PO Box 560, North Sydney, NSW, 2060

Sample Details

Your Reference	**Hydro Groundwater Plume Monitoring - 318001662**
Number of Samples	19 Water
Date samples received	09/02/2024
Date completed instructions received	12/02/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	19/02/2024
Date of Issue	19/02/2024

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Diego Bigolin, Inorganics Supervisor
Hannah Nguyen, Metals Supervisor

Authorised By
Nancy Zhang, Laboratory Manager

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP

Client: Ramboll	Client Project Name / Number / Site etc (ie report title): Hydro Groundwater Plume Monitoring - 318001662	**Envirolab Services** 12 Ashley St, Chatswood, NSW 2067 Phone: 02 9910 6200 Fax :02 9910 6201 E-mail: ahie@envirolabservices.com.au Contact: Aileen Hie
Contact person: Jake Bourke	PO No.:	
Project Mgr: Kirsty Greenfield	Envirolab Quote No. :	
Sampler: Sam Buckley	Date results required:	**Envirolab Services WA t/a MPL** 16-18 Hayden Crt, Myaree WA 6154 Phone: 08 9317 2505 Fax :08 9317 4163 E-mail: lab@mpl.com.au Contact: Joshua Lim
Address: The Arc, 45a Watt Street Newcastle, NSW 2300	Or choose: standard / same day / 1 day / 2 day / 3 day	
	Note: Inform lab in advance if urgent turnaround is required - surcharge applies	
Phone: (02) 49625444 Mob: 0481 384 112	Lab comments: Highly contaminated	
Fax:		
Email: jkirsch@ramboll.com; jbourke@ramboll.com		

Sample information					Tests Required													Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Soluble Fluoride	Total Cyanide	Free Cyanide	Total Aluminium	Dissolved Aluminium									Provide as much information about the sample as you can
1	D01_20240206		6/02/2024	WATER	X	X	X	X	X									
2	T01_20240206		6/02/2024	WATER	X	X	X	X	X									
3	A7		7/02/2024	WATER	X	X	X	X	X									
4	E5D		7/02/2024	WATER	X	X	X	X	X									
5	E11		6/02/2024	WATER	X	X	X	X	X									
6	F5		7/02/2024	WATER	X	X	X	X	X									
7	F6		6/02/2024	WATER	X	X	X	X	X									
8	G2		6/02/2024	WATER	X	X	X	X	X									
9	G5		7/02/2024	WATER	X	X	X	X	X									
10	G6		7/02/2024	WATER	X	X	X	X	X									
11	N2		7/02/2024	WATER	X	X	X	X	X									
12	N8		6/02/2024	WATER	X	X	X	X	X									
13	W1D		7/02/2024	WATER	X	X	X	X	X									

Relinquished by (company):	Ramboll	Received by (company): ECS SYD	*Lab use only:* 343577
Print Name:	Sam Buckley	Print Name: JENNA	Samples Received: Cool or Ambient (circle one)
Date & Time:	8/02/2024	Date & Time: 9/2/24, 1040	Temperature Received at: 14°C (if applicable)
Signature:		Signature:	Transported by: Hand delivered / courier

CoC 8/2 8:31

ENVIROLAB GROUP

Client: Ramboll	Client Project Name / Number / Site etc (ie report title): Hydro Groundwater Plume Monitoring - 318001662	Envirolab Services 12 Ashley St, Chatswood, NSW 2067 Phone: 02 9910 6200 Fax :02 9910 6201 E-mail: ahie@envirolabservices.com.au Contact: Aileen Hie
Contact person: Jake Bourke	PO No.:	
Project Mgr: Kirsty Greenfield	Envirolab Quote No. :	
Sampler: Sam Buckley	Date results required:	
Address: The Arc, 45a Watt Street Newcastle, NSW 2300	Or choose: standard / same day / 1 day / 2 day / 3 day	Envirolab Services WA t/a MPL 16-18 Hayden Crt, Myaree WA 6154 Phone: 08 9317 2505 Fax :08 9317 4163 E-mail: lab@mpl.com.au Contact: Joshua Lim
Phone: (02) 49625444 Mob: 0481 384 112	*Note: Inform lab in advance if urgent turnaround is required - surcharge applies*	
Fax:	Lab comments: Highly contaminated	
Email: jkirsch@ramboll.com; jbourke@ramboll.com		

Sample information					Tests Required															Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Soluble Fluoride	Total Cyanide	Free Cyanide	Total Aluminium	Dissolved Aluminium	HOLD										Provide as much information about the sample as you can
14	W2D		7/02/2024	WATER	X	X	X	X	X											
15	W5D		7/02/2024	WATER	X	X	X	X	X											
16	W6D		7/02/2024	WATER	X	X	X	X	X											
17	W7M		7/02/2024	WATER	X	X	X	X	X											
18	R01_20240207	extra samples JN																		
19	R02_20240206																			

Relinquished by (company):	Ramboll	Received by (company): ELS SYD	Lab use only: 343577
Print Name:	Sam Buckley	Print Name: JENNA	Samples Received: Cool or Ambient (circle one)
Date & Time:	8/02/2024	Date & Time: 9/2/24, 1040	Temperature Received at: 14 (if applicable)
Signature:		Signature:	Transported by: Hand delivered / courier

updated COC 12/2/24, 0956

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP

Client: Ramboll	Client Project Name / Number / Site etc (ie report title): Hydro Groundwater Plume Monitoring - 318001662	**Envirolab Services** 12 Ashley St, Chatswood, NSW 2067 Phone: 02 9910 6200 Fax :02 9910 6201 E-mail: ahie@envirolabservices.com.au Contact: Aileen Hie
Contact person: Jake Bourke		
Project Mgr: Kirsty Greenfield	PO No.:	
Sampler: Sam Buckley	Envirolab Quote No. :	
Address: The Arc, 45a Watt Street Newcastle, NSW 2300	Date results required:	**Envirolab Services WA t/a MPL** 16-18 Hayden Crt, Myaree WA 6154 Phone: 08 9317 2505 Fax :08 9317 4163 E-mail: lab@mpl.com.au Contact: Joshua Lim
	Or choose: standard / same day / 1 day / 2 day / 3 day	
Phone: (02) 49625444 Mob: 0481 384 112	*Note: Inform lab in advance if urgent turnaround is required - surcharge applies*	
Fax:	Lab comments: Highly contaminated	
Email: jkirsch@ramboll.com; jbourke@ramboll.com		

Sample information					Tests Required													Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Soluble Fluoride	Total Cyanide	Free Cyanide	Total Aluminium	Dissolved Aluminium									Provide as much information about the sample as you can
1	D01_20240206		6/02/2024	WATER	X	X	X	X	X									
2	T01_20240206		6/02/2024	WATER	X	X	X	X	X									
3	A7		7/02/2024	WATER	X	X	X	X	X									
4	E5D		7/02/2024	WATER	X	X	X	X	X									
5	E11		6/02/2024	WATER	X	X	X	X	X									
6	F5		7/02/2024	WATER	X	X	X	X	X									
7	F6		6/02/2024	WATER	X	X	X	X	X									
8	G2		6/02/2024	WATER	X	X	X	X	X									
9	G5		7/02/2024	WATER	X	X	X	X	X									
10	G6		7/02/2024	WATER	X	X	X	X	X									
11	N2		7/02/2024	WATER	X	X	X	X	X									
12	N8		6/02/2024	WATER	X	X	X	X	X									
13	W1D		7/02/2024	WATER	X	X	X	X	X									

Relinquished by (company):	Ramboll	Received by (company):	*Lab use only:* 343571
Print Name:	Sam Buckley	Print Name:	Samples Received: Cool or Ambient (circle one)
Date & Time:	8/02/2024	Date & Time:	Temperature Received at: (if applicable)
Signature:		Signature:	Transported by: Hand delivered / courier

updated COC 12/4/24, 0956

ENVIROLAB GROUP

Client: Ramboll	Client Project Name / Number / Site etc (ie report title): Hydro Groundwater Plume Monitoring - 318001662	Envirolab Services 12 Ashley St, Chatswood, NSW 2067 Phone: 02 9910 6200 Fax :02 9910 6201 E-mail: ahie@envirolabservices.com.au Contact: Aileen Hie
Contact person: Jake Bourke		
Project Mgr: Kirsty Greenfield	PO No.:	
Sampler: Sam Buckley	Envirolab Quote No. :	
Address: The Arc, 45a Watt Street Newcastle, NSW 2300	Date results required:	
	Or choose: standard / same day / 1 day / 2 day / 3 day	Envirolab Services WA t/a MPL 16-18 Hayden Crt, Myaree WA 6154
Phone: (02) 49625444 Mob: 0481 384 112	*Note: Inform lab in advance if urgent turnaround is required - surcharge applies*	Phone: 08 9317 2505 Fax :08 9317 4163
Fax:	Lab comments: Highly contaminated	E-mail: lab@mpl.com.au
Email: jkirsch@ramboll.com; jbourke@ramboll.com		Contact: Joshua Lim

Sample information					Tests Required														Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Soluble Fluoride	Total Cyanide	Free Cyanide	Total Aluminium	Dissolved Aluminium	HOLD									Provide as much information about the sample as you can
14	W2D		7/02/2024	WATER	X	X	X	X	X										
15	W5D		7/02/2024	WATER	X	X	X	X	X										
16	W6D		7/02/2024	WATER	X	X	X	X	X										
17	W7M		7/02/2024	WATER	X	X	X	X	X										
18	R01_20240206		6/02/2024	WATER	X	X	X	X	X										
19	R02_20240207		7/02/2024	WATER	X	X	X	X	X										

Relinquished by (company):	Ramboll	Received by (company):	*Lab use only:* 343577
Print Name:	Sam Buckley	Print Name:	Samples Received: Cool or Ambient (circle one)
Date & Time:	8/02/2024	Date & Time:	Temperature Received at: (if applicable)
Signature:		Signature:	Transported by: Hand delivered / courier

HM in water - dissolved						
Our Reference		343577-1	343577-2	343577-3	343577-4	343577-5
Your Reference	UNITS	D01_20240206	T01_20240206	A7	E5D	E11
Date Sampled		07/02/2024	07/02/2024	07/02/2024	07/02/2024	07/02/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	18/02/2024	18/02/2024	18/02/2024	18/02/2024	18/02/2024
Date analysed	-	18/02/2024	18/02/2024	18/02/2024	18/02/2024	18/02/2024
Aluminium-Dissolved	µg/L	20	20	220	100	100

HM in water - dissolved						
Our Reference		343577-6	343577-7	343577-8	343577-9	343577-10
Your Reference	UNITS	F5	F6	G2	G5	G6
Date Sampled		07/02/2024	07/02/2024	07/02/2024	07/02/2024	07/02/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	18/02/2024	18/02/2024	18/02/2024	18/02/2024	18/02/2024
Date analysed	-	18/02/2024	18/02/2024	18/02/2024	18/02/2024	18/02/2024
Aluminium-Dissolved	µg/L	3,800	20	20	90	22,000

HM in water - dissolved						
Our Reference		343577-11	343577-12	343577-13	343577-14	343577-15
Your Reference	UNITS	N2	N8	W1D	W2D	W5D
Date Sampled		07/02/2024	07/02/2024	07/02/2024	07/02/2024	07/02/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	18/02/2024	18/02/2024	18/02/2024	18/02/2024	18/02/2024
Date analysed	-	18/02/2024	18/02/2024	18/02/2024	18/02/2024	18/02/2024
Aluminium-Dissolved	µg/L	5,800	80	200	530	30

HM in water - dissolved					
Our Reference		343577-16	343577-17	343577-18	343577-19
Your Reference	UNITS	W6D	W7M	R01_20240207	R02_20240206
Date Sampled		07/02/2024	07/02/2024	07/02/2024	07/02/2024
Type of sample		Water	Water	Water	Water
Date prepared	-	18/02/2024	18/02/2024	18/02/2024	18/02/2024
Date analysed	-	18/02/2024	18/02/2024	18/02/2024	18/02/2024
Aluminium-Dissolved	µg/L	30	390	20	20

HM in water - total						
Our Reference		343577-1	343577-2	343577-3	343577-4	343577-5
Your Reference	UNITS	D01_20240206	T01_20240206	A7	E5D	E11
Date Sampled		07/02/2024	07/02/2024	07/02/2024	07/02/2024	07/02/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	14/02/2024	14/02/2024	14/02/2024	14/02/2024	14/02/2024
Date analysed	-	15/02/2024	15/02/2024	15/02/2024	15/02/2024	15/02/2024
Aluminium-Total	µg/L	40	40	430	2,000	100,000

HM in water - total						
Our Reference		343577-6	343577-7	343577-8	343577-9	343577-10
Your Reference	UNITS	F5	F6	G2	G5	G6
Date Sampled		07/02/2024	07/02/2024	07/02/2024	07/02/2024	07/02/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	14/02/2024	14/02/2024	14/02/2024	14/02/2024	14/02/2024
Date analysed	-	15/02/2024	15/02/2024	15/02/2024	15/02/2024	15/02/2024
Aluminium-Total	µg/L	3,500	20	170	130	21,000

HM in water - total						
Our Reference		343577-11	343577-12	343577-13	343577-14	343577-15
Your Reference	UNITS	N2	N8	W1D	W2D	W5D
Date Sampled		07/02/2024	07/02/2024	07/02/2024	07/02/2024	07/02/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	14/02/2024	14/02/2024	14/02/2024	14/02/2024	14/02/2024
Date analysed	-	15/02/2024	15/02/2024	15/02/2024	15/02/2024	15/02/2024
Aluminium-Total	µg/L	5,700	1,700	280	1,300	80

HM in water - total					
Our Reference		343577-16	343577-17	343577-18	343577-19
Your Reference	UNITS	W6D	W7M	R01_20240207	R02_20240206
Date Sampled		07/02/2024	07/02/2024	07/02/2024	07/02/2024
Type of sample		Water	Water	Water	Water
Date prepared	-	14/02/2024	14/02/2024	14/02/2024	14/02/2024
Date analysed	-	15/02/2024	15/02/2024	15/02/2024	15/02/2024
Aluminium-Total	µg/L	430	18,000	<10	<10

Miscellaneous Inorganics						
Our Reference		343577-1	343577-2	343577-3	343577-4	343577-5
Your Reference	UNITS	D01_20240206	T01_20240206	A7	E5D	E11
Date Sampled		07/02/2024	07/02/2024	07/02/2024	07/02/2024	07/02/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	12/02/2024	12/02/2024	12/02/2024	12/02/2024	12/02/2024
Date analysed	-	12/02/2024	12/02/2024	12/02/2024	12/02/2024	12/02/2024
Free Cyanide in Water	mg/L	<0.004	<0.004	0.011	<0.004	0.007
Total Cyanide	mg/L	<0.004	<0.004	64	0.94	18
Fluoride, F	mg/L	0.5	0.5	360	8.0	890

Miscellaneous Inorganics						
Our Reference		343577-6	343577-7	343577-8	343577-9	343577-10
Your Reference	UNITS	F5	F6	G2	G5	G6
Date Sampled		07/02/2024	07/02/2024	07/02/2024	07/02/2024	07/02/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	12/02/2024	12/02/2024	12/02/2024	12/02/2024	12/02/2024
Date analysed	-	12/02/2024	12/02/2024	12/02/2024	12/02/2024	12/02/2024
Free Cyanide in Water	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
Total Cyanide	mg/L	<0.004	<0.004	<0.004	0.031	<0.004
Fluoride, F	mg/L	0.3	0.5	0.6	0.7	0.7

Miscellaneous Inorganics						
Our Reference		343577-11	343577-12	343577-13	343577-14	343577-15
Your Reference	UNITS	N2	N8	W1D	W2D	W5D
Date Sampled		07/02/2024	07/02/2024	07/02/2024	07/02/2024	07/02/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	12/02/2024	12/02/2024	12/02/2024	12/02/2024	12/02/2024
Date analysed	-	12/02/2024	12/02/2024	12/02/2024	12/02/2024	12/02/2024
Free Cyanide in Water	mg/L	<0.004	<0.004	<0.004	0.016	<0.004
Total Cyanide	mg/L	0.005	0.60	1.0	170	<0.004
Fluoride, F	mg/L	1.1	0.5	10	1,200	0.4

Miscellaneous Inorganics					
Our Reference		343577-16	343577-17	343577-18	343577-19
Your Reference	UNITS	W6D	W7M	R01_20240207	R02_20240206
Date Sampled		07/02/2024	07/02/2024	07/02/2024	07/02/2024
Type of sample		Water	Water	Water	Water
Date prepared	-	12/02/2024	12/02/2024	12/02/2024	12/02/2024
Date analysed	-	12/02/2024	12/02/2024	12/02/2024	12/02/2024
Free Cyanide in Water	mg/L	<0.004	0.015	<0.004	<0.004
Total Cyanide	mg/L	<0.004	93	<0.004	<0.004
Fluoride, F	mg/L	<0.1	7.1	<0.1	<0.1

Method ID	Methodology Summary
Inorg-014	Cyanide - free, total, weak acid dissociable by segmented flow analyser (in line dialysis with colourimetric finish). Solids/Filters and sorbents are extracted in a caustic media prior to analysis. Impingers are pH adjusted as required prior to analysis. Cyanides amenable to Chlorination - samples are analysed untreated and treated with hypochlorite to assess the potential for chlorination of cyanide forms. Based on APHA latest edition, 4500-CN_G,H.
Inorg-026	Fluoride determined by ion selective electrode (ISE) in accordance with APHA latest edition, 4500-F-C.
Metals-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Salt forms (e.g. FeO, PbO, ZnO) are determinined stoichiometrically from the base metal concentration.

