



Bi-Annual Construction Monitoring Report- July 2023 - December 2023

SMWSTCTP-AFJ-1NL-EN-RPT-000024 Revision 02

Sydney Metro West – Central Tunnelling Package



DOCUMENT APPROVAL

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COMPLIANCE MATRIX

Condition Reference	Condition Requirement	Reference
C14	The following Construction Monitoring Programs must be prepared in consultation with the relevant government agencies identified for each to compare actual performance of construction of Stage 1 of the CSSI against the performance predicted in the documents listed in Condition A1 of this schedule or in the CEMP: (a) Noise and vibration Monitoring program; consult with EPA, SOPA (in respect of Sydney Olympic Park), Place Management NSW (in respect of The Bays) and Relevant Council(s) (b) Blasting Monitoring program; consult with SOPA (in respect of Sydney Olympic Park), Place Management NSW (in respect of The Bays) and Relevant Council(s) (c) Surface water quality Monitoring program; consult with DPE Water, Relevant Council(s) and Sydney Water (if any Sydney Water assets are impacted) (d) Groundwater Monitoring program; consult with DPE Water and SOPA (in respect of Sydney Olympic Park) Note: The Blasting Construction Monitoring Program is only required to be prepared if blasting is proposed to be conducted during construction.	Section 3 of the Surface Water Monitoring Program (SMWSTCTP-AFJ-1NL-PE-PRG-000001) Section 3 of the Groundwater Monitoring Program (SMWSTCTP-AFJ-1NL-PE-PLN-000006)
C15	Each Construction Monitoring Program must provide: (a) details of baseline data available including the period of baseline monitoring; (b) details of baseline data to be obtained and when; (c) details of all monitoring of the project to be undertaken; (d) the parameters of the project to be monitored; (e) the frequency of monitoring to be undertaken; (f) the location of monitoring; (g) the reporting of monitoring results and analysis results against relevant criteria; (h) details of the methods that will be used to analyse the monitoring data; (i) procedures to identify and implement additional mitigation measures where the results of the monitoring indicated unacceptable project impacts; (j) a consideration of SMART principles; and (k) any consultation to be undertaken in relation to the monitoring programs; and (l) any specific requirements as required by Conditions C16 to C17 of this schedule.	Section 3 of the Noise and Vibration Monitoring Program (SMWSTCTP-AFJ-1NL-NV-PLN-000001) Section 3 of the Surface Water Monitoring Program (SMWSTCTP-AFJ-1NL-PE-PRG-000001) Section 3 of the Groundwater Monitoring Program (SMWSTCTP-AFJ-1NL-PE-PLN-000006)
C16	The Noise and Vibration Construction Monitoring Program and Blasting Construction Monitoring Program must include: (a) noise and vibration monitoring determined in consultation with the AA to confirm the best-achievable construction noise and vibration levels with consideration of all reasonable and feasible mitigation and management measures that will be implemented; (b) for the purposes of (a), noise monitoring must be undertaken during the day, evening and night-time periods and within the first month of work as well as throughout the construction period and cover the range of activities being undertaken at the sites; and (c) a process to undertake real time noise and vibration monitoring. The results of the monitoring must be readily available to the construction team, the Proponent, ER and AA. The Planning Secretary and EPA must be provided with access to the results on request.	Section 3 of the Noise and Vibration Monitoring Program (SMWSTCTP-AFJ-1NL-NV-PLN-000001)

C17	Groundwater Construction Monitoring Program must include: (a) groundwater monitoring networks at each construction excavation site; (b) detail of the location of all monitoring bores with nested sites to monitor both shallow and deep groundwater levels and quality; (c) define the location of saltwater interception monitoring where sentinel groundwater monitoring bores will be installed between the saline sources of the estuary or river and that of the stations or shafts; (d) results from existing monitoring bores; (e) monitoring and gauging of groundwater inflow to the excavations, appropriate trigger action response plan for all predicted groundwater impacts upon each noted neighbouring groundwater system component for each excavation construction site; (f) trigger levels for groundwater quality, salinity and groundwater drawdown in monitoring bores and / or other groundwater users; (g) daily measurement of the amount of water discharged from the water treatment plants; (h) water quality testing of the water discharged from treatment plants; (i) management and mitigation measures and criteria; (j) groundwater inflow to the excavations to enable a full accounting of the groundwater take from the Sydney Basin Central Groundwater Source; and (k) reporting of groundwater gauging at excavations, groundwater monitoring, groundwater trigger events and action responses; and (l) methods for providing the data collected to Sydney Water where discharges are directed to their assets.	Section 3 of the Groundwater Monitoring Program (SMWSTCTP-AFJ-1NL-PE-PLN-000006)
C23	The results of the Construction Monitoring Programs must be submitted to the Planning Secretary, ER and relevant regulatory agencies, for information in the form of a Construction Monitoring Report at the frequency identified in the relevant Construction Monitoring Program. Note: Where a relevant CEMP Sub-plan exists, the relevant Construction Monitoring Program may be incorporated into that CEMP Sub-plan.	This Report

1. INTRODUCTION

This bi-annual monitoring report (B-ACMR) has been prepared to address the Condition of Approval (CoA) C23 of the planning approval for Sydney Metro West – Concept and Stage 1. The B-ACMR presents monitoring data for the reporting period for all works undertaken on the Sydney Metro West Central Tunnelling Package (CTP) from **21st of June 2023 to 30th December 2023**. This is the fourth B-ACMR prepared for the CTP. This period has been expanded to align bi-annually with the calendar months for ease of reporting and will continue with this data range for the following reports.

This report will present results from the construction phase of the monitoring programs and compare the results against established baseline data where available. There is a large amount of noise and vibration data from the unattended monitors, therefore, examples of data have been provided to demonstrate the monitoring which occurred during the period. Groundwater and surface water data will be provided in full. This report will primarily highlight and discuss exceedances of the required criteria and show other results demonstrating compliance.

In accordance with each Construction Monitoring Program, the data will be made available to relevant authorities within 40 business days of the ending of the monitoring period.

During the reporting period the CTP has seen significant progression, achieving several milestones including the completion of excavation of all station box sites and the breakthrough of the TBM's into Five Dock. The completion of approximately 4.3km's of TBM tunnelling has also meant the conclusion of a key risk as White Bay Power Station now falls outside the zone of influence for any significant vibratory impact resulting from TBM activity. Furthermore, staggered monitoring programs (such as groundwater and surface water) have now typically entered a quarterly phase, reducing the overall quantity of results.

2. NOISE AND VIBRATION

The Noise and Vibration Monitoring Program (NVMP) aims to identify the potential impacts of the CTP works on noise and vibration within the local environments surrounding the construction sites. The data presented in the B-ACMR has been prepared in accordance with CoA 16 and 23 of the project Planning Approval, which requires reporting the results of CTP works to the Planning Secretary, ER and relevant regulatory agencies.

The report details the results of the construction phase of the NVMP. This report compares the noise and vibration criteria against monitoring data recorded during the reporting period.

All Noise and Vibration monitoring conducted by AFJV throughout the reporting period was executed in strict compliance with the methodology, calibration requirements and standard stipulated in the Noise and Vibration Monitoring Program (NVMoP).

It is noted that the metric of 'Compliance' identified in the Appendix A Noise Register is a fluid term which refers to a noise monitoring events determination based on several monitoring caveats when assessed against the project approvals, requirements, and licences. However generally, a noise monitoring events 'compliance' is assessed by comparing the following inputs:

- Is the relevant NML exceeded (Yes/No),
- Has a modelled prediction been exceeded (Yes/No)
- Is the noise source AFJV activity related (Yes/No).

Implementation of any works specific mitigation measures is also considered when determining a monitoring events compliance.

2.1 MONITORING LOCATIONS

2.1.1 ATTENDED MONITORING

Attended noise monitoring was completed using a handheld sound level meter fixed to a tripod. Noise monitoring was completed as required, generally for verification purposes for noise impacts associated with Out of Hours Works (OOHW), DNVIS verification and to confirm the SWL for plant being used during daytime hours. Attended monitoring results are provided in Appendix A. The LAeq noise levels captured by these monitors include both construction related activities and extraneous noise sources.

It should be noted that the duration of each monitoring event is 15 minutes unless stated otherwise. On occasion shorter durations of noise monitoring was conducted at source point locations.

No attended vibration monitoring was completed during this reporting period. This can largely be contributed to the staging of work requiring minimal surface works for the completion of station boxes.

2.1.2 UNATTENDED MONITORING

Unattended Noise and vibration monitoring throughout this report was undertaken in accordance with CTP's Noise and Vibration Management Plan (NVMP), Noise and Vibration Monitoring Program (NVMoP) and Detailed Noise and Vibration Impact Statement (DNVIS). All monitors have been installed to monitor on a 24 basis throughout the reporting period using noise and vibration loggers deployed at each of the CTP construction sites to obtain real time data as per CoA C16c.

The unattended monitoring locations are identified in Appendix A.

Examples of unattended noise monitoring data for Five Dock, Burwood North, North Strathfield, Sydney Olympic Park and The Bays are provided in Appendix A. Several examples of real time monitoring set-ups for unattended noise are also provided in Appendix A.

2.2 NOISE AND VIBRATION MONITORING RESULTS

2.2.1 ATTENDED NOISE AND VIBRATION MONITORING

During this period, 97 attended noise monitoring events were conducted at different locations near the construction sites. Of these events, several readings above NML and/or predicted noise levels were identified. In all cases, non-construction-related activities were observed to be responsible for the elevated noise results. A summary of attended noise results including field notes are provided in Appendix A. No attended vibration monitoring was conducted during this period.

2.2.2 UNATTENDED NOISE AND VIBRATION MONITORING

Unattended noise monitor locations and data can be found in Appendix A. It is difficult to identify the source of all elevated data points identified during unattended monitoring considering the mass of data collected throughout the 6 months as there are over 260,000 data points. As unattended monitoring is ongoing, the data is only assessed on a case-by-case basis such as in response to complaints or to ensure compliance with OOHW models. Appendix A provides examples of unattended monitoring data, the data is presented in weekly periods extracted from each month for each site.

An example of the review of unattended monitoring data was undertaken to produce an addendum to the NST DNVIS with rock hammering included in August of 2023. The unattended monitoring data was reviewed for daytime impacts and used to analyse the impacts of AFJV works on the surrounding community. This data as included in the addendum as part of the assessment. Once rock hammering commenced at NST, unattended monitoring data in September 2023 was reviewed to confirm the noise impacts which were shown to be below NML.

Unattended vibration monitoring was also conducted, both continuously and on a case-by-case basis at

Burwood North (), Sydney Olympic Park () and The Bays (WBPS). Throughout the reporting period, 3 vibration spikes were recorded and investigated as outlined below.

- A spike of 11.1mm/s was recorded on 15th August 2023 on the BWD_3 vibration unit near Burwood North southern shaft site. The spike was caused by the AFJV Environmental Advisor whilst checking monitors at 13:00 and was not as a result of AFJV works.
- Monitoring of the () property adjacent to Burwood southern shaft site recorded a spike of 148mm/s on the 30th of October 2023. The spike was noted to be the AFJV Environmental Advisor swapping vibration monitor batteries and was not as a result of AFJV works. No further action was required.
- Monitoring of the unit at () recorded a spike of 172mm/s on the 1st of December 2023 at 13:08. The spike was noted to be an AFJV Environmental Advisor swapping vibration monitor batteries and was not as a result of AFJV works. No further action was required.

Vibratory spikes observed at White Bay Power Station were not linked to AFJV works. Frequencies observed in the events were not consistent with TBM operations. At the time of the spike the geophones were located within an adjacent contractor's construction site, and most likely related to the geophones being disturbed, which is consistent with the events velocity and frequency readings.

All other unattended vibration monitoring was recorded below site criteria and was compliant. Several examples of real time unattended vibration monitoring data is provided in Appendix B.

2.2.3 PLANT SOUND POWER LEVELS

In accordance with the NVMoP, DNVIS and CNVS, AFJV conducted a number of sound power measurements to ensure all the machines and equipment operating on CTP maintained a sound power level (SWL) within acceptable limits, as defined in Table 13 of the CNVS. In line with CNVS Section 4, special attention is given to items of plant with predicted loudness of 105dB(A) or more. Regular noise checks, of all high-risk plant was conducted upon arrival at the site.

Throughout the reporting period, SWL measurements were carried out across various plant and equipment on the CTP project. Measurements were conducted in line with Australian and ISO standards AS2012–1990, ISO 9614-2 1996, and AS2012–1977, ensuring all plant on site were within allowable sound powers.

During the reporting period a single Surface Minor at Five Dock was identified to exceed the 105dB(A) trigger value with a monitored 120dB(A) SWL. However, the item of plant was captured within the AA endorsed Five Dock DNVIS, predicting a SWL of 122dB(A), rendering the plant compliant. A full range of results for the period can be found in Appendix A.

The measurements were taken under regular operating conditions, ensuring a realistic representation of noise emissions during day-to-day project activities. In cases where normal operating conditions were impractical, stationary tests at high idle were used, offering a thorough evaluation of sound power levels. As per the results depicted in Appendix A, no instances of machines exceeding 105dB(A) levels were identified during the reporting period across the CTP project.

Although no exceedances were observed AFJV recognises the requirement to implement reasonable and feasible corrective actions to mitigate elevated SPL's. Reasonable and feasible measures may include adding or upgrading muffling devices, and building enclosures around stationary plant items, provide practical solutions to address any deviation from the allowed noise levels.

2.2.4 TRAFFIC NOISE REVIEW

Construction traffic impact reviews were undertaken by noise consultant Hutchison Weller at Burwood North

and Five Dock constructions sites throughout July 2023 in accordance with REMM NV14.

Predicted noise levels at Burton Street and Loftus Street fall within the 2dB range for exceedances of the NSW Road Noise Policy 2011(RNP) criteria therefore, no additional consideration of noise impacts were required for these locations.

Based on the measured construction traffic noise, typical daily spoil vehicle movement noise impacts are expected to be within 2 dBA of the base criteria at all sites. However, maximum truck movements, specifically on local roads are likely to exceed the base criteria by more than 2 dBA and would therefore require reasonable and feasible management measures in line with NV14, to reduce these impacts to an acceptable range.

AFJV has continued to implement reasonable and feasible mitigation measures across CTP including:

- On-site spoil storage capacity would be maximised to reduce the need for truck movements during sensitive times
- Vehicle movements would be redirected away from sensitive receiver areas and scheduled during less sensitive times
- The speed of vehicles would be limited and the use of engine compression brakes would be avoided
- Heavy vehicles would not be permitted to idle near sensitive receivers.

2.2 NOISE AND VIBRATION COMPLAINTS

There were several complaints received from the community regarding noise at each site. Complaints were addressed by the AFJV community team and preventive actions were taken. Reasonable and feasible mitigation measures were provided to minimise the impacts on the affected community members. A number of mitigation strategies were recommended by the environmental team and implemented and facilitated in consultation with the community and stakeholders team.

Examples of mitigation measures associated complaints:

- A noise complaint was received on 14th September 2023 from a resident adjacent to the Five Dock station box. The complaint related to the night works occurring in the central underground cavern. In response to the complaints, AFJV conducting a series of attended noise monitoring measurements at the residence's balcony. Monitoring was first conducted during the evening period (6pm to 10pm) on the 4th of October 2023 and then again during the night period (10pm to 7am). Both monitoring events identified works to be operating below predicted noise levels. Follow up monitoring was again conducted at the resident's property on the 18th of October 2023. Results again identified compliance with the modelled noise prediction for the residence.

2.4 CONCLUSION

Attended and unattended monitoring has occurred throughout the reporting period at each CTP site. The monitoring was for various purposes including compliance, sound power level checks and verification of out of hours work impacts.

Throughout the monitoring period no non-compliance with the Noise and Vibration Management Plan and associated documents were identified. A majority of observations obtained in the reporting period identified auditory contributors that were not related to construction activities. Although elevated levels were observed, reasonable and feasible mitigation measures were implemented. Elevated noise levels were identified during the operation of ventilation fans at Five Dock East. A review of the works occurring found all reasonable and feasible mitigation measures had been installed.

Elevated events observed during vibration monitoring at the White Bay Power Station were not related to AFJV works. Monitoring undertaken at Burwood North Southern site identified elevated events as isolated spikes, related to monitoring personnel performing maintenance on the unit or tests by the site team to ensure the monitor was set up correctly and not a result of construction activities.

AFJV will continue to implement noise & vibration mitigation strategies where reasonable and feasible. Where applicable these mitigation measures are included in the relevant DNVIS. For example, the Five Dock DNVIS Rev12 where a reasonable and feasible table was included to detail the assessment process by AFJV in regard to ventilation in the acoustic shed. AFJV is committed to minimising their impact on surrounding receivers with the implementation of a dedicated noise specialist aimed specifically at identifying and mitigating noise and vibrational impacts. AFJV has an environmental resource available on night shift.

3. SURFACE WATER

The purpose of the Surface Water Monitoring Program (SWMP) is to identify the potential impacts of the CTP works on water quality within local receiving waters. The data presented in the B-ACMR was prepared in accordance with Condition C23 of the Project Planning Approval which requires reporting the results of the CTP works to the Planning Secretary, ER and relevant regulatory agencies.

The report is to provide monitoring data and analysis of results as required to be generated in SWMP. This report details the results during the construction phase of the SWMP. This report will compare the ANZECC guideline and baseline water quality against water quality monitoring data undertaken during the reporting period.

3.1 MONITORING SITES

During the reporting period, surface water quality monitoring was undertaken for dry and wet weather conditions in accordance with SWMP monitoring program. Table 3-A Surface water quality monitoring locations provide a summary of the monitoring locations, and the monitoring location map is included in Appendix D.

Surface water quality was measured at eight locations during the reporting period. Monitoring locations were identified as being representative of the surrounding receiving waters and sufficient to identify potential project impacts should there be any quality exceedances.

Table 3-A SURFACE WATER MONITORING LOCATIONS

Name	Waterway	Nearest Project Site	Location	Distance From Site to Creek
WB-D/S	White Bay	The Bays	-33.866245°S, 151.180450° E	Immediately adjacent to the site
DC-U/S	Dobroyd Canal / Iron Cove Creek	Five Dock	-33.873828 ° S, 151.128243° E	600m
DC-D/S	Dobroyd Canal / Iron Cove Creek	Five Dock	-33.870604° S, 151.141474° E	600m
SLP-D/S	St Lukes Park Canal	Burwood North	-33.861571°S , 151.113347° E	230m
PC-U/S	Powells Creek	North Strathfield	-33.862145°S, 151.086294° E	350m
PC-D/S	Powells Creek	North Strathfield	-33.852589°S, 151.082359° E	350m
SC-D/S	Saleyards Creek	Sydney Olympic Park	-33.852282°S, 151.081934° E	1km
HC-D/S	Haslams Creek	Sydney Olympic Park	-33.834564°S, 151.075772° E	1km

3.2 SURFACE WATER QUALITY CRITERIA

The surface water monitoring results were compared to the ANZECC guideline. No detailed pre-project baseline surface water monitoring data was identified in the Sydney Metro West EIS documentation. Monitoring data collected from other projects has been used as background data as presented in Table 3-B. The data collected provides insight into the general health of the waterway. As per the review of existing water quality data collected, some background levels exceed the ANZECC guidelines (2000). The surface water monitoring

results for this reporting period have been compared to the pre-existing water quality in Table 3-B.

Table 3-B- PRE-EXISTING WATER QUALITY DATA BASED ON ANZECC GUIDELINES

Parameter	ANZECC Guideline ¹	Sal1 (U/S) ³ – Salesyard creek	Sal2 (D/S) ³ - Salesyard creek	Pow1 (U/S) ³ - Powells Creek	Pow2 (D/S) ³ - Powells Creek	SLP2 (D/S) ³ -St Lukes Park Canal	Bar2 (D/S) ³ - Barnwell Park Canal	Dob1 (U/S) ³ - Dobroyd Canal	Dob2 (D/S) ³ - Dobroyd Canal	SW09 Dobroyd Canal ⁴	SW01 Rozelle Bay ⁵
pH	7.0 – 8.5 ²	7.8-9.4	7.5-9.1	7.6-9.5	7.7-9.9	7.8-9.7	7.1-8.2	8.1-9.1	7.0-9.1	7.0 – 8.5	5.6-8.0
Conductivity (uS/cm)	Lowland rivers: 125–2200 µS/cm	126-3744	203-40,823	99-2977	101-36,323	165-4,535	258-30,752	230-1718	260-52,630	42 average	403-541,180
DO (mg/L)	N/a	8.8-15	5.4-14	6.9-13	6.8-16	8.2-14	4.7-10.8	9.0-13	4.4-15	n/a	-0.16-558
DO (%sat)	85-110	107-151	67-151	89-130	75-168	96-161	56-110	106-132	58-159	n/a	n/a
Turbidity (ntu)	0.5 – 10 ²	0-138	5-101	4-501	2-444	0-364	6-48	11-549	2.5-187	n/a	0-52
Oil and grease	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

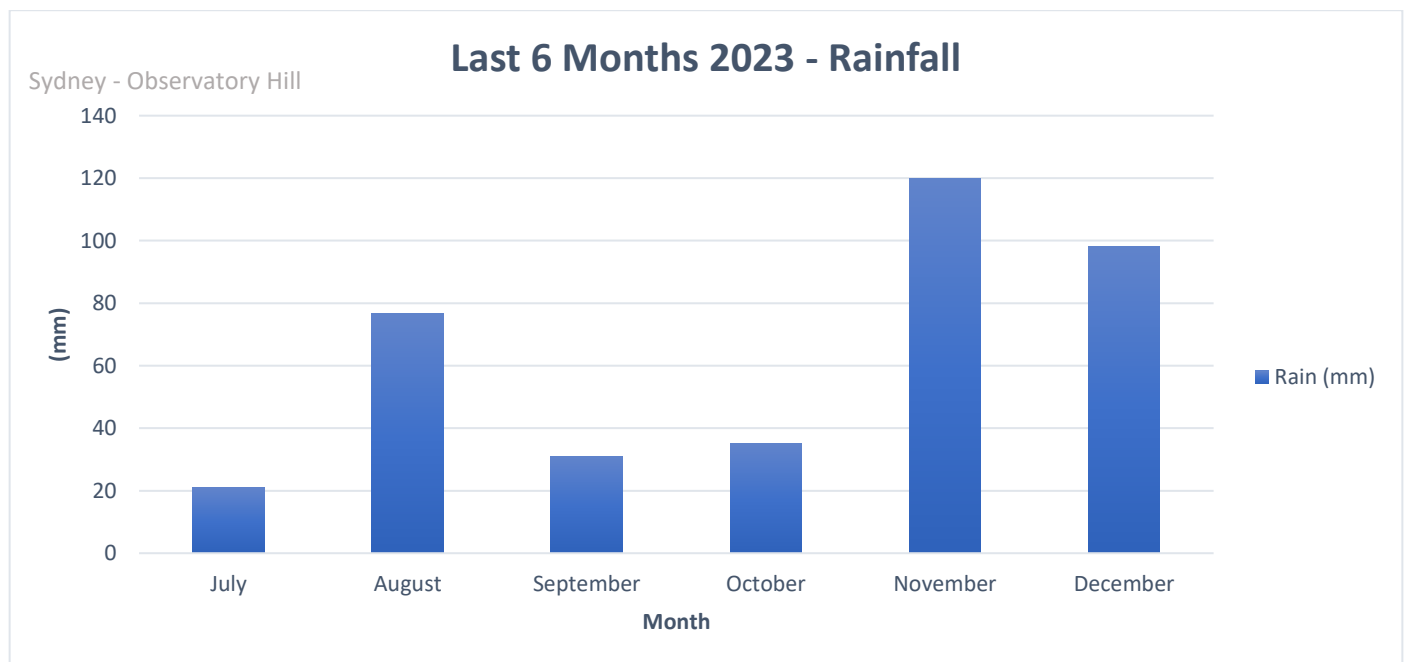
Notes: 1 – ANZECC (2000) – slightly to moderately disturbed aquatic ecosystems, 2 – Guideline value for SE Australian estuaries 3 - Appendix R of the M4 East project EIS 4- WestConnex M4-M5 Link Mainline Tunnels Soil and Surface Water Management Sub-Plan 5- WestConnex Rozelle Interchange Project Soil and Surface Water Management Plan

As per 6.6.2 of the AFJV SWMP, “surface water quality trigger values can be modified after sufficient data has been collected”. After evaluating monitoring results and considering the considerable geographical separation between CTP sites and designated water sampling points, it was determined that the diverse urban stormwater sources between CTP and the catchment make modifying existing ANZEC (2000) based trigger values unnecessary. Such modifications would not enhance the monitoring program outcomes or align with the project approvals' intent.

3.3 RAINFALL DATA

During the reporting period 382 mm of rainfall was received at Observatory Hill with the highest rainfall received in November 2023 and lowest in July 2023 as presented in Figure 3-A.

Figure 3-A- Rainfall statistics



3.4 SURFACE WATER QUALITY RESULTS

A review of the water quality data gathered as part of the project EIS was conducted, it was noted that the watercourses associated with the Central Tunnelling Package (CTP) Project were identified to be in poor condition prior to project commencement, and indicative of a highly urbanised system. Surface water data collected throughout the subsequent monitoring period revealed minor exceedances (Against preliminary ANZECC 2000 trigger values) in Dissolved Oxygen, Electrical Conductivity, and Turbidity. These exceedances were compared with preconstruction values presented in Table 3-B, as well as the EIS. The comparison found results were consistent with observations made throughout chapter 19 of the EIS, particularly section 19.5.2 and table 19-6. It can therefore be concluded that as a result of the densely populated urban setting with multiple potential impact sources along the corridor, the observed deviations in surface water quality do not appear to be directly linked to the project activities and are more likely the result of the array of pre-existing pollutants.

Furthermore, A comparison of surface water monitoring results (Appendix C) with discharge data collected from the Water Treatment plants WTP discharge results found no correlation in analyte fluctuations.

3.5 FIELD OBSERVATIONS

No abnormal odours, visible turbidity/contamination attributable to AFJV works were identified throughout the reporting period. Appendix C provides a detailed summary of pH, EC (Electrical Conductivity), dissolved oxygen, redox and turbidity results collected from each water quality sampling location.

Throughout the monitoring no significant variance in water quality or obvious sediment plumes were observed during sampling period.

3.6 CONCLUSION

As outlined in section 3.3, review of the pre-existing surface water quality data collected from Sydney Metro, Local Councils, University of Western Sydney, and WestConnex M4 East project undertaken as part of the EIS, revealed that some of the background levels exceeded the ANZECC (2000) water quality trigger values, identifying the watercourses as slightly to moderately disturbed ecosystems. When compared with pre-existing data, elevated water quality results obtained by AFJV across the monitoring period fall within expected ranges, with no identifiable analyte trends observed throughout the periods data (see appendix C). Given the significant sprawl of urban development and substantial distance between the project boundary and the surface monitoring points, it can be concluded that elevated water quality analyte levels observed across the surface water monitoring data for the period, cannot be attributable to the CTP project or associated operations.

4. GROUNDWATER

The purpose of the Groundwater Monitoring Program (GWMP) is to identify the potential impacts of the CTP works on the groundwater quality of the local environments. The data presented in the B-ACMR is prepared in accordance with condition C17 and C23 of the Project Planning Approval, which requires reporting the results of the CTP works to the Planning Secretary, ER and other relevant regulatory agencies.

This report details the results during the construction phase of the GWMP for The Bays, Five Dock, Burwood North, Sydney Olympic Park and North Strathfield. All locations are currently being monitored on a quarterly basis as per the Groundwater Monitoring Program.

Groundwater encountered in excavations for the Project has been treated by water treatment plants (WTP) at The Bays, Burwood North, Sydney Olympic Park and Five Dock sites during this monitoring period. The influx of groundwater in the sites is highly dependent on rainfall as greater ingress is observed during higher rainfall. Since the surface water and ground water is treated through single water treatment plants at each site, the numerous variables, including sprinkler systems utilised for dust suppression, makes calculating the specific amount of groundwater ingress for each site an estimation.

4.1 GROUNDWATER MONITORING LOCATIONS

In accordance with the GWMP, there are 33 boreholes identified throughout the project to monitor and sample. However, borehole SMW-BH068 was grout filled due to being located at the top of the SOP station box cavern. Section 7.1 of the CEMP specifies monitoring monthly for the first three months of construction and quarterly thereafter. Borehole locations utilised during the reporting period are summarised in Appendix D.

Refer to Table 4-A for a summary of monitoring completed within the reporting period.

Table 4-A- GROUNDWATER MONITORING PERIOD

Site	Ground Disturbance Trigger Date	Construction Monitoring (first 3 months of construction)	Quarterly Monitoring
The Bays	05/04/2022	Round 1: 05/05/2022 Round 2: 25/5/2022 Round 3: 21/06/2022	Round 1: 19/09/2022 Round 2: 12/12/2022 Round 3: 21/03/2023 Round 4: 26/06/2023 Round 5: 20/09/2023 Round 6: 11/12/2023
Five Dock	23/05/2022	Round 1: 21/06/2022 Round 2: 18/07/2022 Round 3: 29/08/2022	Round 1: 21/11/2022 Round 2: 21/02/2023 Round 3: 27/06/2023 Round 4: 23/08/2023 Round 5: 21/11/2023
Burwood North	1/06/2022	Round 1: 21/06/2022 Round 2: 18/07/2022 Round 3: 29/08/2022	Round 1: 21/11/2022 Round 2: 20/03/2023 Round 3: 19/06/2023 Round 4: 23/08/2023 Round 5: 21/11/2023
North Strathfield	09/11/2022	Round 1: 21/03/2023 Round 2: 27/04/2023 Round 3: 30/05/2023 Refer to section 4.2.3	Round 1- 28/08/23 Round 2: 22/11/2023
Sydney Olympic Park	21/06/2022	Round 1: 18/07/2022 Round 2: 29/08/2022 Round 3: 19/09/2022	Round 1: 12/12/2022 Round 2: 21/03/2023 Round 3: 27/06/2023 Round 4: 20/09/2023 Round 5: 12/12/2023

4.2 FIELD INVESTIGATION

4.2.1 GROUNDWATER MONITORING METHODOLOGY

To ensure accurate results, the methodology outlined in the Groundwater Monitoring Program for gauging and collecting samples during the monitoring rounds was followed. In cases where it was not possible to pump water out of the boreholes due to lack of water or space restrictions on site (for example, physically unable to place equipment), a bailer was used to collect samples. Detailed monitoring methodology is available in Appendix D.

4.2.2 GROUNDWATER SAMPLING AND GAUGING

Groundwater sampling and gauging was conducted at accessible groundwater monitoring wells. Table 4-B outlines the boreholes that were sampled during the monitoring period. Further explanation on why some boreholes were not sampled it is included in table 4-C.

Table 4-B Groundwater Wells Monitored

Site	Borehole number	Quarterly Monitoring 1	Quarterly Monitoring 2	Quarterly Monitoring 3	Quarterly Monitoring 4	Quarterly Monitoring 5	Quarterly Monitoring 6
The Bays	S02d	N/A - Previously reported	N/A - Previously reported	N/A - Previously reported	Sampled	Sampled	
	S02s	<u>N/A - Previously reported</u>	<u>N/A - Previously reported</u>	N/A - Previously reported	Not Monitored (Refer to table 4-C)	Not Monitored (Refer to table 4-C)	
	S06	<u>N/A - Previously reported</u>	<u>N/A - Previously reported</u>	N/A - Previously reported	Not Monitored (Refer to table 4-C)	Sampled	
	S58d	<u>N/A - Previously reported</u>	<u>N/A - Previously reported</u>	N/A - Previously reported	Under ETP boundary	Under ETP boundary	
	S58s	<u>N/A - Previously reported</u>	<u>N/A - Previously reported</u>	N/A - Previously reported	Under ETP boundary	Under ETP boundary	
	S55	<u>N/A - Previously reported</u>	<u>N/A - Previously reported</u>	N/A - Previously reported	Under ETP boundary	Under ETP boundary	
	S40d	<u>N/A - Previously reported</u>	<u>N/A - Previously reported</u>	N/A - Previously reported	Under ETP boundary	Under ETP boundary	
	S40s	<u>N/A - Previously reported</u>	<u>N/A - Previously reported</u>	N/A - Previously reported	Under ETP boundary	Under ETP boundary	
	AF__CGW1	<u>N/A - Previously reported</u>	<u>N/A - Previously reported</u>	N/A - Previously reported	Not Monitored (Refer to table 4-C)	Not Monitored (Refer to table 4-C)	
	S54	<u>N/A - Previously reported</u>	<u>N/A - Previously reported</u>	N/A - Previously reported	Not Monitored (Refer to table 4-C)	Not Monitored (Refer to table 4-C)	
Sydney Olympic Park	SMW_BH019	<u>N/A - Previously reported</u>	<u>N/A - Previously reported</u>	N/A - Previously reported	Not sampled	Sampled	
	SMW_BH120	<u>N/A - Previously reported</u>	<u>N/A - Previously reported</u>	N/A - Previously reported	Sampled	Sampled	

	SMW_BH068	<u>N/A - Previously reported</u>	<u>N/A - Previously reported</u>	N/A - Previously reported	The monitoring wells were grouted	The monitoring wells were grouted	
	SMW_BH126	<u>N/A - Previously reported</u>	<u>N/A - Previously reported</u>	N/A - Previously reported	Sampled	Sampled	
Tunnel NW of SOP	SMW_BH121	<u>N/A - Previously reported</u>	<u>N/A - Previously reported</u>	N/A - Previously reported	Sampled	Not Monitored (Refer to table 4-C)	
Tunnel SOP-NS	BH715B	<u>N/A - Previously reported</u>	<u>N/A - Previously reported</u>	N/A - Previously reported	Sampled	Sampled	
	AF_BH36	<u>N/A - Previously reported</u>	<u>N/A - Previously reported</u>	N/A - Previously reported	-Sampled	Sampled	
Burwood	BH046R	<u>N/A - Previously reported</u>	<u>N/A - Previously reported</u>	N/A - Previously reported	Sampled	Sampled	
	BH044	<u>N/A - Previously reported</u>	<u>N/A - Previously reported</u>	N/A - Previously reported	Sampled	Not Monitored (Refer to table 4-C)	
Five Dock	BH051	<u>N/A - Previously reported</u>	<u>N/A - Previously reported</u>	Sampled	Sampled	Sampled	
North Strathfield	SMW-BH035s	Sampled	Sampled				
	SMW_BH009	Sampled	Sampled				
	SMW_BH009s	Sampled	Sampled				
	SMW_BH035	Sampled	Sampled				
	SMW_BH038	Sampled	Sampled				

Refer to Appendix D for detailed description of the monitoring conducted. Sampling dates are specified in table 4-A. Due to the staging of stations boxes and therefore disturbance of ground, the “reporting quarter” for each site will vary from site to site based on staging of works.

4.2.3 GROUNDWATER MONITORING WELL STATUS

The groundwater monitoring wells that could not be accessed, replaced, or sampled during this monitoring period are listed in Table 4-C.