QUALITY CONTROL: HM in water - dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W5	343577-2
Date prepared	-			18/02/2024	1	18/02/2024	18/02/2024		18/02/2024	18/02/2024
Date analysed	-			18/02/2024	1	18/02/2024	18/02/2024		18/02/2024	18/02/2024
Aluminium-Dissolved	µg/L	10	Metals-022	<10	1	20	20	0	105	88

QUALITY CONTROL: HM in water - dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	18/02/2024	18/02/2024		[NT]	[NT]
Date analysed	-			[NT]	11	18/02/2024	18/02/2024		[NT]	[NT]
Aluminium-Dissolved	µg/L	10	Metals-022	[NT]	11	5800	5800	0	[NT]	[NT]

QUALITY CONTROL: HM in water - total					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	343577-5
Date prepared	-			14/02/2024	2	14/02/2024	14/02/2024		14/02/2024	14/02/2024
Date analysed	-			15/02/2024	2	15/02/2024	15/02/2024		15/02/2024	15/02/2024
Aluminium-Total	µg/L	10	Metals-022	<10	2	40	40	0	93	#

QUALITY CONTROL: HM in water - total					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	12	14/02/2024	14/02/2024		[NT]	[NT]
Date analysed	-			[NT]	12	15/02/2024	15/02/2024		[NT]	[NT]
Aluminium-Total	µg/L	10	Metals-022	[NT]	12	1700	2100	21	[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	343577-2
Date prepared	-			12/02/2024	1	12/02/2024	12/02/2024		12/02/2024	12/02/2024
Date analysed	-			12/02/2024	1	12/02/2024	12/02/2024		12/02/2024	12/02/2024
Free Cyanide in Water	mg/L	0.004	Inorg-014	<0.004	1	<0.004	<0.004	0	100	93
Total Cyanide	mg/L	0.004	Inorg-014	<0.004	1	<0.004	<0.004	0	108	75
Fluoride, F	mg/L	0.1	Inorg-026	<0.1	1	0.5	0.5	0	93	100

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	343577-18
Date prepared	-			[NT]	11	12/02/2024	12/02/2024		[NT]	12/02/2024
Date analysed	-			[NT]	11	12/02/2024	12/02/2024		[NT]	12/02/2024
Free Cyanide in Water	mg/L	0.004	Inorg-014	[NT]	11	<0.004	<0.004	0	[NT]	103
Total Cyanide	mg/L	0.004	Inorg-014	[NT]	11	0.005	0.006	18	[NT]	98
Fluoride, F	mg/L	0.1	Inorg-026	[NT]	11	1.1	1.0	10	[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	343577-19
Date prepared	-			[NT]	[NT]	[NT]	[NT]	[NT]	[NT]	12/02/2024
Date analysed	-			[NT]	[NT]	[NT]	[NT]	[NT]	[NT]	12/02/2024
Free Cyanide in Water	mg/L	0.004	Inorg-014	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]	102
Total Cyanide	mg/L	0.004	Inorg-014	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]	107

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

8 HM in water - total - # Percent recovery is not applicable due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

COC @10:32 16/4

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP

Client: Ramboll	Client Project Name / Number / Site etc (ie report title): Hydro Groundwater Plume Monitoring - 318000344-003
Contact person: Sam Buckley	PO No.:
Project Mgr: Kirsty Greenfield	Envirolab Quote No. :
Sampler: Sam Buckley	Date results required:
Address: The Arc, 45a Watt Street Newcastle, NSW 2300	Or choose: standard / same day / 1 day / 2 day / 3 day
Phone: (02) 49625444 Mob: 0481 384 112	*Note: Inform lab in advance if urgent turnaround is required - surcharge applies*
Fax:	Lab comments: Highly contaminated
Email: sbuckley@ramboll.com & kgreenfield@ramboll.com	

Envirolab Services
12 Ashley St, Chatswood, NSW 2067
Phone: 02 9910 6200 Fax :02 9910 6201
E-mail: ahie@envirolabservices.com.au
Contact: Aileen Hie

Envirolab Services WA t/a MPL
16-18 Hayden Crt, Myaree WA 6154
Phone: 08 9317 2505 Fax :08 9317 4163
E-mail: lab@mpl.com.au
Contact: Joshua Lim

Sample information					Tests Required														Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Soluble Fluoride	Total Cyanide	Free Cyanide	Total Aluminium	Dissolved Aluminium										Provide as much information about the sample as you can
1	D01_20240409		09/04/2024	WATER	X	X	X	X	X										
2	T01_20240409		09/04/2024	WATER	X	X	X	X	X										
3	A7		10/04/2024	WATER	X	X	X	X	X										
4	E5D		09/04/2024	WATER	X	X	X	X	X										
5	W3S		09/04/2024	WATER	X	X	X	X	X										
6	F5		10/04/2024	WATER	X	X	X	X	X										
7	F6		10/04/2024	WATER	X	X	X	X	X										
8	G2		09/04/2024	WATER	X	X	X	X	X										
9	G5		10/04/2024	WATER	X	X	X	X	X										
10	G6		10/04/2024	WATER	X	X	X	X	X										
11	N2		10/04/2024	WATER	X	X	X	X	X										
12	N8		09/04/2024	WATER	X	X	X	X	X										
13	W1D		09/04/2024	WATER	X	X	X	X	X										

Relinquished by (company):	Ramboll	Received by (company):	ELS SMD
Print Name:	Sam Buckley	Print Name:	JENNA
Date & Time:	10/04/2024	Date & Time:	16/4/24 15/4/24, 1010
Signature:		Signature:	

Lab use only: 348911
Samples Received: Cool or Ambient (circle one)
Temperature Received at: 3°C (if applicable)
Transported by: Hand delivered / courier

ENVIROLAB GROUP

Client: Ramboll	Client Project Name / Number / Site etc (ie report title): Hydro Groundwater Plume Monitoring - 318000344-003
Contact person: Sam Buckley	PO No.:
Project Mgr: Kirsty Greenfield	Envirolab Quote No. :
Sampler: Sam Buckley	Date results required:
Address: The Arc, 45a Watt Street Newcastle, NSW 2300	Or choose: standard / same day / 1 day / 2 day / 3 day
Phone: (02) 49625444 Mob: 0481 384 112	*Note: Inform lab in advance if urgent turnaround is required - surcharge applies*
Fax:	Lab comments: Highly contaminated
Email: sbuckley@ramboll.com & kgreenfield@ramboll.com	

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Contact: Aileen Hie

Envirolab Services WA t/a MPL
16-18 Hayden Crt, Myaree WA 6154
Phone: 08 9317 2505 Fax :08 9317 4163
E-mail: lab@mpl.com.au
Contact: Joshua Lim

Sample information					Tests Required														Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Soluble Fluoride	Total Cyanide	Free Cyanide	Total Aluminium	Dissolved Aluminium	HOLD									Provide as much information about the sample as you can
14	W2D		09/04/2024	WATER	X	X	X	X	X										
15	W5D		09/04/2024	WATER	X	X	X	X	X										
16	W6D		09/04/2024	WATER	X	X	X	X	X										
17	W7M		09/04/2024	WATER	X	X	X	X	X										
18	R01_20240409		09/04/2024	WATER	X	X	X	X	X										
19	R02_20240410		10/04/2024	WATER	X	X	X	X	X										

Relinquished by (company):	Ramboll	Received by (company):	*Lab use only:* 348911
Print Name:	Sam Buckley	Print Name:	Samples Received: Cool or Ambient (circle one)
Date & Time:	10/04/2024	Date & Time:	Temperature Received at: (if applicable)
Signature:		Signature:	Transported by: Hand delivered / courier

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 348911

Client Details

Client	Ramboll Australia Pty Ltd
Attention	S Buckley
Address	PO Box 560, North Sydney, NSW, 2060

Sample Details

Your Reference	**Hydro Groundwater Plume Monitoring - 318000344-003**
Number of Samples	19 Water
Date samples received	16/04/2024
Date completed instructions received	16/04/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	23/04/2024
Date of Issue	23/04/2024

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Diego Bigolin, Inorganics Supervisor
Loren Bardwell, Development Chemist

Authorised By
Nancy Zhang, Laboratory Manager

HM in water - dissolved						
Our Reference		348911-1	348911-2	348911-3	348911-4	348911-5
Your Reference	UNITS	D01_20240409	T01_20240409	A7	E5D	W3S
Date Sampled		09/04/2024	09/04/2024	10/04/2024	09/04/2024	09/04/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Date analysed	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Aluminium-Dissolved	µg/L	<10	<10	180	10	330

HM in water - dissolved						
Our Reference		348911-6	348911-7	348911-8	348911-9	348911-10
Your Reference	UNITS	F5	F6	G2	G5	G6
Date Sampled		10/04/2024	10/04/2024	09/04/2024	10/04/2024	10/04/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Date analysed	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Aluminium-Dissolved	µg/L	2,500	<10	<10	70	16,000

HM in water - dissolved						
Our Reference		348911-11	348911-12	348911-13	348911-14	348911-15
Your Reference	UNITS	N2	N8	W1D	W2D	W5D
Date Sampled		10/04/2024	09/04/2024	09/04/2024	09/04/2024	09/04/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Date analysed	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Aluminium-Dissolved	µg/L	3,700	60	190	540	70

HM in water - dissolved					
Our Reference		348911-16	348911-17	348911-18	348911-19
Your Reference	UNITS	W6D	W7M	R01_20240409	R02_20240410
Date Sampled		09/04/2024	09/04/2024	09/04/2024	10/04/2024
Type of sample		Water	Water	Water	Water
Date prepared	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Date analysed	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Aluminium-Dissolved	µg/L	20	310	<10	<10

HM in water - total						
Our Reference		348911-1	348911-2	348911-3	348911-4	348911-5
Your Reference	UNITS	D01_20240409	T01_20240409	A7	E5D	W3S
Date Sampled		09/04/2024	09/04/2024	10/04/2024	09/04/2024	09/04/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Date analysed	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Aluminium-Total	µg/L	210	160	230	390	18,000

HM in water - total						
Our Reference		348911-6	348911-7	348911-8	348911-9	348911-10
Your Reference	UNITS	F5	F6	G2	G5	G6
Date Sampled		10/04/2024	10/04/2024	09/04/2024	10/04/2024	10/04/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Date analysed	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Aluminium-Total	µg/L	2,700	20	220	110	17,000

HM in water - total						
Our Reference		348911-11	348911-12	348911-13	348911-14	348911-15
Your Reference	UNITS	N2	N8	W1D	W2D	W5D
Date Sampled		10/04/2024	09/04/2024	09/04/2024	09/04/2024	09/04/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Date analysed	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Aluminium-Total	µg/L	4,000	23,000	310	720	340

HM in water - total					
Our Reference		348911-16	348911-17	348911-18	348911-19
Your Reference	UNITS	W6D	W7M	R01_20240409	R02_20240410
Date Sampled		09/04/2024	09/04/2024	09/04/2024	10/04/2024
Type of sample		Water	Water	Water	Water
Date prepared	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Date analysed	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Aluminium-Total	µg/L	1,200	1,400	<10	<10

Miscellaneous Inorganics						
Our Reference		348911-1	348911-2	348911-3	348911-4	348911-5
Your Reference	UNITS	D01_20240409	T01_20240409	A7	E5D	W3S
Date Sampled		09/04/2024	09/04/2024	10/04/2024	09/04/2024	09/04/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Date analysed	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Free Cyanide in Water	mg/L	<0.004	<0.004	0.005	<0.004	0.005
Total Cyanide	mg/L	<0.004	<0.004	65	0.77	30
Fluoride, F	mg/L	0.3	0.3	380	7.9	210

Miscellaneous Inorganics						
Our Reference		348911-6	348911-7	348911-8	348911-9	348911-10
Your Reference	UNITS	F5	F6	G2	G5	G6
Date Sampled		10/04/2024	10/04/2024	09/04/2024	10/04/2024	10/04/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Date analysed	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Free Cyanide in Water	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
Total Cyanide	mg/L	<0.004	0.009	<0.004	0.004	<0.004
Fluoride, F	mg/L	0.3	0.6	0.3	0.5	0.6

Miscellaneous Inorganics						
Our Reference		348911-11	348911-12	348911-13	348911-14	348911-15
Your Reference	UNITS	N2	N8	W1D	W2D	W5D
Date Sampled		10/04/2024	09/04/2024	09/04/2024	09/04/2024	09/04/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Date analysed	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Free Cyanide in Water	mg/L	<0.004	<0.004	<0.004	0.011	<0.004
Total Cyanide	mg/L	<0.004	0.58	0.71	150	0.013
Fluoride, F	mg/L	1.1	0.6	9.0	1,300	0.6

Miscellaneous Inorganics					
Our Reference		348911-16	348911-17	348911-18	348911-19
Your Reference	UNITS	W6D	W7M	R01_20240409	R02_20240410
Date Sampled		09/04/2024	09/04/2024	09/04/2024	10/04/2024
Type of sample		Water	Water	Water	Water
Date prepared	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Date analysed	-	18/04/2024	18/04/2024	18/04/2024	18/04/2024
Free Cyanide in Water	mg/L	<0.004	0.011	<0.004	<0.004
Total Cyanide	mg/L	<0.004	81	<0.004	<0.004
Fluoride, F	mg/L	<0.1	830	<0.1	<0.1

Method ID	Methodology Summary
Inorg-014	Cyanide - free, total, weak acid dissociable by segmented flow analyser (in line dialysis with colourimetric finish). Solids/Filters and sorbents are extracted in a caustic media prior to analysis. Impingers are pH adjusted as required prior to analysis. Cyanides amenable to Chlorination - samples are analysed untreated and treated with hypochlorite to assess the potential for chlorination of cyanide forms. Based on APHA latest edition, 4500-CN_G,H.
Inorg-026	Fluoride determined by ion selective electrode (ISE) in accordance with APHA latest edition, 4500-F-C.
Metals-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Salt forms (e.g. FeO, PbO, ZnO) are determinined stoichiometrically from the base metal concentration.

QUALITY CONTROL: HM in water - dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	348911-2
Date prepared	-			18/04/2024	1	18/04/2024	18/04/2024		18/04/2024	18/04/2024
Date analysed	-			18/04/2024	1	18/04/2024	18/04/2024		18/04/2024	18/04/2024
Aluminium-Dissolved	µg/L	10	Metals-022	<10	1	<10	<10	0	97	98

QUALITY CONTROL: HM in water - dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	18/04/2024	18/04/2024		[NT]	[NT]
Date analysed	-			[NT]	11	18/04/2024	18/04/2024		[NT]	[NT]
Aluminium-Dissolved	µg/L	10	Metals-022	[NT]	11	3700	3600	3	[NT]	[NT]

QUALITY CONTROL: HM in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	348911-2
Date prepared	-			18/04/2024	1	18/04/2024	18/04/2024		18/04/2024	18/04/2024
Date analysed	-			18/04/2024	1	18/04/2024	18/04/2024		18/04/2024	18/04/2024
Aluminium-Total	µg/L	10	Metals-022	<10	1	210	230	9	92	#

QUALITY CONTROL: HM in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	18/04/2024	18/04/2024		[NT]	[NT]
Date analysed	-			[NT]	11	18/04/2024	18/04/2024		[NT]	[NT]
Aluminium-Total	µg/L	10	Metals-022	[NT]	11	4000	3900	3	[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	348911-2
Date prepared	-			18/04/2024	1	18/04/2024	18/04/2024		18/04/2024	18/04/2024
Date analysed	-			18/04/2024	1	18/04/2024	18/04/2024		18/04/2024	18/04/2024
Free Cyanide in Water	mg/L	0.004	Inorg-014	<0.004	1	<0.004	<0.004	0	100	97
Total Cyanide	mg/L	0.004	Inorg-014	<0.004	1	<0.004	<0.004	0	103	86
Fluoride, F	mg/L	0.1	Inorg-026	<0.1	1	0.3	0.3	0	106	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	348911-9
Date prepared	-			[NT]	8	18/04/2024	18/04/2024		[NT]	18/04/2024
Date analysed	-			[NT]	8	18/04/2024	18/04/2024		[NT]	18/04/2024
Free Cyanide in Water	mg/L	0.004	Inorg-014	[NT]	8	<0.004	[NT]		[NT]	[NT]
Total Cyanide	mg/L	0.004	Inorg-014	[NT]	8	<0.004	[NT]		[NT]	[NT]
Fluoride, F	mg/L	0.1	Inorg-026	[NT]	8	0.3	0.3	0	[NT]	103

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	16	18/04/2024	18/04/2024		[NT]	[NT]
Date analysed	-			[NT]	16	18/04/2024	18/04/2024		[NT]	[NT]
Free Cyanide in Water	mg/L	0.004	Inorg-014	[NT]	16	<0.004	[NT]		[NT]	[NT]
Total Cyanide	mg/L	0.004	Inorg-014	[NT]	16	<0.004	[NT]		[NT]	[NT]
Fluoride, F	mg/L	0.1	Inorg-026	[NT]	16	<0.1	<0.1	0	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

8 HM in water - total - # Percent recovery is not applicable due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

coc: 19/06/24 1020

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP

ENVIROLAB

Client: Ramboll	Client Project Name / Number / Site etc (ie report title):	Envirolab Services
Contact person: Sam Buckley	Hydro Groundwater Plume Monitoring - 318000344-003	12 Ashley St, Chatswood, NSW 2067
Project Mgr: Kirsty Greenfield	PO No.:	Phone: 02 9910 6200 Fax :02 9910 6201
Sampler: Sam Buckley & Brodie Wood	Envirolab Quote No. :	E-mail: ahie@envirolabservices.com.au
Address: The Arc, 45a Watt Street Newcastle, NSW 2300	Date results required:	Contact: Aileen Hie
		Envirolab Services WA t/a MPL
	Or choose: standard / same day / 1 day / 2 day / 3 day	16-18 Hayden Crt, Myaree WA 6154
Phone: (02) 49625444 Mob: 0481 384 112	*Note: Inform lab in advance if urgent turnaround is required - surcharge applies*	Phone: 08 9317 2505 Fax :08 9317 4163
Fax:	Lab comments: Highly contaminated	E-mail: lab@mpl.com.au
Email: sbuckley@ramboll.com & kgreenfield@ramboll.com & brwood@ramboll.com		Contact: Joshua Lim

Sample information					Tests Required															Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Fluoride	Total Cyanide	Free Cyanide	Total Aluminium	Dissolved Aluminium											Provide as much information about the sample as you can
1	D01_20240618		18/06/2024	WATER	X	X	X	X	X											
2	T01_202400619		18/06/2024	WATER	X	X	X	X	X											
3	A7		17/06/2024	WATER	X	X	X	X	X											
4	E11		18/06/2024	WATER	X	X	X	X	X											
5	E4		17/06/2024	WATER	X	X	X	X	X											
6	E5		17/06/2024	WATER	X	X	X	X	X											
7	E5D		17/06/2024	WATER	X	X	X	X	X											
8	F5		17/06/2024	WATER	X	X	X	X	X											
9	F6		17/06/2024	WATER	X	X	X	X	X											
10	G2		18/06/2024	WATER	X	X	X	X	X											
11	G5		17/06/2024	WATER	X	X	X	X	X											
12	G6		17/06/2024	WATER	X	X	X	X	X											
13	N2		17/06/2024	WATER	X	X	X	X	X											
14	N8		18/06/2024	WATER	X	X	X	X	X											
15	W1D		17/06/2024	WATER	X	X	X	X	X											
16	W1S		17/06/2024	WATER	X	X	X	X	X											
17	W2D		18/06/2024	WATER	X	X	X	X	X											
18	W3S		17/06/2024	WATER	X	X	X	X	X											
19	W5D		17/06/2024	WATER	X	X	X	X	X											
20	W6D		18/06/2024	WATER	X	X	X	X	X											
21	W7M		18/06/2024	WATER	X	X	X	X	X											

Relinquished by (company): Ramboll	Received by (company): ELS	*Lab use only:* 354561
Print Name: Sam Buckley	Print Name: TT	Samples Received: Cool or Ambient (circle one) ice
Date & Time: 19/06/2024	Date & Time: 19/6/24, 1040	Temperature Received at: 2°C (if applicable)
Signature:	Signature: TT	Transported by: Hand delivered / courier

①

RE: 318000344-003 COC

Sam Buckley <SBUCKLEY@ramboll.com>
Wed 19/06/2024 15:05

To:Da-Hyun Lee <DLee@envirolab.com.au>;Brodie Wood <BRWOOD@ramboll.com>;SydneyMailbox <Sydney@envirolab.com.au>
Cc:Customer Service <CustomerService@envirolab.com.au>;Kirsty Greenfield <kgreenfield@ramboll.com>

Hi,

Yes there should have been two eskies sent off, both packaged in carboard boxes.

Sample ID W36 should correspond to W3S

Kind regards

Sam Buckley

Bachelor of Environmental Science and Management

Environmental Scientist

Environment & Health

M +61481384112

sbuckley@ramboll.com

Ramboll
The Arc, 45a Watt St

Newcastle, NSW 2300

https://www.ramboll.com/

Ramboll Australia Pty Ltd.

ACN 095 437 442

ABN 49 095 437 442

Classification: Confidential

From: Da-Hyun Lee <DLee@envirolab.com.au>
Sent: Wednesday, June 19, 2024 12:58 PM
To: Brodie Wood <BRWOOD@ramboll.com>; SydneyMailbox <Sydney@envirolab.com.au>
Cc: Customer Service <CustomerService@envirolab.com.au>; Sam Buckley <SBUCKLEY@ramboll.com>; Kirsty Greenfield

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
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customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 354561

Client Details

Client	Ramboll (Newcastle) Australia Pty Ltd
Attention	Kirsty Greenfield
Address	Suite 18, Level 2, 50 Glebe Rd, The Junction, NSW, 2291

Sample Details

Your Reference	**Hydro Groundwater Plume Monitoring - 318000344-003**
Number of Samples	21 Water
Date samples received	21/06/2024
Date completed instructions received	19/06/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	28/06/2024
Date of Issue	28/06/2024

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Diego Bigolin, Inorganics Supervisor
Giovanni Agosti, Group Technical Manager

Authorised By
Nancy Zhang, Laboratory Manager

HM in water - dissolved						
Our Reference		354561-1	354561-2	354561-3	354561-4	354561-5
Your Reference	UNITS	D01_20240618	T01_202400619	A7	E11	E4
Date Sampled		18/06/2024	18/06/2024	17/06/2024	18/06/2024	17/06/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	26/06/2024	26/06/2024	26/06/2024	26/06/2024	26/06/2024
Date analysed	-	26/06/2024	26/06/2024	26/06/2024	26/06/2024	26/06/2024
Aluminium-Dissolved	µg/L	50	40	150	3,100	270

HM in water - dissolved						
Our Reference		354561-6	354561-7	354561-8	354561-9	354561-10
Your Reference	UNITS	E5	E5D	F5	F6	G2
Date Sampled		17/06/2024	17/06/2024	17/06/2024	17/06/2024	18/06/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	26/06/2024	26/06/2024	26/06/2024	26/06/2024	26/06/2024
Date analysed	-	26/06/2024	26/06/2024	26/06/2024	26/06/2024	26/06/2024
Aluminium-Dissolved	µg/L	70	<10	2,700	<10	<10

HM in water - dissolved						
Our Reference		354561-11	354561-12	354561-13	354561-14	354561-15
Your Reference	UNITS	G5	G6	N2	N8	W1D
Date Sampled		17/06/2024	17/06/2024	17/06/2024	18/06/2024	17/06/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	26/06/2024	26/06/2024	26/06/2024	26/06/2024	26/06/2024
Date analysed	-	26/06/2024	26/06/2024	26/06/2024	26/06/2024	26/06/2024
Aluminium-Dissolved	µg/L	30	14,000	3,000	50	140

HM in water - dissolved						
Our Reference		354561-16	354561-17	354561-18	354561-19	354561-20
Your Reference	UNITS	W1S	W2D	W3S	W5D	W6D
Date Sampled		17/06/2024	18/06/2024	17/06/2024	17/06/2024	18/06/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	26/06/2024	26/06/2024	26/06/2024	26/06/2024	26/06/2024
Date analysed	-	26/06/2024	26/06/2024	26/06/2024	26/06/2024	26/06/2024
Aluminium-Dissolved	µg/L	130	470	350	30	40

HM in water - dissolved		
Our Reference		354561-21
Your Reference	UNITS	W7M
Date Sampled		18/06/2024
Type of sample		Water
Date prepared	-	26/06/2024
Date analysed	-	26/06/2024
Aluminium-Dissolved	µg/L	190

HM in water - total						
Our Reference		354561-1	354561-2	354561-3	354561-4	354561-5
Your Reference	UNITS	D01_20240618	T01_202400619	A7	E11	E4
Date Sampled		18/06/2024	18/06/2024	17/06/2024	18/06/2024	17/06/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	26/06/2024	26/06/2024	26/06/2024	26/06/2024	26/06/2024
Date analysed	-	26/06/2024	26/06/2024	26/06/2024	26/06/2024	26/06/2024
Aluminium-Total	µg/L	190	250	150	19,000	530

HM in water - total						
Our Reference		354561-6	354561-7	354561-8	354561-9	354561-10
Your Reference	UNITS	E5	E5D	F5	F6	G2
Date Sampled		17/06/2024	17/06/2024	17/06/2024	17/06/2024	18/06/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	26/06/2024	26/06/2024	26/06/2024	26/06/2024	26/06/2024
Date analysed	-	26/06/2024	26/06/2024	26/06/2024	26/06/2024	26/06/2024
Aluminium-Total	µg/L	360	160	2,800	10	50

HM in water - total						
Our Reference		354561-11	354561-12	354561-13	354561-14	354561-15
Your Reference	UNITS	G5	G6	N2	N8	W1D
Date Sampled		17/06/2024	17/06/2024	17/06/2024	18/06/2024	17/06/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	26/06/2024	26/06/2024	26/06/2024	26/06/2024	26/06/2024
Date analysed	-	26/06/2024	26/06/2024	26/06/2024	26/06/2024	26/06/2024
Aluminium-Total	µg/L	60	14,000	3,200	240	210

HM in water - total						
Our Reference		354561-16	354561-17	354561-18	354561-19	354561-20
Your Reference	UNITS	W1S	W2D	W3S	W5D	W6D
Date Sampled		17/06/2024	18/06/2024	17/06/2024	17/06/2024	18/06/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	26/06/2024	26/06/2024	26/06/2024	26/06/2024	26/06/2024
Date analysed	-	26/06/2024	26/06/2024	26/06/2024	26/06/2024	26/06/2024
Aluminium-Total	µg/L	1,300	560	2,000	240	540

HM in water - total		
Our Reference		354561-21
Your Reference	UNITS	W7M
Date Sampled		18/06/2024
Type of sample		Water
Date prepared	-	26/06/2024
Date analysed	-	26/06/2024
Aluminium-Total	µg/L	760

Miscellaneous Inorganics						
Our Reference		354561-1	354561-2	354561-3	354561-4	354561-5
Your Reference	UNITS	D01_20240618	T01_202400619	A7	E11	E4
Date Sampled		18/06/2024	18/06/2024	17/06/2024	18/06/2024	17/06/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	24/06/2024	24/06/2024	24/06/2024	24/06/2024	24/06/2024
Date analysed	-	24/06/2024	24/06/2024	24/06/2024	24/06/2024	24/06/2024
Free Cyanide in Water	mg/L	<0.004	<0.004	0.011	<0.004	0.021
Total Cyanide	mg/L	0.39	0.40	85	<0.004	130
Fluoride, F	mg/L	0.6	0.6	430	2.0	590

Miscellaneous Inorganics						
Our Reference		354561-6	354561-7	354561-8	354561-9	354561-10
Your Reference	UNITS	E5	E5D	F5	F6	G2
Date Sampled		17/06/2024	17/06/2024	17/06/2024	17/06/2024	18/06/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	24/06/2024	24/06/2024	24/06/2024	24/06/2024	24/06/2024
Date analysed	-	24/06/2024	24/06/2024	24/06/2024	24/06/2024	24/06/2024
Free Cyanide in Water	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
Total Cyanide	mg/L	69	0.78	<0.004	<0.004	<0.004
Fluoride, F	mg/L	270	8.0	0.2	0.6	0.4

Miscellaneous Inorganics						
Our Reference		354561-11	354561-12	354561-13	354561-14	354561-15
Your Reference	UNITS	G5	G6	N2	N8	W1D
Date Sampled		17/06/2024	17/06/2024	17/06/2024	18/06/2024	17/06/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	24/06/2024	24/06/2024	24/06/2024	24/06/2024	24/06/2024
Date analysed	-	24/06/2024	24/06/2024	24/06/2024	24/06/2024	24/06/2024
Free Cyanide in Water	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
Total Cyanide	mg/L	<0.004	<0.004	0.005	0.38	0.73
Fluoride, F	mg/L	0.1	0.6	0.8	0.5	8.8

Miscellaneous Inorganics						
Our Reference		354561-16	354561-17	354561-18	354561-19	354561-20
Your Reference	UNITS	W1S	W2D	W3S	W5D	W6D
Date Sampled		17/06/2024	18/06/2024	17/06/2024	17/06/2024	18/06/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	24/06/2024	24/06/2024	24/06/2024	24/06/2024	24/06/2024
Date analysed	-	24/06/2024	24/06/2024	24/06/2024	24/06/2024	24/06/2024
Free Cyanide in Water	mg/L	<0.004	0.040	<0.004	<0.004	<0.004
Total Cyanide	mg/L	1.1	250	35	<0.004	<0.004
Fluoride, F	mg/L	10	1,200	180	0.4	0.1

Miscellaneous Inorganics		
Our Reference		354561-21
Your Reference	UNITS	W7M
Date Sampled		18/06/2024
Type of sample		Water
Date prepared	-	24/06/2024
Date analysed	-	24/06/2024
Free Cyanide in Water	mg/L	0.017
Total Cyanide	mg/L	110
Fluoride, F	mg/L	670

Method ID	Methodology Summary
Inorg-014	Cyanide - free, total, weak acid dissociable by segmented flow analyser (in line dialysis with colourimetric finish). Solids/Filters and sorbents are extracted in a caustic media prior to analysis. Impingers are pH adjusted as required prior to analysis. Cyanides amenable to Chlorination - samples are analysed untreated and treated with hypochlorite to assess the potential for chlorination of cyanide forms. Based on APHA latest edition, 4500-CN_G,H.
Inorg-026	Fluoride determined by ion selective electrode (ISE) in accordance with APHA latest edition, 4500-F-C.
Metals-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Salt forms (e.g. FeO, PbO, ZnO) are determined stoichiometrically from the base metal concentration.

QUALITY CONTROL: HM in water - dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W6	354561-2
Date prepared	-			26/06/2024	1	26/06/2024	26/06/2024		26/06/2024	26/06/2024
Date analysed	-			26/06/2024	1	26/06/2024	26/06/2024		26/06/2024	26/06/2024
Aluminium-Dissolved	µg/L	10	Metals-022	<10	1	50	30	50	96	89

QUALITY CONTROL: HM in water - dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W7	[NT]
Date prepared	-			[NT]	11	26/06/2024	26/06/2024		26/06/2024	[NT]
Date analysed	-			[NT]	11	26/06/2024	26/06/2024		26/06/2024	[NT]
Aluminium-Dissolved	µg/L	10	Metals-022	[NT]	11	30	30	0	94	[NT]

QUALITY CONTROL: HM in water - dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	21	26/06/2024	26/06/2024		[NT]	[NT]
Date analysed	-			[NT]	21	26/06/2024	26/06/2024		[NT]	[NT]
Aluminium-Dissolved	µg/L	10	Metals-022	[NT]	21	190	200	5	[NT]	[NT]

QUALITY CONTROL: HM in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	354561-2
Date prepared	-			26/06/2024	1	26/06/2024	26/06/2024		26/06/2024	26/06/2024
Date analysed	-			26/06/2024	1	26/06/2024	26/06/2024		26/06/2024	26/06/2024
Aluminium-Total	µg/L	10	Metals-022	<10	1	190	190	0	96	#

QUALITY CONTROL: HM in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date prepared	-			[NT]	11	26/06/2024	26/06/2024		26/06/2024	[NT]
Date analysed	-			[NT]	11	26/06/2024	26/06/2024		26/06/2024	[NT]
Aluminium-Total	µg/L	10	Metals-022	[NT]	11	60	50	18	96	[NT]

QUALITY CONTROL: HM in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	21	26/06/2024	26/06/2024		[NT]	[NT]
Date analysed	-			[NT]	21	26/06/2024	26/06/2024		[NT]	[NT]
Aluminium-Total	µg/L	10	Metals-022	[NT]	21	760	690	10	[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	354561-2
Date prepared	-			24/06/2024	1	24/06/2024	24/06/2024		24/06/2024	24/06/2024
Date analysed	-			24/06/2024	1	24/06/2024	24/06/2024		24/06/2024	24/06/2024
Free Cyanide in Water	mg/L	0.004	Inorg-014	<0.004	1	<0.004	<0.004	0	100	#
Total Cyanide	mg/L	0.004	Inorg-014	<0.004	1	0.39	0.39	0	95	#
Fluoride, F	mg/L	0.1	Inorg-026	<0.1	1	0.6	0.5	18	101	101

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	354561-20
Date prepared	-			[NT]	11	24/06/2024	24/06/2024		24/06/2024	24/06/2024
Date analysed	-			[NT]	11	24/06/2024	24/06/2024		24/06/2024	24/06/2024
Free Cyanide in Water	mg/L	0.004	Inorg-014	[NT]	11	<0.004	<0.004	0	99	#
Total Cyanide	mg/L	0.004	Inorg-014	[NT]	11	<0.004	<0.004	0	107	#
Fluoride, F	mg/L	0.1	Inorg-026	[NT]	11	0.1	0.1	0	103	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	20	24/06/2024	24/06/2024		[NT]	[NT]
Date analysed	-			[NT]	20	24/06/2024	24/06/2024		[NT]	[NT]
Free Cyanide in Water	mg/L	0.004	Inorg-014	[NT]	20	<0.004	[NT]		[NT]	[NT]
Total Cyanide	mg/L	0.004	Inorg-014	[NT]	20	<0.004	[NT]		[NT]	[NT]
Fluoride, F	mg/L	0.1	Inorg-026	[NT]	20	0.1	0.1	0	[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	21	24/06/2024	24/06/2024		[NT]	[NT]
Date analysed	-			[NT]	21	24/06/2024	24/06/2024		[NT]	[NT]
Free Cyanide in Water	mg/L	0.004	Inorg-014	[NT]	21	0.017	0.018	6	[NT]	[NT]
Total Cyanide	mg/L	0.004	Inorg-014	[NT]	21	110	100	10	[NT]	[NT]
Fluoride, F	mg/L	0.1	Inorg-026	[NT]	21	670	[NT]		[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

8 HM in water - total - # Percent recovery is not applicable due to the high concentration of the element in the sample. However an acceptable recovery was obtained for the LCS.

MISC_INORG: # Percent recovery is not possible to report due to the high concentration of the analyte/s in the sample/s. However an acceptable recovery was obtained for the LCS.

COC 20108/24, 1509

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP

Client: Ramboll	Client Project Name / Number / Site etc (ie report title): Hydro Groundwater Plume Monitoring - 318000344-003	Envirolab Services 12 Ashley St, Chatswood, NSW 2067 Phone: 02 9910 6200 Fax :02 9910 6201 E-mail: ahie@envirolabservices.com.au Contact: Aileen Hie
Contact person: Matilda Englert	PO No.:	
Project Mgr: Kirsty Greenfield	Envirolab Quote No. :	
Sampler: Matilda Englert	Date results required:	
Address: The Arc, 45a Watt Street Newcastle, NSW 2300	Or choose: standard / same day / 1 day / 2 day / 3 day	Envirolab Services WA t/a MPL 16-18 Hayden Crt, Myaree WA 6154 Phone: 08 9317 2505 Fax :08 9317 4163 E-mail: lab@mpl.com.au Contact: Joshua Lim
Phone: (02) 49625444 Mob: 0473 014 006	*Note: Inform lab in advance if urgent turnaround is required - surcharge applies*	
Fax:	Lab comments: Highly contaminated	
Email: sbuckley@ramboll.com, menglert@ramboll.com & kgreenfield@ramboll.com		

Sample Information					Tests Required													Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Fluoride	Total Cyanide	Free Cyanide	Total Aluminium	Dissolved Aluminium									Provide as much information about the sample as you can
1	D01_20240813		13/08/2024	WATER	X	X	X	X	X									Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
2	T01_20240813		13/08/2024	WATER	x	x	x	x	x									Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
3	W5D		13/08/2024	WATER	x	x	x	x	x									Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
4	F5		13/08/2024	WATER	x	x	x	x	x									Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
5	F6		13/08/2024	WATER	x	x	x	x	x									Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
6	G5		13/08/2024	WATER	x	x	x	x	x									Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
7	G6		13/08/2024	WATER	x	x	x	x	x									Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
8	N2		13/08/2024	WATER	x	x	x	x	x									Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
9	E11		13/08/2024	WATER	x	x	x	x	x									Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
10	G2		14/08/2024	WATER	x	x	x	x	x									Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
11	N8		14/08/2024	WATER	x	x	x	x	x									Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
12	N9		14/08/2024	WATER	x	x	x	x	x									Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
13	W6D		14/08/2024	WATER	x	x	x	x	x									Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
14	WS3		14/08/2024	WATER	x	x	x	x	x									Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
15	E4		15/08/2024	WATER	x	x	x	x	x									Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
16	E5D		15/08/2024	WATER	x	x	x	x	x									Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
17	W1D		15/08/2024	WATER	x	x	x	x	x									Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
18	W1S		15/08/2024	WATER	x	x	x	x	x									Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
19	W2D		15/08/2024	WATER	x	x	x	x	x									Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
20	W7M		15/08/2024	WATER	x	x	x	x	x									Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
21	R01_20240815		15/08/2024	WATER	x	x	x	x	x									Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
22	R02_20240815		15/08/2024	WATER	x	x	x	x	x									Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed

Relinquished by (company): Ramboll	Received by (company): EJ SYD	*Lab use only:*	#350612.
Print Name: Matilda Englert	Print Name: [illegible]	Samples Received: Cool or Ambient (circle one)	
Date & Time:	Date & Time: 20/8/24 1120	Temperature Received at: 9°C (if applicable)	
Signature:	Signature:	Transported by: Hand delivered / courier	