Table 4-C Explanation of groundwater wells not monitored

Month (2023)	Site	Borehole number	Comments
Round 4: 23/08/2023 Round 5: 11/12/2023	Five Dock	SMW_BH051s	The monitoring well had no water to sample.
Round 4: 23/08/2023 Round 5: 11/12/2023	Five Dock	SMW_BH050s	The monitoring well had no water to sample.
Round 4: 23/08/2023 Round 5: 11/12/2023	Five Dock	SMW_BH050	The monitoring well had no water to sample.
Round 3: 27/06/23	Sydney Olympic Park	SMW_BH019	The monitoring well could not be located during the first monitoring Round 3 due to the well being overgrown with vegetation. It was then located in monitoring Round 4 and sampled.
Round 3: 27/06/23	Sydney Olympic Park	SMW-BH068	Monitoring well grouted.
Round 4: 20/09/2023	Sydney Olympic Park	SMW_BH121	The monitoring well could not be located during the first monitoring Round 4 due to the well being overgrown with mulch. It was then located in monitoring Round 5 and sampled.
Round 1: 28/08/2023 Round 2: 22/11/2023	North Strathfield	SMW_BH009	During the sampling operation conducted in the month of August 2023, an incident occurred wherein the bailer became lodged within the well, which possesses a depth of approximately 40m. Despite efforts, the bailer proved unretrievable, leading to the decision to sever the rope from the surface. As a consequence of this unforeseen circumstance, the monitoring well remains inaccessible for sampling.
Round 5: 21/11/2023	Burwood	BH 044	Sampling could not be acquired due to a parked car obstructing access.
Round 5: 20/09/2023 Round 6: 11/12/2023	The Bays	S54	The borehole couldn't be monitored as the casing is bent making it impossible to feed the pump/bailer through the casing.
Round 4: 26/06/2023	The Bays	S06	Sampling of the monitoring well was precluded in Round 4 by the presence of mud and silt within the well despite attempts to purge and sample. Consequently, the sampling activity was deferred to the following monitoring Rounds 5 and 6 where sampling was successful.
Round 5: 20/09/2023	The Bays	S02_s	The monitoring well had no water to sample.
Round 5: 20/09/2023 Round 6: 11/12/2023	The Bays	AF_CGW1	Shallow and dry Well

During previous reporting periods, a consultant was engaged to provide input as to the potential cause of water not being able to be retrieved from the wells at North Strathfield. The potential causes and solution provided by the consultant for being unable to retrieve water from the monitoring wells after piling commenced are:

- i. Bladder pump was not working as there may be insufficient water to push water to the surface, and the possible solution provided was to use a bailer.

Even after using a disposable bailer, no water was retrieved, and the potential cause suggested was:

- i. The bailer could not reach the depth where groundwater was intercepted, which might be due to friction on the side walls due to silt/clay smearing, stopping the bailer from reaching the groundwater.

Hence, a stainless-steel bailer was used to overcome the sidewall friction.

4.2.4 FIELD OBSERVATIONS

During sampling and gauging, no odours were noted. Also, no visual sign of contamination (such as a sheen) was observed. Refer to Appendix D for a detailed summary of pH and EC (Electrical Conductivity) dissolved oxygen, redox, turbidity, EC (Electrical Conductivity) for each borehole sampled during the monitoring period.

4.3 TRIGGER VALUES

A set of trigger values has been developed on a site-by-site basis. This has been done following these steps:

- If result below LOR (Limit of reporting), the trigger value is set at:
 - o LOR x 10 (if LOR is more than 10x > screening levels);
 - o LOR (if LOR is less than 10x screening levels)
- For result with detects:
 - o If data does not support statistics applied maximum plus 20%, also note where the maximum already exceeds screening levels (The 20% represents the standard field/lab error we apply in normal QA/QC (Quality Assurance/Quality Control)).

If there is an exceedance of a Trigger Value, the following next steps may be considered:

- Review Site data for the well with the exceedance
- Data for that well should be tracked for long-term trends after the next sampling period;
- If the next sampling round also exceeds, increased frequency of sampling is warranted to evaluate the longer-term trend; and
- If increasing trends are identified, further site-specific assessment should be conducted that can include review of hydrogeologic information, trends and as well as assessment of risks to quality of water.

4.3.1 LABORATORY RESULTS ANALYSIS

Throughout this monitoring period all groundwater laboratory results were assessed against the determined trigger values. These results can be found in appendix D. A summary of exceedances identified across CTP are outlined in table 4-D.

It is noted that although fluctuations in water chemistry were observed throughout the reporting period, no trends in analyte concentrations were observed. This is inclusive of Dissolved Sodium and Chloride which has been identified as an indicator of saltwater ingress due to groundwater drawdown.

Table 4-D Identified exceedances of Groundwater trigger values.

Site	Borehole	Month	Analyte
The Bays	S_02d	September	TRH C10 - C1-, TRH C15 - C28, Total +ve TRH (C10-C36)- TRH >C16 - C34, Total +ve TRH (>C10-C40), Molybdenum-Dissolved, Antimony-Dissolved, Chromium-Total, Copper-Total, Mercury-Total, Manganese-Total, Molybdenum-Total, Nickel-Total, Antimony-Total, Selenium-Total, Tin-Total, Zinc-Total, Iron-Total
		December	TRH C10 - C1-, TRH C15 - C28, Total +ve TRH (C10-C36)- TRH >C16 - C34, Total +ve TRH (>C10-C40), Fluoranthene, Molybdenum-Dissolved, Tin-Total
	S06	December	Manganese-Dissolved, Iron-Dissolved, Boron-Dissolved, Total +ve TRH (>C10-C40)- TRH >C16 - C34, Total +ve TRH (C10-C36-, TRH C15 - C28

Five Dock	SMW_BH051	September	Calcium - Dissolved, Potassium - Dissolved, Hardness, Bicarbonate Alkalinity as CaCO ₃ , Total Alkalinity as CaCO ₃ , Chloride, Cl, Barium-Dissolved, Molybdenum-Dissolved, Arsenic-Total, Boron-Total, Barium-Total, Beryllium-Total, Cadmium-Total, Chromium-Total, Copper-Total, Molybdenum-Total, Lead-Total, Zinc-Total
		November	Nitrate as N in water
	SMW_BH051s	September	Ionic Balance, Barium-Dissolved, Arsenic-Total, Boron-Total, Barium-Total, Beryllium-Total, Lead-Total, Zinc-Total, Iron-Total
	SMW_BH050	November	Iron-Total, Boron-Total, Barium-Total, Boron-Dissolved, Barium-Dissolved
	SMW_BH050s	September	Chloride, Cl, Iron-Dissolved, Arsenic-Total, Boron-Total, Barium-Total, Beryllium-Total, Cadmium-Total, Chromium-Total, Copper-Total, Cobalt-Total, Manganese-Total, Molybdenum-Total, Nickel-Total, Lead-Total, Antimony-Total, Tin-Total, Zinc-Total, Iron-Total
Burwood	SMW_BH046R	September	Ionic Balance, Cobalt-Dissolved, Zinc-Dissolved, Arsenic-Total, Barium-Total, Beryllium-Total, Cadmium-Total, Copper-Total, Cobalt-Total, Nickel-Total, Lead-Total, Zinc-Total, Iron-Total
	SMW_BH044	September	Cadmium-Total, Cobalt-Total, Lead-Total, Zinc-Total, Iron-Total
North Strathfield	SMW_BH035s	September	Manganese-Dissolved, Beryllium-Total, Cadmium-Total, Chromium-Total, Copper-Total, Nickel-Total, Zinc-Total, Iron-Total
		November	Manganese-Dissolved, Zinc-Dissolved
	SMW_BH009S	August	Copper-Dissolved
		November	Perfluorohexanesulonic acid - PFHxS, Cobalt-Dissolved, Manganese-Dissolved, Cobalt-Total, Manganese-Total, Nickel-Total
	SMW_BH035	September	Ammonia (as N in water), Total Nitrogen in water, Barium-Dissolved, Barium-Total
		November	Hardness, Ammonia (as N in water), Nitrate as N in water, Total Nitrogen in water, Barium-Dissolved
	SMW_B H038	August	Ammonia (as N in water), Arsenic-Dissolved
Olympic Park	SMW_BH120	September	Cobalt-Dissolved, Copper-Total, Manganese-Total
		December	Cobalt-Dissolved, Manganese-Dissolved, Manganese-Total
	SMW_BH126	September	Benzene, Toluene, TRH C29 - C36- TRH >C10 - C16- TRH >C10 - C16 less Naphthalene (F2)- TRH >C34 - C40, Phenanthrene, Perfluorobutanesulfonic acid, Total Positive PFOA & PFOS, Arsenic-Dissolved, Cobalt-Dissolved, Arsenic-Total, Beryllium-Total, Cadmium-Total, Chromium-Total, Copper-Total, Cobalt-Total, Manganese-Total, Nickel-Total, Lead-Total, Tin-Total, Zinc-Total, Iron-Total
		December	Bicarbonate Alkalinity as CaCO ₃ , Total Alkalinity as CaCO ₃ , Cyclohexane, Chlorobenzene, TRH C6 - C9, Perfluorobutanesulfonic acid, Perfluorohexanesulonic acid - PFHxS, Perfluorooctanesulfonic acid PFOS, Perfluorobutanoic acid, Perfluorohexanoic acid, Perfluorooctanoic acid PFOA, Total Positive PFHxS & PFOS, Total Positive PFAS, Chromium-Dissolved, Boron-Total, Cadmium-Total, Chromium-Total, Cobalt-Total, Lead-Total, Tin-Total, Zinc-Total, Iron-Total
	AF_BH36	September	Cobalt-Dissolved, Manganese-Dissolved, Arsenic-Total, Beryllium-Total, Cadmium-Total, Copper-Total, Cobalt-Total, Manganese-Total, Nickel-Total, Zinc-Total, Iron-Total
		December	Cobalt-Dissolved, Manganese-Dissolved, Arsenic-Total, Beryllium-Total, Cadmium-Total, Chromium-Total, Copper-Total, Cobalt-Total, Manganese-Total, Nickel-Total, Lead-Total, Tin-Total, Zinc-Total, Iron-Total
	SMW_BH019	September	Arsenic-Total, Manganese-Total
		December	Manganese-Dissolved, Barium-Total, Manganese-Total
	BH_715B	September	Cobalt-Dissolved, Manganese-Dissolved, Cobalt-Total, Manganese-Total
		December	Manganese-Total, Manganese-Dissolved, Cobalt-Dissolved

As previously noted, no trend in analyte exceedance were observed throughout the reporting period, indicating exceedances were pre-existing and not the result of AFJV activities. This is particularly true of Sydney Olympic Park which was identified highly disturbed due to its extensive industrial and waste management history.

It is noted that background groundwater contamination had been identified prior to construction throughout sampling undertaken in the project EIS and technical paper 7 (Hydrology), with levels of Heavy metals (including cobalt, manganese, arsenic, copper, lead, nickel and zinc), PFAS, hydrocarbons and ammonia exceeding that of the ANZECC 95th percentile trigger values. Results obtained during these assessment stages also displayed a high level of variability which has been reflected by results collected during AFJV's groundwater monitoring program. It can therefore be concluded that the exceedances identified in Table 4-D are not the result of AFJV activities.

4.4 GROUNDWATER LEVELS

Apart from the data gathered during the field investigations, live dataloggers were installed in boreholes across the CTP station boxes and tunnel alignment. This data was monitored by a discreet engineers and survey teams to monitor observable drawdowns are assess levels to ensures they are within the expected levels. This report was collated in consultation with respective engineering teams who provided input into the conclusions drawn from groundwater data logger data.

During the reporting period, groundwater levels in the boreholes located along the project alignment station boxes exhibited minimal variance. The data revealed a nearly direct correlation between rainfall and water levels in the boreholes, with increased rainfall leading to higher water levels, gradually tapering off as rainfall decreases. Analysis of data retrieved from water well loggers indicated no significant fluctuations in groundwater levels since the previous reporting period. Some fluctuation in water levels were observed during the immediate passing of TBM's, namely AF_BH22.30, AF_BH22.42, SMW_BH722.2, and SMW_BH720.56 along the tunnel alignment, and AF_BH51.34, AF_BH44_W, SMW_BH724.log, AF_BH07s_W and AF_BH07_W within The Bays project area. These variations are likely attributed to localised TBM-induced water drawdown, with effects being short-term and stabilising shortly after TBM passage.

An assessment in EIS Technical Paper 7 (Hydrology) and the CTP Hydrogeological Reports conducted in accordance with condition D122 revealed that the observed drawdown levels align closely with the pre-assessment data. The projected drawdown in the immediate proximity of The Bays station box, anticipated to decline up to -28 meters, corresponds well with the outcomes derived from the AFJV analysis. Moreover, the recharging levels, while exhibiting a deceleration, are expected to continue fluctuating. The EIS Technical Paper 7 and Hydrogeological Reports modelled groundwater drawdown levels at 2 years after the commencement of station box excavation. This two year period has not yet been reached but AFJV will continue to review groundwater levels and this will be reviewed in the next bi-annual report.

Refer to Appendix D for a summary of all groundwater level data compiled during the reporting period.

Table 4-E shows the boreholes that possess live dataloggers.

Table 4-E Live datalogger boreholes

LIVE DATALOGGER BOREHOLES					
TBM Alignment Water Levels	THE BAYS	FIVE DOCK	BURWOOD	NORTH STRATHFIELD	SYDNEY OLYMPIC PARK
AF_BH22.15	AF_BH07_W	SMW_BH050_s	SMW_BH044w	SMW_BH009_s	SMW_BH019_w
AF_BH22.30	AF_BH07S_W	SMW_BH050_w	SMW_BH046s	SMW_BH009_w	SMW_BH032_S
AF_BH22.42	AF_BH44_W	SMW_BH051_s	SMW_BH046w	SMW_BH035_s	SMW_BH032_W
AF_BH26.15	AF_BH51.04	SMW_BH051_w	BH1326	SMW_BH035_w	SMW_BH068
AF_BH26.30	AF_BH51.11	R248_3103_BH141A	BH1336	SMW_BH038_w	SMW_BH068S
AF_BH26.42	AF_BH51.18	SMW_BH719	BH714_s		SMW_BH120_W
AF_BH30.15	AF_BH51.34		BH714_w		SMW_ENV712d
AF_BH30.30	AF_BHCGW2-1		SMW_BHCINT01		SMW_ENV712s
AF_BH30.48	AFGW2-2		SMW_BHCINT02		SMW_ENV714_W
AF_BH36	AFGW2-1		SMW_BHCINT03		SMW_ENV715
AF_BH36s	AFGW5S				
AF_BH37	AFGW7M				
AF_BH37s	AFGW9				
AF_BH38	AFGW11				
AF_BH38s	SMW_BH724				
SMW_BH062.032	S54				
SMW_BH062.062	S58_d				
SMW_BH062.104					
SMW_BH069_w					
SMW_BH126_w					
SMW_BH710_v					
SMW_BH720.20					
SMW_BH720.56					
SMW_BH722.20					
SMW_BH722.43					
SMW_BH722.56					

BN_W1 SMW_ENV715B_w SOP_W1					
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The Project EIS identified a GDE (terrestrial vegetation) Turpentine – Grey Ironbark open forest on shale in the lower Blue Mountains, Sydney Basin Bioregion Plant Community Type (PCT 1281) in proximity to the Five Dock construction site (approximately 350 metres to the east). This PCT is considered to have a moderate to high likelihood to be terrestrial GDEs. The draw down in the water table at Five Dock was within the expected tolerance and no anticipated impact on the GDE is likely to have occurred. There has been little to no water ingress into the excavations at Five Dock so it is unlikely that any drawdown would be associated with AFJV works.

4.5 WATER TREATMENT PLANTS

Water treatment plant monitoring has been undertaken following the stipulated frequency in condition E2.1 and condition M2.2 of the project's EPL:

- i) Daily on the first 3 days of discharges,
- ii) Weekly for the first month of discharges,
- iii) Fortnightly for the first 3 months,
- iv) Monthly for the rest of the WTPs operation. (Condition M2.2 of the EPL)

Within 10 business days of each sample results being taken a Performance report must be submitted to the EPA.

In the period from June to December 2023, four Construction Water Treatment Plants were in operation at The Bays, Burwood North, Sydney Olympic Park and Five Dock sites. All plants are on a monthly sampling regime, except Burwood North, that has not discharged water off site since June 2023. Due to ongoing operation issues and low levels of groundwater interaction BWD has been restricted to reuse only during the reporting period, utilising treated water a dust suppression across the Burwood north station box. Refer to Appendix E for results in the sampling rounds of each of the WTP's.

As part of the ongoing performance improvement, elevated concentrations of some analytes have been found in some of the sampling rounds. Examples of exceedances of EPL criteria through the Proof of Performance (PoP) reports supplied to the EPA and are provided in Table 4-F along with corrective actions taken to improve water quality. Refer to Appendix E for monitoring results..

Table 4 details corrected actions taken when elevated concentrations of analytes have been recorded at the WTPs.

Table 4-F corrective actions for WTP elevated concentrations

Site	Analyte	Corrective action for elevated concentration
The Bays	TSS	Daily field monitoring has been done for turbidity and pH to detect anomalies as soon as possible. Special emphasis has been made to the cleaning and maintenance activities in the reaction tanks and the lamella clarifier. In the first quarter of 2024, two additional silos and a belt press are going to be installed to

		help in the removal of suspended solids. AFJV engaged a water treatment plant consultant, who is currently attending site on a weekly basis to rectify issues associated with the water treatment plant and to assess possibilities for improvements to the plant.
	Aluminium	As part of the ongoing performance improvement, measures are in place to treat the elevated values and proceed to backwash the activated carbon filters to try to move the captured metals to the feed of the plant for reprocessing. Granular Activated Carbon (GAC) filter media is scheduled to be replaced in all 6 filters in February 2024.
	Chromium IV compounds	
	Copper	
	Iron	
	Zinc	
	Nitrate + nitrate	Additional backwashing of media vessels and monitoring. 2 IP 65 filter were repaired, and filter media have been replaced in 4 of 6 filters in December 2023.
	Nitrogen total	
	Phosphorus total	
	Perfluorooctane sulphonate (PFOS)	Additional backwashing of ion exchange resin media vessels and plans to replace filter media in the first quarter of 2024.
	pH	Review of the probes have been conducted to ensure values being discharged are correct.
Burwood North	pH	During this reporting period no discharge took place at Burwood North WTP and water was reused on site for construction activities. AFJV engaged a water treatment plant consultant, who is currently attending site on a weekly basis to rectify issues associated with the water treatment plant.
	Copper	
	Aluminium	
	Manganese	
	Iron	
	Nitrogen total	
	Phosphorus total	
	Zinc	
Five Dock	Nitrogen total	AFJV will continue to monitor results throughout the next sampling period and adjust treatment of the water if required. An external water treatment plant consultant was engaged to provide professional advice on water treatment methodologies and potential system improvements.
	Nitrate + nitrate	
	Copper	AFJV will monitor results during next sampling period for exceedances.
	Zinc	
	Phosphorus total	Monitor results during next sampling period and adjust chemical dosing level if required.
	Perfluorooctane sulphonate (PFOS)	Monitor results during next sampling period and change the media if required.
Sydney Olympic Park	Perfluorooctane sulphonate (PFOS)	Additional backwashing of media vessels and subsequent monitoring to ensure additional cleaning has improve performance in this criteria
	Chromium IV compounds	
	Copper	Adjusting the coagulant dosing and backwashing
	Manganese	Adjusting the coagulant dosing and backwashing
	Zinc	Additional backwashing of media vessels and monitoring

The performance of the WTPs is continually monitored and maintenance conducted to ensure the discharge concentrations are within the established limits in the EPL Condition L2. As inlet water values are consistently over the design limits, the WTP's ability to achieve some of the discharge criteria set out in the EPL is unachievable. This scenario was discussed with the EPA prior to commencement of WTP discharge and agreed that a Pollution Reduction Plan (PRP) would be added to the EPL and performance of the WTP's would be tracked through Proof of Performance (POP) reporting to determine the limits of treatment by the plants. After enough data was gathered an updated Water Pollution Impact Assessment (WPIA) based on the performance of the WTP's has been developed and submitted to the EPA (June 2023) as per CoA U1.3. The WPIA adjusts some of the limits under condition L2 based the WTP's capacity and proposes new reasonable and feasible discharge limits. AFJV have yet to receive a response on the updated WPIA from the EPA and continue to report on the current discharge criteria outlined in the EPL.

During this reporting period, AFJVs review of the monthly discharge values from The Bays WTP noted a range of readings registered at the discharge pH and NTU probes to be above the discharge criteria outlined in the EPL. This occurred for the period 14 September 2023 to 11 October 2023. Whilst readings in excess of the EPL discharge criteria registered at these discharge probes, AFJV does not consider that non-compliant water has been discharged from site due to the presence of an automated isolation valve located downstream of the probes in the discharge line (which diverts water to the reuse tank and not off site). The high readings have been recorded as an anomaly that required further investigation. AFJV notified the EPA of this incident/period of high readings and has provided information to the EPA in accordance with the EPL.

Average daily discharge varies depending on production and groundwater ingress in the station boxes and at the front of the TBM. The cumulative discharge from all The Bays, Five Dock and Sydney Olympic Park plants is portrayed below in Figure 4-A, 4-B and 4-C.

Figure 4-A - Six month cumulative discharge for The Bays’ WTP

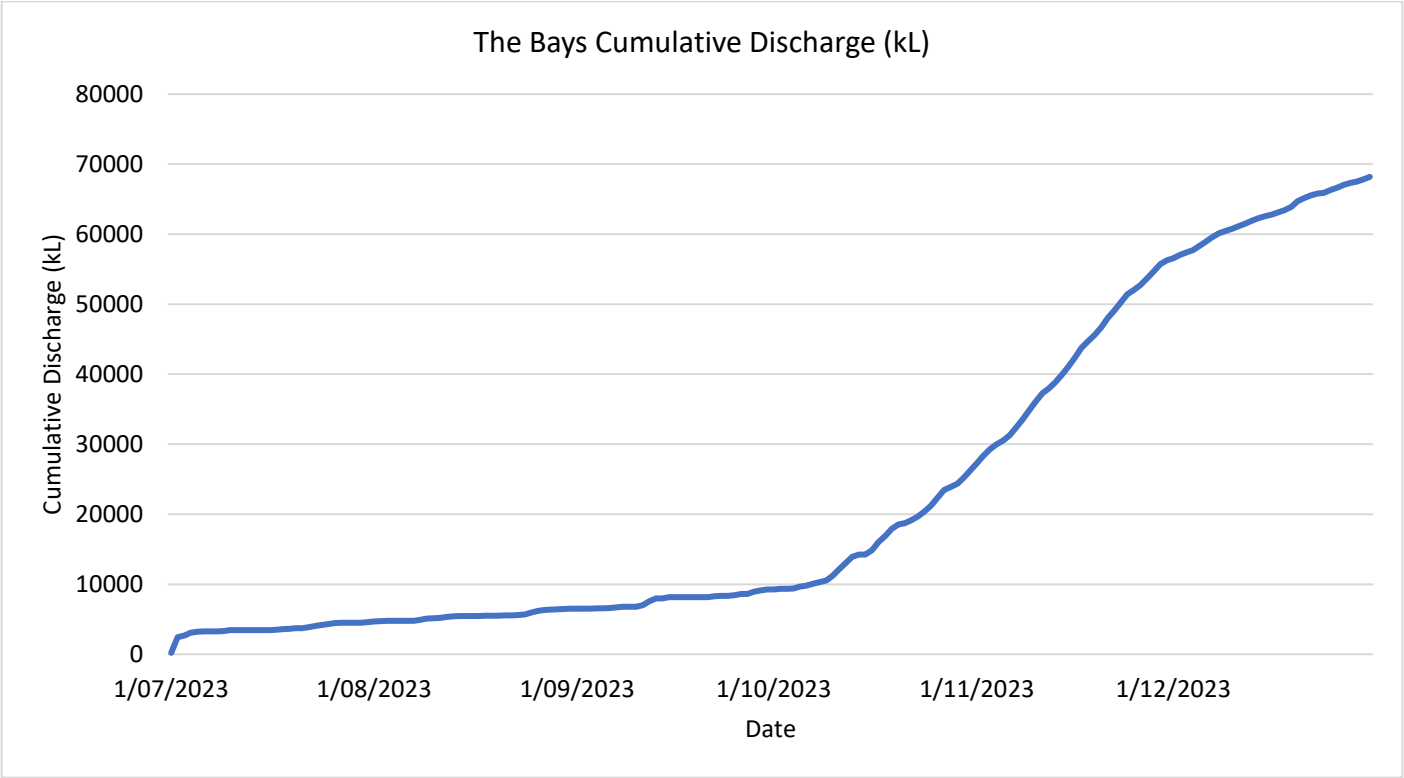


Figure 4-B - Six month cumulative discharge for Five Dock’s WTP

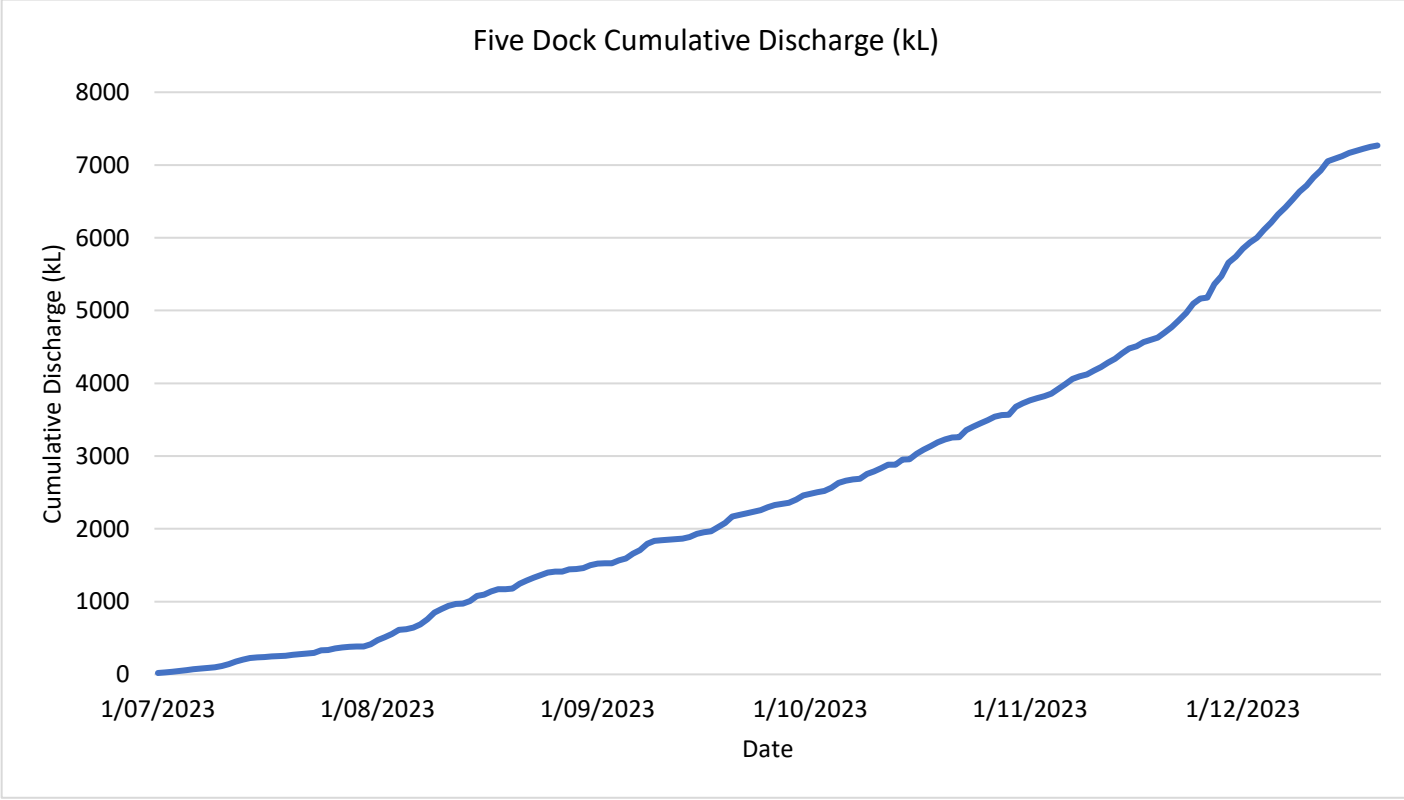
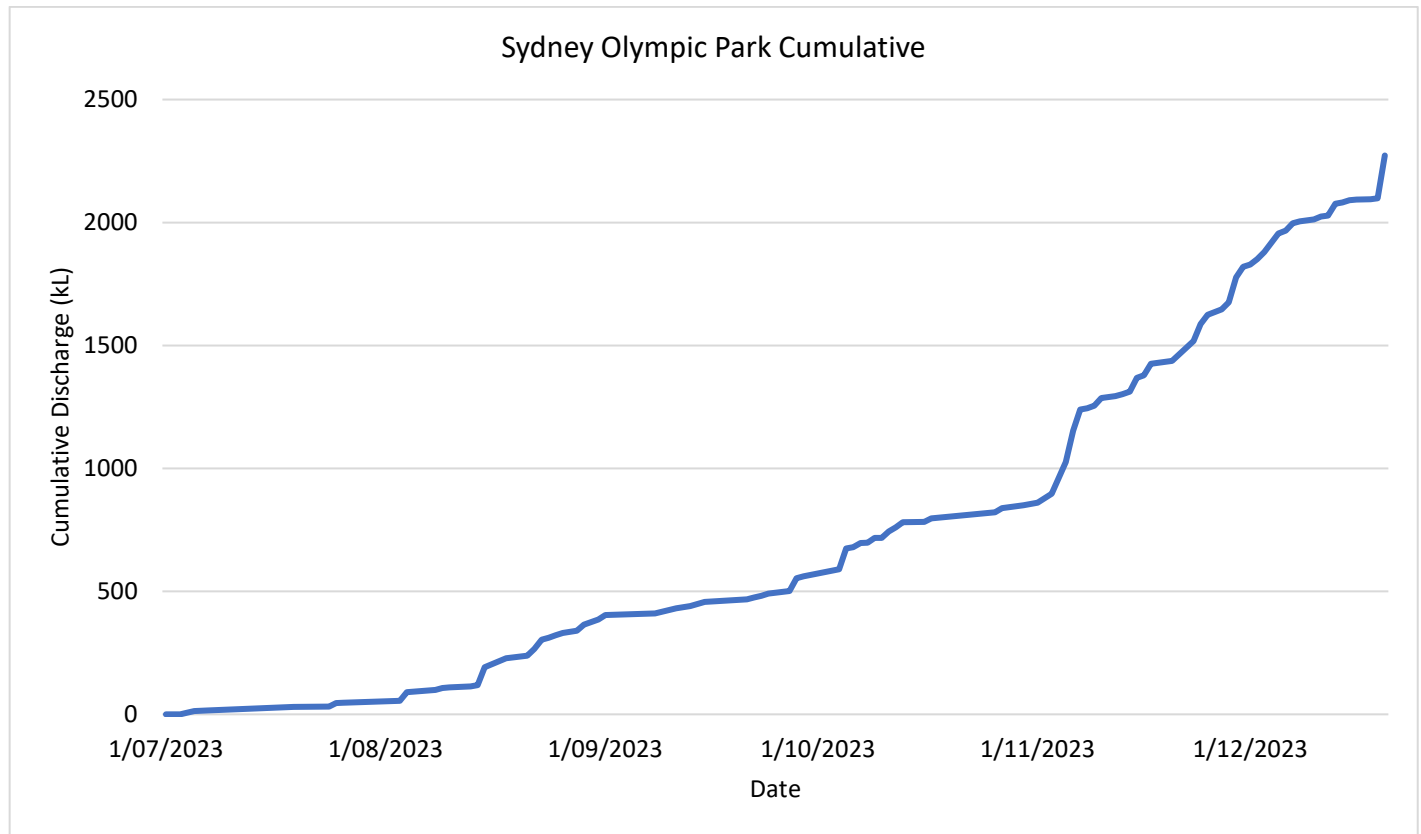


Figure 4-C - Six month cumulative discharge Sydney Olympic Park's WTP



4.6 CONCLUSION

As highlighted in section 4.3 of this report, the groundwater environment in the vicinity of the CTP construction site exhibits notable background contamination, as identified in the pre-construction assessments outlined in the project's EIS, Technical Paper 7 (Hydrology) and Tech Paper 8 (Contamination). Notably, heavy metals (cobalt, manganese, arsenic, copper, lead, nickel, and zinc), PFAS, hydrocarbons (TRH, BTEX, PAH), and ammonia levels surpassed the ANZECC 95th percentile trigger values.

The results obtained by AFJV during the monitoring period align with the pre-existing groundwater conditions documented in the EIS and technical paper 7. Both assessments noted significant variability in various analytes, especially among heavy metals. The analysis of AFJV's results revealed no discernible trend in analytes across the project that could be attributed to project-induced drawdown. Special attention was given to analytes like sodium and chloride, indicative of saltwater ingress, a key indicator of project-related drawdown. No identifiable trend was observed in the results or field observations collected by AFJV. Consequently, based on AFJV's extensive groundwater monitoring, it can be concluded that exceedances identified during the period reflect pre-existing conditions rather than groundwater drawdown or other construction related impacts.

Data loggers analysed across the CTP station boxes and tunnel alignment confirmed that the groundwater levels remained consistent with estimated drawdown outlined in technical paper 7 – Hydrology. Throughout the reporting period, the groundwater levels in the boreholes situated along the project alignment and station boxes displayed minimal variance. An examination of data retrieved from water well loggers indicated no significant fluctuations in groundwater levels compared to pre-existing estimates. However, some water level fluctuations were identified during the passage of TBMs, specifically AF_BH22.30, AF_BH22.42, SMW_BH722.2, and SMW_BH720.56 along the tunnel alignment, and AF_BH51.34, AF_BH44_W, SMW_BH724.log, AF_BH07s_W, and AF_BH07_W within The Bays project area. These variations are likely attributed to localised TBM-induced water drawdown and did not exceed the expectations of the EIS (Section 5.11 Tech paper 7). Furthermore, the evaluation of EIS Technical Paper 7 (Hydrology) and CTP Hydrogeological Reports depict drawdown levels consistent with observed drawdown levels compared to pre-assessment data. The projected drawdown near the The Bays station box, forecasted at a maximum of -28 meters, is reflected by findings observed in AFJV analysis. A conclusive analysis of CTP's drawdown effect

against the predictive values cannot be made until the 2-year post station box excavation milestone is reached. During this reporting period localised drawdown was observed, however it was observed to be short-term, recharging shortly after the TBM passage.

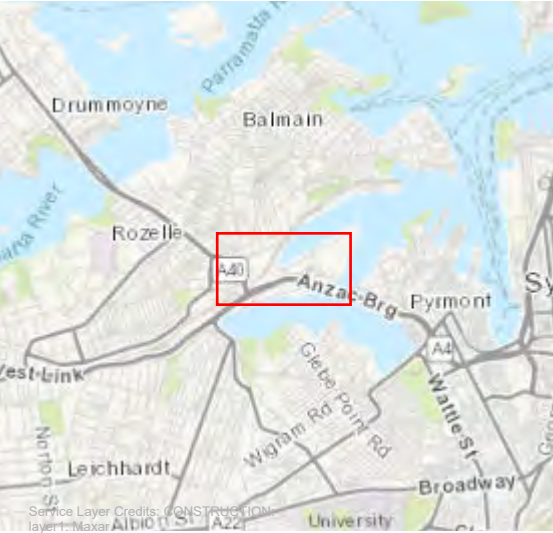
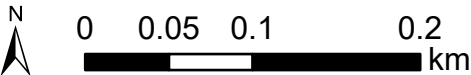
Monitoring of water treatment plants found minor exceedances of organic compounds, nutrients and metals. Exceedances were minor and unlikely to generate measurable impact to the receiving environment and waterways. Exceedances of the EPL criteria for pH and turbidity were identified for a period between 14 September 2023 to the 11 October 2023, which were reported to the EPA. No exceedances of these analytes have been identified since this period. A number of corrective actions such as backflushing and filter media renewal were conducted in response to observed exceedances. All water treatment monitoring results were collated and submitted to the EPA in the form of proof of performance reports in accordance with the EPL.

APPENDIX A - NOISE MONITORING LOCATIONS AND RESULTS



Sydney Metro West - CTP

-  The Bays
-  Shared access areas
-  Ancillary facility location
-  Indicative location of unattended noise monitor



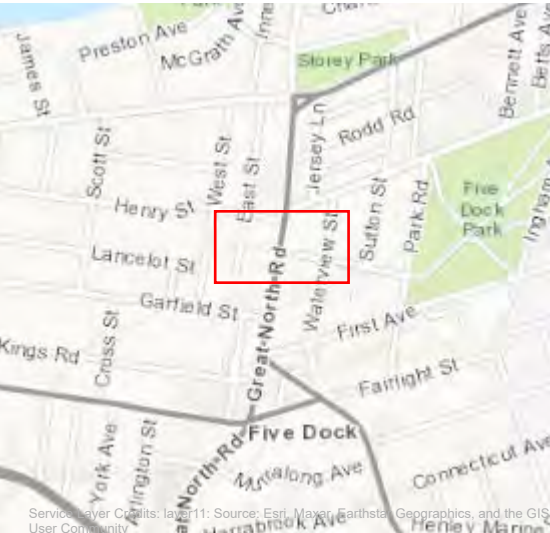
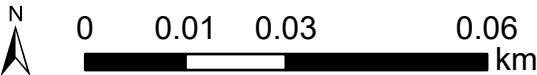
This map is shown for reference purposes only. Acciona Ferrovia JV provides this information "as is" with the understanding that it is not guaranteed to be accurate, correct or complete and conclusions drawn from such information are the responsibility of the user. While every effort is made to ensure the information displayed is as accurate and current as possible, Acciona Ferrovia JV will not be held responsible for any loss, damage or inconvenience caused as a result of reliance on such information or data.