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
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CERTIFICATE OF ANALYSIS 359612

Client Details

Client	Ramboll Australia Pty Ltd
Attention	M englert
Address	PO Box 560, North Sydney, NSW, 2060

Sample Details

Your Reference	**Hydro Groundwater Plume Monitoring - 318000344-003**
Number of Samples	22 Water
Date samples received	20/08/2024
Date completed instructions received	20/08/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	27/08/2024
Date of Issue	27/08/2024

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Diego Bigolin, Inorganics Supervisor
Loren Bardwell, Development Chemist

Authorised By
Nancy Zhang, Laboratory Manager

HM in water - dissolved						
Our Reference		359612-1	359612-2	359612-3	359612-4	359612-5
Your Reference	UNITS	D01_20240813	T01_20240813	W5D	F5	F6
Date Sampled		13/08/2024	13/08/2024	13/08/2024	13/08/2024	13/08/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	23/08/2024	23/08/2024	23/08/2024	23/08/2024	23/08/2024
Date analysed	-	23/08/2024	23/08/2024	23/08/2024	23/08/2024	23/08/2024
Aluminium-Dissolved	µg/L	14,000	13,000	10	2,900	<10

HM in water - dissolved						
Our Reference		359612-6	359612-7	359612-8	359612-9	359612-10
Your Reference	UNITS	G5	G6	N2	E11	G2
Date Sampled		13/08/2024	13/08/2024	13/08/2024	13/08/2024	14/08/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	23/08/2024	23/08/2024	23/08/2024	23/08/2024	23/08/2024
Date analysed	-	23/08/2024	23/08/2024	23/08/2024	23/08/2024	23/08/2024
Aluminium-Dissolved	µg/L	30	14,000	3,200	7,600	<10

HM in water - dissolved						
Our Reference		359612-11	359612-12	359612-13	359612-14	359612-15
Your Reference	UNITS	N8	N9	W6D	WS3	E4
Date Sampled		14/08/2024	14/08/2024	14/08/2024	14/08/2024	15/08/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	23/08/2024	23/08/2024	23/08/2024	23/08/2024	23/08/2024
Date analysed	-	23/08/2024	23/08/2024	23/08/2024	23/08/2024	23/08/2024
Aluminium-Dissolved	µg/L	30	990	10	400	270

HM in water - dissolved						
Our Reference		359612-16	359612-17	359612-18	359612-19	359612-20
Your Reference	UNITS	E5D	W1D	W1S	W2D	W7M
Date Sampled		15/08/2024	15/08/2024	15/08/2024	15/08/2024	15/08/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	23/08/2024	23/08/2024	23/08/2024	23/08/2024	23/08/2024
Date analysed	-	23/08/2024	23/08/2024	23/08/2024	23/08/2024	23/08/2024
Aluminium-Dissolved	µg/L	<10	70	3,900	440	400

HM in water - dissolved			
Our Reference		359612-21	359612-22
Your Reference	UNITS	R01_20240815	R02_20240815
Date Sampled		15/08/2024	15/08/2024
Type of sample		Water	Water
Date prepared	-	23/08/2024	23/08/2024
Date analysed	-	23/08/2024	23/08/2024
Aluminium-Dissolved	µg/L	<10	<10

HM in water - total						
Our Reference		359612-1	359612-2	359612-3	359612-4	359612-5
Your Reference	UNITS	D01_20240813	T01_20240813	W5D	F5	F6
Date Sampled		13/08/2024	13/08/2024	13/08/2024	13/08/2024	13/08/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	26/08/2024	26/08/2024	26/08/2024	26/08/2024	26/08/2024
Date analysed	-	26/08/2024	26/08/2024	26/08/2024	26/08/2024	26/08/2024
Aluminium-Total	µg/L	16,000	15,000	1,600	3,500	10

HM in water - total						
Our Reference		359612-6	359612-7	359612-8	359612-9	359612-10
Your Reference	UNITS	G5	G6	N2	E11	G2
Date Sampled		13/08/2024	13/08/2024	13/08/2024	13/08/2024	14/08/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	26/08/2024	26/08/2024	26/08/2024	26/08/2024	26/08/2024
Date analysed	-	26/08/2024	26/08/2024	26/08/2024	26/08/2024	26/08/2024
Aluminium-Total	µg/L	120	16,000	3,800	15,000	20

HM in water - total						
Our Reference		359612-11	359612-12	359612-13	359612-14	359612-15
Your Reference	UNITS	N8	N9	W6D	WS3	E4
Date Sampled		14/08/2024	14/08/2024	14/08/2024	14/08/2024	15/08/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	26/08/2024	26/08/2024	26/08/2024	26/08/2024	26/08/2024
Date analysed	-	26/08/2024	26/08/2024	26/08/2024	26/08/2024	26/08/2024
Aluminium-Total	µg/L	850	5,200	150	1,900	410

HM in water - total						
Our Reference		359612-16	359612-17	359612-18	359612-19	359612-20
Your Reference	UNITS	E5D	W1D	W1S	W2D	W7M
Date Sampled		15/08/2024	15/08/2024	15/08/2024	15/08/2024	15/08/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	26/08/2024	26/08/2024	26/08/2024	26/08/2024	26/08/2024
Date analysed	-	26/08/2024	26/08/2024	26/08/2024	26/08/2024	26/08/2024
Aluminium-Total	µg/L	210	150	2,500	450	420

HM in water - total			
Our Reference		359612-21	359612-22
Your Reference	UNITS	R01_20240815	R02_20240815
Date Sampled		15/08/2024	15/08/2024
Type of sample		Water	Water
Date prepared	-	26/08/2024	26/08/2024
Date analysed	-	26/08/2024	26/08/2024
Aluminium-Total	µg/L	<10	<10

Miscellaneous Inorganics						
Our Reference		359612-1	359612-2	359612-3	359612-4	359612-5
Your Reference	UNITS	D01_20240813	T01_20240813	W5D	F5	F6
Date Sampled		13/08/2024	13/08/2024	13/08/2024	13/08/2024	13/08/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024
Date analysed	-	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024
Fluoride, F	mg/L	0.6	0.6	0.3	0.2	0.6
Total Cyanide	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
Free Cyanide in Water	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004

Miscellaneous Inorganics						
Our Reference		359612-6	359612-7	359612-8	359612-9	359612-10
Your Reference	UNITS	G5	G6	N2	E11	G2
Date Sampled		13/08/2024	13/08/2024	13/08/2024	13/08/2024	14/08/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024
Date analysed	-	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024
Fluoride, F	mg/L	0.1	0.6	0.9	110	0.3
Total Cyanide	mg/L	<0.004	<0.004	<0.004	8.5	<0.004
Free Cyanide in Water	mg/L	<0.004	<0.004	<0.004	0.01	<0.004

Miscellaneous Inorganics						
Our Reference		359612-11	359612-12	359612-13	359612-14	359612-15
Your Reference	UNITS	N8	N9	W6D	WS3	E4
Date Sampled		14/08/2024	14/08/2024	14/08/2024	14/08/2024	15/08/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024
Date analysed	-	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024
Fluoride, F	mg/L	0.6	56	0.1	160	580
Total Cyanide	mg/L	0.64	0.44	<0.004	1.7	11
Free Cyanide in Water	mg/L	<0.004	<0.004	<0.004	<0.004	0.020

Miscellaneous Inorganics						
Our Reference		359612-16	359612-17	359612-18	359612-19	359612-20
Your Reference	UNITS	E5D	W1D	W1S	W2D	W7M
Date Sampled		15/08/2024	15/08/2024	15/08/2024	15/08/2024	15/08/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024
Date analysed	-	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024
Fluoride, F	mg/L	7.5	9.4	11	1,300	740
Total Cyanide	mg/L	0.86	1.1	1.5	20	12
Free Cyanide in Water	mg/L	<0.004	<0.004	<0.004	0.042	0.031

Miscellaneous Inorganics			
Our Reference		359612-21	359612-22
Your Reference	UNITS	R01_20240815	R02_20240815
Date Sampled		15/08/2024	15/08/2024
Type of sample		Water	Water
Date prepared	-	21/08/2024	21/08/2024
Date analysed	-	21/08/2024	21/08/2024
Fluoride, F	mg/L	<0.1	<0.1
Total Cyanide	mg/L	<0.004	<0.004
Free Cyanide in Water	mg/L	<0.004	<0.004

Method ID	Methodology Summary
Inorg-014	Cyanide - free, total, weak acid dissociable by segmented flow analyser (in line dialysis with colourimetric finish). Solids/Filters and sorbents are extracted in a caustic media prior to analysis. Impingers are pH adjusted as required prior to analysis. Cyanides amenable to Chlorination - samples are analysed untreated and treated with hypochlorite to assess the potential for chlorination of cyanide forms. Based on APHA latest edition, 4500-CN_G,H.
Inorg-026	Fluoride determined by ion selective electrode (ISE) in accordance with APHA latest edition, 4500-F-C.
Metals-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Salt forms (e.g. FeO, PbO, ZnO) are determined stoichiometrically from the base metal concentration.

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W7	359612-4
Date prepared	-			23/08/2024	3	23/08/2024	23/08/2024		23/08/2024	23/08/2024
Date analysed	-			23/08/2024	3	23/08/2024	23/08/2024		23/08/2024	23/08/2024
Aluminium-Dissolved	µg/L	10	Metals-022	<10	3	10	<10	0	101	#

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W8	359612-14
Date prepared	-			[NT]	11	23/08/2024	23/08/2024		23/08/2024	23/08/2024
Date analysed	-			[NT]	11	23/08/2024	23/08/2024		23/08/2024	23/08/2024
Aluminium-Dissolved	µg/L	10	Metals-022	[NT]	11	30	30	0	98	#

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	19	23/08/2024	23/08/2024		[NT]	[NT]
Date analysed	-			[NT]	19	23/08/2024	23/08/2024		[NT]	[NT]
Aluminium-Dissolved	µg/L	10	Metals-022	[NT]	19	440	470	7	[NT]	[NT]

QUALITY CONTROL: HM in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	359612-2
Date prepared	-			26/08/2024	1	26/08/2024	26/08/2024		26/08/2024	26/08/2024
Date analysed	-			26/08/2024	1	26/08/2024	26/08/2024		26/08/2024	26/08/2024
Aluminium-Total	µg/L	10	Metals-022	<10	1	16000	15000	6	98	#

QUALITY CONTROL: HM in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	359612-18
Date prepared	-			[NT]	11	26/08/2024	26/08/2024		26/08/2024	26/08/2024
Date analysed	-			[NT]	11	26/08/2024	26/08/2024		26/08/2024	26/08/2024
Aluminium-Total	µg/L	10	Metals-022	[NT]	11	850	710	18	95	#

QUALITY CONTROL: HM in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	19	26/08/2024	26/08/2024		[NT]	[NT]
Date analysed	-			[NT]	19	26/08/2024	26/08/2024		[NT]	[NT]
Aluminium-Total	µg/L	10	Metals-022	[NT]	19	450	390	14	[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	359612-2
Date prepared	-			21/08/2024	1	21/08/2024	21/08/2024		21/08/2024	21/08/2024
Date analysed	-			21/08/2024	1	21/08/2024	21/08/2024		21/08/2024	21/08/2024
Fluoride, F	mg/L	0.1	Inorg-026	<0.1	1	0.6	0.6	0	99	72
Total Cyanide	mg/L	0.004	Inorg-014	<0.004	1	<0.004	<0.004	0	104	85
Free Cyanide in Water	mg/L	0.004	Inorg-014	<0.004	1	<0.004	<0.004	0	96	95

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	359612-22
Date prepared	-			[NT]	11	21/08/2024	21/08/2024		21/08/2024	21/08/2024
Date analysed	-			[NT]	11	21/08/2024	21/08/2024		21/08/2024	21/08/2024
Fluoride, F	mg/L	0.1	Inorg-026	[NT]	11	0.6	0.5	18	100	104
Total Cyanide	mg/L	0.004	Inorg-014	[NT]	11	0.64	0.54	17	103	89
Free Cyanide in Water	mg/L	0.004	Inorg-014	[NT]	11	<0.004	<0.004	0	100	85

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	19	21/08/2024	21/08/2024		[NT]	[NT]
Date analysed	-			[NT]	19	21/08/2024	21/08/2024		[NT]	[NT]
Fluoride, F	mg/L	0.1	Inorg-026	[NT]	19	1300	[NT]		[NT]	[NT]
Total Cyanide	mg/L	0.004	Inorg-014	[NT]	19	20	[NT]		[NT]	[NT]
Free Cyanide in Water	mg/L	0.004	Inorg-014	[NT]	19	0.042	0.047	11	[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	21	21/08/2024	21/08/2024		[NT]	[NT]
Date analysed	-			[NT]	21	21/08/2024	21/08/2024		[NT]	[NT]
Fluoride, F	mg/L	0.1	Inorg-026	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Total Cyanide	mg/L	0.004	Inorg-014	[NT]	21	<0.004	<0.004	0	[NT]	[NT]
Free Cyanide in Water	mg/L	0.004	Inorg-014	[NT]	21	<0.004	<0.004	0	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

8 HM in water - dissolved - # Percent recovery is not applicable due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

8 HM in water - total - # Percent recovery is not applicable due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

TRACE METALS: In theory the total metal content should be higher than the dissolved metal content. However, in some samples this is not the case. The sample has been re-analysed for both Total and Dissolved metals and results have been confirmed.

COC: 16.10.24 0930

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP

ENVIROLAB

Client: Ramboll	Client Project Name / Number / Site etc (ie report title): Hydro Groundwater Plume Monitoring - 318000344-003	**Envirolab Services** 12 Ashley St, Chatswood, NSW 2067 Phone: 02 9910 6200 Fax :02 9910 6201 E-mail: ahie@envirolabservices.com.au Contact: Aileen Hie
Contact person: Matilda Englert	PO No.:	
Project Mgr: Kirsty Greenfield	Envirolab Quote No. :	
Sampler: Matilda Englert	Date results required:	
Address: The Arc, 45a Watt Street Newcastle, NSW 2300	Or choose: standard / same day / 1 day / 2 day / 3 day *Note: Inform lab in advance if urgent turnaround is required - surcharge applies*	**Envirolab Services WA t/a MPL** 16-18 Hayden Crt, Myaree WA 6154 Phone: 08 9317 2505 Fax :08 9317 4163 E-mail: lab@mpl.com.au Contact: Joshua Lim
Phone: (02) 49625444 Mob: 0473 014 006	Lab comments: Highly contaminated	
Fax:		
Email: sbuckley@ramboll.com, menglert@ramboll.com & kgreenfield@ramboll.com		

Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Fluoride	Total Cyanide	Free Cyanide	Total Aluminium	Dissolved Aluminium	Comments: Provide as much information about the sample as you can
1	W1S		15/10/24	WATER	X	X	X	X	X	Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
2	W1D		15/10/24	WATER	X	X	X	X	X	Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
3	W2D		15/10/24	WATER	X	X	X	X	X	Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
4	W3S		15/10/24	WATER	X	X	X	X	X	Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
5	W7M		15/10/24	WATER	X	X	X	X	X	Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
6	A7		15/10/24	WATER	X	X	X	X	X	Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
7	E4		15/10/24	WATER	X	X	X	X	X	Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
8	E5		15/10/24	WATER	X	X	X	X	X	Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
9	E5D		15/10/24	WATER	X	X	X	X	X	Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
10	N9		15/10/24	WATER	X	X	X	X	X	Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
11	D01_20241015		15/10/24	WATER	X	X	X	X	X	Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
1 SO	T01_20241015		15/10/24	WATER	X	X	X	X	X	Please forward to ALS
12	R01_20241015		15/10/24	WATER	X	X	X	X	X	Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
13	R02_20241015		15/10/24	WATER	X	X	X	X	X	Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
14	W5D		14/10/24	WATER	X	X	X	X	X	Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
15	F6		14/10/24	WATER	X	X	X	X	X	Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
16	G6		14/10/24	WATER	X	X	X	X	X	Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
17	F5		14/10/24	WATER	X	X	X	X	X	Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
18	G5		14/10/24	WATER	X	X	X	X	X	Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
19	N2		14/10/24	WATER	X	X	X	X	X	Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
20	G2		14/10/24	WATER	X	X	X	X	X	Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
21	N8		14/10/24	WATER	X	X	X	X	X	Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
22	D02_20241014		14/10/24	WATER	X	X	X	X	X	Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed
2 SO	T02_20241014		14/10/24	WATER	X	X	X	X	X	Please forward to ALS
23	W6D		14/10/24	WATER	X	X	X	X	X	Some dissolved metals bottles have limited volume due to number of filters in the field - use some from green inorganics bottle if needed

Relinquished by (company): Ramboll / ELS Sydney	Received by (company): ELS SYD	*Lab use only:*
Print Name: Matilda Englert / Tony Trinh	Print Name: Danielle Le	Samples Received: (Cool) or Ambient (circle one)
Date & Time: 15/10/24 / 18.10.24 11:26	Date & Time: 17/10/24 1050	Temperature Received at: 14°C (if applicable)
Signature:	Signature:	Transported by: Hand delivered / (courier)

Rec ... 18/10/24 1725.