Sydney Metro West - CTP

- Five Dock
- Ancillary facility location
- Indicative location of unattended noise monitor
- Indicative location of unattended vibration monitor



Map Creation Date: 6/9/2023

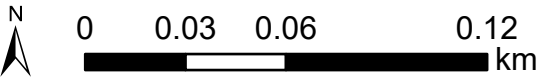
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Sydney Metro West - CTP

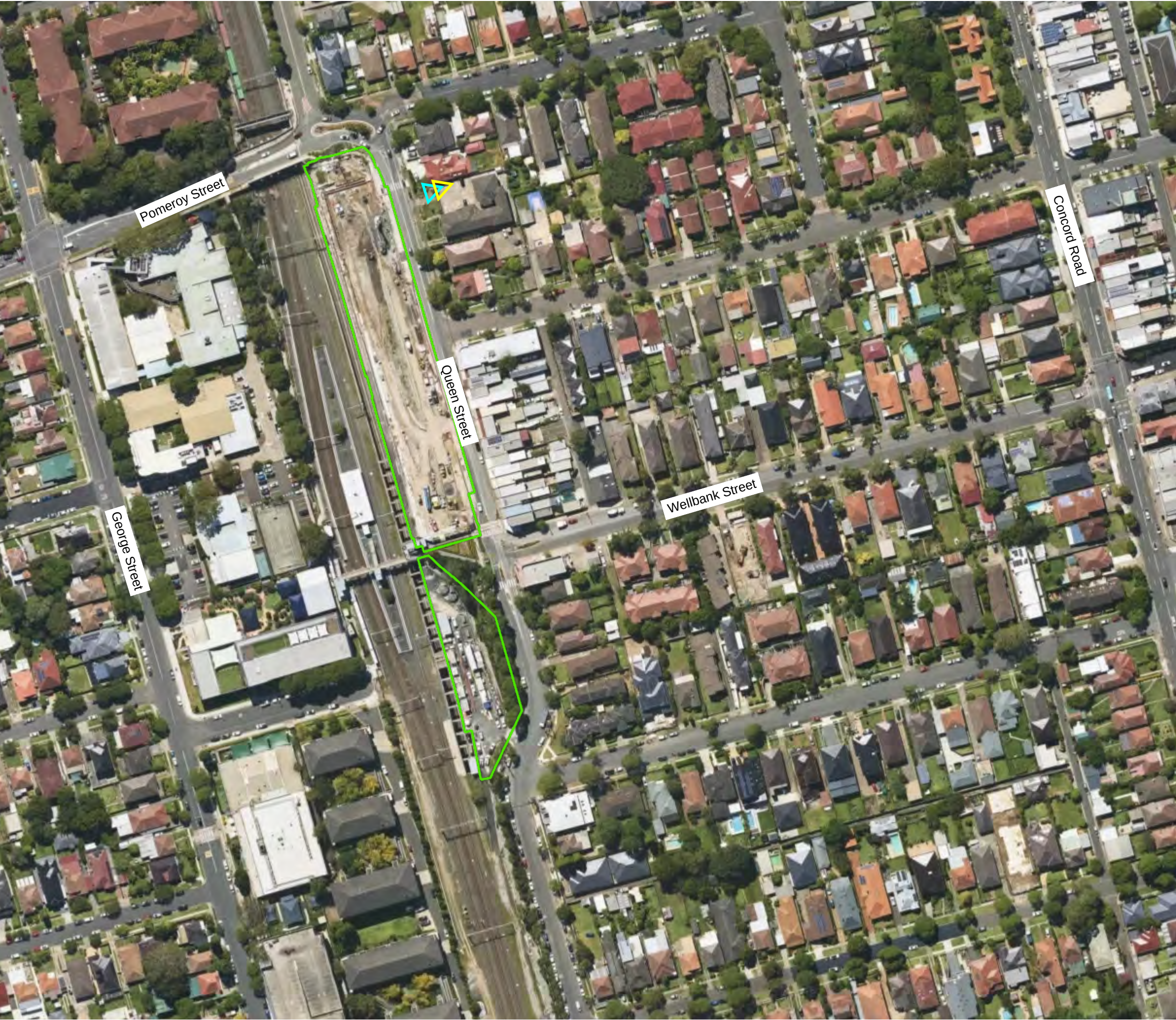
- Burwood North
- Indicative location of unattended noise monitor
- Indicative location of unattended vibration monitor



Map Creation Date: 6/9/2023

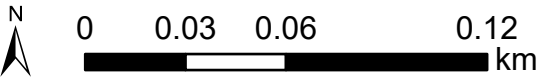
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ArcGIS Web Map

- North Strathfield
- Indicative location of unattended noise monitor
- Indicative location of unattended vibration monitor



Service Layer Credits: layer1: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
CONSTRUCTION:
Map Creation Date: 5/30/2023

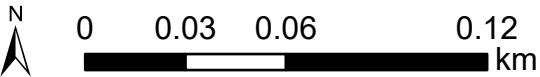
This map is shown for reference purposes only. Acciona Ferrovia JV provides this information "as is" with the understanding that it is not guaranteed to be accurate, correct or complete and conclusions drawn from such information are the responsibility of the user. While every effort is made to ensure the information displayed is as accurate and current as possible, Acciona Ferrovia JV will not be held responsible for any loss, damage or inconvenience caused as a result of reliance on such information or data.





Sydney Metro West - CTP

-  Olympic Park
-  Indicative location of unattended noise monitor
-  Indicative location of unattended vibration monitor



Map Creation Date: 6/9/2023

This map is shown for reference purposes only. Acciona Ferrovia JV provides this information "as is" with the understanding that it is not guaranteed to be accurate, correct or complete and conclusions drawn from such information are the responsibility of the user. While every effort is made to ensure the information displayed is as accurate and current as possible, Acciona Ferrovia JV will not be held responsible for any loss, damage or inconvenience caused as a result of reliance on such information or data.



APPENDIX A (i) – ATTENDED NOISE MONITORING EXAMPLES



Attended Noise Monitoring Rion-42 - Strathfield



Attended Noise Monitoring Rion-42- Five Dock



Attended Noise Monitoring Rion-42- Strathfield



Attended Noise Monitoring Rion-42 - Five Dock



Attended Noise Monitoring Rion-42- Burwood

APPENDIX A (ii) – SOUND POWER LEVELS

Location	Plant	Predicted SWL (dB(A))	Monitored SWL (dB(A))	Compliant with CNVS Table 13	Date
<i>Sydney Olympic Park</i>	13t excavator		93	Yes	2/10/2023
<i>Burwood</i>	Scrubber		103	Not listed	20/07/2023
<i>Sydney Olympic Park</i>	Long reach excavator		96	Yes	25/07/2023
<i>The Bays</i>	Air compressor		103	Yes	18/08/2023
<i>The Bays</i>	Grout pump		94	Not listed	21/08/2023
<i>Five Dock</i>	Surface Miner	122	120	Not listed	14/09/2023
<i>The Bays</i>	Conveyor Booster		95	Not listed	21/08/2023
<i>The Bays</i>	Conveyor	-	91	Not listed	21/08/2023
<i>Sydney Olympic Park</i>	C6 Drilling Rig		100	Yes	28/09/2023
<i>The Bays</i>	TBM		102	Not listed	22/09/2023
<i>The Bays</i>	Tunnelling MSV		94	Not listed	3/10/2023

APPENDIX A (iii) – RESULTS

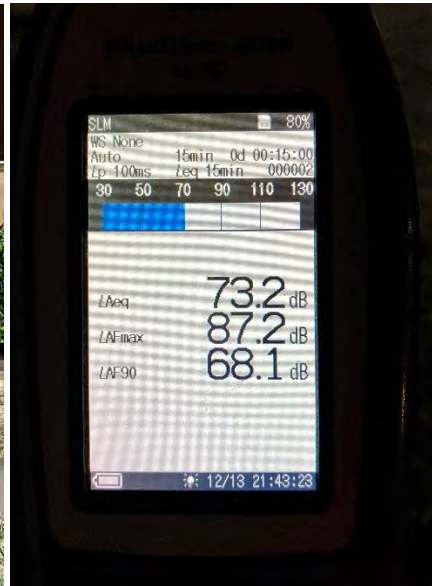
Date	Time	Report number	Attended/Unattended	Site	Purpose	CHW#	Source location	Monitoring location	Works	NCA	Period	NM Level dB	Model Prediction (LAeq) dB	LAeq dB	LA90 dB	Lmax dB	NM exceeded?	Exceed model prediction?	Mitigation measures implemented?	LAeq After MM Implementation	Prediction Exceedance AFV related?	Works Compliant?	Notes	Instrumentation Details	Collaboration Validity	Report Link (Field Sheet)
29/06/2023	3:30pm	20230629-F0K-01	Attended	Five Dock	Spot Check	N/A	Five Dock East acoustic		Some noise from Waterview Ave	NCA15	Day	N/A	N/A	53.2	53.8	63.2	N/A	N/A	Acoustic shed	N/A	N/A	Yes	1st monitoring result had the least amount of external noise and would be the best for determining effect of acoustic shed.	Swan971	13/04/2024	20230629-F0K-01
29/06/2023	3:30pm	20230629-F0K-01	Attended	Five Dock	Spot Check	N/A	Five Dock East acoustic		Scrubber dominant noise source.	NCA15	Day	N/A	N/A	80.3	79.2	78.4	N/A	N/A	Acoustic shed	N/A	N/A	Yes	1st monitoring result had the least amount of external noise and would be the best for determining effect of acoustic shed.	Swan971	13/04/2024	20230629-F0K-01
29/06/2023	4:03pm	20230629-F0K-01	Attended	Five Dock	Spot Check	N/A	Five Dock East acoustic		Scrubber dominant noise source.	NCA15	Day	N/A	N/A	80.6	79.3	78.4	N/A	N/A	Acoustic shed	N/A	N/A	Yes	1st monitoring result had the least amount of external noise and would be the best for determining effect of acoustic shed.	Swan971	13/04/2024	20230629-F0K-01
29/06/2023	4:05pm	20230629-F0K-01	Attended	Five Dock	Spot Check	N/A	Five Dock East acoustic		Scrubber dominant noise source.	NCA15	Day	N/A	N/A	80.7	79.3	78.4	N/A	N/A	Acoustic shed	N/A	N/A	Yes	1st monitoring result had the least amount of external noise and would be the best for determining effect of acoustic shed.	Swan971	13/04/2024	20230629-F0K-01
29/06/2023	4:08pm	20230629-F0K-01	Attended	Five Dock	Spot Check	N/A	Five Dock East acoustic		Scrubber dominant noise source.	NCA15	Day	N/A	N/A	80.8	79.3	78.4	N/A	N/A	Acoustic shed	N/A	N/A	Yes	1st monitoring result had the least amount of external noise and would be the best for determining effect of acoustic shed.	Swan971	13/04/2024	20230629-F0K-01
29/06/2023	4:17 PM	20230629-F0K-01	Attended	Five Dock	Spot Check	N/A	Five Dock East acoustic		Scrubber dominant noise source.	NCA15	Day	N/A	N/A	80.9	79.3	78.4	N/A	N/A	Acoustic shed	N/A	N/A	Yes	1st monitoring result had the least amount of external noise and would be the best for determining effect of acoustic shed.	Swan971	13/04/2024	20230629-F0K-01
29/06/2023	14:00-06:00	20230629-G8N	Unattended	TBM Tunnelling	GBN	N/A	Chippendale		TBM Operation - GBN Monitoring	GBN	3yr (Standard)	60	46.5	44.1	37.9	48.6	No	Yes	Notifications as per CHWS	N/A	No	Swan958	12/02/2024	20230629-G8N		
29/06/2023	16:00-10:00	20230629-G8N	Unattended	TBM Tunnelling	GBN	N/A	Chippendale		TBM Operation - GBN Monitoring	GBN	3yr (Standard)	60	46.5	44.1	37.9	48.6	No	Yes	Notifications as per CHWS	N/A	No	Swan958	12/02/2024	20230629-G8N		
11/07/2023	Continuous	20230710	Attended	Five Dock	GBN	N/A	Five Dock Cavern		Roadheader Operation	GBN	3yr (Standard)	60	42	77.9	52.2	89.4	Yes	Yes	Notifications as per CHWS	N/A	No	Swan958	13/02/2024	20230710-G8N		
12/07/2023	Continuous	20230710	Attended	Five Dock	GBN	N/A	Five Dock Cavern		Roadheader Operation	GBN	3yr (Standard)	60	42	77.9	52.2	89.4	Yes	Yes	Notifications as per CHWS	N/A	No	Swan958	13/02/2024	20230710-G8N		
12/07/2023	8:46 - 9:01pm	20230712 - TRV-01	Attended	The Bays	Spot Check	N/A	Spot Shed interior		Spill / Unloading spoil	NCA21	Evening	48	69	76.1	65.7	83.7	N/A	N/A	Acoustic shed	N/A	No	Swan971	14/04/2024	20230712-TRV-01		
12/07/2023	9:39 - 9:42pm	20230712 - TRV-01	Attended	The Bays	Spot Check	N/A	Segment Shed exterior		Spill / Unloading spoil	NCA21	Evening	48	N/A	76.9	71.3	81.9	N/A	N/A	Acoustic shed	N/A	No	Swan971	14/04/2024	20230712-TRV-01		
12/07/2023	9:43 - 9:53pm	20230712 - TRV-01	Attended	The Bays	Spot Check	N/A	Segment Shed interior		Spill / Unloading spoil	NCA21	Evening	48	N/A	71.8	69.4	84.3	N/A	N/A	Acoustic shed	N/A	No	Swan971	14/04/2024	20230712-TRV-01		
12/07/2023	9:53 - 9:54pm	20230712 - TRV-01	Attended	The Bays	Spot Check	N/A	Segment Shed interior		Spill / Unloading spoil	NCA21	Evening	48	N/A	77.8	72.2	86.3	N/A	N/A	Acoustic shed	N/A	No	Swan971	14/04/2024	20230712-TRV-01		
12/07/2023	10:15 - 10:30pm	20230712-TRV-01	Attended	The Bays	CHWV Verification	N/A	Segment and spoil		Trucks and Dogs entering to spoil	NCA21	Night	48	39	49.8	48.3	59.7	Yes	Yes	N/A	N/A	No	Swan971	14/04/2024	20230712-TRV-01		
12/07/2023	03:00-15:00	20230710	Attended	Five Dock	GBN	N/A	Five Dock Cavern		Roadheader Operation	GBN	3yr (Standard)	60	42	63.9	77.8	58.3	Yes	Yes	Notifications as per CHWS	N/A	No	Swan958	13/02/2024	20230710-G8N		
14/07/2023	03:00-15:00	20230710	Attended	Five Dock	GBN	N/A	Five Dock Cavern		Roadheader Operation and Rock	GBN	3yr (Standard)	60	42	63.9	77.8	58.3	Yes	Yes	Notifications as per CHWS	N/A	No	Swan958	13/02/2024	20230710-G8N		
15/07/2023	03:00-15:00	20230710	Attended	Five Dock	GBN	N/A	Five Dock Cavern		No works happening	GBN	3yr (Standard)	60	42	60.4	51.9	81.1	Yes	Yes	Notifications as per CHWS	N/A	No	Swan958	13/02/2024	20230710-G8N		
18/07/2023	8:46 - 9:01pm	20230718-F0K-01	Attended	Five Dock	CHWV Verification	N/A	Acoustic Shed		Vent fan check	NCA15	Evening	48	48	62.8	150.61.2	78.3	Yes	Yes	N/A	N/A	No	Swan971	13/02/2024	20230718-F0K-01		
18/07/2023	10:40-10:55pm	20230718-BWD-01	Attended	Burwood	CHWV Verification	309, 310	Burwood Road		Water main adjustment and	NCA12	Night	47	89	71.3	150.70.3	85.7	Yes	Yes	N/A	N/A	No	Swan971	13/02/2024	20230718-BWD-01		
18/07/2023	11:00-11:15pm	20230718-BWD-01	Attended	Burwood	CHWV Verification	310	Burwood Road		Delivery of C&D via via Semi	NCA12	Night	49	63	58.9	150.56.1	78.7	Yes	Yes	N/A	N/A	No	Swan971	13/02/2024	20230718-BWD-01		
19/07/2023	9:55-10:30pm	20230718-NST-01	Attended	North Stratfield	CHWV Verification	178	Concord / Werbank Rd		Traffic control signals (TCS) wiring	NCA11	Night	44	91	70	Lamin 65.2	93.1	Yes	No	N/A	N/A	No	Swan971	23/05/2024	20230718-NST-01		
19/07/2023	11:40-11:55pm	20230718-NST-01	Attended	North Stratfield	CHWV Verification	194	Pomeroy / George St		Install mast arms and traffic	NCA10	Night	49	74	55.8		72.3	Yes	Yes	N/A	N/A	No	Swan971	23/05/2024	20230718-NST-01		
24/07/2023	08:44 - 08:59pm	20230724-BWD-01	Attended	Burwood	CHWV Verification	309	Burwood Road		Watermain adjustment &	NCA12	Evening	48	89	74.8	64.9	82.1	Yes	Yes	N/A	N/A	No	Swan971	23/05/2024	20230724-BWD-01		
24/07/2023	09:07 - 09:22pm	20230724-BWD-01	Attended	Burwood	CHWV Verification	310	Parramatta Rd		Driveway & utilities	NCA12	Evening	48	73	73.2	64.1	89.6	Yes	Yes	N/A	N/A	No	Swan971	23/05/2024	20230724-BWD-01		
24/07/2023	09:56 - 08:11pm	20230724-F0K-01	Attended	Five Dock	CHWV Verification	N/A	Acoustic Shed		Western shaft (no work) and	NCA14	Evening	46	46	53.7	49.7	73.6	Yes	Yes	N/A	N/A	No	Swan971	23/05/2024	20230724-F0K-01		
24/07/2023	08:17 - 08:23pm	20230724-F0K-01	Attended	Five Dock	CHWV Verification	N/A	Acoustic Shed		Western shaft (no work) and	NCA14	Evening	46	46	53.7	49.7	73.6	Yes	Yes	N/A	N/A	No	Swan971	23/05/2024	20230724-F0K-01		
24/07/2023	10:17 - 10:32pm	20230724-F0K-01	Attended	Five Dock	CHWV Verification	N/A	Acoustic Shed		Western shaft (no work) and	NCA14	Evening	38	38	60	43.9	75.9	Yes	Yes	N/A	N/A	No	Swan971	23/05/2024	20230724-F0K-01		
24/07/2023	10:30 - 10:33pm	20230724-F0K-01	Attended	Five Dock	CHWV Verification	N/A	Acoustic Shed		Western shaft (no work) and	NCA14	Evening	43	43	52.9	47.2	69.6	Yes	Yes	N/A	N/A	No	Swan971	23/05/2024	20230724-F0K-01		
24/07/2023	8:41-8:54pm	20230725-F0K-01	Attended	Five Dock	CHWV Verification	N/A	Acoustic Shed		Western shaft (no work) and	NCA14	Evening	46	46	62.8	48.9	77.9	Yes	Yes	N/A	N/A	No	Swan971	23/05/2024	20230725-F0K-01		
25/07/2023	9:10-9:16pm	20230725-F0K-01	Attended	Five Dock	CHWV Verification	N/A	Acoustic Shed		Western shaft (no work) and	NCA14	Evening	46	46	62.8	48.9	77.9	Yes	Yes	N/A	N/A	No	Swan971	23/05/2024	20230725-F0K-01		
25/07/2023	10:45 - 11:00pm	20230725-F0K-01	Attended	Five Dock	CHWV Verification	N/A	Acoustic Shed		Western shaft (no work) and	NCA14	Evening	46	46	62.8	48.9	77.9	Yes	Yes	N/A	N/A	No	Swan971	23/05/2024	20230725-F0K-01		
25/07/2023	11:04 - 11:10pm	20230725-F0K-01	Attended	Five Dock	CHWV Verification	N/A	Acoustic Shed		Western shaft (no work) and	NCA14	Evening	46	46	62.8	48.9	77.9	Yes	Yes	N/A	N/A	No	Swan971	23/05/2024	20230725-F0K-01		
25/07/2023	09:50 - 10:05pm	20230725-NST-01	Attended	North Stratfield	CHWV Verification	276	Queen St / Warratta St		Jeeping	NCA11	Night	44	67.6	65.3	50	80.2	Yes	No	N/A	N/A	No	Swan971	23/05/2024	20230725-NST-01		
25/07/2023	10:10 - 10:25pm	20230725-NST-01	Attended	North Stratfield	CHWV Verification	229, 302	Queen St / Werbank St		Hoarding / concrete hoarding	NCA11	Night	44	67.6	65.3	50	80.2	Yes	No	N/A	N/A	No	Swan971	23/05/2024	20230725-NST-01		
25/07/2023	8:05 - 8:20pm	20230726-F0K-01	Attended	Five Dock	CHWV Verification	310	Acoustic Shed		Jeeping	NCA11	Night	44	67.6	65.3	50	80.2	Yes	No	N/A	N/A	No	Swan971	23/05/2024	20230726-F0K-01		
26/07/2023	09:41 - 09:56pm	20230726-F0K-01	Attended	Five Dock	CHWV Verification	N/A	Acoustic Shed		Jeeping	NCA11	Night	44	67.6	65.3	50	80.2	Yes	No	N/A	N/A	No	Swan971	23/05/2024	20230726-F0K-01		
26/07/2023	10:08 - 10:23pm	20230726-F0K-01	Attended	Five Dock	CHWV Verification	N/A	Acoustic Shed		Jeeping	NCA11	Night	44	67.6	65.3	50	80.2	Yes	No	N/A	N/A	No	Swan971	23/05/2024	20230726-F0K-01		
26/07/2023	10:40 - 10:55pm	20230726-F0K-01	Attended	Five Dock	CHWV Verification	N/A	Acoustic Shed		Jeeping	NCA11	Night	44	67.6	65.3	50	80.2	Yes	No	N/A	N/A	No	Swan971	23/05/2024	20230726-F0K-01		
26/07/2023	11:00-11:15pm	20230726-BWD-01	Attended	Burwood	CHWV Verification	319	Small work site		Jeeping	NCA11	Night	49	63	58.7	150.56.1	78.7	Yes	Yes	N/A	N/A	No	Swan971	23/05/2024	20230726-BWD-01		
31/07/2023	09:03 - 09:18pm	20230731-BWD-01	Attended	Burwood	CHWV Verification	20	Opposite 6 Burwood		Trailing / utilities work	NCA12	Evening	48	77	71.6	65.5	84.2	Yes	No	N/A	N/A	No	Swan971	23/05/2024	20230731-BWD-01		
31/07/2023	10:07 - 10:22pm	20230731-BWD-01	Attended	Burwood	CHWV Verification	20	Opposite 6 Burwood		Trailing / utilities work	NCA12	Evening	48	77	71.6	65.5	84.2	Yes	No	N/A	N/A	No	Swan971	23/05/2024	20230731-BWD-01		
1/08/2023	10:48 - 11:03pm	20230801-BWD-01	Attended	Burwood	CHWV Verification	20	Opposite 6 Burwood		Trailing / utilities work	NCA12	Night	47	80	67.9	59.3	82.3	Yes	No	N/A	N/A	No	Swan971	23/05/2024	20230801-BWD-01		
1/08/2023	8:00 - 8:15pm	20230801-F0K-01	Attended	Five Dock	Spot Check	N/A	Acoustic Shed		Traffic noise monitoring check	NCA15	Evening	48	N/A	68.7	55.9	89.7	Yes	No	N/A	N/A	No	Swan971	13/04/2024	20230801-F0K-01		
2/08/2023	10:01 - 10:08pm	20230801-NST-01	Attended	North Stratfield	CHWV Verification	329	Parramatta Rd		Traffic noise monitoring check	NCA15	Evening	48	N/A	68.7	55.9	89.7	Yes	No	N/A	N/A	No	Swan971	13/04/2024	20230801-NST-01		
3/08/2023	11:09 - 11:24pm	20230803-F0K-01	Attended	Five Dock	CHWV Verification	326	Parramatta Rd		Scavenger delivery and utilities	NCA15	Night	43	79	60.2	53.5	84.2	Yes	No	N/A	N/A	No	Swan971	23/05/2024	20230803-F0K-01		
4/08/2023	08:12 - 08:27pm	20230804-F0K-01	Attended	Sydney Olympic Park	CHWV Verification	239	Spot Shed		Excavator and truck movements	NCA08	Evening	53	78	59.6	52.9	76.6	Yes	Yes	N/A	N/A	No	Swan971	23/05/2024	20230804-F0K-01		
4/08/2023	10:07 - 10:22pm	20230804-F0K-01	Attended	Sydney Olympic Park	CHWV Verification	239	Spot Shed		Excavator and truck movements	NCA08	Evening	53	78	59.6	52.9	76.6	Yes	Yes	N/A	N/A	No	Swan971	23/05/2024	20230804-F0K-01		
7/08/2023	07:00 - 07:15pm	20230807-SOP-01	Attended	Sydney Olympic Park	CHWV Verification	335	Next to SGP station box		Jeeping	NCA08	Evening	53	40	62.9	50.5	82.6	Yes	Yes	N/A	N/A	No	Swan971	23/05/2024	20230807-SOP-01		
7/08/2023	07:42 - 07:57pm	20230807-SOP-01	Attended	Sydney Olympic Park	CHWV Verification	335	Next to SGP station box		Jeeping	NCA08	Evening	53	40	62.9	50.5	82.6	Yes	Yes	N/A	N/A	No	Swan971	23/05/2024	20230807-SOP-01		
8/08/2023	9:39 - 9:54pm	20230808-BWD-01	Attended	Burwood	CHWV Verification	20	Opposite 6 Burwood		Jeeping	NCA12	Evening	48	80	69.8	61.4	86.5	Yes	Yes	N/A	N/A	No	Swan971				

Noise monitoring report

Project:	Sydney Metro West – Central Tunnelling Package			Report No.	20231213-NST-01		
Site:	NST			Monitoring type:	Attended ☒ unattended ☐		
Data collected by:	[REDACTED]			Date:	13/12/2023		
Purpose of monitoring:	OOHW verification	OOHW#:	374	Time:	Start: 9:29pm End: 9:44pm		
Was this monitoring event conducted in response to a complaint?				YES ☐ NO ☒			
Construction noise source:			Monitoring location/s:		NCA	NML (dB)	Prediction (dB)
250T Crane			[REDACTED]		11	44	76
Meteorological conditions							
Temperature (°C):	25			Cloud cover (%):	35		
Wind (km/hr and direction):	4Km			Rainfall:	No		
Instrumentation details:	Rion NL-42 C36211			Calibration valid until:	13/05/2024		
				Field Calibrated?	YES ☐ NO ☒		
Assessment of light spill:	No issue						
Instrumentation and method:							
Tripod 1.5m height, Rion NL-42 15 mins Attended OOHV verification, nearest residential receiver							
Results summary:							
(i)	Was NML exceeded during monitoring period?				YES ☒	NO ☐	
(ii)	Was prediction exceeded during monitoring period?				YES ☐	NO ☒	
(iii)	Was exceedance/s the result of AFJV works?				YES ☐	NO ☒	
If answered yes for (ii or iv), please indicate what mitigation measures were reactively put in place. Also add examples of other mitigation measures observed during monitoring							
AA provided by AFJV.							
Summary of Findings including dominant noise sources: Construction works were dominant noise source. However, Traffic (bus and planes) also audible.							

Location	Time	Observations	LAeq dBA	LA90 dBA	LAmix dBA
	9:29	77.1 Crane 250T			
	9:30	70.8 " "			
	9:31	80.1 " " + Pedestrian			
	9:32	74.5 " "			
	9:33	68.4 " "		68.1	87.2
	9:34	81.1 " " + Cars came out of building		73.2	
	9:35	71.4 " "			
	9:36	70.8 " "			
	9:37	75.9 " " + airplane			
	9:38	68.6 " "			
	9:39	69.2 " "			
	9:40	75.2 " "			
	9:40	78.1 " "			
	9:41	81.4 " " + Pedestrian			
	9:42	69.5 " "			
	9:43	72.5 " "			
	9:44	70.2 " "			

Attachment A: Monitoring, work locations & photos





 Monitoring Location

 Crane Location

 Site location

Noise monitoring report

Project:	Sydney Metro West – Central Tunnelling Package			Report No.	20231216-FDK-01		
Site:	FDK			Monitoring type:	Attended ☒ unattended ☐		
Data collected by:	[REDACTED]			Date:	16/12/2023		
Purpose of monitoring:	OOHW verification	OOHW#:	384	Time:	Start: 10:56pm End: 11:10pm		
Was this monitoring event conducted in response to a complaint?				YES ☐ NO ☒			
Construction noise source:				Monitoring location/s:	NCA	NML (dB)	Prediction (dB)
EWP				[REDACTED]	15	43	47
Meteorological conditions							
Temperature (°C):	26			Cloud cover (%):	40		
Wind (km/hr and direction)	3Km			Rainfall:	No		
Instrumentation details:	Rion NL-42 C36211			Calibration valid until:			
				Field Calibrated?	YES ☒ NO ☐		
Assessment of light spill:							
Instrumentation and method:							
Tripod 1.5m high, Rion NL-42							
15 mins							
Attended OOHW verification, Nearest residential receiver							
Results summary:							
(i)	Was NML exceeded during monitoring period?				YES ☒	NO ☐	
(ii)	Was prediction exceeded during monitoring period?				YES ☒	NO ☐	
(iii)	Was exceedance/s the result of AFJV works?				YES ☐	NO ☒	
If answered yes for (ii or iv), please indicate what mitigation measures were reactively put in place							
Also add examples of other mitigation measures observed during monitoring							
Summary of Findings including dominant noise sources:							
Construction works inaudible but cars, and pedestrian were dominant noise source.							



FDK/DNVIS

16/01/24

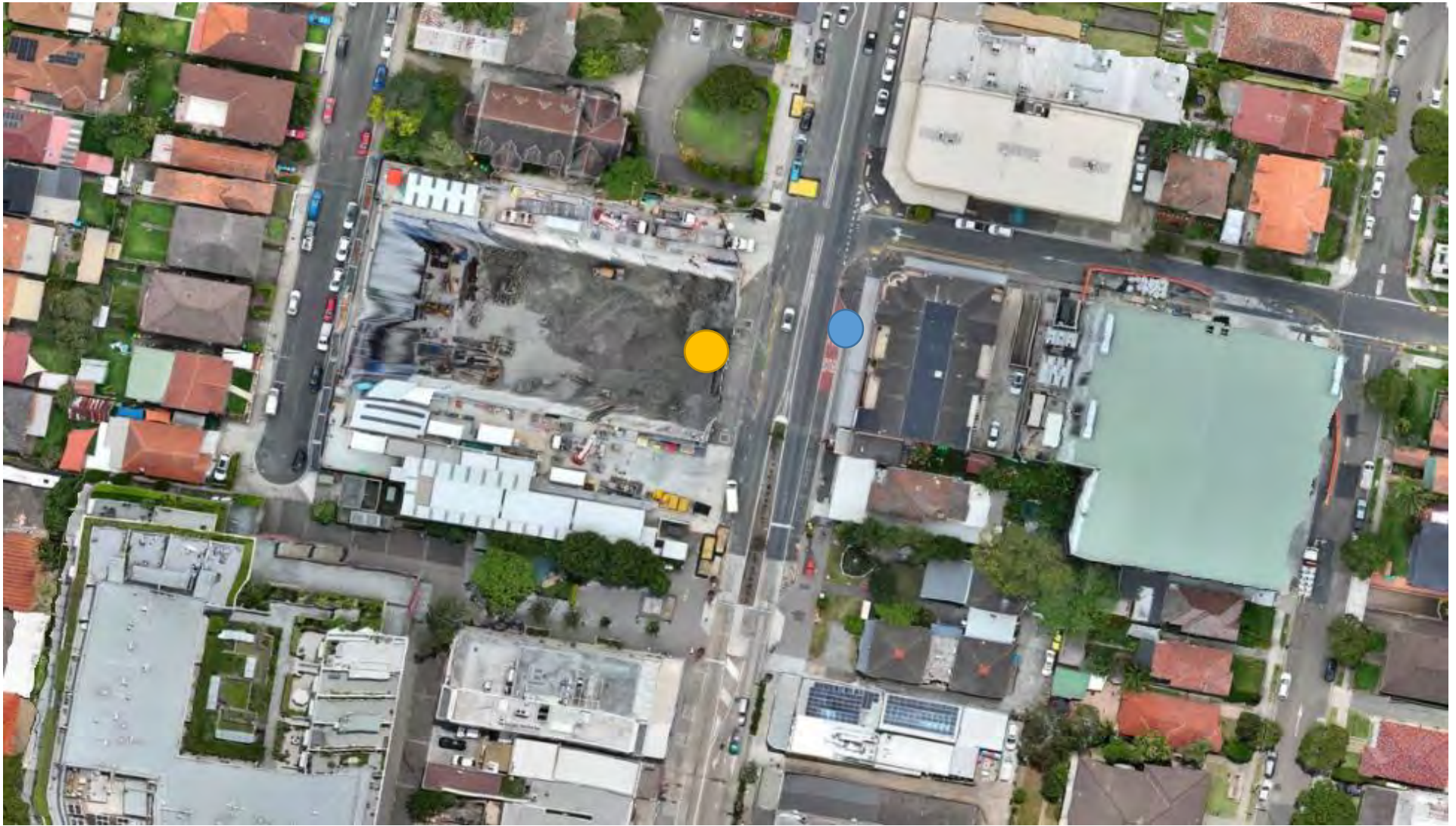
Noise monitoring report

10:56 pm - 11:

Location	Time	Observations	LAeq dBA	LA90 dBA	LAmx dBA
	10:56	79.2 sport car			
	10:57	75.3 Bus			
	10:58	67.5 Cars			
	10:59	52.2 Pedestrian			
	11:00	53.1 "	63.8	52	79.4
	11:01	63.1 Cars			
	11:02	70.5 Cars			
	11:03	61.5 "			
	11:04	52.1 pedestrian			
	11:05	72.2 Cars			
	11:06	66.5 "			
	11:07	72.5 Bus			
	11:08	71.9 Bus			
	11:09	52.1 Car			
	11:10	59.2 Car			