Environmental Division
Sydney
Work Order Reference
ES2434401

Telephone : + 61-2-8784 8555

ENVIROLAB
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 364166
Date Received: 17/10/24
Time Received: 1050
Received By: DL
Temp: (Cool)/Ambient
Cooling: (Ice)/Icepack
Security: (Intact)/Broken/None

CERTIFICATE OF ANALYSIS

Work Order	: **ES2434401**	Page	: 1 of 2
Client	: **RAMBOLL AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Matilda Englert	Contact	: Customer Services ES
Address	: The Arc, 45a Watt St NEWCASTLE 2300	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: Hydro Groundwater Plume Monitoring - 318000344-003	Date Samples Received	: 18-Oct-2024 17:15
Order number	: ----	Date Analysis Commenced	: 22-Oct-2024
C-O-C number	: ----	Issue Date	: 25-Oct-2024 09:07
Sampler	: Matilda Englert		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 2		
No. of samples analysed	: 2		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	T01_20241015	T02_20241014	----	----	----
			Sampling date / time	14-Oct-2024 00:00	15-Oct-2024 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2434401-001	ES2434401-002	--------	--------	--------
				Result	Result	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	10	ug/L	<10	**40**	**----**	**----**	**----**
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	10	ug/L	**----**	**200**	**----**	**----**	**----**
EK025SF: Free CN by Segmented Flow Analyser								
Free Cyanide	----	0.004	mg/L	<0.004	<0.004	**----**	**----**	**----**
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	**0.566**	**----**	**----**	**----**
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**----**	**8.6**	**----**	**----**	**----**

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2434401**	Page	: 1 of 4
Client	: **RAMBOLL AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Matilda Englert	Telephone	: +61 2 8784 8555
Project	: Hydro Groundwater Plume Monitoring - 318000344-003	Date Samples Received	: 18-Oct-2024
Site	: ----	Issue Date	: 25-Oct-2024
Sampler	: Matilda Englert	No. of samples received	: 2
Order number	: ----	No. of samples analysed	: 2

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, where applicable to the methodology, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Matrix Spikes (MS)						
Dissolved Metals by ICP-MS - Suite A	EG020A-F	0	17	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	0	4	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
T01_20241015	**14-Oct-2024**	**----**	----	----	**22-Oct-2024**	12-Apr-2025	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
T02_20241014	**15-Oct-2024**	**----**	----	----	**22-Oct-2024**	13-Apr-2025	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)							
T02_20241014	**15-Oct-2024**	**23-Oct-2024**	13-Apr-2025	✓	**23-Oct-2024**	13-Apr-2025	✓
EK025SF: Free CN by Segmented Flow Analyser							
Opaque plastic bottle - NaOH (EK025SF)							
T01_20241015	**14-Oct-2024**	**----**	----	----	**23-Oct-2024**	28-Oct-2024	✓
Opaque plastic bottle - NaOH (EK025SF)							
T02_20241014	**15-Oct-2024**	**----**	----	----	**23-Oct-2024**	29-Oct-2024	✓
EK026SF: Total CN by Segmented Flow Analyser							
Opaque plastic bottle - NaOH (EK026SF)							
T01_20241015	**14-Oct-2024**	**----**	----	----	**23-Oct-2024**	28-Oct-2024	✓
Opaque plastic bottle - NaOH (EK026SF)							
T02_20241014	**15-Oct-2024**	**----**	----	----	**23-Oct-2024**	29-Oct-2024	✓
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P)							
T02_20241014	**15-Oct-2024**	**----**	----	----	**23-Oct-2024**	12-Nov-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	3	17	**17.65**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	2	10	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Free CN by Segmented Flow Analyser	EK025SF	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	4	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	17	**11.76**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Free CN by Segmented Flow Analyser	EK025SF	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	17	**11.76**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Free CN by Segmented Flow Analyser	EK025SF	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	0	17	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Free CN by Segmented Flow Analyser	EK025SF	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	0	4	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Free CN by Segmented Flow Analyser	EK025SF	WATER	In house: Referenced to ASTM D7237, APHA 4500-CN-C&O and ISO 14403: Using an automated segmented flow analyser, a sample at high pH (sodium hydroxide preserved) is buffered to pH 6.0. The hydrogen cyanide present passes across a gas dialysis membrane into an acceptor stream consisting of 0.01 M sodium hydroxide. The acceptor stream mixes with a buffer at pH 5.2 and reacts with chloramine-T to form cyanogen chloride. Cyanogen chloride reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour, measured at 600nm. This method is compliant with NEPM Schedule B(3)
Total Cyanide by Segmented Flow Analyser	EK026SF	WATER	In house: Referenced to APHA 4500-CN C&O / ASTM D7511 / ISO 14403. Sodium hydroxide preserved samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM Schedule B(3)
Fluoride by Auto Titrator	EK040P	WATER	In house: Referenced to APHA 4500-F C: CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)

QUALITY CONTROL REPORT

Work Order	: **ES2434401**	Page	: 1 of 3
Client	: **RAMBOLL AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Matilda Englert	Contact	: Customer Services ES
Address	: The Arc, 45a Watt St NEWCASTLE 2300	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: Hydro Groundwater Plume Monitoring - 318000344-003	Date Samples Received	: 18-Oct-2024
Order number	: ----	Date Analysis Commenced	: 22-Oct-2024
C-O-C number	: ----	Issue Date	: 25-Oct-2024
Sampler	: Matilda Englert		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 2		
No. of samples analysed	: 2		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6136997)									
EB2435660-001	Anonymous	EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2434150-001	Anonymous	EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.01	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6137001)									
EW2404824-001	Anonymous	EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.05	0.05	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 6138058)									
ES2434002-001	Anonymous	EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.09	0.09	0.0	No Limit
EW2404824-001	Anonymous	EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.22	0.27	17.4	0% - 20%
EK025SF: Free CN by Segmented Flow Analyser (QC Lot: 6137811)									
ES2433765-001	Anonymous	EK025SF: Free Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
ES2433872-008	Anonymous	EK025SF: Free Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK026SF: Total CN by Segmented Flow Analyser (QC Lot: 6137809)									
ES2433765-001	Anonymous	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
ES2433872-008	Anonymous	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	0.154	0.153	0.7	0% - 20%
EK040P: Fluoride by PC Titrator (QC Lot: 6138548)									
ES2434401-002	T02_20241014	EK040P: Fluoride	16984-48-8	0.1 (1.0)*	mg/L	8.6	8.1	5.3	No Limit
EN2413182-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.3	0.3	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 6136997)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	90.4	80.0	116
EG020F: Dissolved Metals by ICP-MS (QCLot: 6137001)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	90.7	80.0	116
EG020T: Total Metals by ICP-MS (QCLot: 6138058)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	94.3	82.0	120
EK025SF: Free CN by Segmented Flow Analyser (QCLot: 6137811)								
EK025SF: Free Cyanide	----	0.004	mg/L	<0.004	0.2 mg/L	108	88.0	128
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 6137809)								
EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.2 mg/L	98.4	73.0	133
EK040P: Fluoride by PC Titrator (QCLot: 6138548)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	83.9	82.0	116

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK025SF: Free CN by Segmented Flow Analyser (QCLot: 6137811)							
ES2433765-001	Anonymous	EK025SF: Free Cyanide	----	0.2 mg/L	110	70.0	130
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 6137809)							
ES2433765-001	Anonymous	EK026SF: Total Cyanide	57-12-5	0.2 mg/L	101	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 6138548)							
EN2413182-002	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	70.6	70.0	130

COC 12/12/24 1741

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP

Client: Ramboll	Client Project Name / Number / Site etc (le report title): Hydro Groundwater Plume Monitoring - 318000344-003	**Envirolab Services** 12 Ashley St, Chatswood, NSW 2067 Phone: 02 9910 6200 Fax :02 9910 6201 E-mail: ahie@envirolabservices.com.au Contact: Aileen Hie
Contact person: Lachlan Richards | Sam Buckley		
Project Mgr: Kirsty Greenfield	PO No.:	
Sampler: Lachlan Richards	Envirolab Quote No. :	
Address: The Arc, 45a Watt Street Newcastle, NSW 2300	Date results required:	**Envirolab Services WA t/a MPL** 16-18 Hayden Crt, Myaree WA 6154
	Or choose: standard / same day / 1 day / 2 day / 3 day	
Phone: (02) 49625444 Mob: 0481384112 (SB) 0403738203 (LR)	*Note: Inform lab in advance if urgent turnaround is required - surcharge applies*	Phone: 08 9317 2505 Fax :08 9317 4163
Fax:	Lab comments: Highly contaminated	E-mail: lab@mpl.com.au
Email: sbuckley@ramboll.com, LARICHARDS@ramboll.com & kgreenfield@ramboll.		Contact: Joshua Lim

Sample information					Tests Required													Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Fluoride	Total Cyanide	Free Cyanide	Total Aluminium	Dissolved Aluminium									Provide as much information about the sample as you can
1	W1S		12/11/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
2	W1D		12/11/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
3	W2D		12/11/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
4	W3S		12/11/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
5	W5D		12/11/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
6	W6D		12/10/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
7	W7M		11/12/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
NR	E4		12/11/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
8	E5		12/11/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
9	E5D		12/11/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
10	E11		12/10/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
11	N9		12/10/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
12	D01_20241210		12/10/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
510	T01_20241210		12/10/2024	WATER	X	X	X	X	X									Please forward to ALS
13	R01_20241211		12/11/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
repeat 5	W5D		12/11/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
14	F6		12/10/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
15	G6		12/10/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
16	F5		12/10/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
17	G5		12/10/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
18	N2		12/10/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
19	G2		12/10/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
20	N8		12/10/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
repeat 11	N9		12/10/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
21	D02_20241211		12/11/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals
510	T02_20241211		12/11/2024	WATER	X	X	X	X	X									Please forward to ALS
repeat 6	W6D		12/10/2024	WATER	X	X	X	X	X									Please decant from green inorganics to filter for metals

Relinquished by (company):	Ramboll	Received by (company): ES 540	*Lab use only:*
Print Name:	Lachlan Richards	Print Name: Danielle	Samples Received: Cool or Ambient (circle one)
Date & Time:	12/12/2024	Date & Time: 13/12/24 1100	Temperature Received at: 20 (if applicable)
Signature:	LR	Signature:	Transported by: Hand delivered / courier

ENVIROLAB GROUP
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 369[redacted] 102

Date Received: 13/12/24 + 16/12/24
Time Received: 1100 - 1110
Received By: DM
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 369102

Client Details

Client	Ramboll (Newcastle) Australia Pty Ltd
Attention	Kirsty Greenfield
Address	Suite 18, Level 2, 50 Glebe Rd, The Junction, NSW, 2291

Sample Details

Your Reference	**Hydro Groundwater Plume Monitoring - 318000344-003**
Number of Samples	21 Water
Date samples received	16/12/2024
Date completed instructions received	12/12/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	23/12/2024
Date of Issue	23/12/2024

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Larry Ye, Senior Chemist
Nick Sarlamis, Assistant Operation Manager
Tabitha Roberts, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

HM in water - dissolved						
Our Reference		369102-1	369102-2	369102-3	369102-4	369102-5
Your Reference	UNITS	W1S	W1D	W2D	W3S	W5D
Date Sampled		11/12/2024	11/12/2024	11/12/2024	11/12/2024	11/12/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Date analysed	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Aluminium-Dissolved	µg/L	20	40	340	420	<10

HM in water - dissolved						
Our Reference		369102-6	369102-7	369102-8	369102-9	369102-10
Your Reference	UNITS	W6D	W7M	E5	E5D	E11
Date Sampled		10/12/2024	12/11/2024	11/12/2024	11/12/2024	10/12/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Date analysed	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Aluminium-Dissolved	µg/L	<10	270	40	<10	20

HM in water - dissolved						
Our Reference		369102-11	369102-12	369102-13	369102-14	369102-15
Your Reference	UNITS	N9	D01_20241210	R01_20241211	F6	G6
Date Sampled		10/12/2024	10/12/2024	11/12/2024	10/12/2024	10/12/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Date analysed	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Aluminium-Dissolved	µg/L	260	<10	<10	<10	19,000

HM in water - dissolved						
Our Reference		369102-16	369102-17	369102-18	369102-19	369102-20
Your Reference	UNITS	F5	G5	N2	G2	N8
Date Sampled		10/12/2024	10/12/2024	10/12/2024	10/12/2024	10/12/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Date analysed	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Aluminium-Dissolved	µg/L	2,900	<10	360	<10	20

HM in water - dissolved		
Our Reference		369102-21
Your Reference	UNITS	D02_20241211
Date Sampled		11/12/2024
Type of sample		Water
Date prepared	-	19/12/2024
Date analysed	-	19/12/2024
Aluminium-Dissolved	µg/L	<10

HM in water - total						
Our Reference		369102-1	369102-2	369102-3	369102-4	369102-5
Your Reference	UNITS	W1S	W1D	W2D	W3S	W5D
Date Sampled		11/12/2024	11/12/2024	11/12/2024	11/12/2024	11/12/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Date analysed	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Aluminium-Total	µg/L	150	100	420	6,800	170

HM in water - total						
Our Reference		369102-6	369102-7	369102-8	369102-9	369102-10
Your Reference	UNITS	W6D	W7M	E5	E5D	E11
Date Sampled		10/12/2024	12/11/2024	11/12/2024	11/12/2024	10/12/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Date analysed	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Aluminium-Total	µg/L	1,100	1,500	190	370	8,400

HM in water - total						
Our Reference		369102-11	369102-12	369102-13	369102-14	369102-15
Your Reference	UNITS	N9	D01_20241210	R01_20241211	F6	G6
Date Sampled		10/12/2024	10/12/2024	11/12/2024	10/12/2024	10/12/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Date analysed	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Aluminium-Total	µg/L	14,000	920	<10	20	19,000

HM in water - total						
Our Reference		369102-16	369102-17	369102-18	369102-19	369102-20
Your Reference	UNITS	F5	G5	N2	G2	N8
Date Sampled		10/12/2024	10/12/2024	10/12/2024	10/12/2024	10/12/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Date analysed	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Aluminium-Total	µg/L	3,000	90	1,000	170	9,800

HM in water - total		
Our Reference		369102-21
Your Reference	UNITS	D02_20241211
Date Sampled		11/12/2024
Type of sample		Water
Date prepared	-	19/12/2024
Date analysed	-	19/12/2024
Aluminium-Total	µg/L	420

Miscellaneous Inorganics						
Our Reference		369102-1	369102-2	369102-3	369102-4	369102-5
Your Reference	UNITS	W1S	W1D	W2D	W3S	W5D
Date Sampled		11/12/2024	11/12/2024	11/12/2024	11/12/2024	11/12/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Date analysed	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Free Cyanide in Water	mg/L	<0.004	0.020	0.011	0.005	<0.004
Total Cyanide	mg/L	1.2	0.93	140	24	0.025
Fluoride, F	mg/L	8.7	8.6	1,300	110	0.5

Miscellaneous Inorganics						
Our Reference		369102-6	369102-7	369102-8	369102-9	369102-10
Your Reference	UNITS	W6D	W7M	E5	E5D	E11
Date Sampled		10/12/2024	12/11/2024	11/12/2024	11/12/2024	10/12/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Date analysed	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Free Cyanide in Water	mg/L	<0.004	0.005	0.007	<0.004	<0.004
Total Cyanide	mg/L	0.016	61	37	0.80	5.4
Fluoride, F	mg/L	<0.1	770	260	7.3	76

Miscellaneous Inorganics						
Our Reference		369102-11	369102-12	369102-13	369102-14	369102-15
Your Reference	UNITS	N9	D01_20241210	R01_20241211	F6	G6
Date Sampled		10/12/2024	10/12/2024	11/12/2024	10/12/2024	10/12/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Date analysed	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Free Cyanide in Water	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
Total Cyanide	mg/L	0.11	<0.004	0.019	<0.004	0.012
Fluoride, F	mg/L	60	<0.1	<0.1	0.5	0.6

Miscellaneous Inorganics						
Our Reference		369102-16	369102-17	369102-18	369102-19	369102-20
Your Reference	UNITS	F5	G5	N2	G2	N8
Date Sampled		10/12/2024	10/12/2024	10/12/2024	10/12/2024	10/12/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Date analysed	-	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024
Free Cyanide in Water	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
Total Cyanide	mg/L	<0.004	<0.004	<0.004	<0.004	0.46
Fluoride, F	mg/L	0.2	0.1	0.7	0.3	0.5

Miscellaneous Inorganics		
Our Reference		369102-21
Your Reference	UNITS	D02_20241211
Date Sampled		11/12/2024
Type of sample		Water
Date prepared	-	19/12/2024
Date analysed	-	19/12/2024
Free Cyanide in Water	mg/L	<0.004
Total Cyanide	mg/L	0.079
Fluoride, F	mg/L	6.8

Method ID	Methodology Summary
Inorg-014	Cyanide - free, total, weak acid dissociable by segmented flow analyser (in line dialysis with colourimetric finish). Solids/Filters and sorbents are extracted in a caustic media prior to analysis. Impingers are pH adjusted as required prior to analysis. Cyanides amenable to Chlorination - samples are analysed untreated and treated with hypochlorite to assess the potential for chlorination of cyanide forms. Based on APHA latest edition, 4500-CN_G,H.
Inorg-026	Fluoride determined by ion selective electrode (ISE) in accordance with APHA latest edition, 4500-F-C.
Metals-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Salt forms (e.g. FeO, PbO, ZnO) are determined stoichiometrically from the base metal concentration.

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	369102-2
Date prepared	-			19/12/2024	1	19/12/2024	19/12/2024		19/12/2024	19/12/2024
Date analysed	-			19/12/2024	1	19/12/2024	19/12/2024		19/12/2024	19/12/2024
Aluminium-Dissolved	µg/L	10	Metals-022	<10	1	20	20	0	101	92

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W5	[NT]
Date prepared	-			[NT]	13	19/12/2024	19/12/2024		19/12/2024	[NT]
Date analysed	-			[NT]	13	19/12/2024	19/12/2024		19/12/2024	[NT]
Aluminium-Dissolved	µg/L	10	Metals-022	[NT]	13	<10	<10	0	99	[NT]

QUALITY CONTROL: HM in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	369102-2
Date prepared	-			19/12/2024	1	19/12/2024	19/12/2024		19/12/2024	19/12/2024
Date analysed	-			19/12/2024	1	19/12/2024	19/12/2024		19/12/2024	19/12/2024
Aluminium-Total	µg/L	10	Metals-022	<10	1	150	120	22	101	91

QUALITY CONTROL: HM in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	369102-21
Date prepared	-			[NT]	11	19/12/2024	19/12/2024		19/12/2024	19/12/2024
Date analysed	-			[NT]	11	19/12/2024	19/12/2024		19/12/2024	19/12/2024
Aluminium-Total	µg/L	10	Metals-022	[NT]	11	14000	14000	0	104	74

QUALITY CONTROL: HM in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	20	19/12/2024	19/12/2024		[NT]	[NT]
Date analysed	-			[NT]	20	19/12/2024	19/12/2024		[NT]	[NT]
Aluminium-Total	µg/L	10	Metals-022	[NT]	20	9800	9800	0	[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	369102-12
Date prepared	-			19/12/2024	1	19/12/2024	19/12/2024		19/12/2024	19/12/2024
Date analysed	-			19/12/2024	1	19/12/2024	19/12/2024		19/12/2024	19/12/2024
Free Cyanide in Water	mg/L	0.004	Inorg-014	<0.004	1	<0.004	<0.004	0	91	[NT]
Total Cyanide	mg/L	0.004	Inorg-014	<0.004	1	1.2	0.97	21	103	[NT]
Fluoride, F	mg/L	0.1	Inorg-026	<0.1	1	8.7	[NT]		107	95

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	369102-13
Date prepared	-			[NT]	2	19/12/2024	19/12/2024		[NT]	23/12/2024
Date analysed	-			[NT]	2	19/12/2024	19/12/2024		[NT]	23/12/2024
Free Cyanide in Water	mg/L	0.004	Inorg-014	[NT]	2	0.020	[NT]		[NT]	88
Total Cyanide	mg/L	0.004	Inorg-014	[NT]	2	0.93	[NT]		[NT]	125
Fluoride, F	mg/L	0.1	Inorg-026	[NT]	2	8.6	8.6	0	[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	10	19/12/2024	19/12/2024		[NT]	[NT]
Date analysed	-			[NT]	10	19/12/2024	19/12/2024		[NT]	[NT]
Free Cyanide in Water	mg/L	0.004	Inorg-014	[NT]	10	<0.004	<0.004	0	[NT]	[NT]
Total Cyanide	mg/L	0.004	Inorg-014	[NT]	10	5.4	6.1	12	[NT]	[NT]
Fluoride, F	mg/L	0.1	Inorg-026	[NT]	10	76	74	3	[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	19/12/2024	19/12/2024		[NT]	[NT]
Date analysed	-			[NT]	11	19/12/2024	19/12/2024		[NT]	[NT]
Free Cyanide in Water	mg/L	0.004	Inorg-014	[NT]	11	<0.004	[NT]		[NT]	[NT]
Total Cyanide	mg/L	0.004	Inorg-014	[NT]	11	0.11	[NT]		[NT]	[NT]
Fluoride, F	mg/L	0.1	Inorg-026	[NT]	11	60	[NT]		[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	13	19/12/2024	[NT]		[NT]	[NT]
Date analysed	-			[NT]	13	19/12/2024	[NT]		[NT]	[NT]
Free Cyanide in Water	mg/L	0.004	Inorg-014	[NT]	13	<0.004	[NT]		[NT]	[NT]
Total Cyanide	mg/L	0.004	Inorg-014	[NT]	13	0.019	[NT]		[NT]	[NT]
Fluoride, F	mg/L	0.1	Inorg-026	[NT]	13	<0.1	[NT]		[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	19	19/12/2024	19/12/2024		[NT]	[NT]
Date analysed	-			[NT]	19	19/12/2024	19/12/2024		[NT]	[NT]
Free Cyanide in Water	mg/L	0.004	Inorg-014	[NT]	19	<0.004	[NT]		[NT]	[NT]
Total Cyanide	mg/L	0.004	Inorg-014	[NT]	19	<0.004	[NT]		[NT]	[NT]
Fluoride, F	mg/L	0.1	Inorg-026	[NT]	19	0.3	0.3	0	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Dissolved Metals: The preserved sample provided was not identified as either total or dissolved, therefore the unpreserved sample was filtered through 0.45µm filter at the lab.
Note: there is a possibility some elements may be underestimated.