Attachment A: Monitoring, work locations & photos

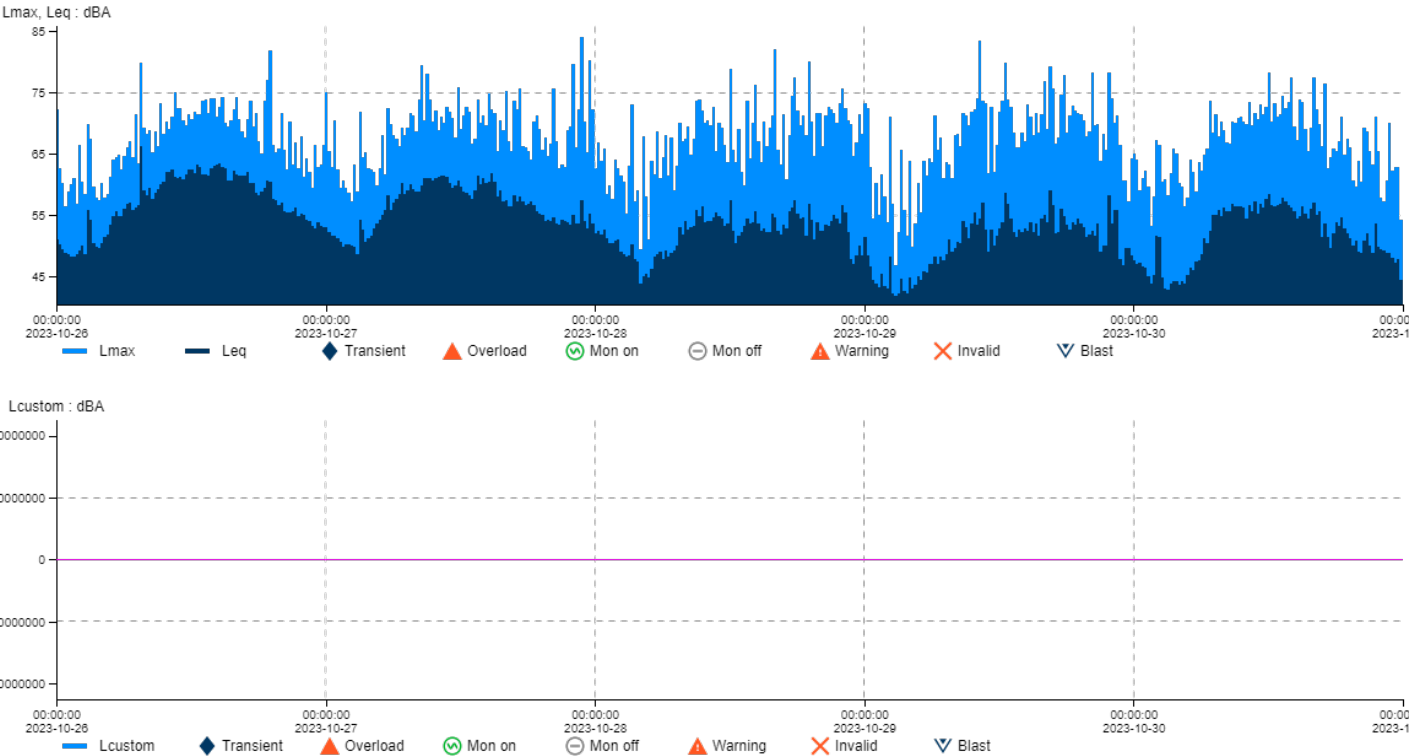




 Monitoring Location

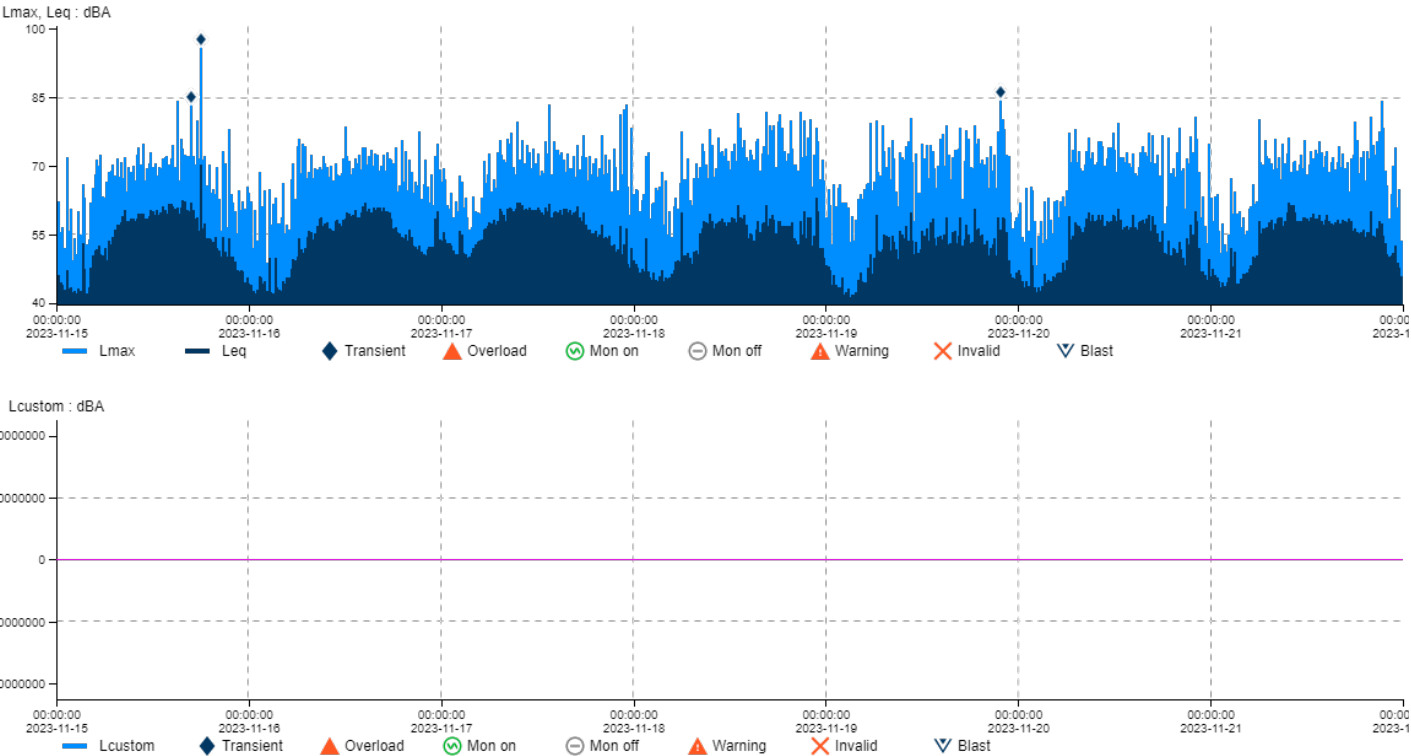
 Work Location

Project	SOP
Project maintainer	-
Time frame	2023-10-26 00:00 - 2023-10-31 00:00 (Australia/Sydney)
Measuring point	N1 #14624
Description	Second floor balcony Pullman Hotel
Sensor type	S50
Sensor serial no.	14624
Master(s) serial no.	108060
Latest calibration	2023-08-02
Standard	(02) Lmax + Leq 30-105 dBA Fast
Unit	dBA
Quantity	Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time	15 minutes
Table threshold	High
Max	Lmax: 84 dBA, Leq: 66.1 dBA, Lcustom: null



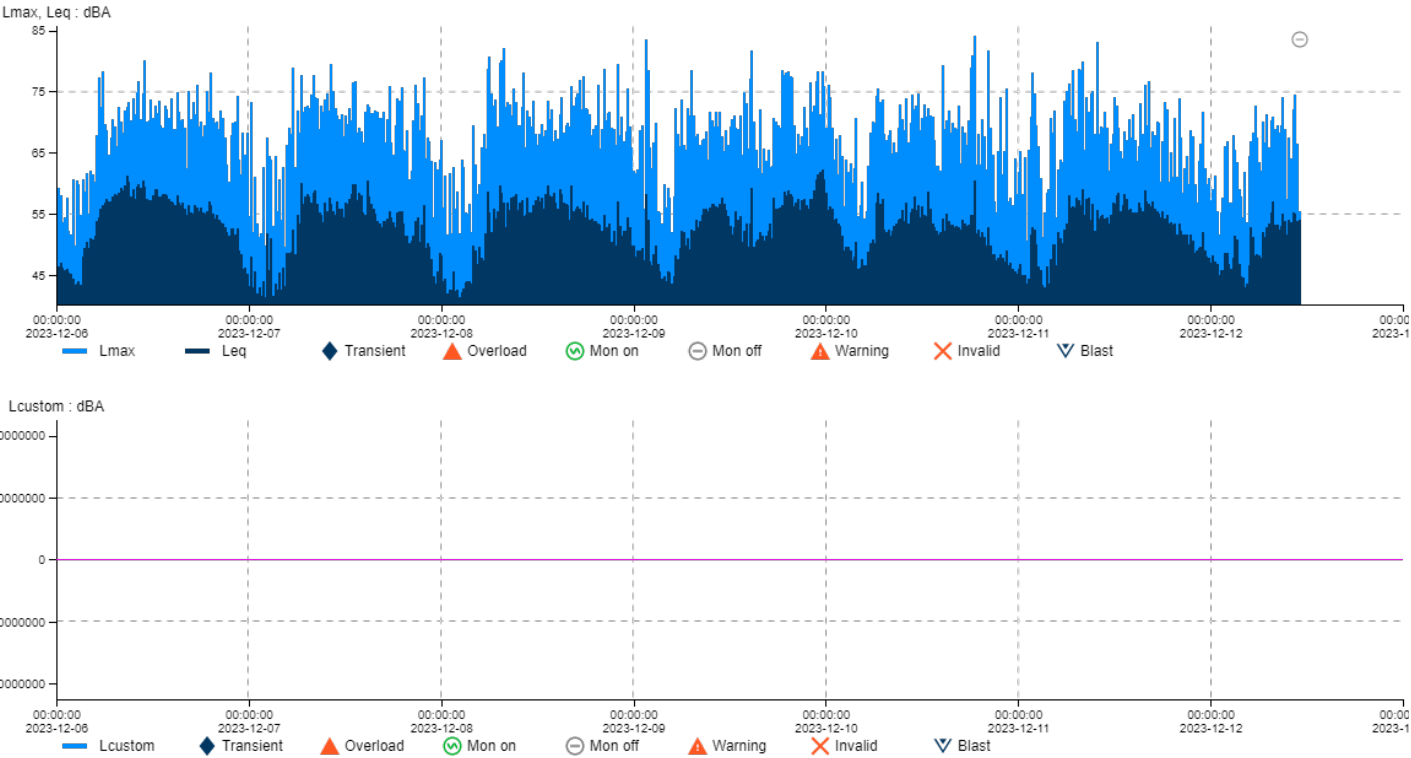
X-span	2023-10-26 00:00 - 2023-10-31 00:00		
Y-span	Lmax, Leq : dBA: 40.48 - 85.86, Lcustom : dBA: 9007199254740991 - -9007199254740991		
	Lmax	Leq	Lcustom
Max	84 dBA	66.1 dBA	-
Date	2023-10-27	2023-10-26	-
Time	23:00:00	07:45:00	-

Project	SOP
Project maintainer	-
Time frame	2023-11-15 00:00 - 2023-11-22 00:00 (Australia/Sydney)
Measuring point	N1 #14624
Description	Second floor balcony Pullman Hotel
Sensor type	S50
Sensor serial no.	14624
Master(s) serial no.	108060
Latest calibration	2023-08-02
Standard	(02) Lmax + Leq 30-105 dBA Fast
Unit	dBA
Quantity	Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time	15 minutes
Table threshold	High
Max	Lmax: 98.1 dBA, Leq: 70 dBA, Lcustom: null



X-span	2023-11-15 00:00 - 2023-11-22 00:00		
Y-span	Lmax, Leq : dBA: 39.66 - 100.6, Lcustom : dBA: 9007199254740991 - -9007199254740991		
	Lmax	Leq	Lcustom
Max	98.1 dBA	70 dBA	-
Date	2023-11-15	2023-11-15	-
Time	18:15:00	18:15:00	-

Project	SOP
Project maintainer	-
Time frame	2023-12-06 00:00 - 2023-12-13 00:00 (Australia/Sydney)
Measuring point	N1 #14624
Description	Second floor balcony Pullman Hotel
Sensor type	S50
Sensor serial no.	14624
Master(s) serial no.	108060
Latest calibration	2023-08-02
Standard	(02) Lmax + Leq 30-105 dBA Fast
Unit	dBA
Quantity	Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time	15 minutes
Table threshold	High
Max	Lmax: 84 dBA, Leq: 62.1 dBA, Lcustom: null



X-span	2023-12-06 00:00 - 2023-12-13 00:00		
Y-span	Lmax, Leq : dBA: 40.16 - 85.73, Lcustom : dBA: 9007199254740991 - -9007199254740991		
	Lmax	Leq	Lcustom
Max	84 dBA	62.1 dBA	-
Date	2023-12-10	2023-12-09	-
Time	18:45:00	23:45:00	-

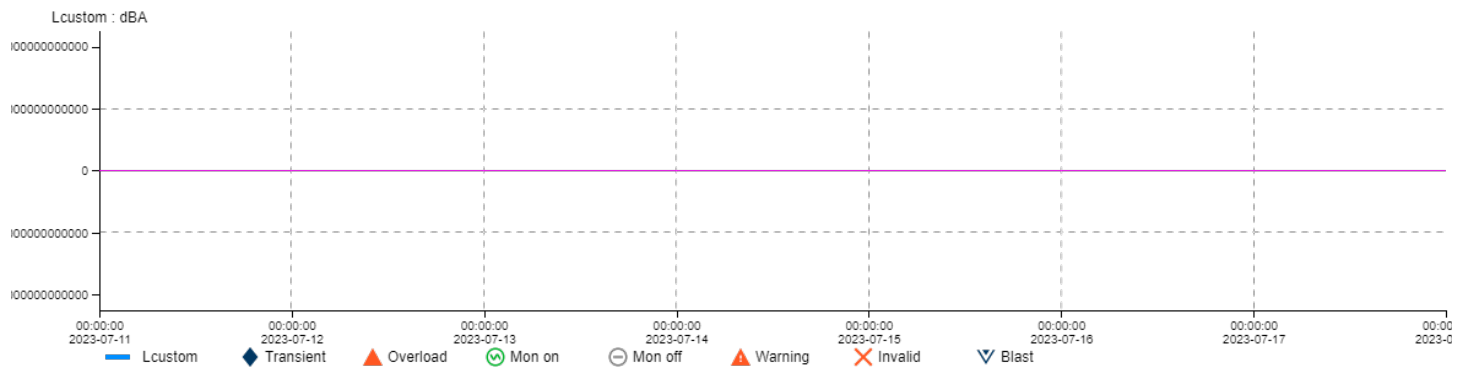
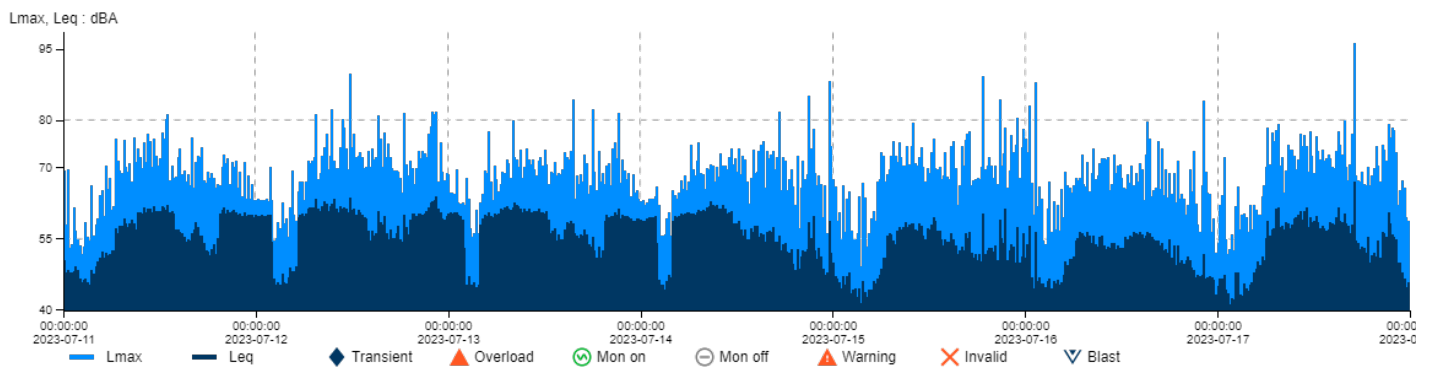
Interval report

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Project SOP
Project maintainer -
Time frame 2023-07-11 00:00 - 2023-07-18 00:00 (Australia/Sydney)

Measuring point N1 Hired
Description Second floor balcony Pullman Hotel
Sensor type S50
Sensor serial no. 10087
Master(s) serial no. 108060
Latest calibration 2022-06-21
Standard (01) Lmax + Leq 20-95 dBA Fast
Unit dBA
Quantity Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time 15 minutes
Table threshold High

Max Lmax: 96.2 dBA, Leq: 66.8 dBA, Lcustom: null



X-span 2023-07-11 00:00 - 2023-07-18 00:00

Y-span Lmax, Leq : dBA: 39.71 - 98.57, Lcustom : dBA: 9007199254740991 - -9007199254740991

	Lmax	Leq	Lcustom
Max	96.2 dBA	66.8 dBA	-
Date	2023-07-17	2023-07-17	-
Time	17:15:00	17:15:00	-

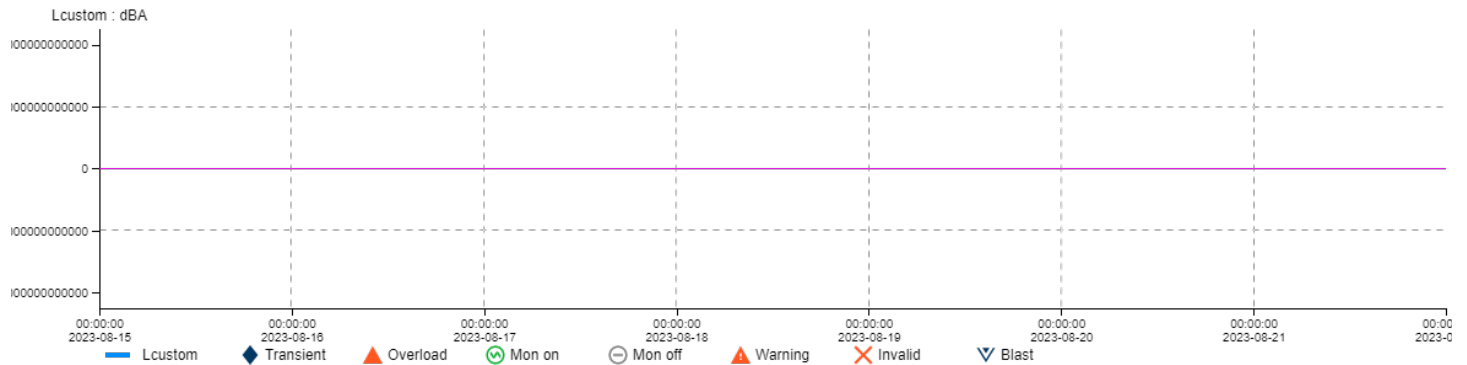
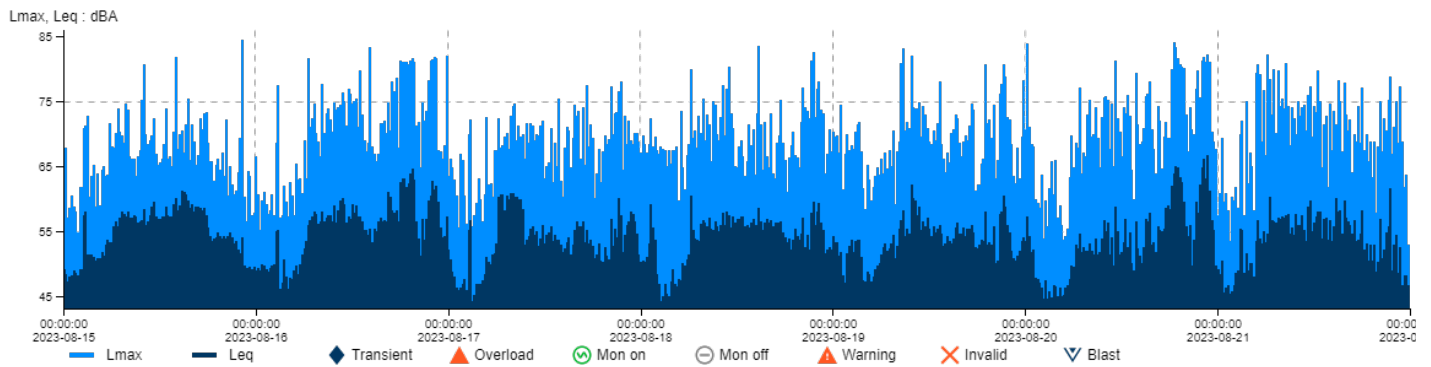
Interval report

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Project SOP
Project maintainer -
Time frame 2023-08-15 00:00 - 2023-08-22 00:00 (Australia/Sydney)

Measuring point N1 Hired
Description Second floor balcony Pullman Hotel
Sensor type S50
Sensor serial no. 10087
Master(s) serial no. 108060
Latest calibration 2022-06-21
Standard (01) Lmax + Leq 20-95 dBA Fast
Unit dBA
Quantity Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time 15 minutes
Table threshold High

Max Lmax: 84.4 dBA, Leq: 66.7 dBA, Lcustom: null



X-span 2023-08-15 00:00 - 2023-08-22 00:00

Y-span Lmax, Leq : dBA: 43.18 - 85.98, Lcustom : dBA: 9007199254740991 - -9007199254740991

	Lmax	Leq	Lcustom
Max	84.4 dBA	66.7 dBA	-
Date	2023-08-15	2023-08-20	-
Time	22:30:00	23:00:00	-

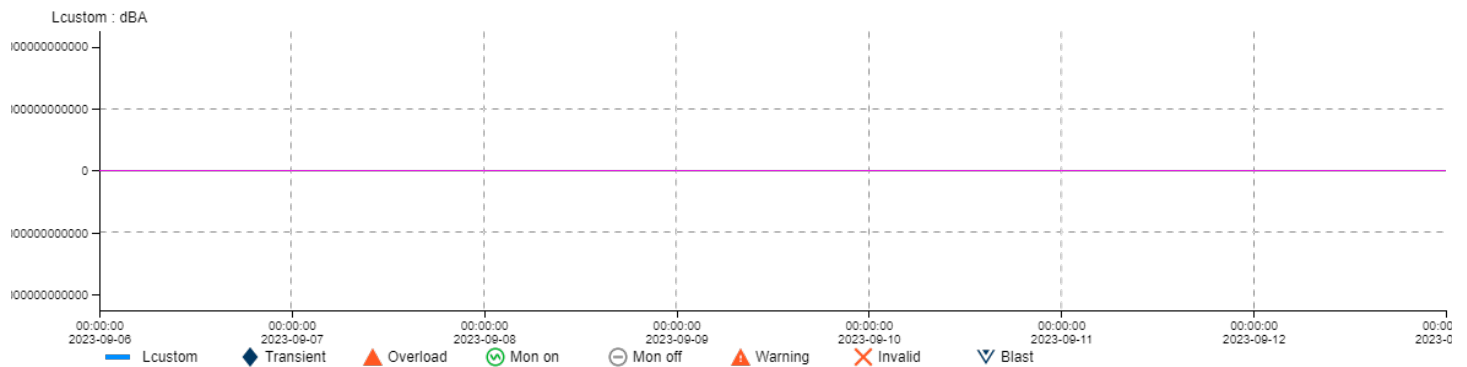
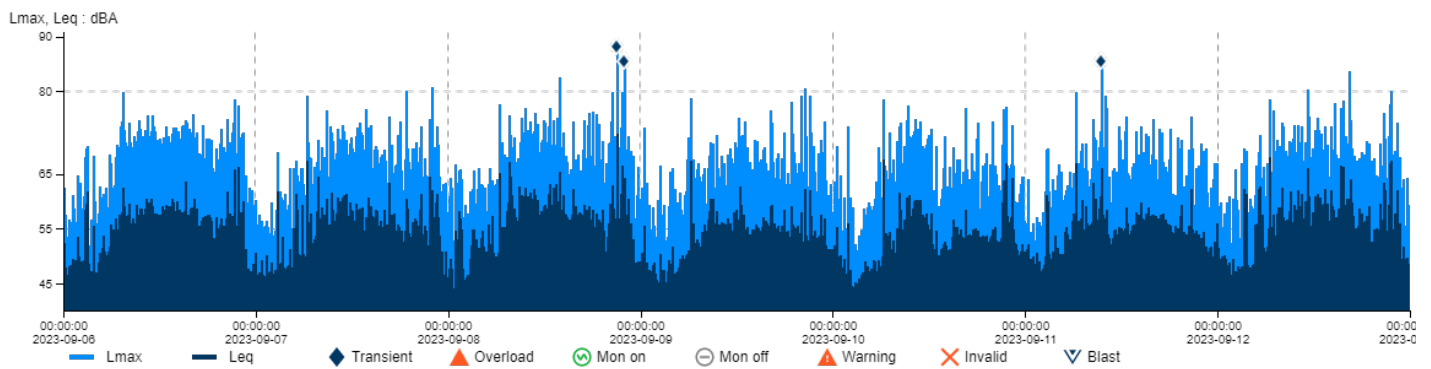
Interval report

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Project SOP
Project maintainer -
Time frame 2023-09-06 00:00 - 2023-09-13 00:00 (Australia/Sydney)

Measuring point N1 Hired
Description Second floor balcony Pullman Hotel
Sensor type S50
Sensor serial no. 10087
Master(s) serial no. 108060
Latest calibration 2022-06-21
Standard (02) Lmax + Leq 30-105 dBA Fast
Unit dBA
Quantity Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time 2 minutes
Table threshold High

Max Lmax: 88.6 dBA, Leq: 72.2 dBA, Lcustom: null

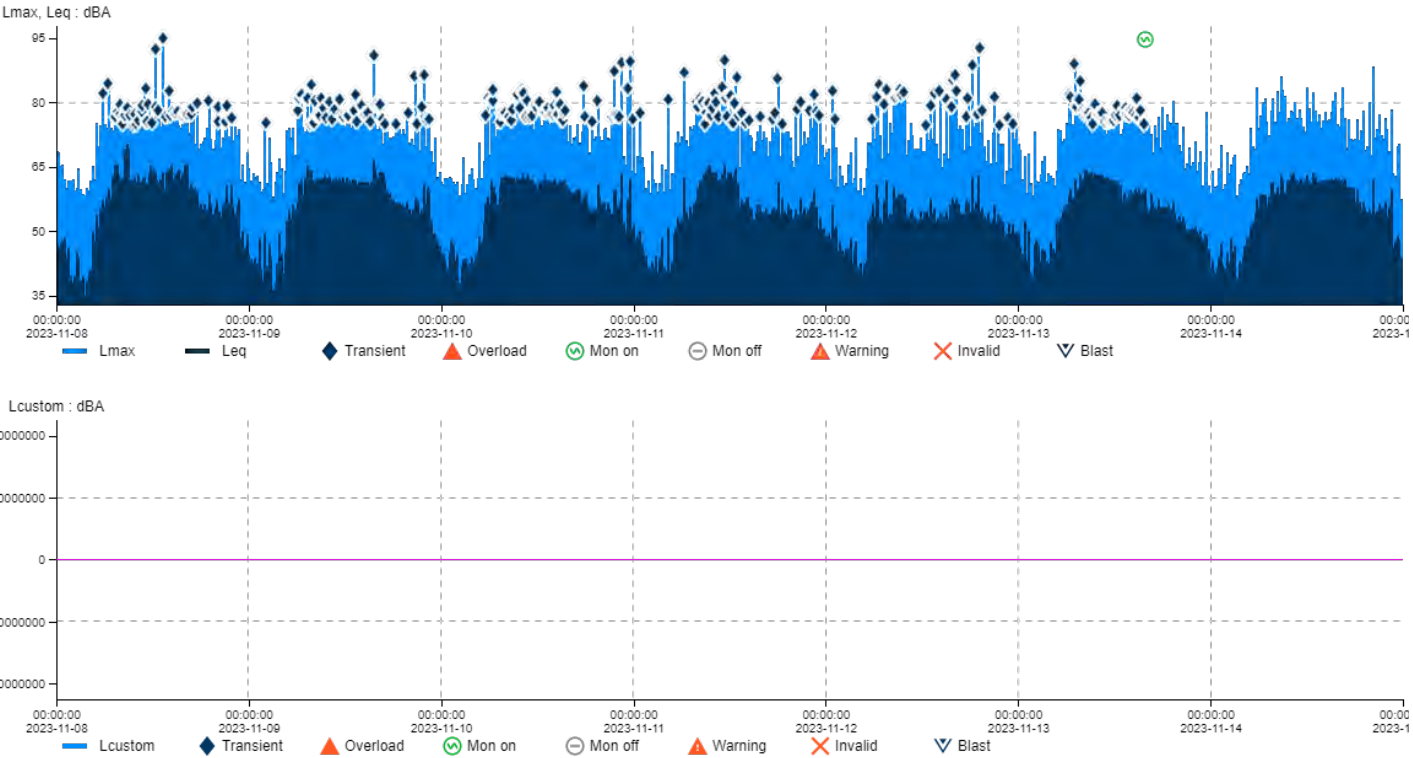


X-span 2023-09-06 00:00 - 2023-09-13 00:00

Y-span Lmax, Leq : dBA: 40.07 - 90.84, Lcustom : dBA: 9007199254740991 - -9007199254740991

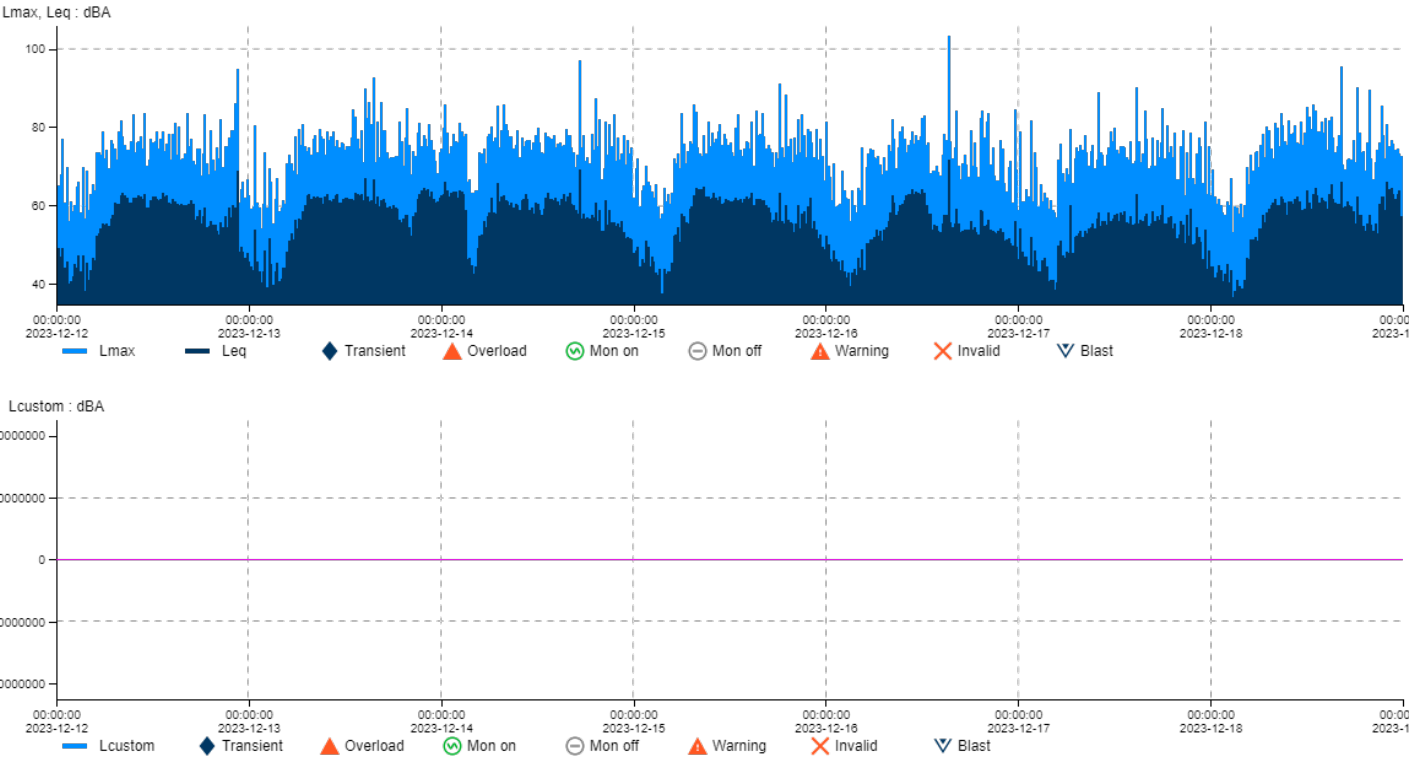
	Lmax	Leq	Lcustom
Max	88.6 dBA	72.2 dBA	-
Date	2023-09-08	2023-09-08	-
Time	21:10:00	21:10:00	-

Project	NST
Project maintainer	-
Time frame	2023-11-08 00:00 - 2023-11-15 00:00 (Australia/Sydney)
Measuring point	NST_1
Description	NST S50 #14084
Sensor type	S50
Sensor serial no.	14084
Master(s) serial no.	108061
Latest calibration	2023-07-25
Standard	(02) Lmax + Leq 30-105 dBA Fast
Unit	dBA
Quantity	Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time	15 minutes
Table threshold	High
Max	Lmax: 95.8 dBA, Leq: 70.1 dBA, Lcustom: null



X-span	2023-11-08 00:00 - 2023-11-15 00:00		
Y-span	Lmax, Leq : dBA: 32.93 - 97.72, Lcustom : dBA: 9007199254740991 - -9007199254740991		
	Lmax	Leq	Lcustom
Max	95.8 dBA	70.1 dBA	-
Date	2023-11-08	2023-11-08	-
Time	13:30:00	09:00:00	-

Project	NST
Project maintainer	-
Time frame	2023-12-12 00:00 - 2023-12-19 00:00 (Australia/Sydney)
Measuring point	NST_1
Description	NST S50 #14084
Sensor type	S50
Sensor serial no.	14084
Master(s) serial no.	108061
Latest calibration	2023-07-25
Standard	(02) Lmax + Leq 30-105 dBA Fast
Unit	dBA
Quantity	Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time	15 minutes
Table threshold	High
Max	Lmax: 103.3 dBA, Leq: 71.5 dBA, Lcustom: null



X-span	2023-12-12 00:00 - 2023-12-19 00:00		
Y-span	Lmax, Leq : dBA: 34.75 - 105.81, Lcustom : dBA: 9007199254740991 - -9007199254740991		
	Lmax	Leq	Lcustom
Max	103.3 dBA	71.5 dBA	
Date	2023-12-16	2023-12-16	-
Time	15:30:00	15:30:00	-

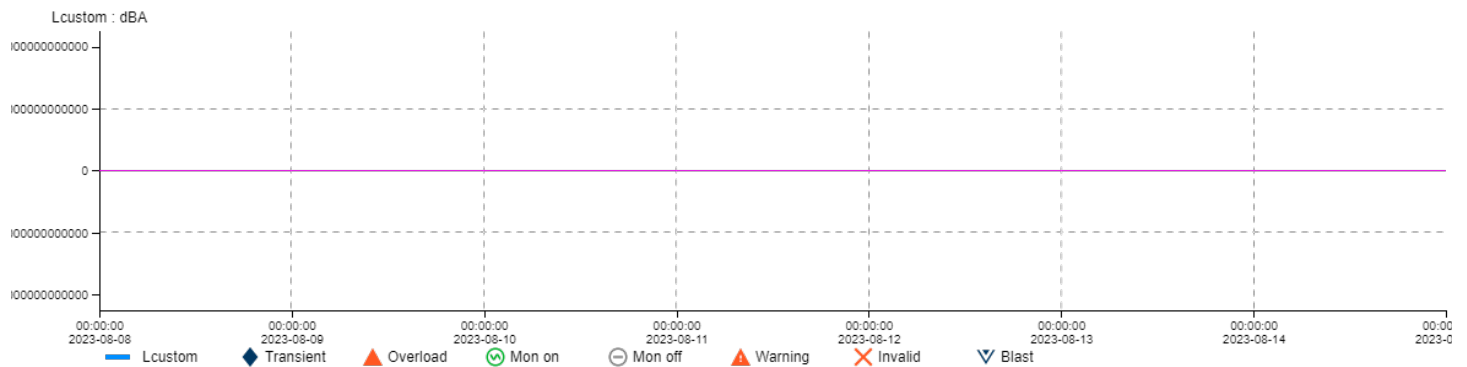
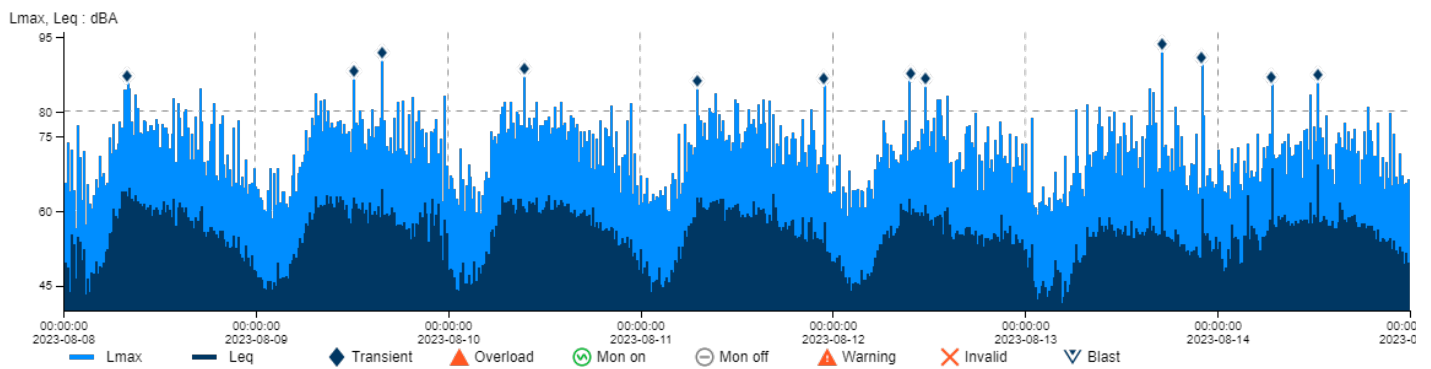
Interval report

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Project NST
Project maintainer -
Time frame 2023-08-08 00:00 - 2023-08-15 00:00 (Australia/Sydney)

Measuring point NST Hire S50
Description NST Sound hire
Sensor type S50
Sensor serial no. 10785
Master(s) serial no. 108061
Latest calibration 2022-05-22
Standard (01) Lmax + Leq 20-95 dBA Fast
Unit dBA
Quantity Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time 15 minutes
Table threshold High

Max Lmax: 94.1 dBA, Leq: 69.3 dBA, Lcustom: null



X-span 2023-08-08 00:00 - 2023-08-15 00:00

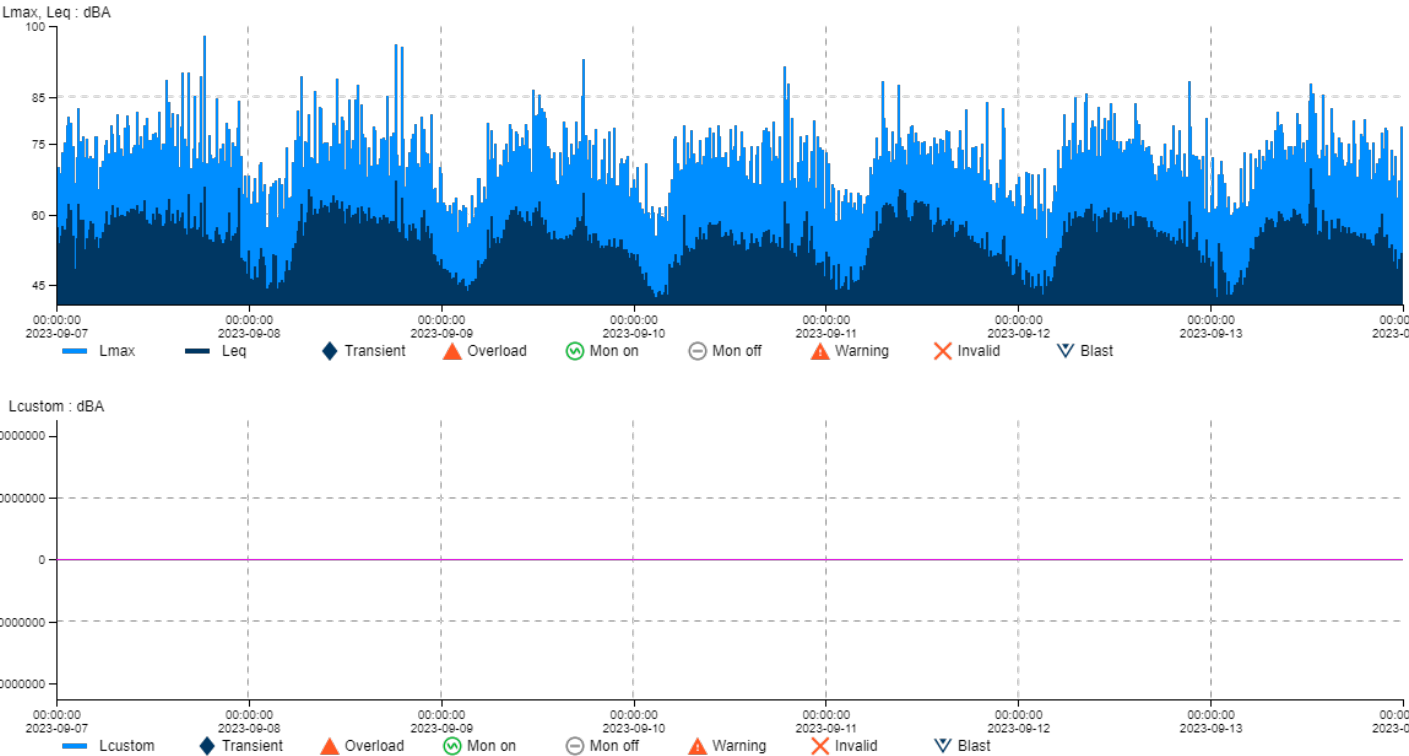
Y-span Lmax, Leq : dBA: 40 - 95.98, Lcustom : dBA: 9007199254740991 - -9007199254740991

	Lmax	Leq	Lcustom
Max	94.1 dBA	69.3 dBA	-
Date	2023-08-13	2023-08-14	-
Time	17:15:00	12:45:00	-

Project NST
Project maintainer -
Time frame 2023-09-07 00:00 - 2023-09-14 00:00 (Australia/Sydney)

Measuring point NST Hire S50
Description NST Sound hire
Sensor type S50
Sensor serial no. 10785
Master(s) serial no. 108061
Latest calibration 2022-05-22
Standard (02) Lmax + Leq 30-105 dBA Fast
Unit dBA
Quantity Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time 15 minutes
Table threshold High

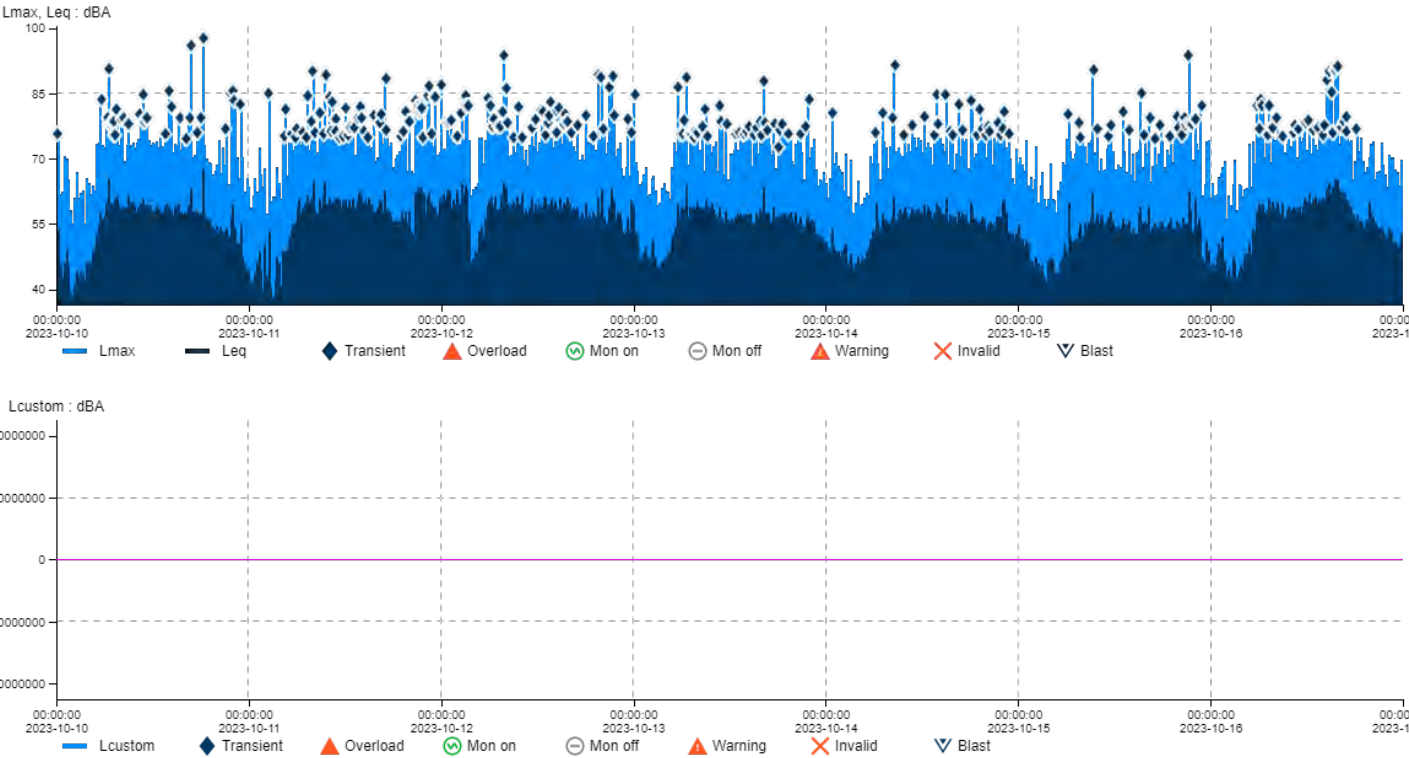
Max Lmax: 97.9 dBA, Leq: 69.6 dBA, Lcustom: null



X-span 2023-09-07 00:00 - 2023-09-14 00:00
Y-span Lmax, Leq : dBA: 40.93 - 100.06, Lcustom : dBA: 9007199254740991 - -9007199254740991

	Lmax	Leq	Lcustom
Max	97.9 dBA	69.6 dBA	-
Date	2023-09-07	2023-09-13	-
Time	18:45:00	12:45:00	-

Project	NST
Project maintainer	-
Time frame	2023-10-10 00:00 - 2023-10-17 00:00 (Australia/Sydney)
Measuring point	NST_1
Description	NST S50 #14084
Sensor type	S50
Sensor serial no.	14084
Master(s) serial no.	108061
Latest calibration	2023-07-25
Standard	(02) Lmax + Leq 30-105 dBA Fast
Unit	dBA
Quantity	Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time	15 minutes
Table threshold	High
Max	Lmax: 98.3 dBA, Leq: 67.6 dBA, Lcustom: null



X-span	2023-10-10 00:00 - 2023-10-17 00:00		
Y-span	Lmax, Leq : dBA: 36.52 - 100.47, Lcustom : dBA: 9007199254740991 - -9007199254740991		
	Lmax	Leq	Lcustom
Max	98.3 dBA	67.6 dBA	-
Date	2023-10-10	2023-10-10	-
Time	18:30:00	18:30:00	-

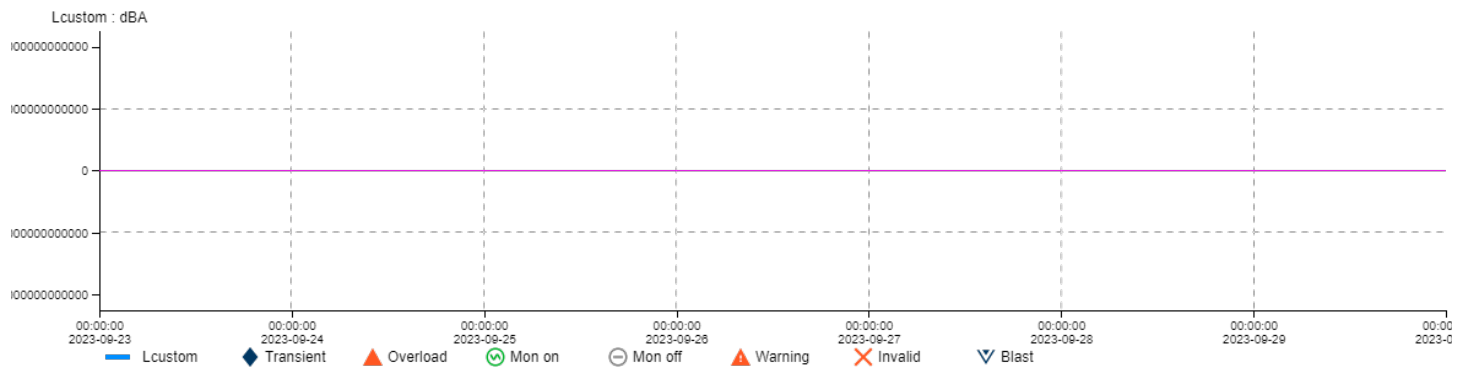
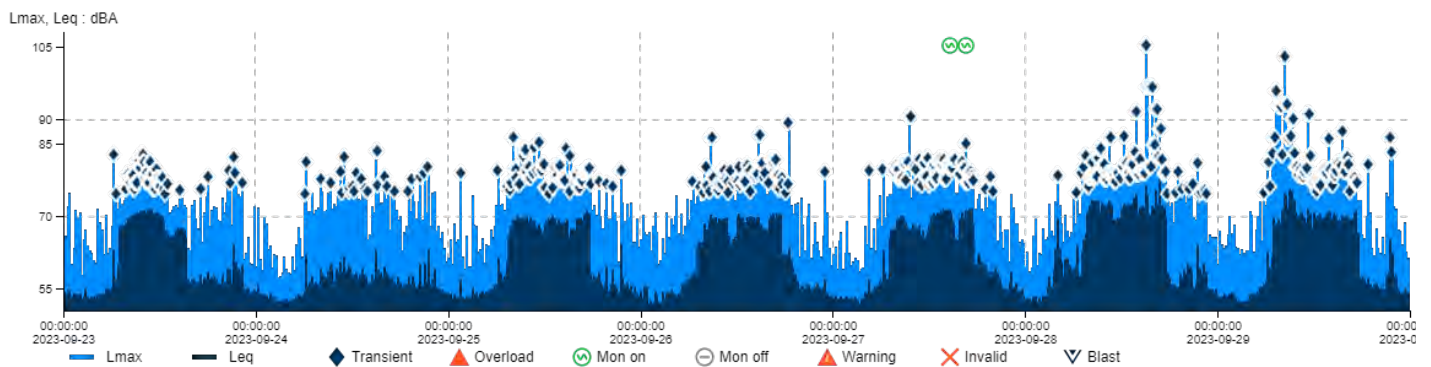
Interval report

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Project BWD
Project maintainer -
Time frame 2023-09-23 00:00 - 2023-09-30 00:00 (Australia/Sydney)

Measuring point BWD_1
Description XXXXXXXXXX
Sensor type S50
Sensor serial no. 14085
Master(s) serial no. 108062
Latest calibration 2023-07-25
Standard (02) Lmax + Leq 30-105 dBA Fast
Unit dBA
Quantity Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time 15 minutes
Table threshold High

Max Lmax: 105.7 dBA, Leq: 77.9 dBA, Lcustom: null



X-span 2023-09-23 00:00 - 2023-09-30 00:00
Y-span Lmax, Leq : dBA: 50.5 - 108.13, Lcustom : dBA: 9007199254740991 - -9007199254740991

	Lmax	Leq	Lcustom
Max	105.7 dBA	77.9 dBA	-
Date	2023-09-28	2023-09-28	-
Time	15:15:00	17:00:00	-

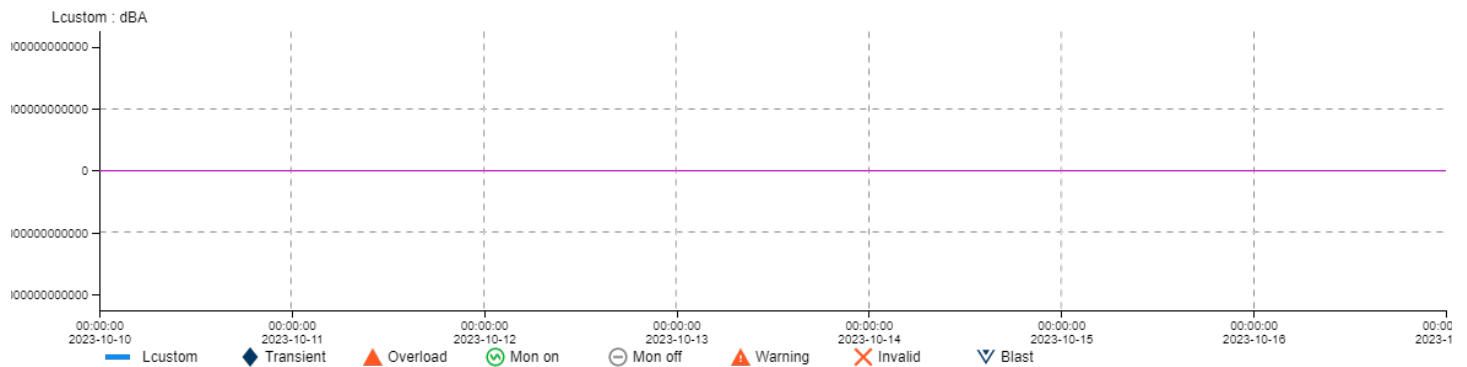
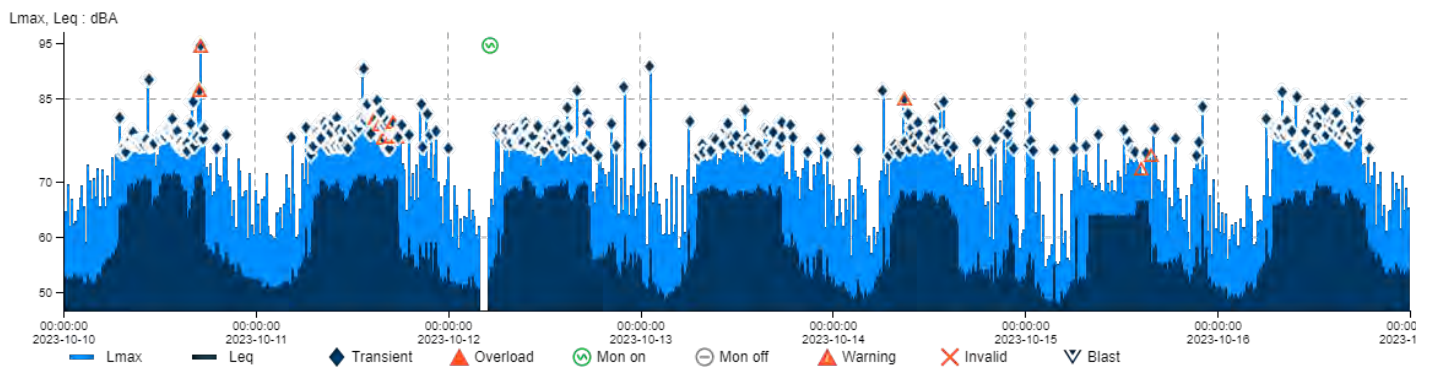
Interval report

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Project BWD
Project maintainer -
Time frame 2023-10-10 00:00 - 2023-10-17 00:00 (Australia/Sydney)

Measuring point BWD_1
Description XXXXXXXXXX
Sensor type S50
Sensor serial no. 14085
Master(s) serial no. 108062
Latest calibration 2023-07-25
Standard (02) Lmax + Leq 30-105 dBA Fast
Unit dBA
Quantity Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time 15 minutes
Table threshold High

Max Lmax: 95 dBA, Leq: 71.7 dBA, Lcustom: null

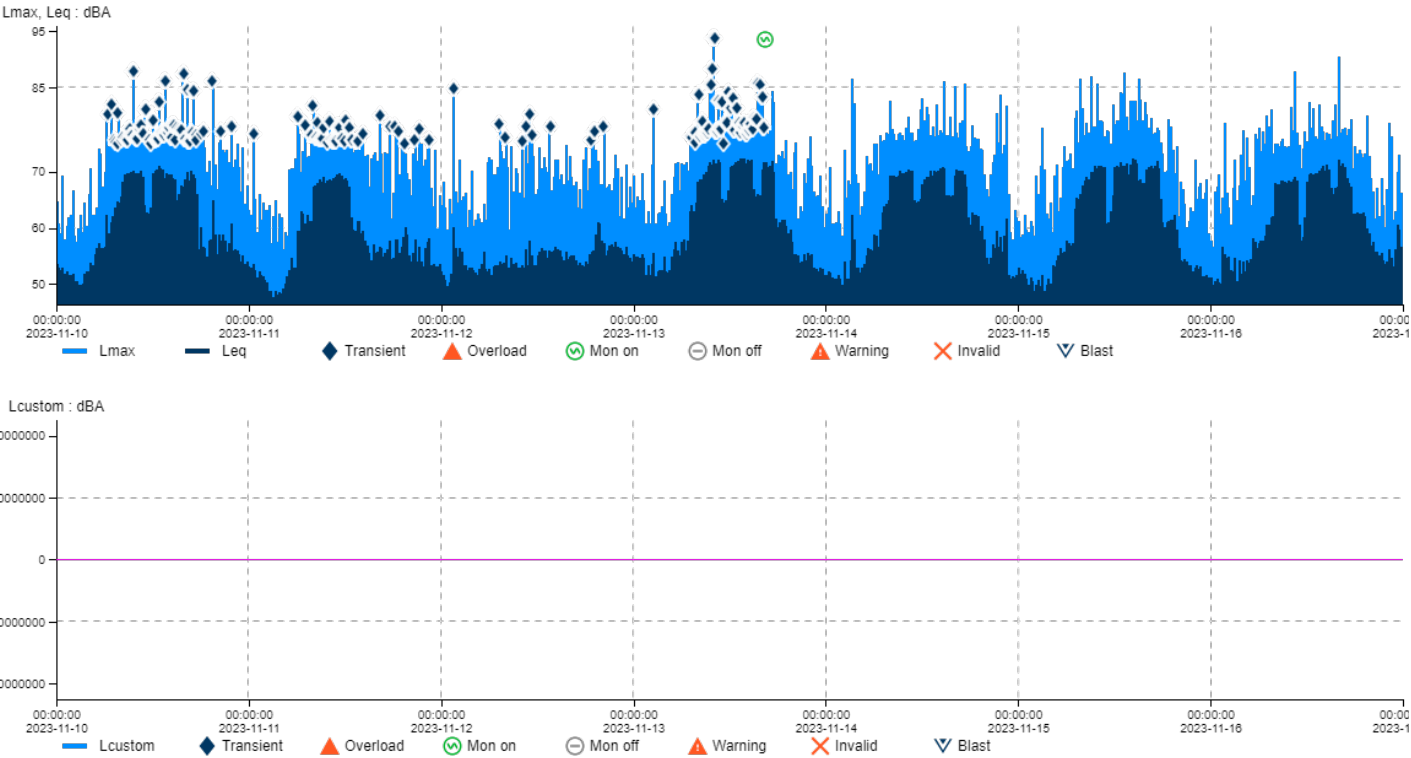


X-span 2023-10-10 00:00 - 2023-10-17 00:00

Y-span Lmax, Leq : dBA: 46.71 - 97.02, Lcustom : dBA: 9007199254740991 - -9007199254740991

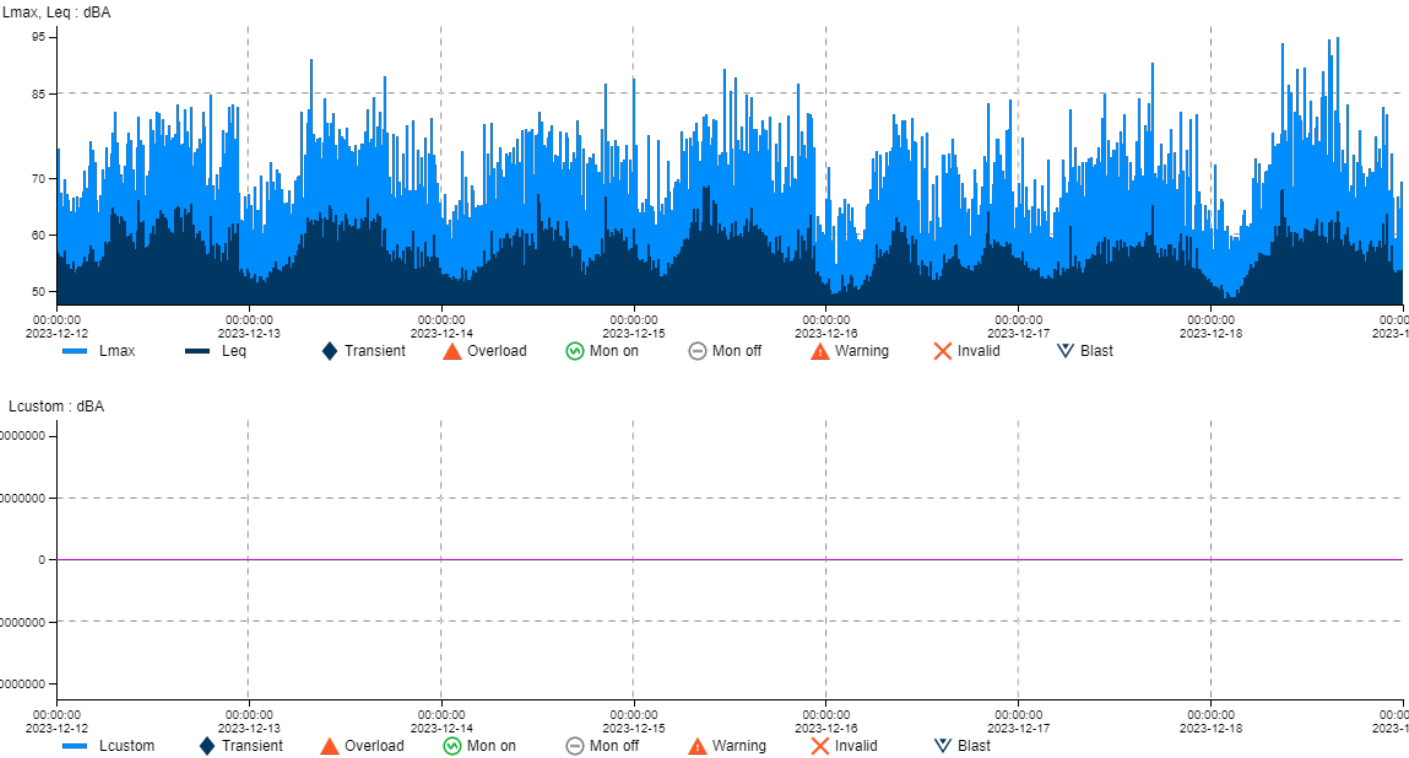
	Lmax	Leq	Lcustom
Max	95 dBA	71.7 dBA	
Date	2023-10-10	2023-10-10	-
Time	17:15:00	14:00:00	-

Project	BWD
Project maintainer	-
Time frame	2023-11-10 00:00 - 2023-11-17 00:00 (Australia/Sydney)
Measuring point	BWD_1
Description	
Sensor type	S50
Sensor serial no.	14085
Master(s) serial no.	108062
Latest calibration	2023-07-25
Standard	(02) Lmax + Leq 30-105 dBA Fast
Unit	dBA
Quantity	Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time	15 minutes
Table threshold	High
Max	Lmax: 94 dBA, Leq: 72.3 dBA, Lcustom: null



X-span	2023-11-10 00:00 - 2023-11-17 00:00		
Y-span	Lmax, Leq : dBA: 46.37 - 95.9, Lcustom : dBA: 9007199254740991 - -9007199254740991		
	Lmax	Leq	Lcustom
Max	94 dBA	72.3 dBA	-
Date	2023-11-13	2023-11-13	-
Time	10:15:00	13:30:00	-

Project	BWD
Project maintainer	-
Time frame	2023-12-12 00:00 - 2023-12-19 00:00 (Australia/Sydney)
Measuring point	BWD_1
Description	
Sensor type	S50
Sensor serial no.	14085
Master(s) serial no.	108062
Latest calibration	2023-07-25
Standard	(02) Lmax + Leq 30-105 dBA Fast
Unit	dBA
Quantity	Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time	15 minutes
Table threshold	High
Max	Lmax: 94.9 dBA, Leq: 68.5 dBA, Lcustom: null



X-span	2023-12-12 00:00 - 2023-12-19 00:00		
Y-span	Lmax, Leq : dBA: 47.61 - 96.91, Lcustom : dBA: 9007199254740991 - -9007199254740991		
	Lmax	Leq	Lcustom
Max	94.9 dBA	68.5 dBA	-
Date	2023-12-18	2023-12-15	-
Time	16:00:00	09:30:00	-

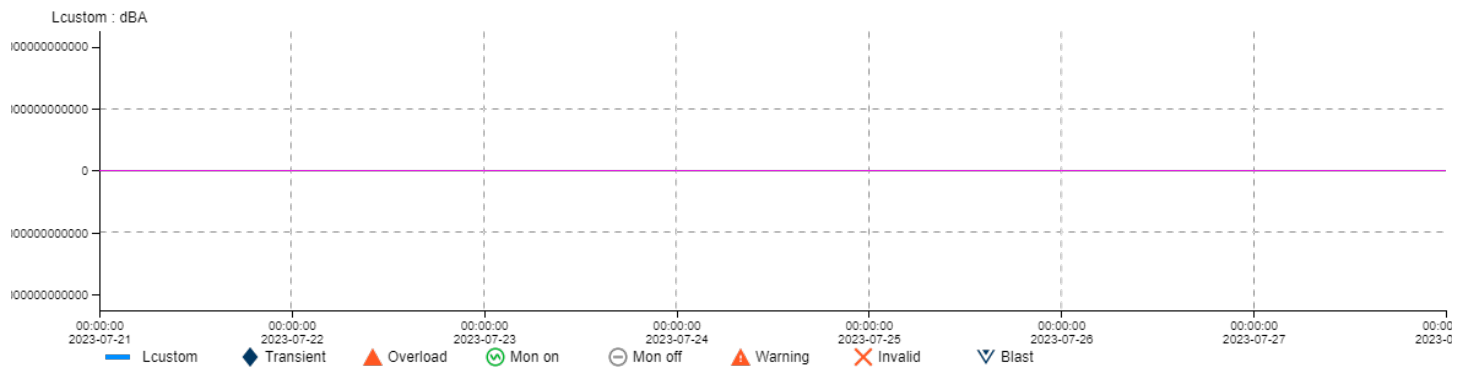
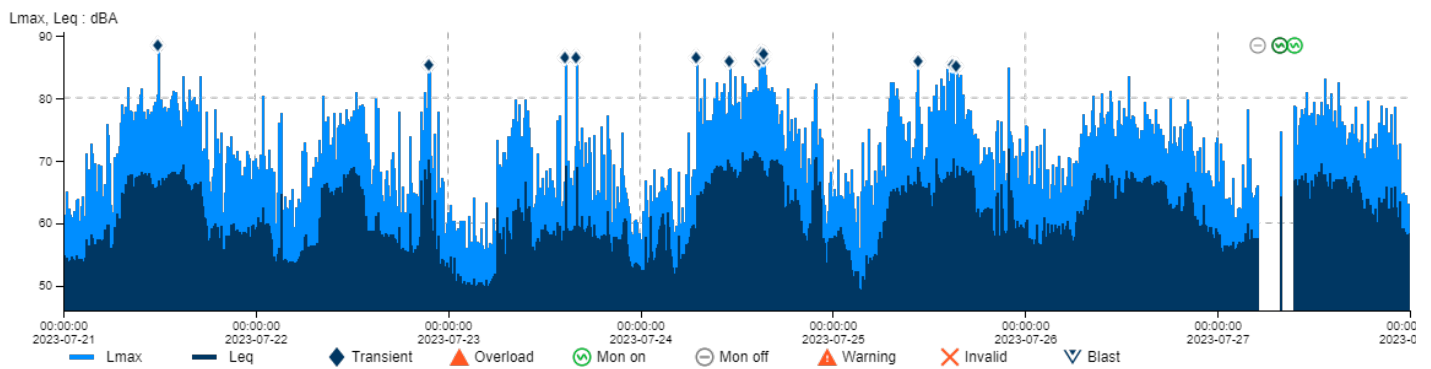
Interval report

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Project BWD
Project maintainer -
Time frame 2023-07-21 00:00 - 2023-07-28 00:00 (Australia/Sydney)

Measuring point BWD_1 hired
Description XXXXXXXXXX
Sensor type S50
Sensor serial no. 10015
Master(s) serial no. 108062
Latest calibration 2022-05-23
Standard (01) Lmax + Leq 20-95 dBA Fast
Unit dBA
Quantity Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time 2 minutes
Table threshold High

Max Lmax: 88.7 dBA, Leq: 71.8 dBA, Lcustom: null



X-span 2023-07-21 00:00 - 2023-07-28 00:00
Y-span Lmax, Leq : dBA: 45.97 - 90.62, Lcustom : dBA: 9007199254740991 - -9007199254740991

	Lmax	Leq	Lcustom
Max	88.7 dBA	71.8 dBA	-
Date	2023-07-21	2023-07-25	-
Time	11:56:00	22:00:00	-

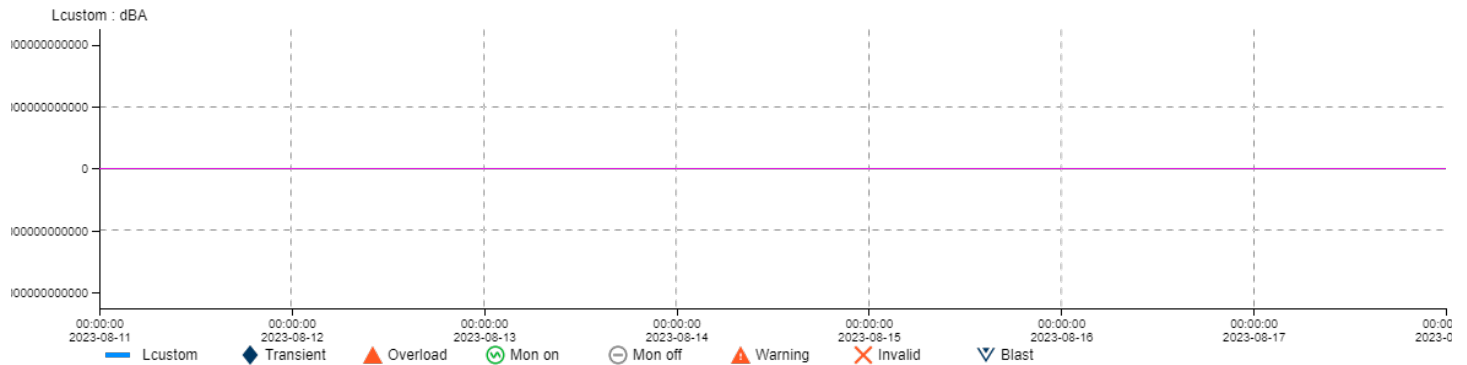
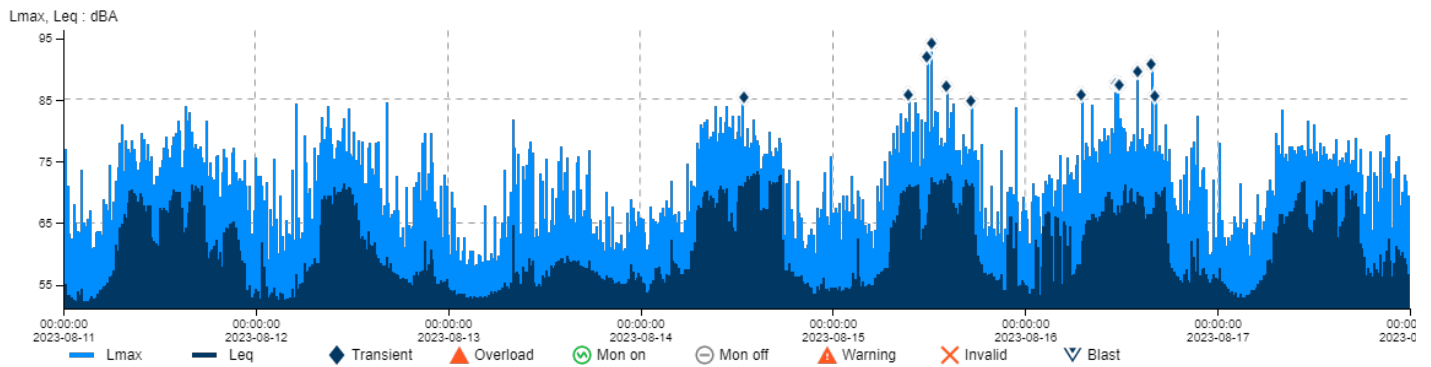
Interval report