Total Metals: The preserved sample provided was not identified as either total or dissolved, therefore the analysis was conducted from the unpreserved sample.
Note: there is a possibility some elements may be underestimated

COC 12/12/24 1741

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP

Client: Ramboll	Client Project Name / Number / Site etc (ie report title): Hydro Groundwater Plume Monitoring - 318000344-003	**Envirolab Services** 12 Ashley St, Chatswood, NSW 2067 Phone: 02 9910 6200 Fax :02 9910 6201 E-mail: ahie@envirolabservices.com.au Contact: Aileen Hie
Contact person: Lachlan Richards | Sam Buckley	PO No.:	
Project Mgr: Kirsty Greenfield	Envirolab Quote No. :	
Sampler: Lachlan Richards	Date results required:	
Address: The Arc, 45a Watt Street Newcastle, NSW 2300	Or choose: standard / same day / 1 day / 2 day / 3 day	**Envirolab Services WA t/a MPL** 16-18 Hayden Crt, Myaree WA 6154
Phone: (02) 49625444 Mob: 0481384112 (SB) 0403738203 (LR)	Note: Inform lab in advance if urgent turnaround is required - surcharge applies	Phone: 08 9317 2505 Fax :08 9317 4163 E-mail: lab@mpl.com.au Contact: Joshua Lim
Fax:	Lab comments: Highly contaminated	
Email: sbuckley@ramboll.com, LARICHARDS@ramboll.com & kgreenfield@ramboll.		

Sample Information					Tests Required														Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Fluoride	Total Cyanide	Free Cyanide	Total Aluminium	Dissolved Aluminium										Provide as much information about the sample as you can
	W1S		12/11/2024	WATER	X	X	X	X	X										Please decant from green inorganics to filter for metals
	W1D		12/11/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals
	W2D		12/11/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals
	W3S		12/11/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals
	W5D		12/11/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals
	W6D		12/10/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals
	W7M		11/12/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals
	E4		12/11/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals
	E5		12/11/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals
	E5D		12/11/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals
	E11		12/10/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals
	N9		12/10/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals
	D01_20241210	(2)	12/10/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals
	T01_20241210		12/10/2024	WATER	x	x	x	x	x										Please forward to ALS
	R01_20241211		12/11/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals
	W5D		12/11/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals
	F6		12/10/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals
	G6		12/10/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals
	F5		12/10/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals
	G5		12/10/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals
	N2		12/10/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals
	G2		12/10/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals
	N8		12/10/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals
	N9		12/10/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals
	D02_20241211		12/11/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals
	T02_20241211	(1)	12/11/2024	WATER	x	x	x	x	x										Please forward to ALS
	W6D		12/10/2024	WATER	x	x	x	x	x										Please decant from green inorganics to filter for metals

Environmental Division Sydney
Work Order Reference
ES2441625

Telephone : - 61-2-8784 8555

Relinquished by (company):	Ramboll	Received by (company): ELS SYD	*Lab use only:*
Print Name:	Lachlan Richards	Print Name: Danielle Lim	Samples Received: Cool or Ambient (circle one)
Date & Time:	12/12/2024	Date & Time: 13/12/24 1100	Temperature Received at: 20 (if applicable)
Signature:	LR	Signature:	Transported by: Hand delivered / courier

Rec: [signature] 17/12/24 1830

Relinquished by: ELS SYD 6mm w 17/12 1130 ew

ENVIROLAB GROUP
Environmental Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 369[illegible] 102

Date Received: 13/12/24 + 16/12/24
Time Received: 1100 - 1110
Received By: DL
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

CERTIFICATE OF ANALYSIS

Work Order	: **ES2441625**	Page	: 1 of 2
Client	: **RAMBOLL AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIRSTY GREENFIELD	Contact	: Customer Services ES
Address	: The Arc, 45a Watt St NEWCASTLE 2300	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 4934 4354	Telephone	: +61 2 8784 8555
Project	: Hydro Groundwater Plume Monitoring - 318000344-003	Date Samples Received	: 17-Dec-2024 18:30
Order number	: ----	Date Analysis Commenced	: 20-Dec-2024
C-O-C number	: ----	Issue Date	: 31-Dec-2024 12:07
Sampler	: LACHLAN RICHARDS		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 2		
No. of samples analysed	: 2		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	T02_20241211	T01_20241211	----	----	----
			Sampling date / time	12-Dec-2024 00:00	12-Dec-2024 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2441625-001	ES2441625-002	--------	--------	--------
				Result	Result	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	10	µg/L	<10	<10	**----**	**----**	**----**
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	10	µg/L	**780**	**780**	**----**	**----**	**----**
EK025SF: Free CN by Segmented Flow Analyser								
Free Cyanide	----	0.004	mg/L	<0.004	<0.004	**----**	**----**	**----**
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	**0.683**	<0.004	**----**	**----**	**----**
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**6.3**	<0.1	**----**	**----**	**----**

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2441625**	Page	: 1 of 5
Client	: **RAMBOLL AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIRSTY GREENFIELD	Telephone	: +61 2 8784 8555
Project	: Hydro Groundwater Plume Monitoring - 318000344-003	Date Samples Received	: 17-Dec-2024
Site	: ----	Issue Date	: 31-Dec-2024
Sampler	: LACHLAN RICHARDS	No. of samples received	: 2
Order number	: ----	No. of samples analysed	: 2

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, where applicable to the methodology, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EK025SF: Free CN by Segmented Flow Analyser							
Black Opaque Plastic Bottle - NaOH							
T02_20241211,	T01_20241211	----	----	----	30-Dec-2024	26-Dec-2024	**4**
EK026SF: Total CN by Segmented Flow Analyser							
Black Opaque Plastic Bottle - NaOH							
T02_20241211,	T01_20241211	----	----	----	30-Dec-2024	26-Dec-2024	**4**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Matrix Spikes (MS)						
Dissolved Metals by ICP-MS - Suite A	EG020A-F	0	13	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	0	3	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS								
Clear Plastic Bottle - Natural (EG020A-F)								
T02_20241211,	T01_20241211	**12-Dec-2024**	**----**	----	----	**24-Dec-2024**	10-Jun-2025	✓
EG020T: Total Metals by ICP-MS								
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)								
T02_20241211,	T01_20241211	**12-Dec-2024**	**24-Dec-2024**	10-Jun-2025	✓	**24-Dec-2024**	10-Jun-2025	✓
EK025SF: Free CN by Segmented Flow Analyser								
Black Opaque Plastic Bottle - NaOH (EK025SF)								
T02_20241211,	T01_20241211	**12-Dec-2024**	**----**	----	----	**30-Dec-2024**	26-Dec-2024	×
EK026SF: Total CN by Segmented Flow Analyser								
Black Opaque Plastic Bottle - NaOH (EK026SF)								
T02_20241211,	T01_20241211	**12-Dec-2024**	**----**	----	----	**30-Dec-2024**	26-Dec-2024	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P)							
T02_20241211, T01_20241211	**12-Dec-2024**	**----**	----	**----**	**20-Dec-2024**	09-Jan-2025	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Free CN by Segmented Flow Analyser	EK025SF	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	3	**66.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Free CN by Segmented Flow Analyser	EK025SF	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Free CN by Segmented Flow Analyser	EK025SF	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	0	13	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Free CN by Segmented Flow Analyser	EK025SF	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	0	3	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Free CN by Segmented Flow Analyser	EK025SF	WATER	In house: Referenced to ASTM D7237, APHA 4500-CN-C&O and ISO 14403: Using an automated segmented flow analyser, a sample at high pH (sodium hydroxide preserved) is buffered to pH 6.0. The hydrogen cyanide present passes across a gas dialysis membrane into an acceptor stream consisting of 0.01 M sodium hydroxide. The acceptor stream mixes with a buffer at pH 5.2 and reacts with chloramine-T to form cyanogen chloride. Cyanogen chloride reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour, measured at 600nm. This method is compliant with NEPM Schedule B(3)
Total Cyanide by Segmented Flow Analyser	EK026SF	WATER	In house: Referenced to APHA 4500-CN C&O / ASTM D7511 / ISO 14403. Sodium hydroxide preserved samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM Schedule B(3)
Fluoride by Auto Titrator	EK040P	WATER	In house: Referenced to APHA 4500-F C: CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)

QUALITY CONTROL REPORT

Work Order	: **ES2441625**	Page	: 1 of 3
Client	: **RAMBOLL AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIRSTY GREENFIELD	Contact	: Customer Services ES
Address	: The Arc, 45a Watt St NEWCASTLE 2300	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 4934 4354	Telephone	: +61 2 8784 8555
Project	: Hydro Groundwater Plume Monitoring - 318000344-003	Date Samples Received	: 17-Dec-2024
Order number	: ----	Date Analysis Commenced	: 20-Dec-2024
C-O-C number	: ----	Issue Date	: 31-Dec-2024
Sampler	: LACHLAN RICHARDS		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 2		
No. of samples analysed	: 2		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6281936)									
ES2441378-006	Anonymous	EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP2418973-002	Anonymous	EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 6281955)									
ES2441602-006	Anonymous	EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2441645-006	Anonymous	EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.01	0.02	0.0	No Limit
EK025SF: Free CN by Segmented Flow Analyser (QC Lot: 6285443)									
ES2441560-010	Anonymous	EK025SF: Free Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
ES2441560-001	Anonymous	EK025SF: Free Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK026SF: Total CN by Segmented Flow Analyser (QC Lot: 6285444)									
ES2441560-013	Anonymous	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
ES2441657-005	Anonymous	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 6277621)									
ES2441856-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	<0.1	0.0	No Limit
ES2441612-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 6281936)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	97.0	80.0	116
EG020T: Total Metals by ICP-MS (QCLot: 6281955)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	88.2	82.0	120
EK025SF: Free CN by Segmented Flow Analyser (QCLot: 6285443)								
EK025SF: Free Cyanide	----	0.004	mg/L	<0.004	0.2 mg/L	110	88.0	128
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 6285444)								
EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.2 mg/L	104	73.0	133
EK040P: Fluoride by PC Titrator (QCLot: 6277621)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	92.5	82.0	116

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK025SF: Free CN by Segmented Flow Analyser (QCLot: 6285443)							
ES2441560-001	Anonymous	EK025SF: Free Cyanide	----	0.2 mg/L	103	70.0	130
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 6285444)							
ES2441560-013	Anonymous	EK026SF: Total Cyanide	57-12-5	0.2 mg/L	97.7	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 6277621)							
ES2441065-001	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	70.7	70.0	130

APPENDIX 6
CALIBRATION CERTIFICATES

Water Level Meter Calibration

Instrument: Solinst Water Level Meter (150m)
Serial No: 556202

Item	Test	Pass	Comments
Battery	Compartment Capacity	Yes Yes	
Probe	Cleaned/Decon. Operation	Yes Yes	
Connectors	Condition	Yes	
Tape Check	Cleaned Checked for cuts	Yes Yes	
Instrument Test	At surface level	Yes	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: **Jake Bourke**

Calibration date: **7/05/2023**

Water Level Meter Calibration

Instrument: Solinst Water Level Meter (150m)
Serial No: 556202

Item	Test	Pass	Comments
Battery	Compartment Capacity	Yes Yes	
Probe	Cleaned/Decon. Operation	Yes Yes	
Connectors	Condition	Yes	
Tape Check	Cleaned Checked for cuts	Yes Yes	
Instrument Test	At surface level	Yes	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: **Matilda Englert**

Calibration date: **2/9/2023**

Water Level Meter Calibration

Instrument: Solinst Water Level Meter (150m)
Serial No: 556202

Item	Test	Pass	Comments
Battery	Compartment Capacity	Yes Yes	
Probe	Cleaned/Decon. Operation	Yes Yes	
Connectors	Condition	Yes	
Tape Check	Cleaned Checked for cuts	Yes Yes	
Instrument Test	At surface level	Yes	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: **Matilda Englert**

Calibration date: **1/3/2024**

Water Level Meter Calibration

Instrument: Solinst Water Level Meter (150m)
Serial No: 556202

Item	Test	Pass	Comments
Battery	Compartment Capacity	Yes Yes	
Probe	Cleaned/Decon. Operation	Yes Yes	
Connectors	Condition	Yes	
Tape Check	Cleaned Checked for cuts	Yes Yes	
Instrument Test	At surface level	Yes	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: **Matilda Englert**

Calibration date: **30/05/2024**

Multi-Parameter Water Quality Meter Calibration

Instrument: Horiba U-52G/10m
Control Unit Serial No: TH06G239
Sensor Probe Unit Serial No: 4KV0033X

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Parameter	Units	Temp. (°C)	Pre Calibratio	Calibratio n Value	Post Calibratio	Comment
pH	pH	23.45	7.74	7.02	7.02	Pass
pH	pH	23.55	4.48	4.00	4.00	Pass
pH	pH	23.49	9.53	10.06	10.06	Pass
ORP	mV	-	239	240	240	Pass
Conductivity	mS/cm	22.13	0.000	0.000	0.000	Pass
Conductivity	mS/cm	22.61	0.354	0.691	0.622	Pass
Conductivity	mS/cm	22.39	2.56	6.29	6.29	Pass
Conductivity	mS/cm	22.68	43.3	56.4	56.4	Pass
Turbidity	NTU	-	0.0	0.0	0.0	Pass
Turbidity	NTU	-	6.8	8.0	8.0	Pass
Turbidity	NTU	-	85.0	80.0	80.0	Pass
Turbidity	NTU	-	395	400	400	Pass
D.O. Zero	mg/L	-	1.54	0.00	0.00	Pass
D.O. Span	mg/L	22.15	5.75	8.72	8.72	Pass

Calibrated by: **Matilda Englert**

Calibration date: **25/07/23**

Table A: Change in pH with temperature (°C)

Temperature (°C)	pH 4 standard solution	pH 7 standard solution	pH 10 standard solution
5	4.00	7.09	10.24
10	4.00	7.06	10.19
15	4.00	7.04	10.12
20	4.00	7.02	10.06
30	4.01	7.00	9.96
35	4.02	6.99	9.92
40	4.03	6.97	9.90
50	4.06	6.95	9.82

Table B: Change in Conductivity with temperature (°C)

Temperature (°C)	Standard solution (0.718 mS/cm)	Standard solution (6.67 mS/cm)	Standard solution (58.6 mS/cm)
10	0.512	4.76	41.80
11	0.526	4.88	42.90
12	0.540	5.01	44.10
13	0.533	0.51	45.20
14	0.567	5.27	46.30
15	0.581	5.39	47.40
16	0.595	5.52	48.50
17	0.608	5.65	49.60
18	0.622	5.87	50.80
19	0.636	5.90	51.90
20	0.649	6.03	53.00
21	0.663	6.16	54.10
22	0.677	6.29	55.20
23	0.691	6.41	56.40
24	0.704	6.54	57.50
25	0.718	6.67	58.60
26	0.732	6.79	59.70
27	0.745	6.92	60.80
28	0.759	7.05	62.00
29	0.773	7.18	63.10
30	0.787	7.30	64.20
31	0.800	7.43	65.30

Table C: Change in Dissolved Oxygen with Temperature at 100% Relative Humidity (Altitude:sea level)

Temperature	DO (100% R.H.)
(Celsius)	(ppm, mg/L)
0.00	14.60
1.00	14.19
2.00	13.81
3.00	13.44
4.00	13.09
5.00	12.75
6.00	12.43
7.00	12.12
8.00	11.83
9.00	11.55
10.00	11.27
11.00	11.01
12.00	10.76
13.00	10.52
14.00	10.29
15.00	10.07
16.00	9.85
17.00	9.65
18.00	9.45
19.00	9.26
20.00	9.07
21.00	8.90
22.00	8.72
23.00	8.56
24.00	8.40
25.00	8.24
26.00	8.09
27.00	7.95
28.00	7.81
29.00	7.67
30.00	7.54
31.00	7.41
32.00	7.28

Values are for pressure = 760 mm Hg for measurements at sea level.
For a given temperature, the concentration of dissolved oxygen concentration decreases by 0.3 mg/L with every 500 ft (152.4 m) increase in altitude.