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Project BWD
Project maintainer -
Time frame 2023-08-11 00:00 - 2023-08-18 00:00 (Australia/Sydney)

Measuring point BWD_1 hired
Description XXXXXXXXXX
Sensor type S50
Sensor serial no. 10015
Master(s) serial no. 108062
Latest calibration 2022-05-23
Standard (01) Lmax + Leq 20-95 dBA Fast
Unit dBA
Quantity Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time 15 minutes
Table threshold High

Max Lmax: 94.5 dBA, Leq: 73.4 dBA, Lcustom: null

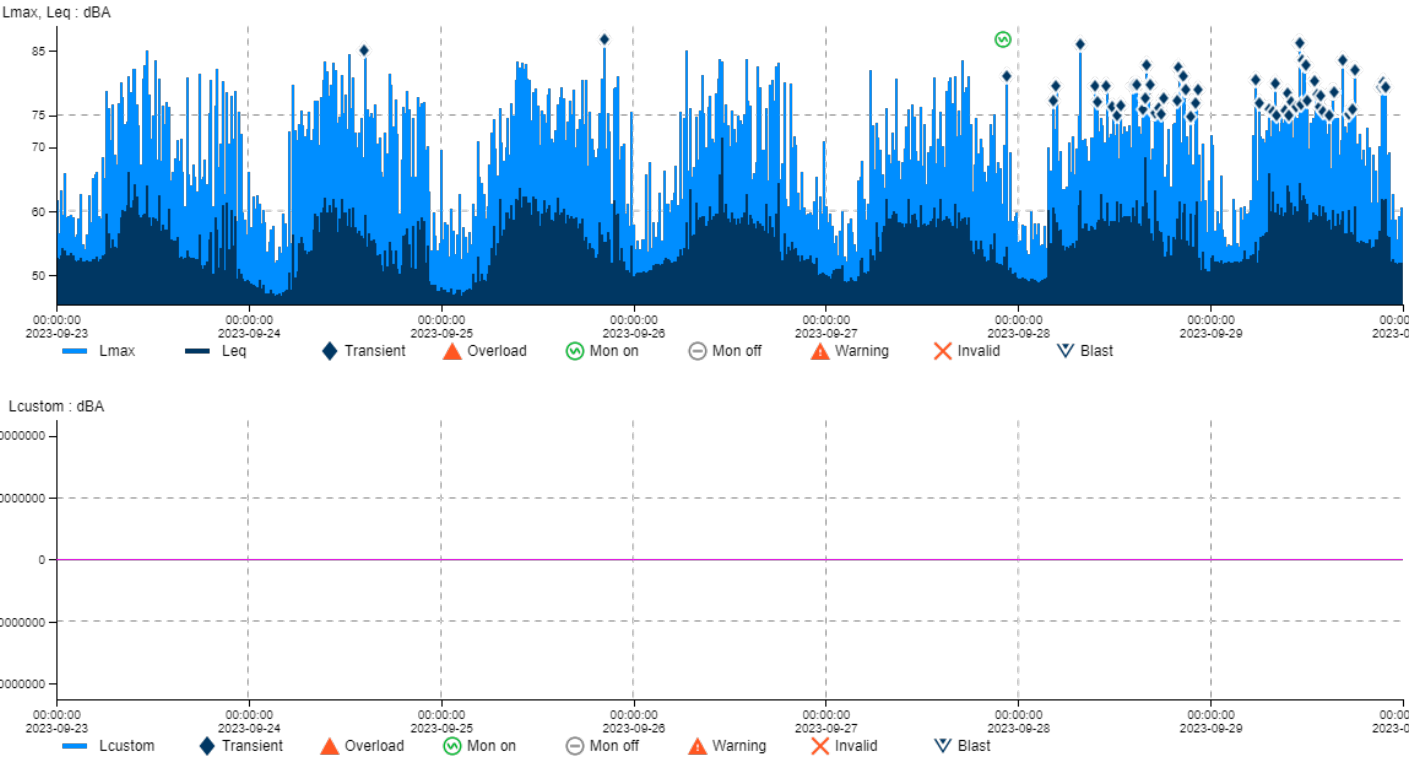


X-span 2023-08-11 00:00 - 2023-08-18 00:00

Y-span Lmax, Leq : dBA: 51.14 - 96.32, Lcustom : dBA: 9007199254740991 - -9007199254740991

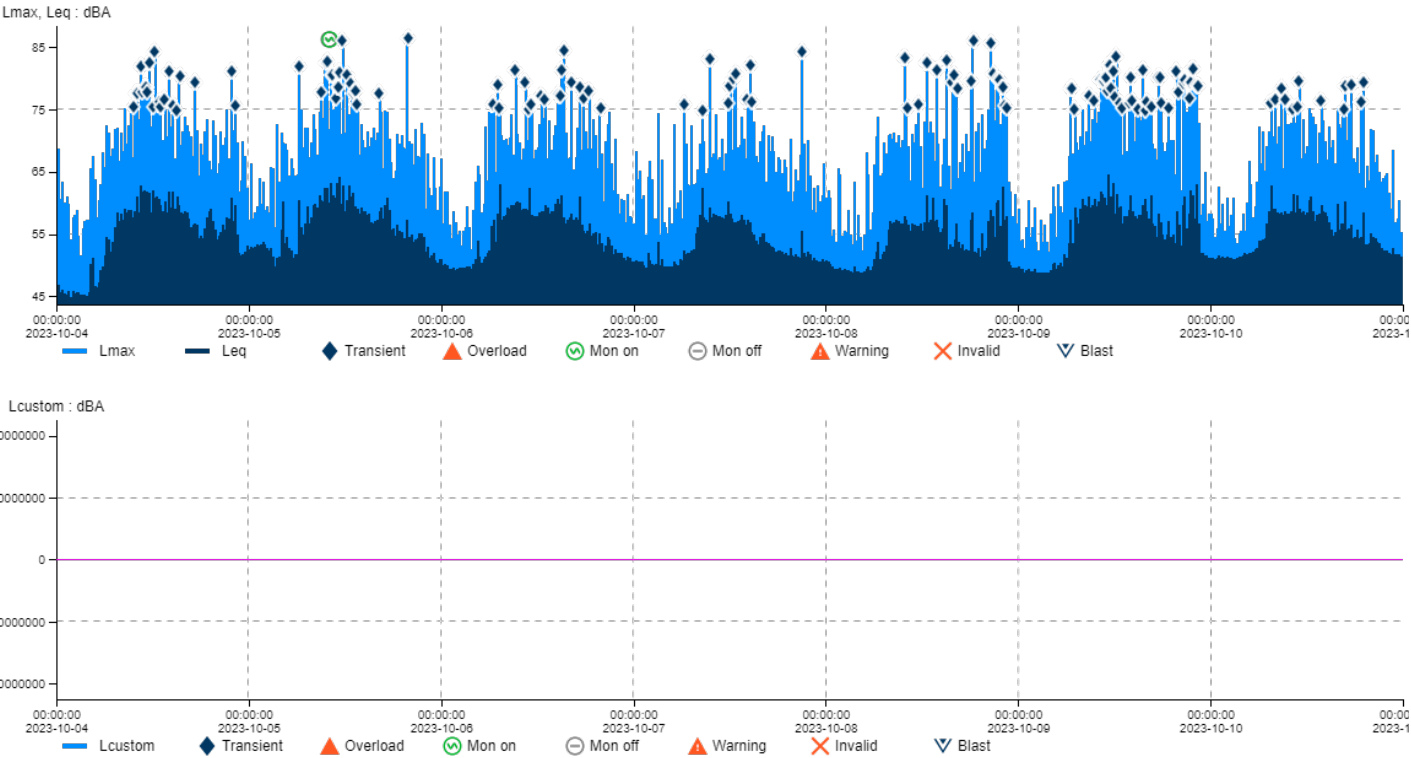
	Lmax	Leq	Lcustom
Max	94.5 dBA	73.4 dBA	-
Date	2023-08-15	2023-08-14	-
Time	12:30:00	14:45:00	-

Project	FDK
Project maintainer	-
Time frame	2023-09-23 00:00 - 2023-09-30 00:00 (Australia/Sydney)
Measuring point	FDK_1
Description	
Sensor type	S50
Sensor serial no.	14176
Master(s) serial no.	107964
Latest calibration	2023-08-14
Standard	(02) Lmax + Leq 30-105 dBA Fast
Unit	dBA
Quantity	Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time	15 minutes
Table threshold	High
Max	Lmax: 87.1 dBA, Leq: 71.3 dBA, Lcustom: null



X-span	2023-09-23 00:00 - 2023-09-30 00:00		
Y-span	Lmax, Leq : dBA: 45.47 - 88.86, Lcustom : dBA: 9007199254740991 - -9007199254740991		
	Lmax	Leq	Lcustom
Max	87.1 dBA	71.3 dBA	
Date	2023-09-25	2023-09-26	-
Time	20:30:00	11:15:00	-

Project	FDK
Project maintainer	-
Time frame	2023-10-04 00:00 - 2023-10-11 00:00 (Australia/Sydney)
Measuring point	FDK_1
Description	
Sensor type	S50
Sensor serial no.	14176
Master(s) serial no.	107964
Latest calibration	2023-08-14
Standard	(02) Lmax + Leq 30-105 dBA Fast
Unit	dBA
Quantity	Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time	15 minutes
Table threshold	High
Max	Lmax: 86.6 dBA, Leq: 64.5 dBA, Lcustom: null

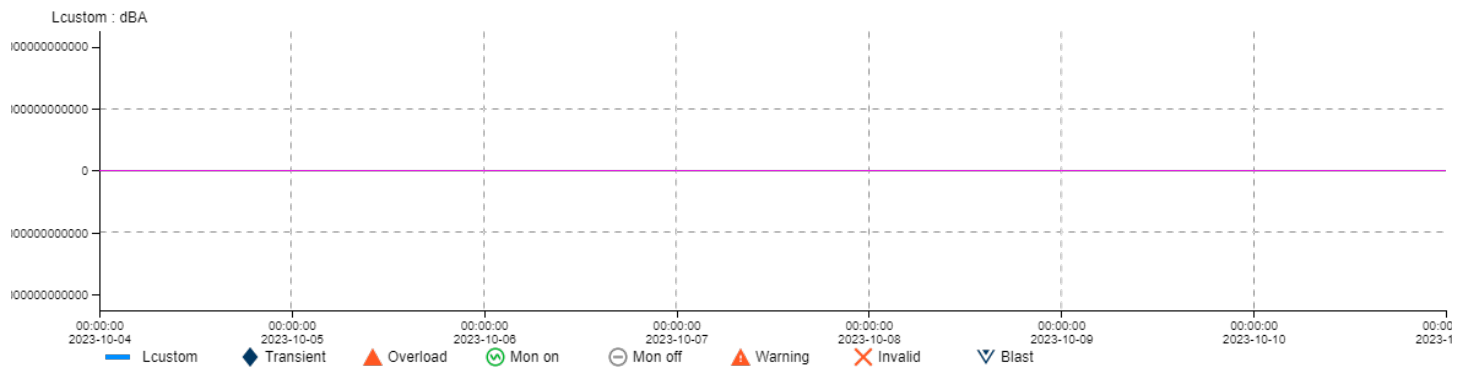
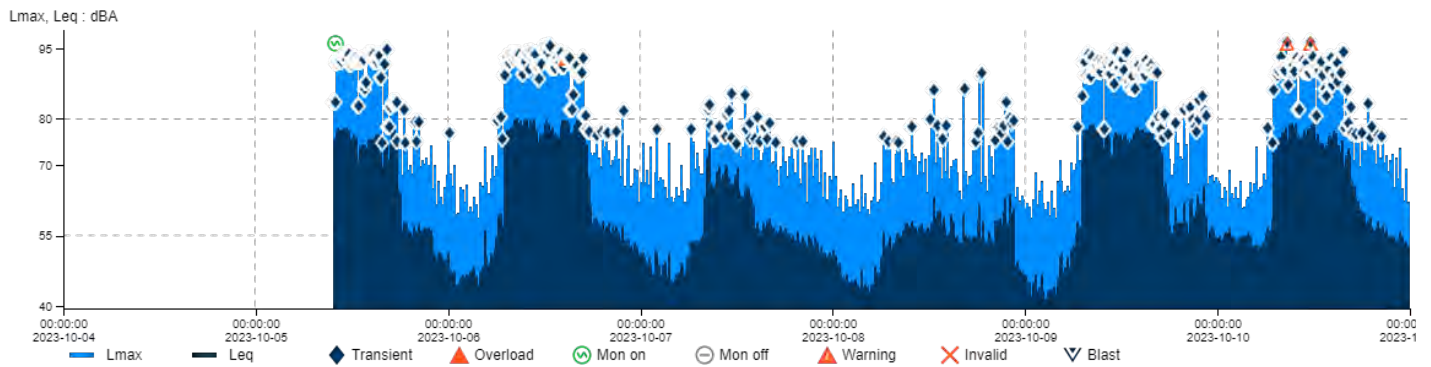


X-span	2023-10-04 00:00 - 2023-10-11 00:00		
Y-span	Lmax, Leq : dBA: 43.71 - 88.35, Lcustom : dBA: 9007199254740991 - -9007199254740991		
	Lmax	Leq	Lcustom
Max	86.6 dBA	64.5 dBA	-
Date	2023-10-05	2023-10-09	-
Time	20:00:00	11:30:00	-

Project FDK
Project maintainer -
Time frame 2023-10-04 00:00 - 2023-10-11 00:00 (Australia/Sydney)

Measuring point FDK_4
Description St Albans Church noise
Sensor type S50
Sensor serial no. 14157
Master(s) serial no. 107963
Latest calibration 2023-07-25
Standard (02) Lmax + Leq 30-105 dBA Fast
Unit dBA
Quantity Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time 15 minutes
Table threshold High

Max Lmax: 97 dBA, Leq: 80 dBA, Lcustom: null

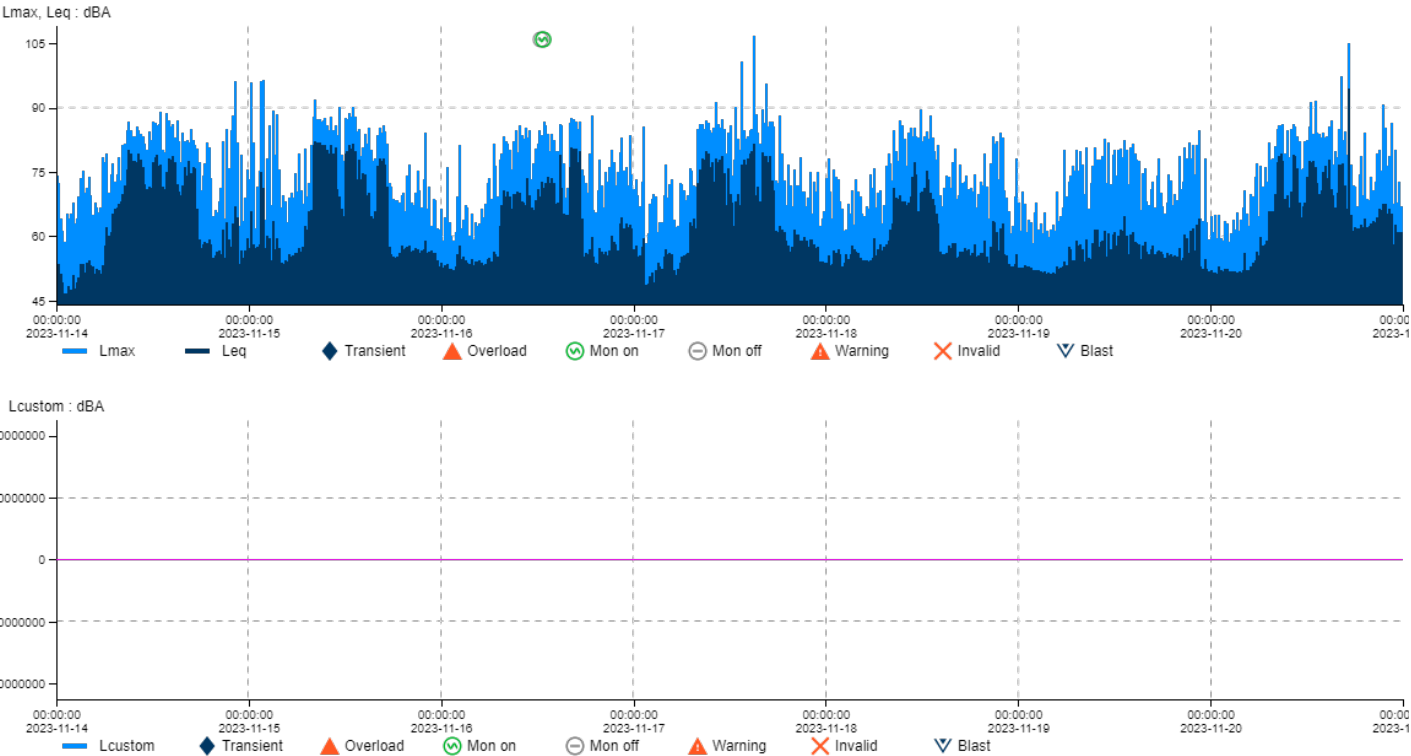


X-span 2023-10-04 00:00 - 2023-10-11 00:00

Y-span Lmax, Leq : dBA: 39.47 - 98.92, Lcustom : dBA: 9007199254740991 - -9007199254740991

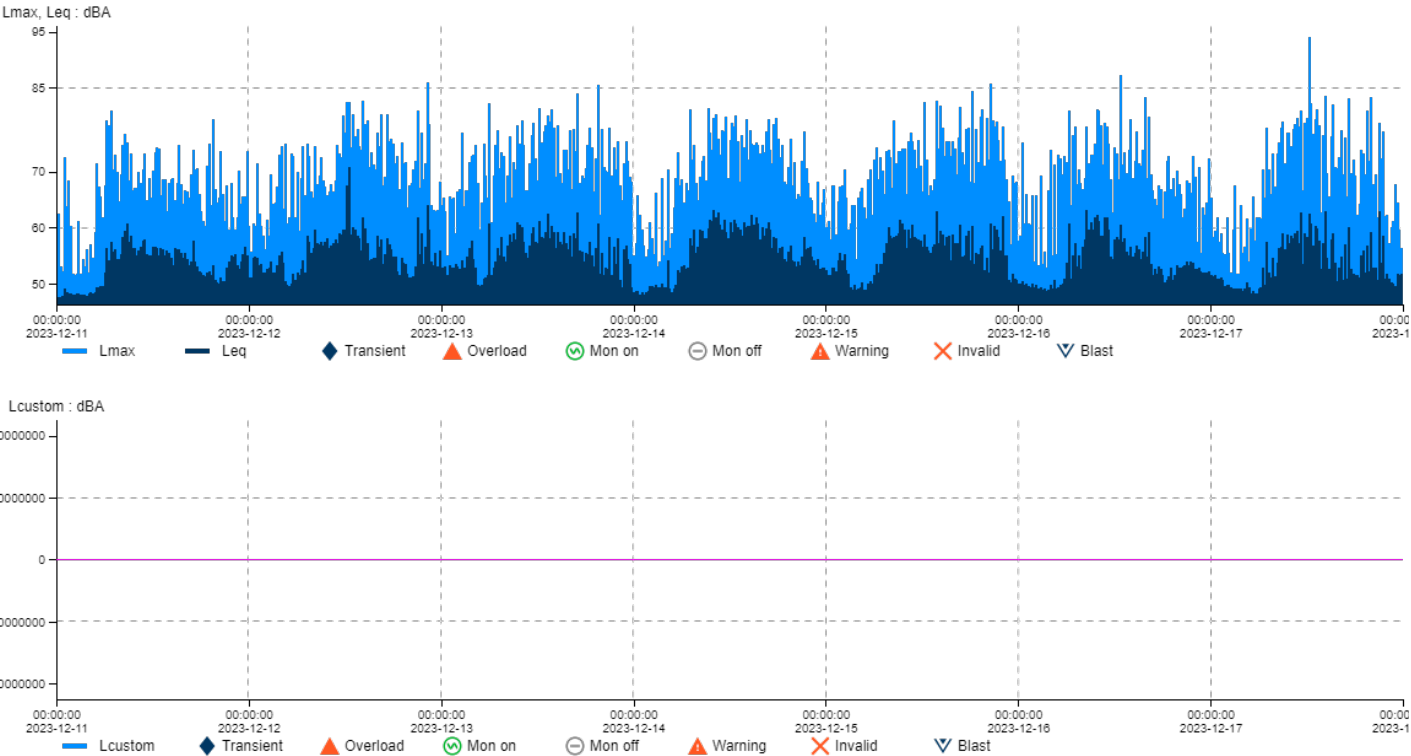
	Lmax	Leq	Lcustom
Max	97 dBA	80 dBA	-
Date	2023-10-10	2023-10-06	-
Time	08:45:00	08:45:00	-

Project	FDK
Project maintainer	-
Time frame	2023-11-14 00:00 - 2023-11-21 00:00 (Australia/Sydney)
Measuring point	FDK_4
Description	St Albans Church noise
Sensor type	S50
Sensor serial no.	14157
Master(s) serial no.	107963
Latest calibration	2023-07-25
Standard	(02) Lmax + Leq 30-105 dBA Fast
Unit	dBA
Quantity	Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time	15 minutes
Table threshold	High
Max	Lmax: 106.6 dBA, Leq: 94.2 dBA, Lcustom: null



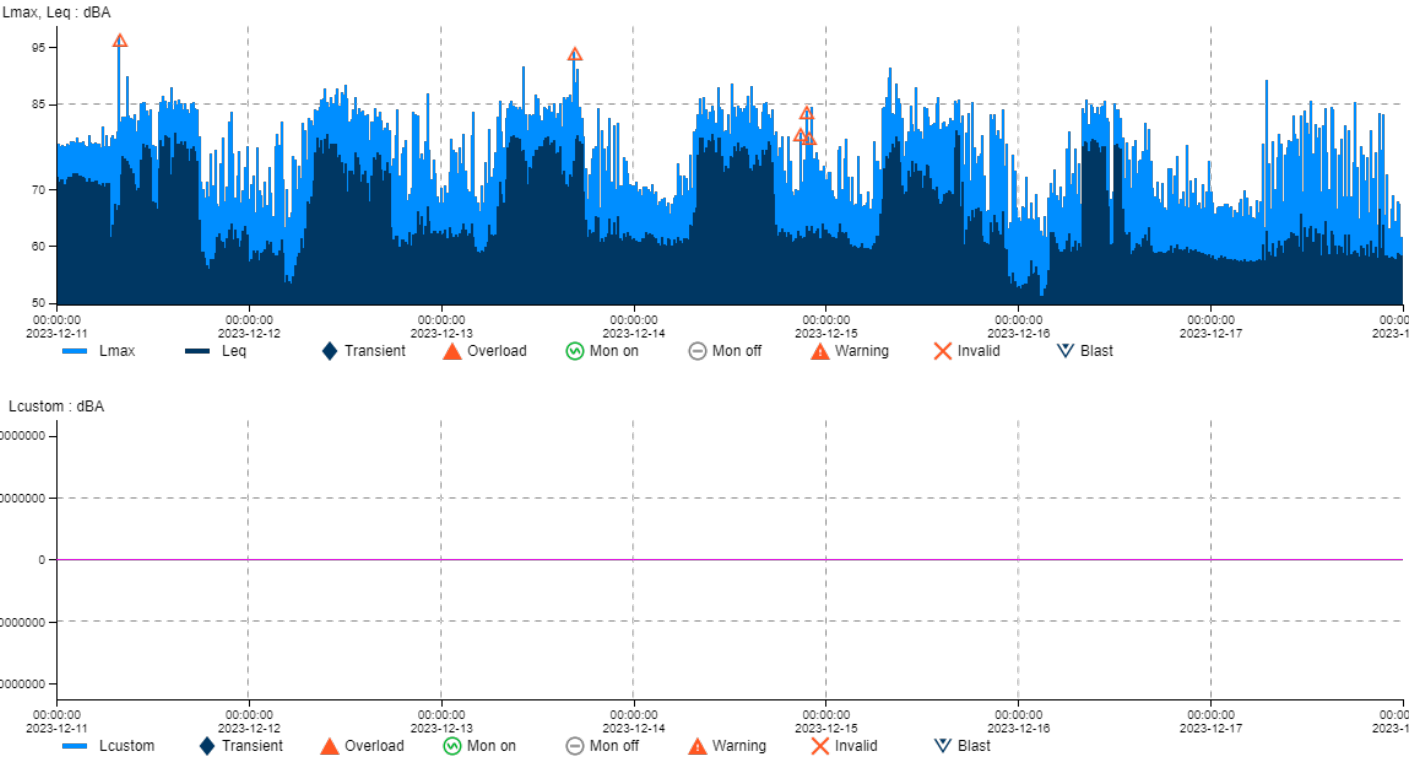
X-span	2023-11-14 00:00 - 2023-11-21 00:00		
Y-span	Lmax, Leq : dBA: 44.12 - 109.02, Lcustom : dBA: 9007199254740991 - -9007199254740991		
	Lmax	Leq	Lcustom
Max	106.6 dBA	94.2 dBA	-
Date	2023-11-17	2023-11-20	-
Time	15:15:00	17:30:00	-

Project	FDK
Project maintainer	-
Time frame	2023-12-11 00:00 - 2023-12-18 00:00 (Australia/Sydney)
Measuring point	FDK_1
Description	
Sensor type	S50
Sensor serial no.	14176
Master(s) serial no.	107964
Latest calibration	2023-08-14
Standard	(02) Lmax + Leq 30-105 dBA Fast
Unit	dBA
Quantity	Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time	15 minutes
Table threshold	High
Max	Lmax: 93.9 dBA, Leq: 70.6 dBA, Lcustom: null



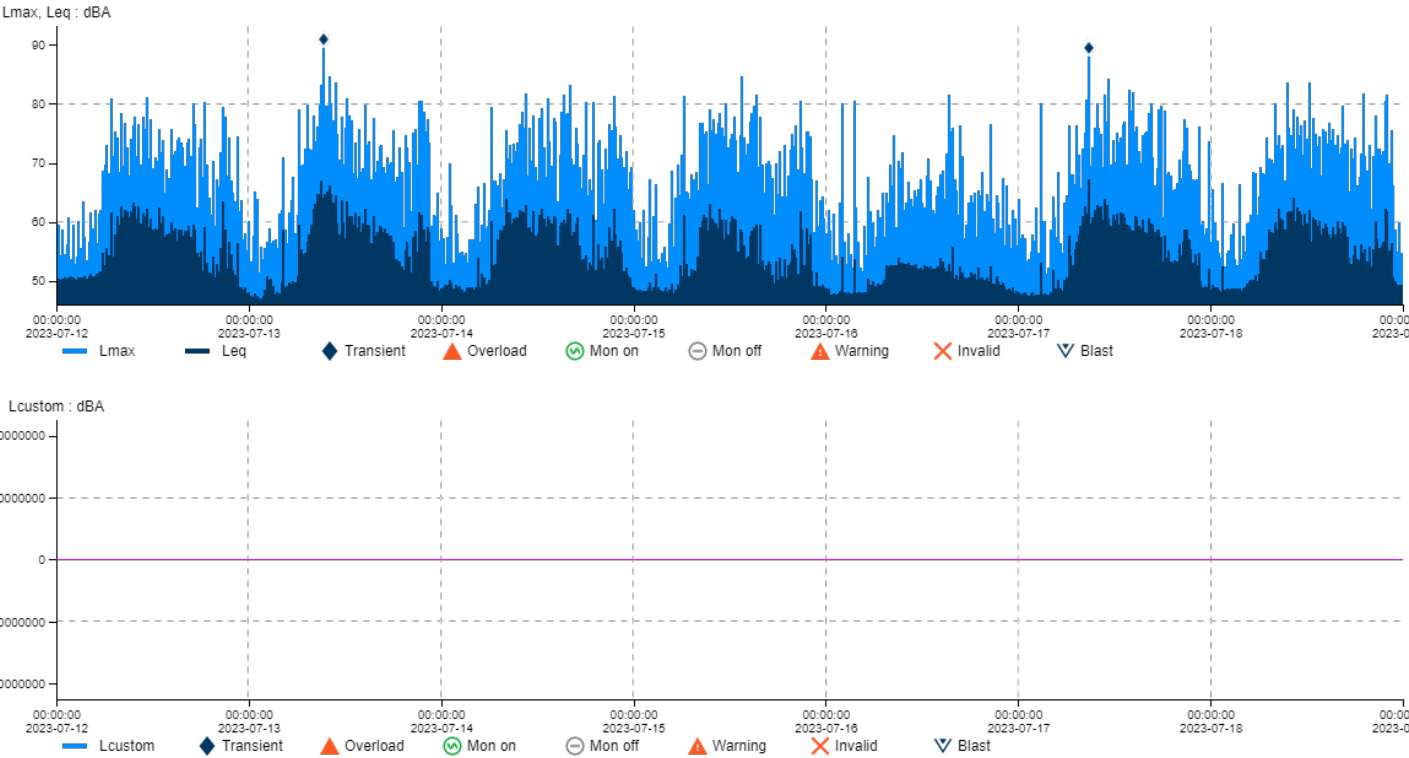
X-span	2023-12-11 00:00 - 2023-12-18 00:00		
Y-span	Lmax, Leq : dBA: 46.24 - 96.02, Lcustom : dBA: 9007199254740991 - -9007199254740991		
	Lmax	Leq	Lcustom
Max	93.9 dBA	70.6 dBA	-
Date	2023-12-17	2023-12-12	-
Time	12:30:00	12:45:00	-

Project	FDK
Project maintainer	-
Time frame	2023-12-11 00:00 - 2023-12-18 00:00 (Australia/Sydney)
Measuring point	FDK_4
Description	St Albans Church noise
Sensor type	S50
Sensor serial no.	14157
Master(s) serial no.	107963
Latest calibration	2023-07-25
Standard	(02) Lmax + Leq 30-105 dBA Fast
Unit	dBA
Quantity	Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time	15 minutes
Table threshold	High
Max	Lmax: 97 dBA, Leq: 80.4 dBA, Lcustom: null



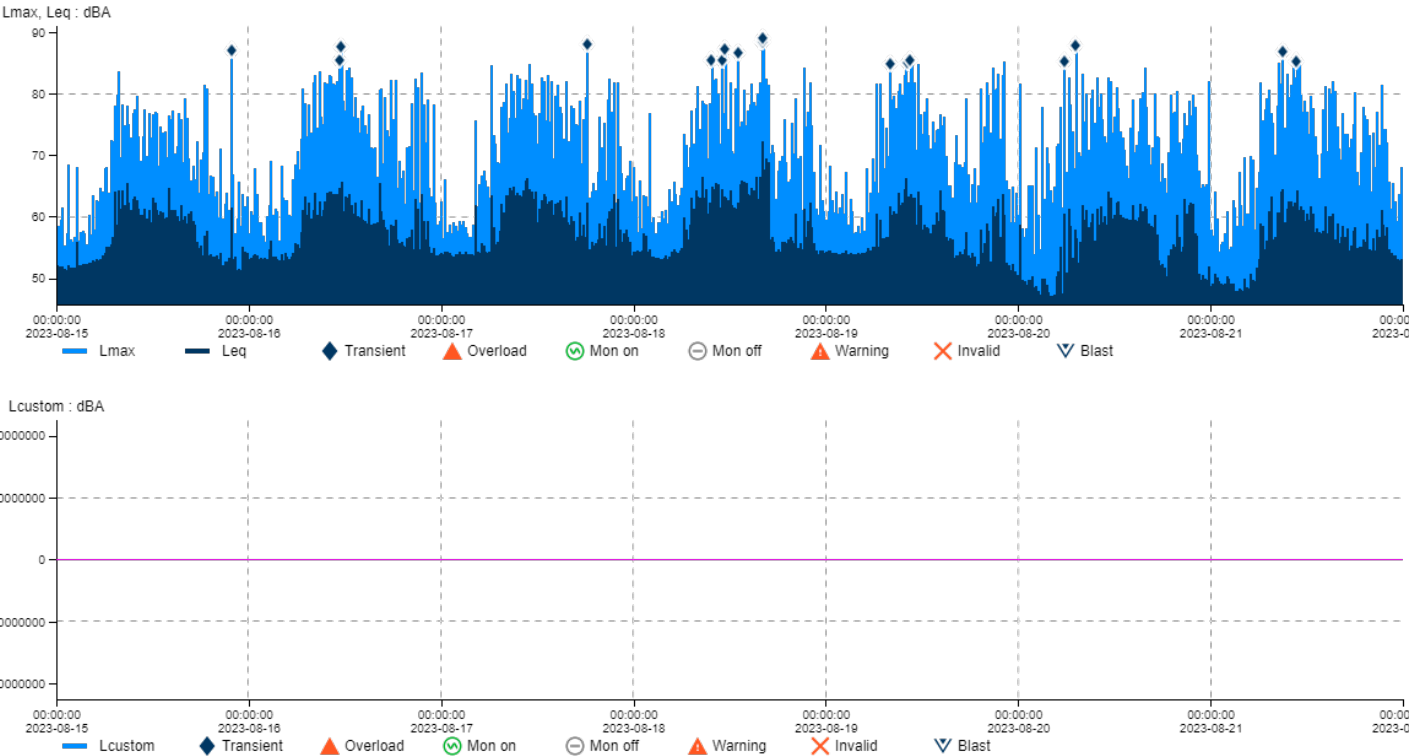
X-span	2023-12-11 00:00 - 2023-12-18 00:00		
Y-span	Lmax, Leq : dBA: 49.74 - 98.77, Lcustom : dBA: 9007199254740991 - -9007199254740991		
	Lmax	Leq	Lcustom
Max	97 dBA	80.4 dBA	-
Date	2023-12-11	2023-12-15	-
Time	08:00:00	16:30:00	-

Project	FDK
Project maintainer	-
Time frame	2023-07-12 00:00 - 2023-07-19 00:00 (Australia/Sydney)
Measuring point	FDK_1 hire
Description	
Sensor type	S50
Sensor serial no.	10118
Master(s) serial no.	107964
Latest calibration	2022-06-21
Standard	(01) Lmax + Leq 20-95 dBA Fast
Unit	dBA
Quantity	Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time	15 minutes
Table threshold	High
Max	Lmax: 91.2 dBA, Leq: 67.1 dBA, Lcustom: null



X-span	2023-07-12 00:00 - 2023-07-19 00:00		
Y-span	Lmax, Leq : dBA: 46 - 93.21, Lcustom : dBA: 9007199254740991 - -9007199254740991		
	Lmax	Leq	Lcustom
Max	91.2 dBA	67.1 dBA	-
Date	2023-07-13	2023-07-17	-
Time	09:30:00	09:00:00	-

Project	FDK
Project maintainer	-
Time frame	2023-08-15 00:00 - 2023-08-22 00:00 (Australia/Sydney)
Measuring point	FDK_1 hire
Description	
Sensor type	S50
Sensor serial no.	10118
Master(s) serial no.	107964
Latest calibration	2022-06-21
Standard	(01) Lmax + Leq 20-95 dBA Fast
Unit	dBA
Quantity	Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time	15 minutes
Table threshold	High
Max	Lmax: 89.2 dBA, Leq: 72.1 dBA, Lcustom: null



X-span	2023-08-15 00:00 - 2023-08-22 00:00		
Y-span	Lmax, Leq : dBA: 45.75 - 90.97, Lcustom : dBA: 9007199254740991 - -9007199254740991		
	Lmax	Leq	Lcustom
Max	89.2 dBA	72.1 dBA	-
Date	2023-08-18	2023-08-18	-
Time	16:30:00	16:15:00	-

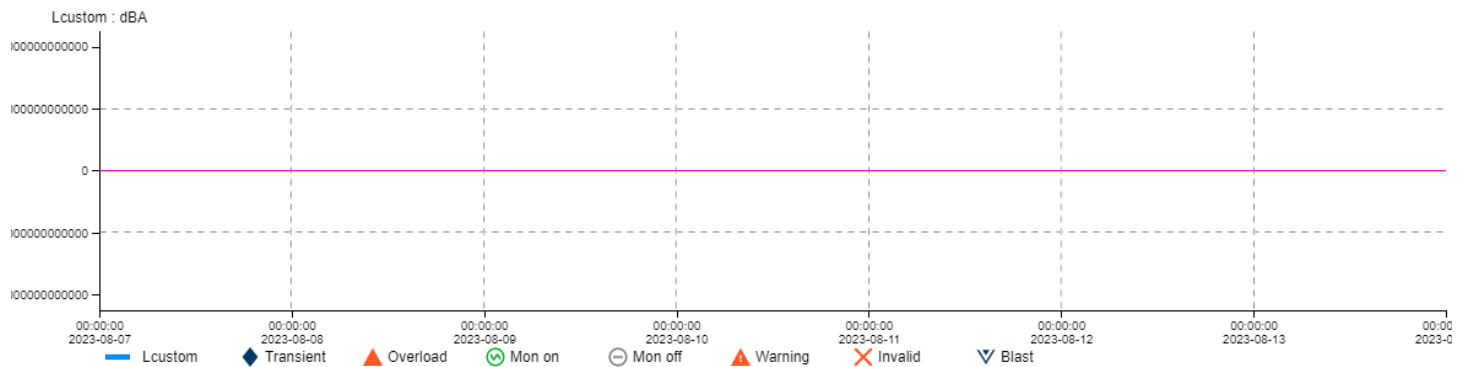
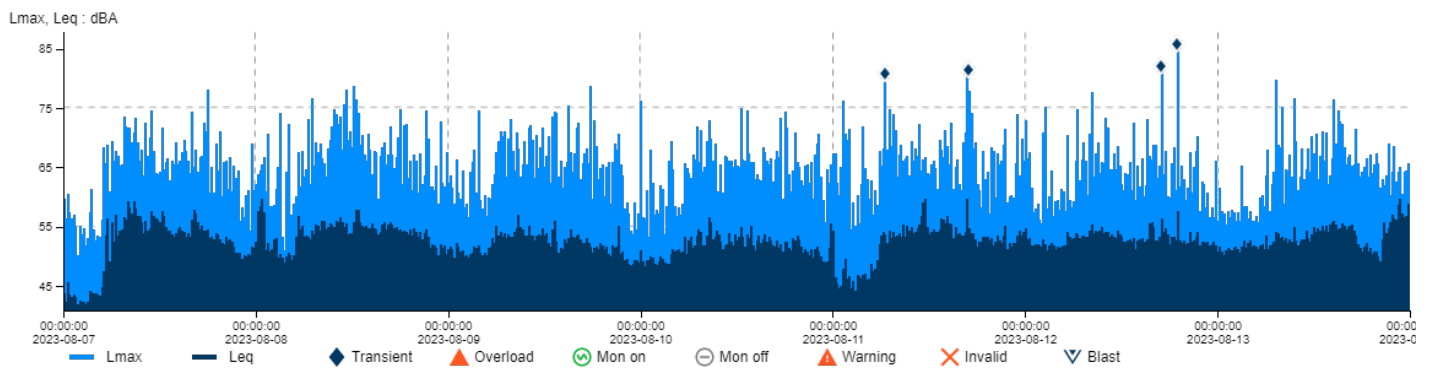
Interval report

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Project TBY
Project maintainer -
Time frame 2023-08-07 00:00 - 2023-08-14 00:00 (Australia/Sydney)

Measuring point N7 hired
Description The Bays noise
Sensor type S50
Sensor serial no. 10443
Master(s) serial no. 108059
Latest calibration 2022-05-22
Standard (01) Lmax + Leq 20-95 dBA Fast
Unit dBA
Quantity Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time 15 minutes
Table threshold High

Max Lmax: 86 dBA, Leq: 59.6 dBA, Lcustom: null



X-span 2023-08-07 00:00 - 2023-08-14 00:00

Y-span Lmax, Leq : dBA: 40.91 - 87.79, Lcustom : dBA: 9007199254740991 - -9007199254740991

	Lmax	Leq	Lcustom
Max	86 dBA	59.6 dBA	-
Date	2023-08-12	2023-08-11	-
Time	19:15:00	11:45:00	-

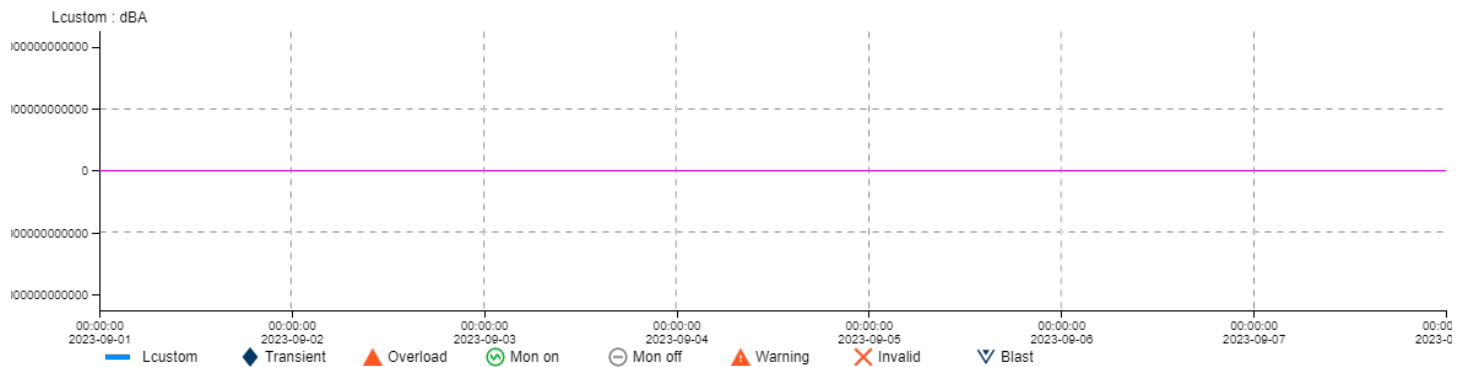
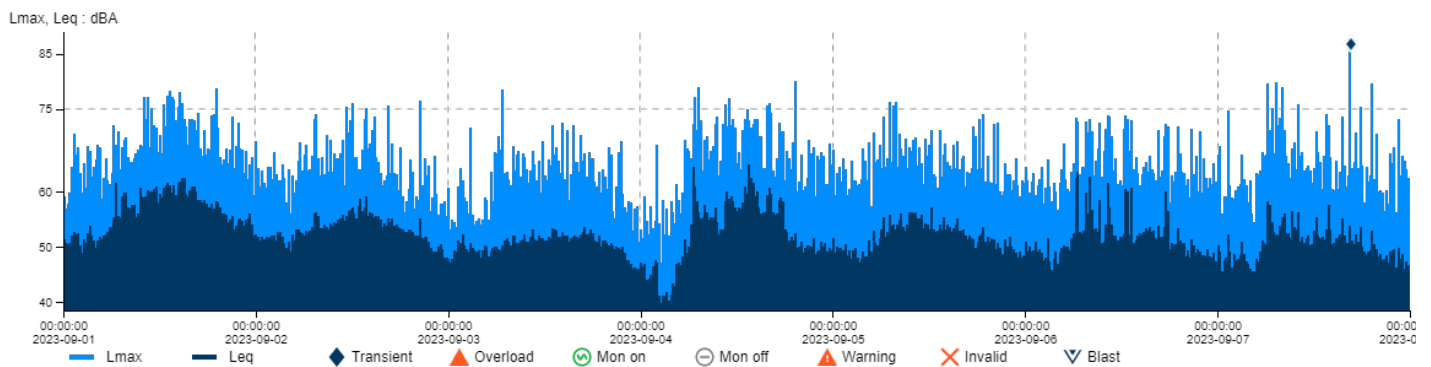
Interval report

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Project TBY
Project maintainer -
Time frame 2023-09-01 00:00 - 2023-09-08 00:00 (Australia/Sydney)

Measuring point N7 hired
Description The Bays noise
Sensor type S50
Sensor serial no. 10443
Master(s) serial no. 108059
Latest calibration 2022-05-22
Standard (01) Lmax + Leq 20-95 dBA Fast
Unit dBA
Quantity Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time 15 minutes
Table threshold High

Max Lmax: 86.9 dBA, Leq: 64.7 dBA, Lcustom: null



X-span 2023-09-01 00:00 - 2023-09-08 00:00

Y-span Lmax, Leq : dBA: 38.45 - 88.89, Lcustom : dBA: 9007199254740991 - -9007199254740991

	Lmax	Leq	Lcustom
Max	86.9 dBA	64.7 dBA	-
Date	2023-09-07	2023-09-04	-
Time	16:45:00	13:45:00	-

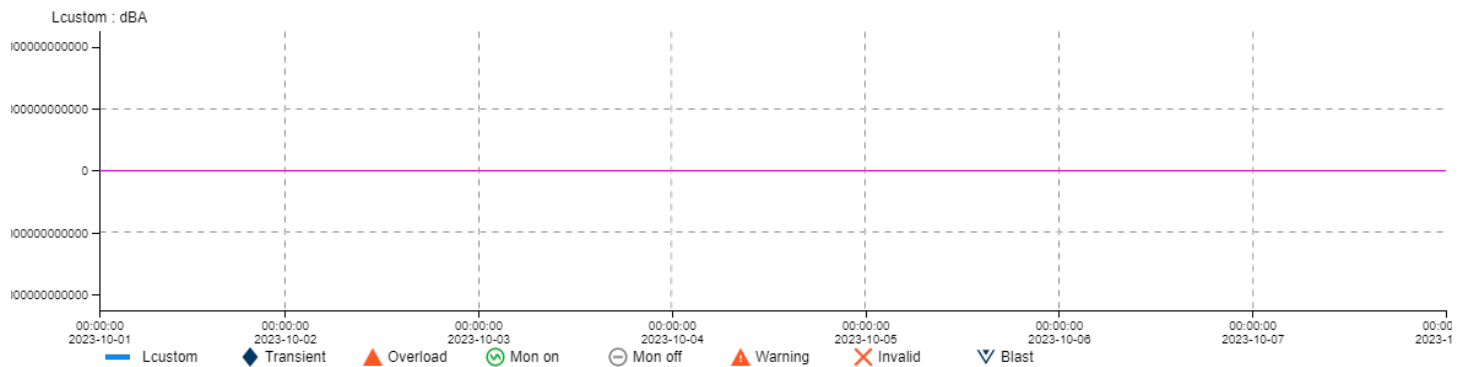
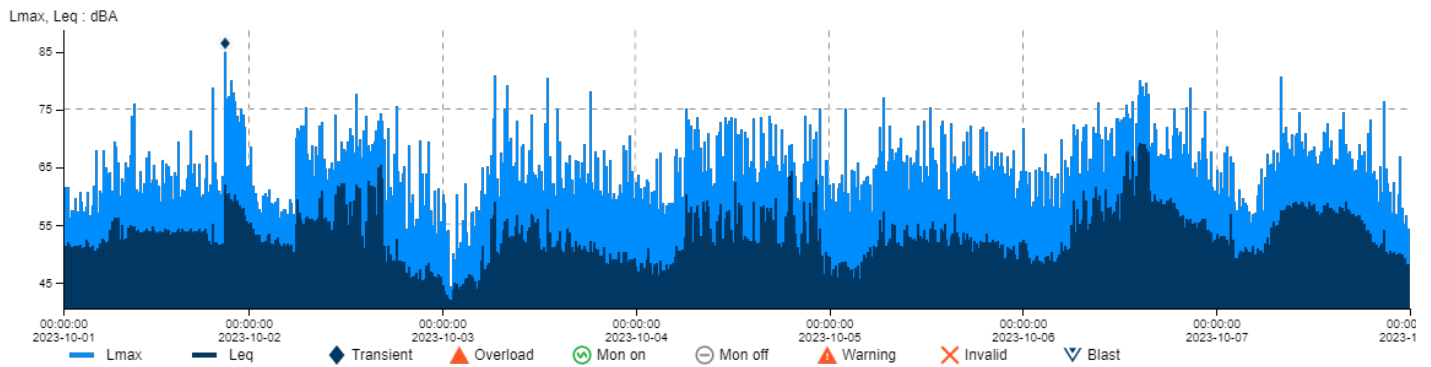
Interval report

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Project TBY
Project maintainer -
Time frame 2023-10-01 00:00 - 2023-10-08 00:00 (Australia/Sydney)

Measuring point N7
Description XXXXXXXXXX
Sensor type S50
Sensor serial no. 14625
Master(s) serial no. 108059
Latest calibration 2023-07-25
Standard (02) Lmax + Leq 30-105 dBA Fast
Unit dBA
Quantity Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time 15 minutes
Table threshold High

Max Lmax: 86.6 dBA, Leq: 69 dBA, Lcustom: null



X-span 2023-10-01 00:00 - 2023-10-08 00:00

Y-span Lmax, Leq : dBA: 40.55 - 88.71, Lcustom : dBA: 9007199254740991 - -9007199254740991

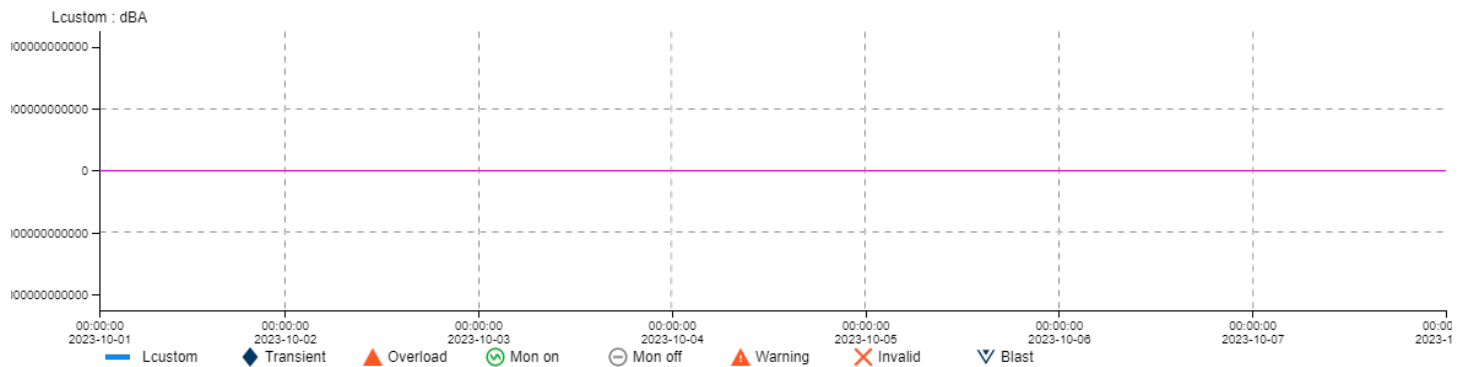
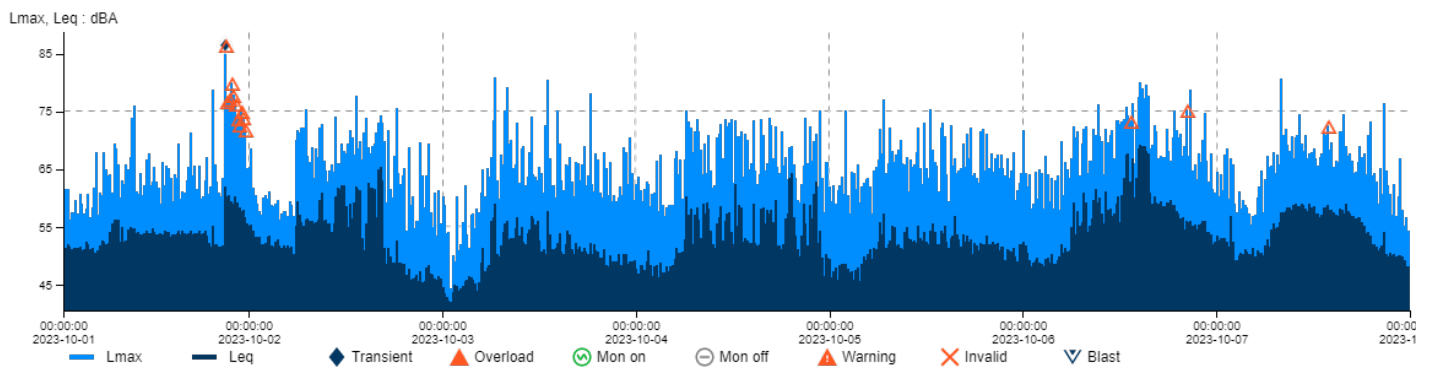
	Lmax	Leq	Lcustom
Max	86.6 dBA	69 dBA	
Date	2023-10-01	2023-10-06	-
Time	21:15:00	14:45:00	-

Interval report

Project TBY
Project maintainer -
Time frame 2023-10-01 00:00 - 2023-10-08 00:00 (Australia/Sydney)

Measuring point N7 TBY
Description XXXXXXXXXX
Sensor type S50
Sensor serial no. 14625
Master(s) serial no. 108059
Latest calibration 2023-07-25
Standard (02) Lmax + Leq 30-105 dBA Fast
Unit dBA
Quantity Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time 15 minutes
Table threshold High

Max Lmax: 86.6 dBA, Leq: 69 dBA, Lcustom: null

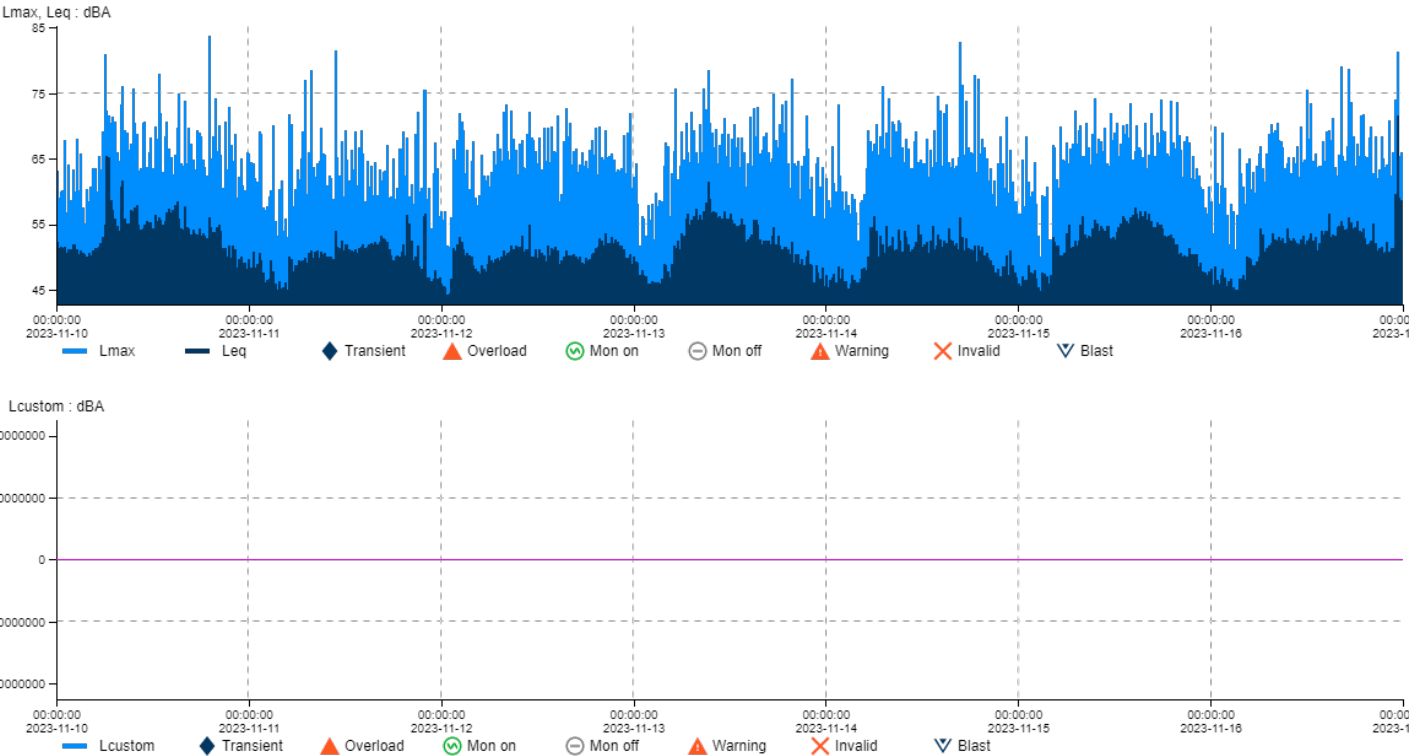


X-span 2023-10-01 00:00 - 2023-10-08 00:00

Y-span Lmax, Leq : dBA: 40.55 - 88.71, Lcustom : dBA: 9007199254740991 - -9007199254740991

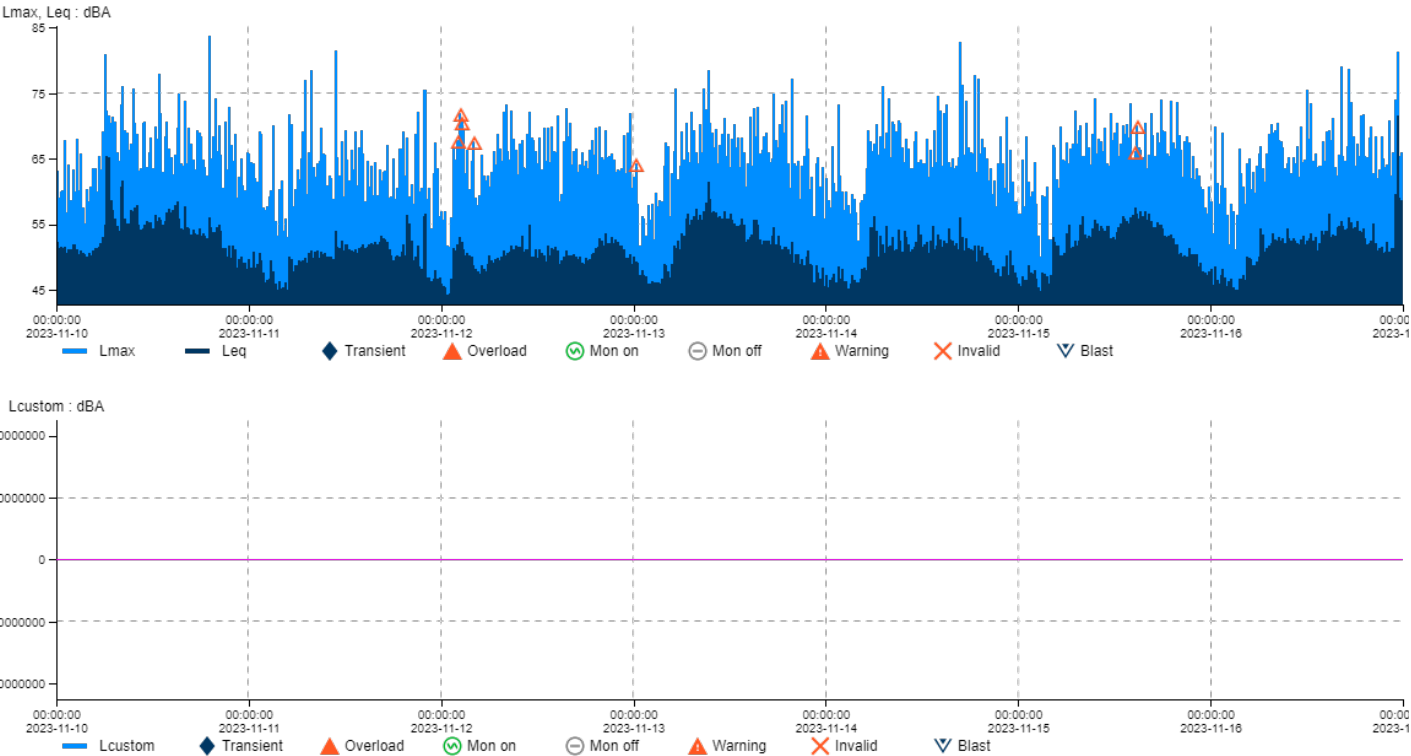
	Lmax	Leq	Lcustom
Max	86.6 dBA	69 dBA	
Date	2023-10-01	2023-10-06	-
Time	21:15:00	14:45:00	-

Project	TBY
Project maintainer	-
Time frame	2023-11-10 00:00 - 2023-11-17 00:00 (Australia/Sydney)
Measuring point	N7
Description	
Sensor type	S50
Sensor serial no.	14625
Master(s) serial no.	108059
Latest calibration	2023-07-25
Standard	(02) Lmax + Leq 30-105 dBA Fast
Unit	dBA
Quantity	Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time	15 minutes
Table threshold	High
Max	Lmax: 83.6 dBA, Leq: 71.5 dBA, Lcustom: null



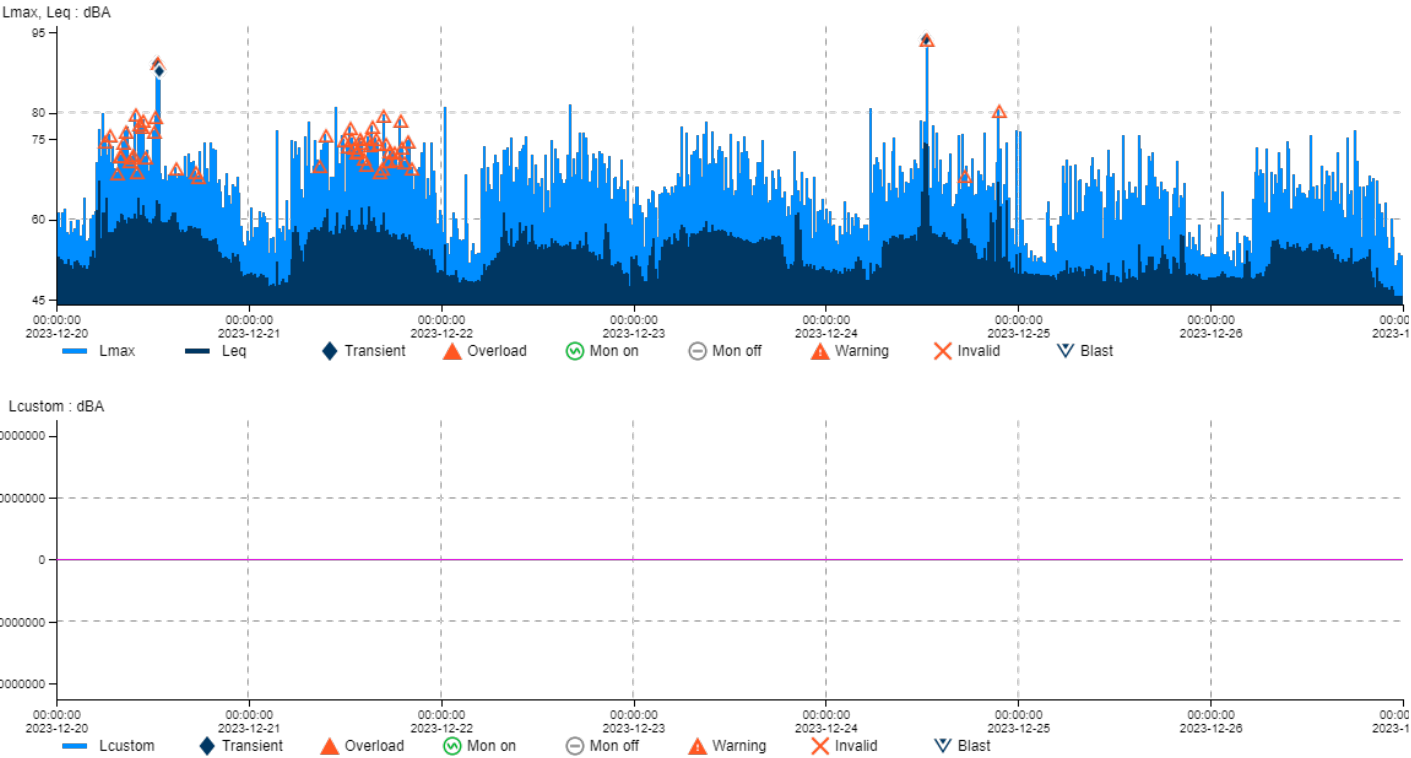
X-span	2023-11-10 00:00 - 2023-11-17 00:00		
Y-span	Lmax, Leq : dBA: 42.73 - 85.28, Lcustom : dBA: 9007199254740991 - -9007199254740991		
	Lmax	Leq	Lcustom
Max	83.6 dBA	71.5 dBA	-
Date	2023-11-10	2023-11-16	-
Time	19:15:00	23:30:00	-

Project	TBY
Project maintainer	-
Time frame	2023-11-10 00:00 - 2023-11-17 00:00 (Australia/Sydney)
Measuring point	N7 TBY
Description	
Sensor type	S50
Sensor serial no.	14625
Master(s) serial no.	108059
Latest calibration	2023-07-25
Standard	(02) Lmax + Leq 30-105 dBA Fast
Unit	dBA
Quantity	Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time	15 minutes
Table threshold	High
Max	Lmax: 83.6 dBA, Leq: 71.5 dBA, Lcustom: null



X-span	2023-11-10 00:00 - 2023-11-17 00:00		
Y-span	Lmax, Leq : dBA: 42.73 - 85.28, Lcustom : dBA: 9007199254740991 - -9007199254740991		
	Lmax	Leq	Lcustom
Max	83.6 dBA	71.5 dBA	-
Date	2023-11-10	2023-11-16	-
Time	19:15:00	23:30:00	-

Project	TBY
Project maintainer	-
Time frame	2023-12-20 00:00 - 2023-12-27 00:00 (Australia/Sydney)
Measuring point	N7
Description	
Sensor type	S50
Sensor serial no.	14625
Master(s) serial no.	108059
Latest calibration	2023-07-25
Standard	(02) Lmax + Leq 30-105 dBA Fast
Unit	dBA
Quantity	Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time	15 minutes
Table threshold	High
Max	Lmax: 94.1 dBA, Leq: 74.4 dBA, Lcustom: null

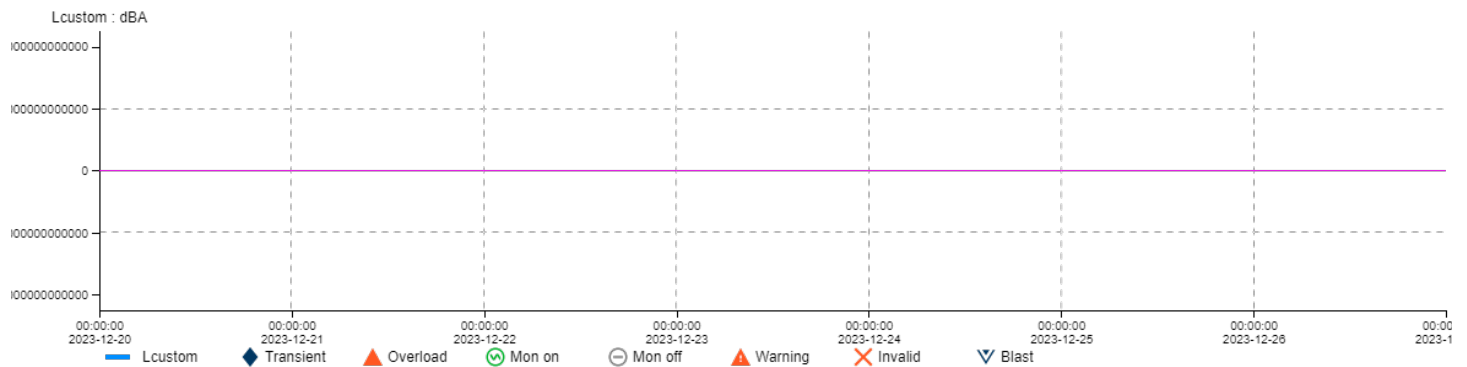
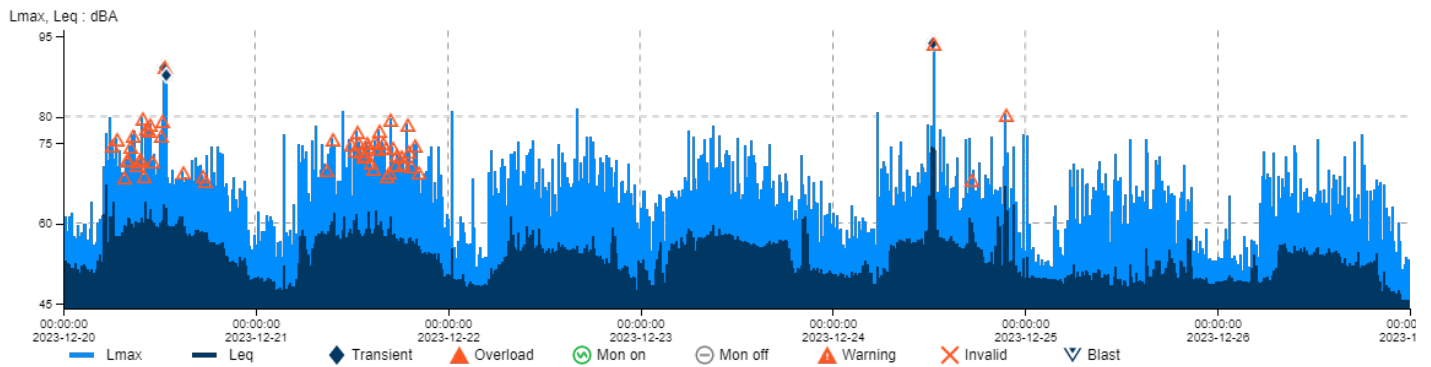


X-span	2023-12-20 00:00 - 2023-12-27 00:00		
Y-span	Lmax, Leq : dBA: 44.06 - 96.25, Lcustom : dBA: 9007199254740991 - -9007199254740991		
	Lmax	Leq	Lcustom
Max	94.1 dBA	74.4 dBA	-
Date	2023-12-24	2023-12-24	-
Time	12:45:00	12:30:00	-

Project TBY
Project maintainer -
Time frame 2023-12-20 00:00 - 2023-12-27 00:00 (Australia/Sydney)

Measuring point N7 TBY
Description XXXXXXXXXX
Sensor type S50
Sensor serial no. 14625
Master(s) serial no. 108059
Latest calibration 2023-07-25
Standard (02) Lmax + Leq 30-105 dBA Fast
Unit dBA
Quantity Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time 15 minutes
Table threshold High

Max Lmax: 94.1 dBA, Leq: 74.4 dBA, Lcustom: null



X-span 2023-12-20 00:00 - 2023-12-27 00:00

Y-span Lmax, Leq : dBA: 44.06 - 96.25, Lcustom : dBA: 9007199254740991 - -9007199254740991

	Lmax	Leq	Lcustom
Max	94.1 dBA	74.4 dBA	-
Date	2023-12-24	2023-12-24	-
Time	12:45:00	12:30:00	-

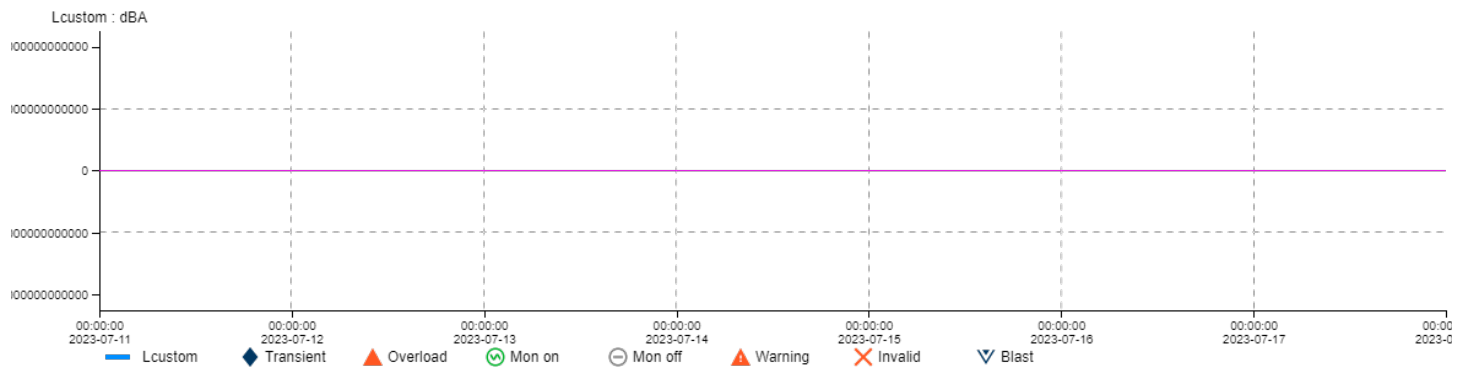
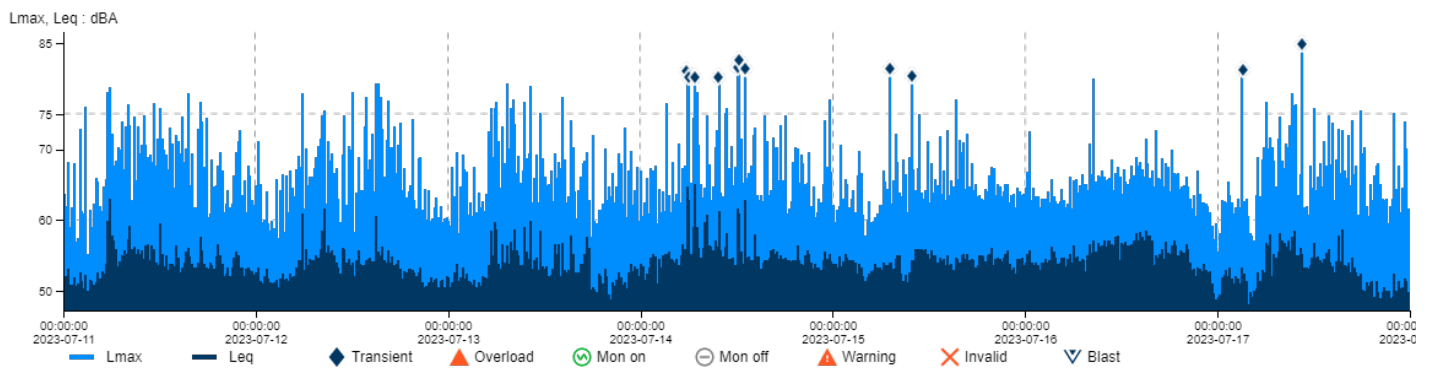
Interval report

Page 1 of 1

Project TBY
Project maintainer -
Time frame 2023-07-11 00:00 - 2023-07-18 00:00 (Australia/Sydney)

Measuring point N7 hired
Description The Bays noise
Sensor type S50
Sensor serial no. 10443
Master(s) serial no. 108059
Latest calibration 2022-05-22
Standard (01) Lmax + Leq 20-95 dBA Fast
Unit dBA
Quantity Sound Pres.Level, Eqv.Sound Pres.L, Leq accumulation
Interval time 15 minutes
Table threshold High

Max Lmax: 85.1 dBA, Leq: 65.1 dBA, Lcustom: null



X-span 2023-07-11 00:00 - 2023-07-18 00:00

Y-span Lmax, Leq : dBA: 47.25 - 86.6, Lcustom : dBA: 9007199254740991 - -9007199254740991

	Lmax	Leq	Lcustom
Max	85.1 dBA	65.1 dBA	-
Date	2023-07-17	2023-07-14	-
Time	10:45:00	07:00:00	-

APPENDIX A (iv) – CALIBRATION RECORDS

CERTIFICATE OF CALIBRATION

CERTIFICATE No: **SLM36212**

EQUIPMENT TESTED: Sound Level Meter

Manufacturer: Rion
Type No: NL-42
Mic. Type: UC-52
Pre-Amp. Type: NH-24

Serial No: 00145400
Serial No: 149905
Serial No: 35296

Owner: Ferrovial York Joint Venture
7 Figtree Drive
Newington NSW 2127

Tests Performed: IEC 61672-3:2013

Comments: All Tests passed for Class 2. (See overleaf for details)

CONDITIONS OF TEST:

Ambient Pressure	1013 hPa ± 1 hPa	Date of Receipt :	15/05/2023
Temperature	24 $^{\circ}\text{C} \pm 1^{\circ}\text{C}$	Date of Calibration :	23/05/2023
Relative Humidity	37 % $\pm 5\%$	Date of Issue :	23/05/2023

Acu-Vib Test Procedure: AVP10 (SLM) based on IEC 61672-3.