Multi-Parameter Water Quality Meter Calibration

pH Manual Calibration

Instrument: Horiba U-52G/10m
Control Unit Serial No: TH06G239
Sensor Probe Unit Serial No: 4KV0033X

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Solution	Temperature	Pre Calibration	Calibration Value	Post Calibration
pH	pH 4 standard solution phthalate	14.71	3.78	4.00	4.00
	pH 7 standard solution Neutral phosphate	14.79	7.73	7.04	7.04
	pH 10 standard solution Neutral phosphate	14.81	8.68	10.12	10.12

Calibrated by: **Jake Bourke**

Calibration date: **16/08/2023**

Table A: Change in pH with temperature (°C)

Temperature (°C)	pH 4 standard solution	pH 7 standard solution	pH 10 standard solution
5	4.00	7.09	10.24
10	4.00	7.06	10.19
15	4.00	7.04	10.12
20	4.00	7.02	10.06
30	4.01	7.00	9.96
35	4.02	6.99	9.92
40	4.03	6.97	9.90
50	4.06	6.95	9.82

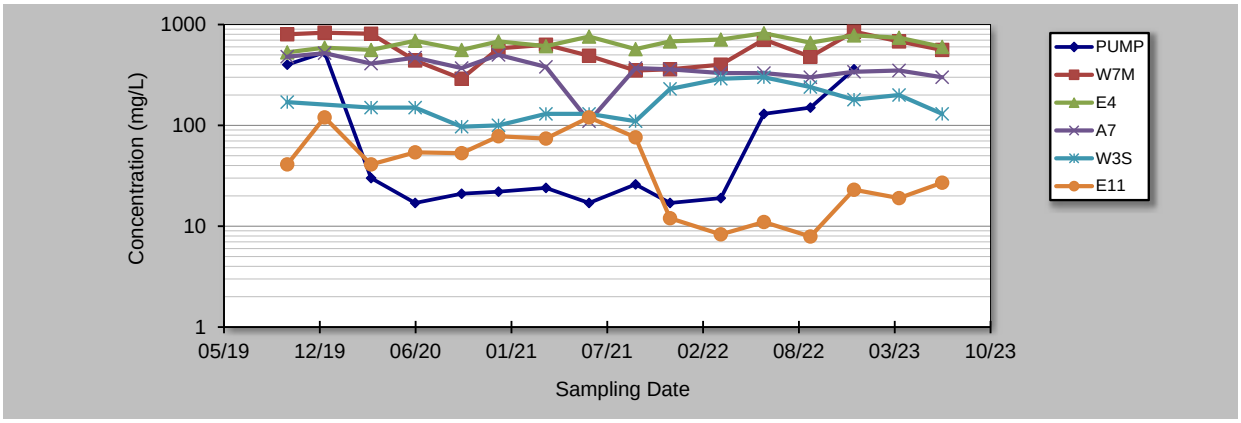
APPENDIX 7
MANN-KENDALL TREND ANALYSIS

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: **19-Jan-24**
Facility Name: **Hydro Kurri Kurri**
Conducted By: **Jake Bourke**

Job ID: **318001662**
Constituent: **Fluoride**
Concentration Units: **mg/L**

Sampling Point ID:	PUMP	W7M	E4	A7	W3S	E11	
Sampling Event	Sampling Date	FLUORIDE CONCENTRATION (mg/L)						
1	24-Sep-19	400	800	530	480	170	41	
2	11-Dec-19	530	830	590	520		120	
3	17-Mar-20	30	810	560	410	150	41	
4	17-Jun-20	17	440	690	470	150	54	
5	22-Sep-20	21	290	560	370	97	53	
6	8-Dec-20	22	580	680	500	100	78	
7	17-Mar-21	24	630	610	380	130	74	
8	15-Jun-21	17	490	760	110	130	120	
9	20-Sep-21	26	350	570	370	110	76	
10	1-Dec-21	17	360	680	360	230	12	
11	17-Mar-22	19	400	710	330	290	8.3	
12	15-Jun-22	130	710	820	330	300	11	
13	20-Sep-22	150	480	660	300	240	7.9	
14	20-Dec-22	360	850	780	340	180	23	
15	24-Mar-23		680	740	350	200	19	
16	22-Jun-23		560	600	300	130	27	
17								
18								
19								
20								
Coefficient of Variation:		1.38	0.32	0.13	0.27	0.38	0.78	
Mann-Kendall Statistic (S):		2	-6	50	-73	25	-40	
Confidence Factor:		52.2%	58.8%	98.7%	>99.9%	88.0%	96.1%	
Concentration Trend:		No Trend	Stable	Increasing	Decreasing	No Trend	Decreasing	



Notes:

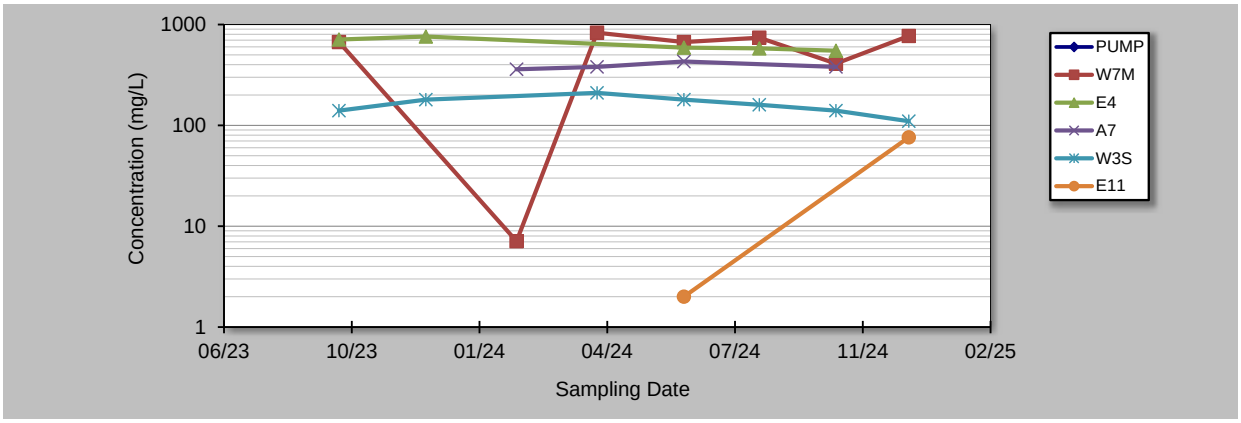
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: **19-Jan-24**
Facility Name: **Hydro Kurri Kurri**
Conducted By: **Jake Bourke**

Job ID: **318001662**
Constituent: **Fluoride**
Concentration Units: **mg/L**

Sampling Point ID:	PUMP	W7M	E4	A7	W3S	E11	
Sampling Event	Sampling Date	FLUORIDE CONCENTRATION (mg/L)						
1	21-Sep-23		670	710		140		
2	28-Nov-23			760		180		
3	7-Feb-24		7.1		360			
4	10-Apr-24		830		380	210		
5	17-Jun-24		670	590	430	180	2	
6	15-Aug-24		740	580		160		
7	14-Oct-24		410	550	380	140		
8	10-Dec-24		770			110	76	
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.49	0.14	0.08	0.21	1.34	
Mann-Kendall Statistic (S):		4	-8	3	-9	1	
Confidence Factor:		66.7%	95.8%	72.9%	88.1%		
Concentration Trend:		No Trend	Decreasing	No Trend	Stable		



Notes:

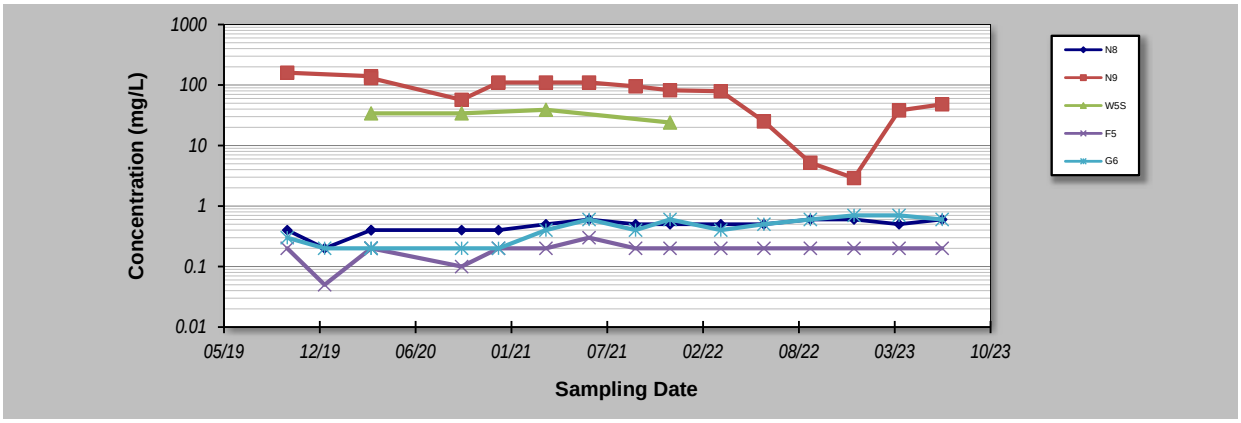
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: **19-Jan-24**
Facility Name: **Hydro Kurri Kurri**
Conducted By: **Sam Buckley**

Job ID: **318000344-003**
Constituent: **Fluoride**
Concentration Units: **mg/L**

Sampling Point ID:	N8	N9	W5S	F5	G6		
Sampling Event	Sampling Date	FLUORIDE CONCENTRATION (mg/L)						
1	24-Sep-19	0.4	160		0.2	0.3		
2	11-Dec-19	0.2			0.05	0.2		
3	17-Mar-20	0.4	140		0.2	0.2		
4	17-Mar-20	0.4	130	34	0.2	0.2		
5	22-Sep-20	0.4	57	34	0.1	0.2		
6	8-Dec-20	0.4	110		0.2	0.2		
7	17-Mar-21	0.5	110	39	0.2	0.4		
8	15-Jun-21	0.6	110		0.3	0.6		
9	20-Sep-21	0.5	95		0.2	0.4		
10	1-Dec-21	0.5	82	24	0.2	0.6		
11	17-Mar-22	0.5	79		0.2	0.4		
12	15-Jun-22	0.5	25		0.2	0.5		
13	20-Sep-22	0.6	5.2		0.2	0.6		
14	20-Dec-22	0.6	2.9		0.2	0.7		
15	24-Mar-23	0.5	38		0.2	0.7		
16	22-Jun-23	0.6	48		0.2	0.6		
17								
18								
19								
20								
Coefficient of Variation:		0.22	0.61	0.19	0.27	0.45		
Mann-Kendall Statistic (S):		73	-76	-1	18	76		
Confidence Factor:		>99.9%	>99.9%	50.0%	77.5%	>99.9%		
Concentration Trend:		Increasing	Decreasing	Stable	No Trend	Increasing		



Notes:

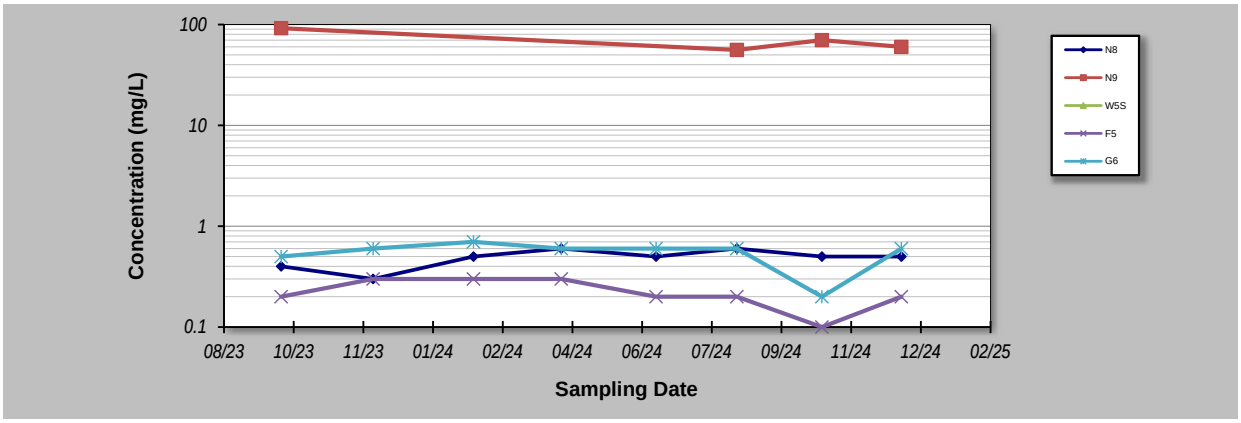
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: **19-Jan-24**
Facility Name: **Hydro Kurri Kurri**
Conducted By: **Sam Buckley**

Job ID: **318000344-003**
Constituent: **Fluoride**
Concentration Units: **mg/L**

Sampling Point ID:	N8	N9	W5S	F5	G6		
Sampling Event	Sampling Date	FLUORIDE CONCENTRATION (mg/L)						
1	22-Sep-23	0.4	92		0.2	0.5		
2	27-Nov-23	0.3			0.3	0.6		
3	7-Feb-24	0.5			0.3	0.7		
4	10-Apr-24	0.6			0.3	0.6		
5	17-Jun-24	0.5			0.2	0.6		
6	14-Aug-24	0.6	56		0.2	0.6		
7	14-Oct-24	0.5	70		0.1	0.2		
8	10-Dec-24	0.5	60		0.2	0.6		
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.20	0.23		0.31	0.27		
Mann-Kendall Statistic (S):		9	-2		-11	-2		
Confidence Factor:		83.2%	62.5%		88.7%	54.8%		
Concentration Trend:		No Trend	Stable		Stable	Stable		



Notes:

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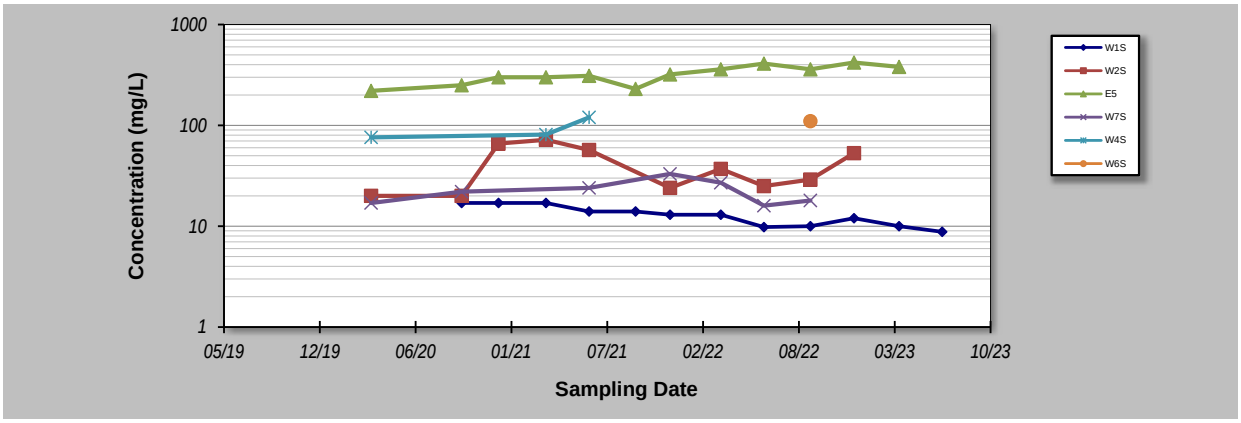
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: **19-Jan-24**
Facility Name: **Hydro Kurri Kurri**
Conducted By: **Sam Buckley**

Job ID: **318000344-003**
Constituent: **Fluoride**
Concentration Units: **mg/L**

Sampling Point ID:	W1S	W2S	E5	W7S	W4S	W6S	
Sampling Event	Sampling Date	FLUORIDE CONCENTRATION (mg/L)						
1	24-Sep-19							
2	11-Dec-19							
3	17-Mar-20							
4	17-Mar-20		20	220	17	76		
5	22-Sep-20	17	20	250	22			
6	8-Dec-20	17	66	300				
7	17-Mar-21	17	72	300		81		
8	15-Jun-21	14	57	310	24	120		
9	20-Sep-21	14		230				
10	1-Dec-21	13	24	320	33			
11	17-Mar-22	13	37	360	27			
12	15-Jun-22	9.8	25	410	16			
13	20-Sep-22	10	29	360	18		110	
14	20-Dec-22	12	53	420				
15	24-Mar-23	10		380				
16	22-Jun-23	8.8						
17								
18								
19								
20								
Coefficient of Variation:		0.23	0.49	0.21	0.27	0.26		
Mann-Kendall Statistic (S):		-52	6	50	1	3		
Confidence Factor:		>99.9%	66.8%	>99.9%	50.0%			
Concentration Trend:		Decreasing	No Trend	Increasing	No Trend			



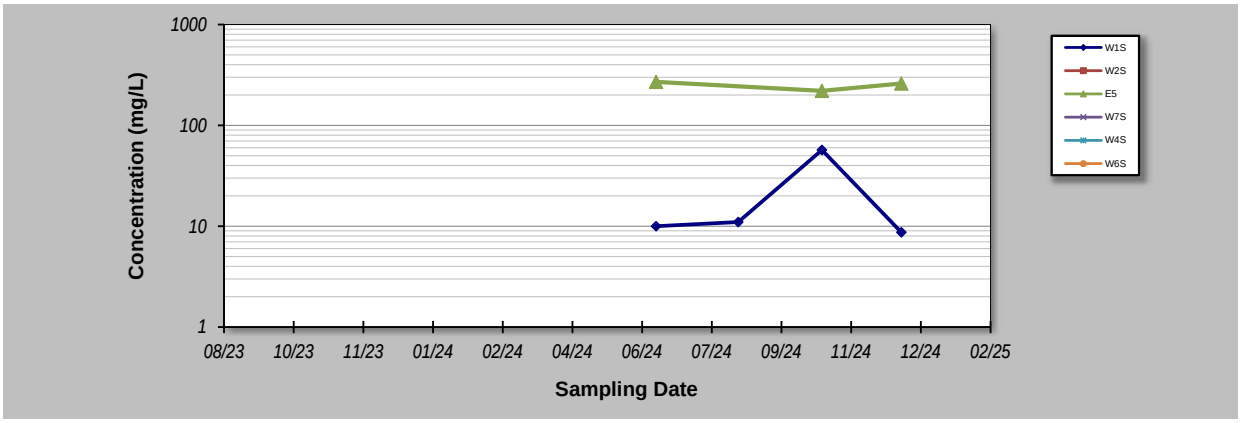
Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	19-Jan-24	Job ID:	318000344-003
Facility Name:	Hydro Kurri Kurri	Constituent:	Fluoride
Conducted By:	Sam Buckley	Concentration Units:	mg/L

Sampling Point ID:	W1S	W2S	E5	W7S	W4S	W6S	
Sampling Event	Sampling Date	FLUORIDE CONCENTRATION (mg/L)						
1	22-Sep-23							
2	27-Nov-23							
3	7-Feb-24							
4	10-Apr-24							
5	17-Jun-24	10		270				
6	15-Aug-24	11						
7	14-Oct-24	57		220				
8	10-Dec-24	8.7		260				
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		1.09		0.11				
Mann-Kendall Statistic (S):		0		-1				
Confidence Factor:		37.5%						
Concentration Trend:		No Trend						



Notes:

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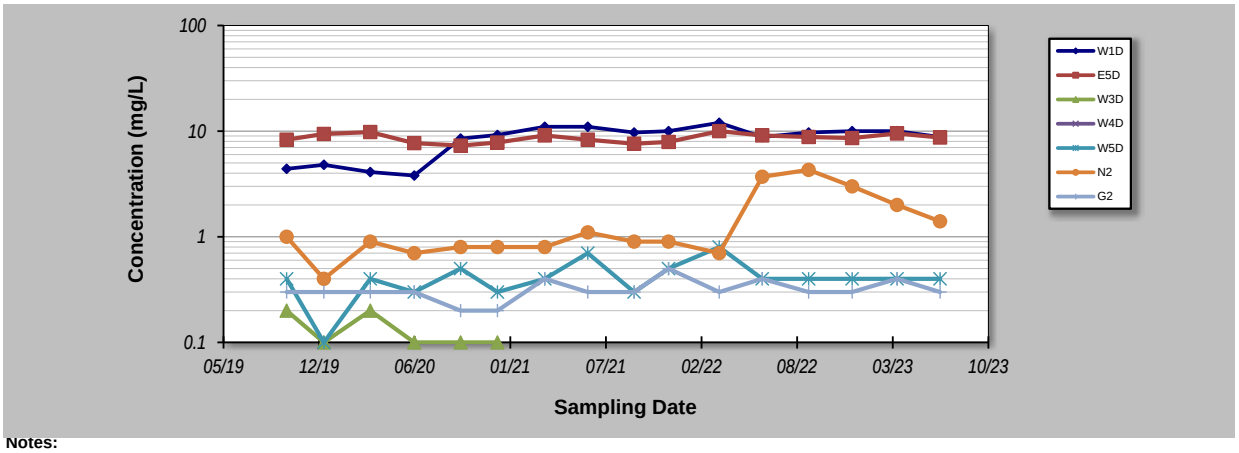
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: **19-Jan-24**
Facility Name: **Hydro Kurri Kurri**
Conducted By: **Sam Buckley**

Job ID: **318000344-003**
Constituent: **Fluoride**
Concentration Units: **mg/L**

Sampling Point ID:	W1D	E5D	W3D	W4D	W5D	N2	G2
Sampling Event	Sampling Date	FLUORIDE CONCENTRATION (mg/L)						
1	24-Sep-19	4.4	8.3	0.2		0.4	1	0.3
2	11-Dec-19	4.8	9.4	0.1		0.1	0.4	0.3
3	17-Mar-20	4.1	9.8	0.2		0.4	0.9	0.3
4	17-Jun-20	3.8	7.7	0.1		0.3	0.7	0.3
5	22-Sep-20	8.5	7.3	0.1		0.5	0.8	0.2
6	8-Dec-20	9.2	7.8	0.1		0.3	0.8	0.2
7	17-Mar-21	11	9.1			0.4	0.8	0.4
8	15-Jun-21	11	8.3			0.7	1.1	0.3
9	20-Sep-21	9.7	7.6			0.3	0.9	0.3
10	1-Dec-21	10	7.9			0.5	0.9	0.5
11	17-Mar-22	12	10			0.8	0.7	0.3
12	15-Jun-22	8.8	9.1			0.4	3.7	0.4
13	20-Sep-22	9.7	8.8			0.4	4.3	0.3
14	20-Dec-22	10	8.6			0.4	3	0.3
15	24-Mar-23	10	9.5			0.4	2	0.4
16	22-Jun-23	8.8	8.7			0.4	1.4	0.3
17								
18								
19								
20								
Coefficient of Variation:		0.31	0.10	0.39		0.38	0.80	0.24
Mann-Kendall Statistic (S):		46	18	-6		22	51	23
Confidence Factor:		97.9%	77.5%	81.5%		82.5%	98.9%	83.6%
Concentration Trend:		Increasing	No Trend	Stable		No Trend	Increasing	No Trend



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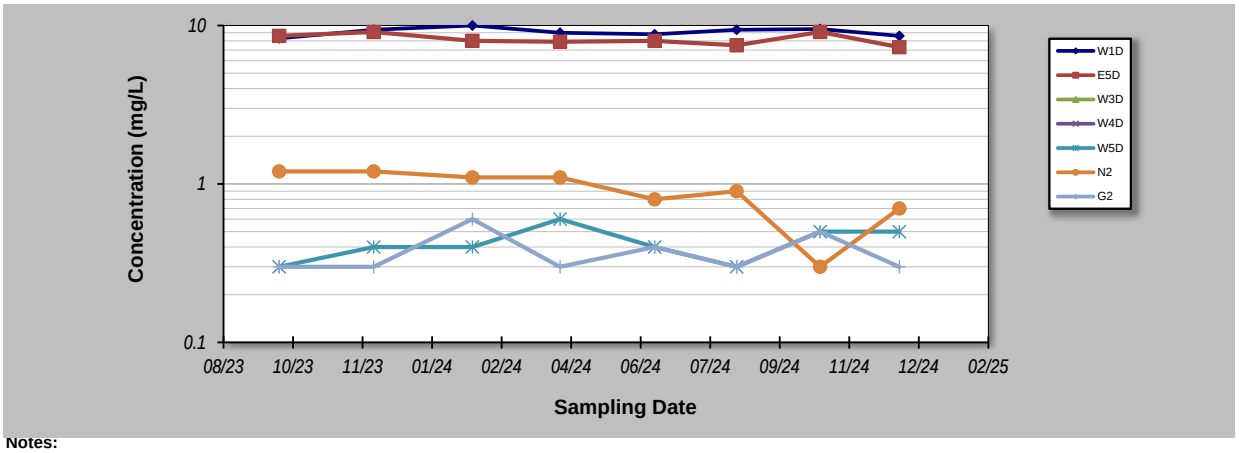
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: **19-Jan-24**
Facility Name: **Hydro Kurri Kurri**
Conducted By: **Sam Buckley**

Job ID: **318000344-003**
Constituent: **Fluoride**
Concentration Units: **mg/L**

Sampling Point ID:	W1D	E5D	W3D	W4D	W5D	N2	G2
Sampling Event	Sampling Date	FLUORIDE CONCENTRATION (mg/L)						
1	21-Sep-23	8.3	8.6			0.3	1.2	0.3
2	28-Nov-23	9.4	9.1			0.4	1.2	0.3
3	7-Feb-24	10	8			0.4	1.1	0.6
4	10-Apr-24	9	7.9			0.6	1.1	0.3
5	17-Jun-24	8.8	8			0.4	0.8	0.4
6	15-Aug-24	9.4	7.5			0.3	0.9	0.3
7	14-Oct-24	9.5	9.1			0.5	0.3	0.5
8	10-Dec-24	8.6	7.3			0.5	0.7	0.3
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.06	0.08			0.24	0.34	0.31
Mann-Kendall Statistic (S):		1	-12			9	-22	2
Confidence Factor:		50.0%	91.1%			83.2%	99.8%	54.8%
Concentration Trend:		No Trend	Prob. Decreasing			No Trend	Decreasing	No Trend



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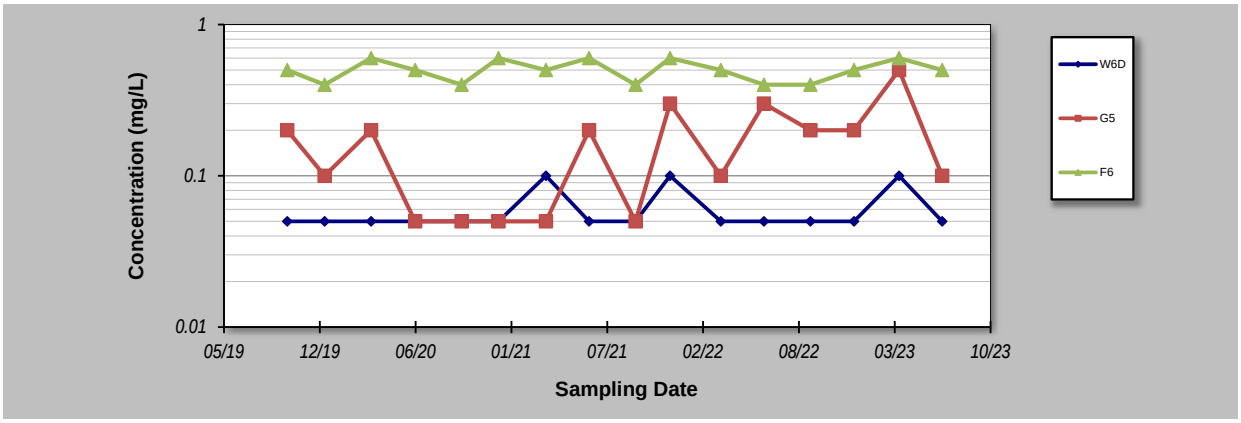
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: **19-Jan-24**
Facility Name: **Hydro Kurri Kurri**
Conducted By: **Sam Buckley**

Job ID: **318000344-003**
Constituent: **Fluoride**
Concentration Units: **mg/L**

Sampling Point ID:	W6D	G5	F6				
Sampling Event	Sampling Date	FLUORIDE CONCENTRATION (mg/L)						
1	24-Sep-19	0.05	0.2	0.5				
2	11-Dec-19	0.05	0.1	0.4				
3	17-Mar-20	0.05	0.2	0.6				
4	17-Jun-20	0.05	0.05	0.5				
5	22-Sep-20	0.05	0.05	0.4				
6	8-Dec-20	0.05	0.05	0.6				
7	17-Mar-21	0.1	0.05	0.5				
8	15-Jun-21	0.05	0.2	0.6				
9	20-Sep-21	0.05	0.05	0.4				
10	1-Dec-21	0.1	0.3	0.6				
11	17-Mar-22	0.05	0.1	0.5				
12	15-Jun-22	0.05	0.3	0.4				
13	20-Sep-22	0.05	0.2	0.4				
14	20-Dec-22	0.05	0.2	0.5				
15	24-Mar-23	0.1	0.5	0.6				
16	22-Jun-23	0.05	0.1	0.5				
17								
18								
19								
20								
Coefficient of Variation:		0.34	0.75	0.16				
Mann-Kendall Statistic (S):		13	30	1				
Confidence Factor:		70.3%	90.3%	50.0%				
Concentration Trend:		No Trend	Prob. Increasing	No Trend				



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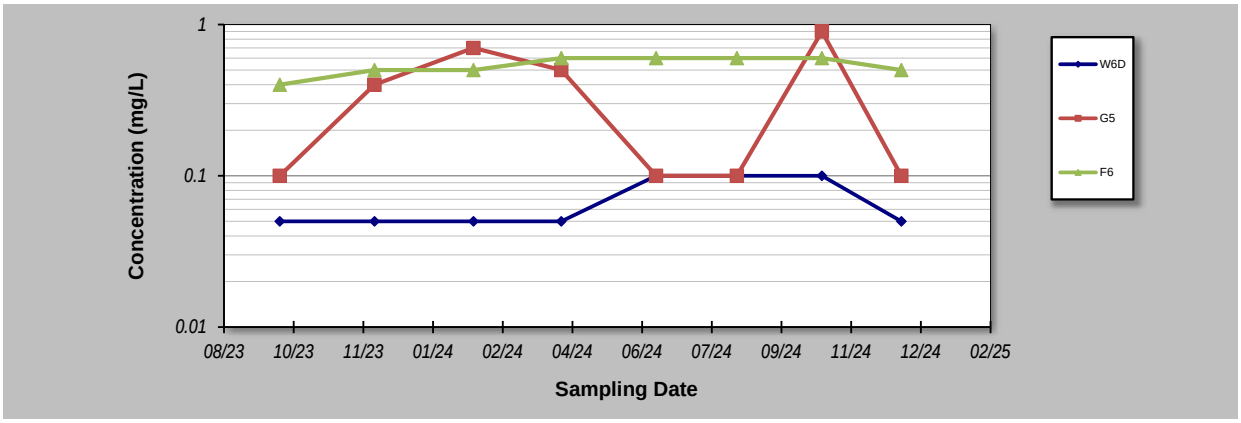
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: **19-Jan-24**
Facility Name: **Hydro Kurri Kurri**
Conducted By: **Sam Buckley**

Job ID: **318000344-003**
Constituent: **Fluoride**
Concentration Units: **mg/L**

Sampling Point ID:	W6D	G5	F6				
Sampling Event	Sampling Date	FLUORIDE CONCENTRATION (mg/L)						
1	21-Sep-23	0.05	0.1	0.4				
2	28-Nov-23	0.05	0.4	0.5				
3	7-Feb-24	0.05	0.7	0.5				
4	10-Apr-24	0.05	0.5	0.6				
5	17-Jun-24	0.1	0.1	0.6				
6	14-Aug-24	0.1	0.1	0.6				
7	14-Oct-24	0.1	0.9	0.6				
8	10-Dec-24	0.05	0.1	0.5				
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.38	0.87	0.14				
Mann-Kendall Statistic (S):		9	0	11				
Confidence Factor:		83.2%	45.2%	88.7%				
Concentration Trend:		No Trend	Stable	No Trend				



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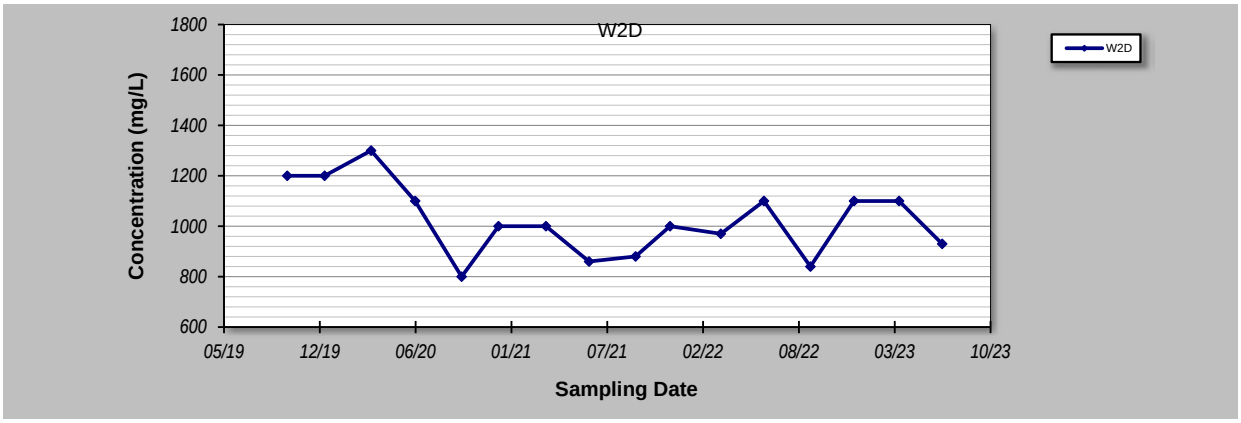
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: **19-Jan-24**
Facility Name: **Hydro Kurri Kurri**
Conducted By: **Sam Buckley**
Job ID: **318000344-003**
Constituent: **Fluoride**
Concentration Units: **mg/L**

Sampling Point ID: **W2D**

Sampling Event	Sampling Date	FLUORIDE CONCENTRATION (mg/L)						
1	24-Sep-19	1200						
2	11-Dec-19	1200						
3	17-Mar-20	1300						
4	17-Jun-20	1100						
5	22-Sep-20	800						
6	8-Dec-20	1000						
7	17-Mar-21	1000						
8	15-Jun-21	860						
9	20-Sep-21	880						
10	1-Dec-21	1000						
11	17-Mar-22	970						
12	15-Jun-22	1100						
13	20-Sep-22	840						
14	20-Dec-22	1100						
15	24-Mar-23	1100						
16	22-Jun-23	930						
17								
18								
19								
20								
Coefficient of Variation:		0.14						
Mann-Kendall Statistic (S):		-28						
Confidence Factor:		88.6%						
Concentration Trend:		Stable						



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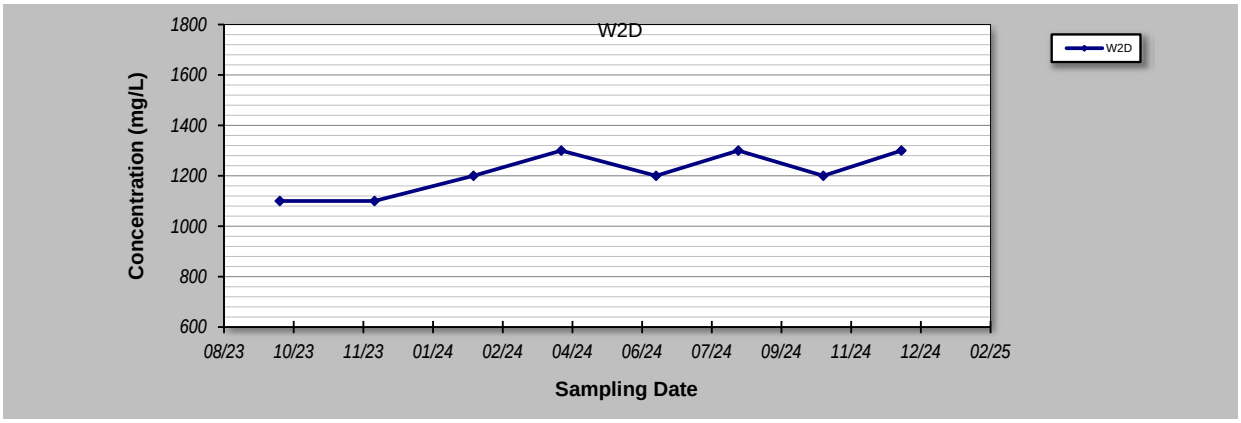
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	19-Jan-24	Job ID:	318000344-003
Facility Name:	Hydro Kurri Kurri	Constituent:	Fluoride
Conducted By:	Sam Buckley	Concentration Units:	mg/L

Sampling Point ID: **W2D**

Sampling Event	Sampling Date	FLUORIDE CONCENTRATION (mg/L)
1	21-Sep-23	1100
2	28-Nov-23	1100
3	7-Feb-24	1200
4	10-Apr-24	1300
5	17-Jun-24	1200
6	15-Aug-24	1300
7	15-Oct-24	1200
8	10-Dec-24	1300
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
Coefficient of Variation:		0.07
Mann-Kendall Statistic (S):		15
Confidence Factor:		95.8%
Concentration Trend:		Increasing



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