CHECKED BY: *MB* **AUTHORISED SIGNATURE:** *Heidi Soe*

Accredited for compliance with ISO/IEC 17025 - Calibration
Results of the tests, calibration and/or measurements included in this document are traceable to SI units through reference equipment that has been calibrated by the Australian National Measurement Institute or other NATA accredited laboratories demonstrating traceability.

This report applies only to the item identified in the report and may not be reproduced in part.

The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.



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ACCREDITATION

Accredited Lab No. 9262
Acoustic and Vibration
Measurements

Acu-Vib Electronics
CALIBRATIONS SALES RENTALS REPAIRS

Head Office & Calibration Laboratory
Unit 14, 22 Hudson Ave. Castle Hill NSW 2154
(02) 9680 8133
www.acu-vib.com.au

The performance characteristics listed below were tested. The tests are based on the relevant clauses of IEC 61672-3:2013

Tests Performed:	Clause	Result
<i>Absolute Calibration</i>	10	Pass
<i>Acoustical Frequency Weighting</i>	12	Pass
<i>Self-Generated Noise</i>	11.1	Observed
<i>Electrical Noise</i>	11.2	Observed
<i>Long Term Stability</i>	15	Pass
<i>Electrical Frequency Weightings</i>	13	Pass
<i>Frequency and Time Weightings</i>	14	Pass
<i>Reference Level Linearity</i>	16	Pass
<i>Range Level Linearity</i>	17	Not Applicable
<i>Toneburst</i>	18	Pass
<i>Peak C Sound Level</i>	19	Pass
<i>Overload Indicator</i>	20	Pass
<i>High Level Stability</i>	21	Pass

Statement of Compliance: The sound level meter submitted for testing successfully completed the periodic tests of IEC 61672-3:-2013, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about conformance of the sound level meter to the full specifications of IEC 61672-1:-2013 because evidence was not publically available, from an independent testing organization responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the class 2 specifications in IEC 61672-1:-2013 and because the periodic tests of IEC 61672-3:-2013 cover only a limited subset of the specifications in IEC 61672-1:-2013.

A full technical report is available on request.

CERTIFICATE OF CALIBRATION

CERTIFICATE No: C35773

EQUIPMENT TESTED : Sound Level Calibrator

Manufacturer: Svantek

Type No: SV-31

Serial No: 31892

Owner: Ferrovial York Joint Venture

7 Figtree Drive

Newington, NSW 2127

Tests Performed: Measured Output Pressure level, Frequency & Distortion

Comments: See Details overleaf. All Test Passed.

Parameter	Pre-Adj	Adj Y/N	Output: (dB re 20 µPa)	Frequency (Hz)	THD&N (%)
Level:	113.88	Y	113.97 dB	1000.02 Hz	0.50 %
Uncertainty			±0.11 dB	±0.05%	±0.20 %
Uncertainty (at 95% c.i.) k=2					

CONDITION OF TEST:

Ambient Pressure 996 hPa ±1 hPa

Date of Receipt : 29/03/2023

Temperature 24 °C ±1° C

Date of Calibration : 13/04/2023

Relative Humidity 49 % ±5%

Date of Issue : 14/04/2023

Acu-Vib Test AVP02 (Calibrators)

Procedure: Test Method: AS IEC 60942 - 2017

CHECKED BY:

AUTHORISED
SIGNATURE:

Hein Soe

Accredited for compliance with ISO/IEC 17025 - Calibration

Results of the tests, calibration and/or measurements included in this document are traceable to SI units through reference equipment that has been calibrated by the Australian National Measurement Institute or other NATA accredited laboratories demonstrating traceability.

This report applies only to the item identified in the report and may not be reproduced in part.

The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.



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The Calibrator described in this report has been tested to the requirements of the standard IEC 60942-[Ed 4]:2017-11.

The tests described in Annex B of the standard (Periodic tests) were carried out under the environmental conditions listed above to the following clauses:

Clause	Test description
B4.6	Sound Pressure Level (By comparison with a reference calibrator).
B4.7	Frequency (By measurement with a calibrated frequency meter).
B4.8	Total distortion and noise. (By measurement with a calibrated Noise and Distortion meter).

Notes:

1. The calibrator was calibrated with the main axis vertical and facing down.
2. No corrections have been made for atmospheric pressure, temperature, or humidity.

Results of the tests, calibration and/or measurements included in this document are traceable to SI units through reference equipment that has been calibrated by the Australian National Measurement Institute or other NATA accredited laboratories demonstrating traceability.

The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.

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APPENDIX B - VIBRATION MONITORING LOCATIONS AND RESULTS

Vibration Monitoring Register																				
Date	Time	Site	Conducted by	Attended/ Unattended	Type/Model number	Serial No.	Calibration due	Duration of monitoring	Source location	Measurement location	Distance to source (m)	Works being undertaken	PPV Preferred Criteria (mm/s)	PPV (mm/s)	Frequency (Hz)	VDV Preferred Criteria (m/s ^{1.75})	Vibration Dose Value (VDV m/s ^{1.75})	Below criteria (Y/N)	Comments	
29/06/2023	3-28pm	TBM Tunnelling		Unattended	Svan958	36688	12/02/2024	2 days	TBM3		~40	TBM tunnel excavation	25	0.224	-	0.26	0.027	Y	TBM 3 was at approximately between 70 and 50 meters the night of the 29th, and at approximately 20 to 10 meters the night of the 30th. The elevated levels of vibration are visible in the vibration graph indicating the operation of the TBM. Measured PPV and VDV were below criteria during the monitoring period. VDV was below prediction of 0.3 m/s ^{1.75}	
01-02/11/2023	11pm - 7am	TBM Tunnelling		Unattended	Svan958	36688	12/02/2024	8 hours	TBM4 tunnel	TBM tunnel excavation	75m on approach from east			0.234	-	0.26	0.072	Y	PPV below criteria for reinforced or framed structures. VDV below prediction of 0.1m/s ^{1.75} and VML	
01-30/09/2023	12am-12pm	BWD		Unattended	C22	107781 & 111350	7/11/2024	30 days	BWD South shaft	BWD South shaft excavation	5		7.5	3.05	N/A	N/A	N/A	Y	No exceedance recorded	
01-30/09/2023	12am-12pm	Five Dock		Unattended	C22	33730	25/07/2025	30 days	FDK East	TBM Maintenance & Spoil loadout	3		7.5	306	26.9	N/A	N/A	N	Non construction related spike. Monitor was disturbed by AFIV staff to check batteries.	
01-30/09/2023	12am-12pm	N Strathfield		Unattended	C22	33720	25/07/2025	30 days	N Strathfield Site	Rocking hammering 250T crane excavation	5		7.5	0.95	45.5	N/A	N/A	Y	No exceedance recorded	
01-30/09/2023	12am-12pm	SOP		Unattended	C22	106848	26/04/2025	30 days	SOP site	Concrete pours. spoil loadout works	5		7.5	20.7	256	N/A	N/A	N	Non construction related spike. Monitor was disturbed by AFIV staff to change batteries.	
01-30/09/2023	12am-12pm	The Bays		Unattended	C22	107769, 1077	31/03/2025	30 days	TBM tunnel	TBM tunnel excavation	25		2.5	181	2	N/A	N/A	N	Not TBM related, as dominant frequency is close to 16 Hz. Because of the high PPV most likely the gophone was disturbed during this peak.	
01-30/11/2023	12am-12pm	Burwood		Unattended	C22	107781 & 111350	7/11/2024	30 days	BWD South shaft	BWD South shaft excavation	5		7.5	4.15	228	N/A	N/A	Y	No exceedance recorded	
01-31/07/2023	12am-12pm	BWD		Unattended	C22	107781 & 111350	7/11/2024	31 days	BWD South shaft	BWD South shaft excavation	5		7.5	2.75	N/A	N/A	N/A	Y	No exceedance recorded	
01-31/07/2023	12am-12pm	Five Dock		Unattended	C22	33730	25/07/2025	31 days	FDK East	TBM Maintenance & Spoil loadout	3		7.5	0.85	44.5	N/A	N/A	Y	No exceedance recorded	
01-31/07/2023	12am-12pm	N Strathfield		Unattended	C22	33720	25/07/2025	31 days	N Strathfield Site	Rocking hammering 250T crane excavation	5		7.5	4.17	N/A	N/A	N/A	Y	No exceedance recorded	
01-31/07/2023	12am-12pm	SOP		Unattended	C22	106848	26/04/2025	31 days	SOP site	Concrete pours. spoil loadout works	5		7.5	1.12	30.1	N/A	N/A	Y	No exceedance recorded	
01-31/07/2023	12am-12pm	The Bays		Unattended	C22	107769, 1077	31/03/2025	31 days	TBM tunnel	TBM tunnel excavation	25		2.5	446	2.9	N/A	N/A	N	Not TBM related, as dominant frequency is close to 16 Hz. Because of the high PPV most likely the gophone was disturbed during this peak.	
01-31/08/2023	12am-12pm	BWD		Unattended	C22	107781 & 111350	7/11/2024	31 days	BWD South shaft	BWD South shaft excavation	5		7.5	1.75	N/A	N/A	N/A	Y	No exceedance recorded	
01-31/08/2023	12am-12pm	Five Dock		Unattended	C22	33730	25/07/2025	31 days	FDK East	TBM Maintenance & Spoil loadout	3		7.5	62.7	7.9	N/A	N/A	N	Non construction related spike. Monitor was disturbed by AFIV staff to check batteries.	
01-31/08/2023	12am-12pm	N Strathfield		Unattended	C22	33720	25/07/2025	31 days	N Strathfield Site	Rocking hammering 250T crane excavation	5		7.5	0.18	N/A	N/A	N/A	Y	No exceedance recorded	
01-31/08/2023	12am-12pm	SOP		Unattended	C22	106848	26/04/2025	31 days	SOP site	Concrete pours. spoil loadout works	5		7.5	1.39	22.8	N/A	N/A	Y	No exceedance recorded	
01-31/08/2023	12am-12pm	The Bays		Unattended	C22	107769, 1077	31/03/2025	31 days	TBM tunnel	TBM tunnel excavation	25		2.5	280	35.9	N/A	N/A	N	Construction frequencies vary between 10-100 Hz. This peak is likely the result of activities undertaken by adjacent contractors operating at	
01-31/10/2023	12am-12pm	BWD		Unattended	C22	107781 & 111350	7/11/2024	31 days	BWD South shaft	BWD South shaft excavation	5		7.5	2.8	N/A	N/A	N/A	Y	No exceedance recorded	
01-31/10/2023	12am-12pm	Five Dock		Unattended	C22	33730	25/07/2025	31 days	FDK East	TBM Maintenance & Spoil loadout	3		7.5	19.9	3.45	N/A	N/A	N	Non construction related spike. Monitor was disturbed by AFIV staff to check batteries.	
01-31/10/2023	12am-12pm	N Strathfield		Unattended	C22	33720	25/07/2025	31 days	N Strathfield Site	Rocking hammering 250T crane excavation	5		7.5	0.65	24	N/A	N/A	Y	No exceedance recorded	
01-31/10/2023	12am-12pm	SOP		Unattended	C22	106848	26/04/2025	31 days	SOP site	Concrete pours. spoil loadout works	5		7.5	4.8	34.7	N/A	N/A	Y	No exceedance recorded	
01-31/10/2023	12am-12pm	The Bays		Unattended	C22	107769, 1077	31/03/2025	31 days	TBM tunnel	TBM tunnel excavation	25		2.5	7	410	N/A	N/A	N	Not TBM related, as dominant frequency is close to 16 Hz. Because of the high PPV most likely the gophone was disturbed during this peak.	
01-31/12/2023	12am-12pm	Burwood South		Unattended	C22	107781 & 106845	7/11/2024	31 days	BWD South shaft	BWD South shaft excavation	5		7.5	3.3	158	N/A	N/A	Y	No exceedance recorded	
01-31/12/2023	12am-12pm	Five Dock		Unattended	C22	106845	26/07/2025	31 days	FDK East	Tunneling work, excavation and spoil loadout	1		7.5	3.3	158	N/A	N/A	Y	No exceedance recorded	
01-31/12/2023	12am-12pm	N Strathfield		Unattended	C22	33720	25/07/2025	31 days	N Strathfield Site	Rocking hammering Spoil loadout excavation	5		7.5	1.3	120	N/A	N/A	Y	No exceedance recorded	
01-31/12/2023	12am-12pm	SOP		Unattended	C22	106848	26/04/2025	31 days	SOP site	Concrete pours. spoil loadout works	5		7.5	172	0.6	N/A	N/A	No	on 01/12/2023 at 13:08:00, the data exceedance limits (Long 172mm/s - Hz 0.6) is attributed to the replacement of the battery by the Environmental representative.	
02-08/11/2023	11pm - 7am	TBM Tunnelling		Unattended	Svan958	36688	12/02/2024	8 hours	TBM4 tunnel	TBM cutting	10-0m at depth of 31m				0.166	-	0.26	0.166	Y	PPV below criteria for reinforced or framed structures. VDV below prediction of 0.3m/s ^{1.75} and VML
02-07/10/2023	0:00	Burwood		Unattended	C22	107781 & 111350	7/11/2024	6 days	BWD South shaft	BWD South shaft excavation	5		7.5	1.45	186	N/A	N/A	Y	No exceedance recorded	
02-07/10/2023	0:00	Burwood		Unattended	C22	107781 & 111350	7/11/2024	6 days	BWD South shaft	BWD South shaft excavation	5		7.5	0.4	N/A	N/A	N/A	Y	No exceedance recorded	
04-09/09/2023	0:00	The Bays		Unattended	C22	107769, 107775 & 36688	31/03/2025	8 days	TBM tunnel	TBM tunnel excavation	~40		2.5	3.5	85.3	N/A	N/A	N	There was a one of spike of 3.5mm/s but the frequency was 102 Hz which is outside the typical frequency expected for a TBM. The PPV was recorded on 8 th June at 7:58am on the WBPS. 3 unit. it's more likely to have been caused by a movement in close proximity to the unit, considering the TBM is currently not working. PPV spikes unlikely to be from TBM. PPV below criteria for reinforced or framed structures. VDV below prediction of 0.3m/s ^{1.75} and VML.	
06-07/11/2023	11pm - 7am	TBM Tunnelling		Unattended	Svan958	36688	12/02/2024	8 hours	TBM4 tunnel	TBM cutting	60m west			25	0.06	-	0.26	0.06	Y	0.16mm/s represents highest value during TBM without spikes which are unlikely to be caused by TBM. VDV below VML. Below prediction threshold of 0.1
07-08/11/2023	11pm - 7am	TBM Tunnelling		Unattended	Svan958	36688	12/02/2024	8 hours	TBM4 tunnel	TBM cutting	100m west			25	0.057	-	0.26	0.057	Y	No exceedance recorded
09-14/10/2023	12am-12am	Burwood		Unattended	C22	107781 & 111350	7/11/2024	6 days	BWD South shaft	BWD South shaft excavation and spoil loadout	5		7.5	7	410	N/A	N/A	Y	No exceedance recorded	
10-15/09/2023	0:00	Burwood		Unattended	C22	107781 & 111350	7/11/2024	6 days	BWD South shaft	BWD South shaft excavation	5		7.5	0.55	228	N/A	N/A	Y	No exceedance recorded	
10-15/7/2023	0:00	Burwood		Unattended	C22	102870 & 111350	16/01/2025	6 days	BWD South shaft	BWD South shaft excavation including excavator with hammer	5		7.5	4.8	64	N/A	N/A	Y	Three spikes (below criteria) recorded during monitoring period when excavator was hammering shaft wall closest to receiver. No exceedance recorded	
14-18/8/2023	7am	Burwood		Unattended	C22	102870 & 111350	16/01/2025	6 days	BWD South shaft	BWD South shaft excavation	5		7.5	11.1	228	N/A	N/A	N	Spike above criteria caused by environmental advisor whilst checking monitors on 15/8/23 at 1pm. BWD_3 had an error and was switched over on 15/8/23. Frequency of spike was outside typical range of construction plant which is further evidence that it wasn't construction related.	
16-21/10/2023	12am-12am	Burwood		Unattended	C22	107781 & 111350	7/11/2024	6 days	BWD South shaft	BWD South shaft excavation and spoil loadout	5		7.5	2.55	256	N/A	N/A	Y	No exceedance recorded	
17-22/7/2023	0:00	Burwood		Unattended	C22	102870 & 111350	16/01/2025	6 days	BWD South shaft	BWD South shaft excavation	5		7.5	1.95	158	N/A	N/A	Y	No exceedance recorded	
18-23/09/2023	0:00	Burwood		Unattended	C22	107781 & 111350	7/11/2024	6 days	BWD South shaft	BWD South shaft excavation	5		7.5	1.9	70.5	N/A	N/A	Y	No exceedance recorded	
23-28/10/2023	12am-12am	Burwood		Unattended	C22	107781 & 111350	7/11/2024	6 days	BWD South shaft	BWD South shaft excavation and spoil loadout	5		7.5	2	228	N/A	N/A	Y	No exceedance recorded	
24-29/7/2023	0:00	Burwood		Unattended	C22	102870 & 111350	16/01/2025	6 days	BWD South shaft	BWD South shaft excavation	5		7.5	5.05	97.5	N/A	N/A	Y	No exceedance recorded	
25-30/09/2023	0:00	Burwood		Unattended	C22	107781 & 111350	7/11/2024	6 days	BWD South shaft	BWD South shaft excavation	5		7.5	2.1	81.9	N/A	N/A	Y	No exceedance recorded	
27/08/ - 02/09/23	0:00	Burwood		Unattended	C22	102870 & 111350	16/01/2025	6 days	BWD South shaft	BWD South shaft excavation including excavator with hammer	5		7.5	0.9	60.2	N/A	N/A	Y	No exceedance recorded	
30/08 - 12/09/2023	0:00	Five Dock		Unattended	C22	106845	26/05/2024	12 days	FDK East	Tunneling work, excavation and spoil loadout	1		25	9.3	7.05	N/A	N/A	Y	No exceedance recorded	
30/10/2023- 02/11/2023	12am-12am	Burwood		Unattended	C22	107781 & 111350	7/11/2024	6 days	BWD South shaft	BWD South shaft excavation and spoil loadout	5		7.5	148	19.9	N/A	N/A	N	Spike of 148mm/s on 30th October, was due to Environmental Advisor swapping Vibration monitor batteries. Other times were below criteria. Photo from the date shows no vibration activity happening on site at the time of spike.	
31/7-5/8/2023	7am	Burwood		Unattended	C22	102870 & 111350	16/01/2024	6 days	BWD South shaft	BWD South shaft excavation	5		7.5	3.45	89	N/A	N/A	Y	No exceedance recorded	
5-12/8/2023	7am	Burwood		Unattended	C22	111350	7/11/2024	6 days	BWD South shaft	BWD South shaft excavation	5		7.5	2.9	205	N/A	N/A	Y	No exceedance recorded	

AFJV Central Tunnel Package

Vibration Monitoring Event Report

Monitoring Information			
Test Location		Unsound heritage structure	YES ☐ NO ☒
Works Monitoring	BWD South shaft excavation including excavator	Distance between geophone and works (m)	5m
Conducted by		Attended monitoring	YES ☐ NO ☒
Date/s	01.12.2023 – 31.12.2023		
Instrumentation & Test Procedure			
Instrument	Sigicom C22		
Calibrator	Sigicom		
Calibration Date	6/07/2024	Calibration Due	6/07/2024
Monitor Serial #	C22 – 107781, C22 - 106845		

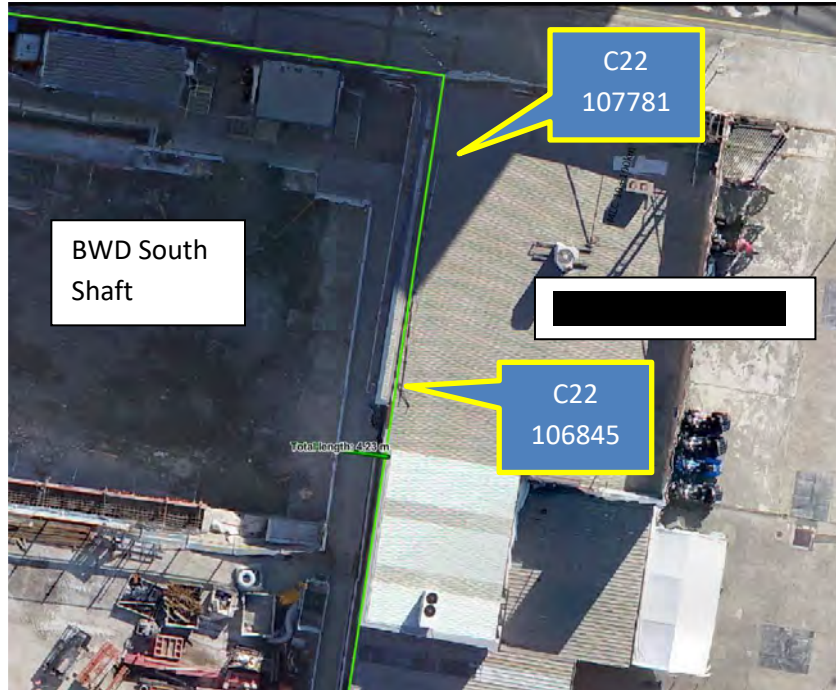
Preferred Criteria (circle criteria relevant to monitoring event)						
	Reinforced or framed structures	Unreinforced or light framed structures	Heritage structurally sound	Heritage structurally unsound	Residential human comfort Day	Residential human comfort Night
Peak Particle Velocity (PPV mm/s)	25	7.5	7.5	2.5	-	-
Vibration Dose Value (VDV m/s ^{1.75})	-	-	-	-	0.4	0.26

Monitoring Results						
Start Time	00:00		Duration		31 Days	
Trigger value (mm/s)	5mm/s		# of vibration triggers		0	
	Trans (y)		Vert (z)		Long (x)	
	Value	Freq (Hz)	Value	Freq (Hz)	Value	Freq (Hz)
Peak Particle Velocity (PPV mm/s)	3.3	158	2.65	114	3.2	58.5
Vibration Dose Value (VDV mm/s ^{1.75})	-	-	-	-	-	-
Below preferred criteria?			YES ☒ NO ☐ If "NO", provide explanation and corrective actions taken in next section			

AFJV Central Tunnel Package

Notes and Diagram/Map, Photos and Graphs

Geophones located inside shop against building wall.



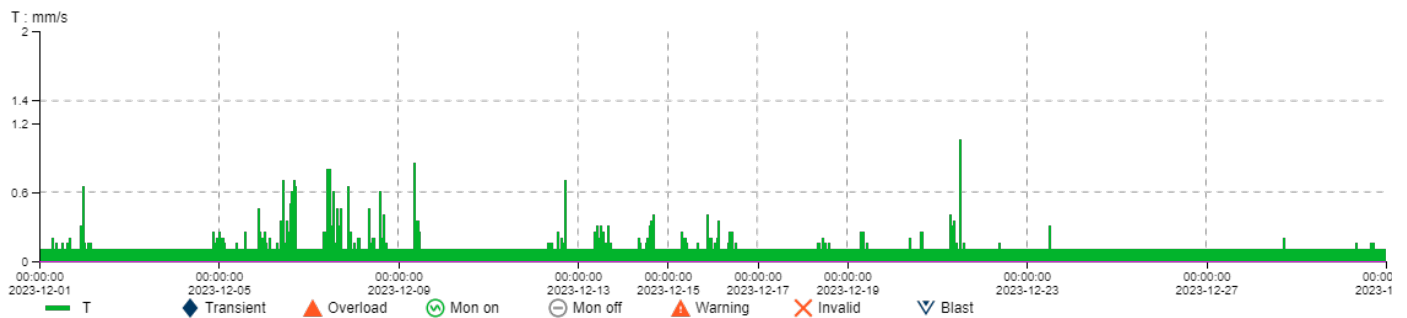
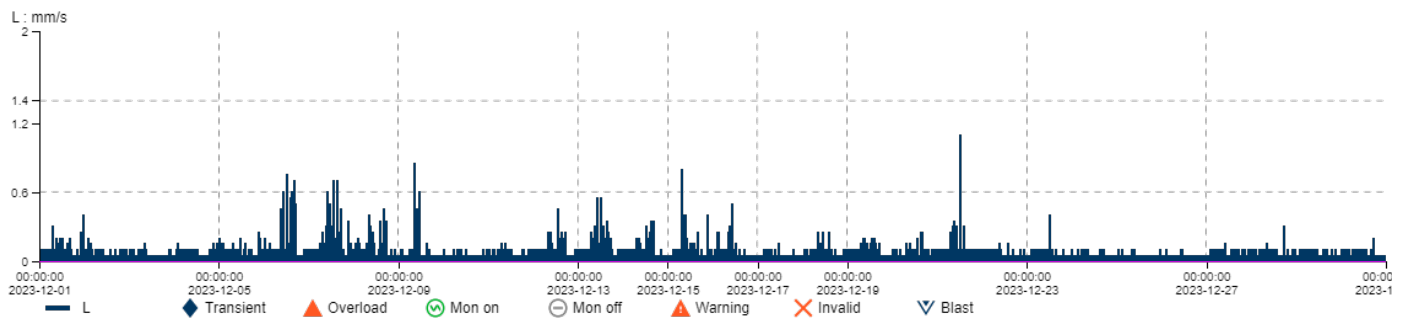
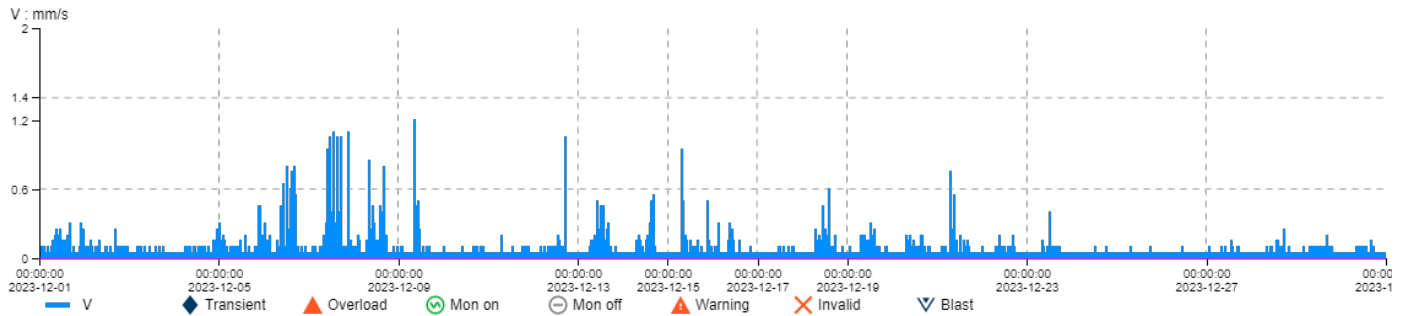
Multi report

Project BWD
Project maintainer -
Time frame 2023-12-01 00:00 - 2023-12-31 00:00 (Australia/Sydney)

NB!

Chart data is aggregated by 1 hour.

BWD_3_107781, [REDACTED] C22 107781, C22, Serial number: 107781, Calibrated: 2021-10-19,



X-span 2023-12-01 00:00 - 2023-12-31 00:00

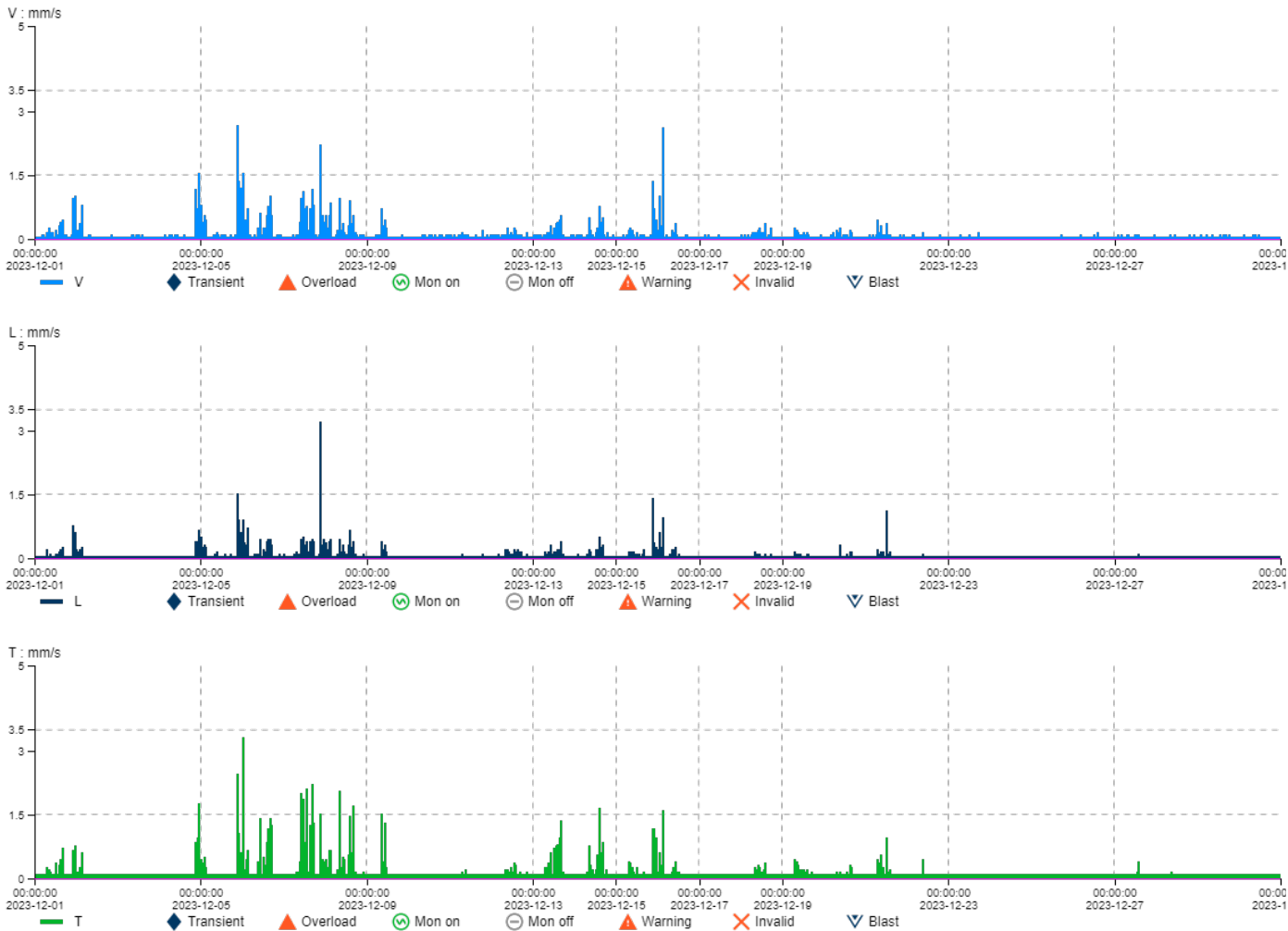
Y-span V, L, T : mm/s: 0 - 2

	V	L	T
Max	1.2 mm/s	1.1 mm/s	1.05 mm/s
Date	2023-12-09	2023-12-21	2023-12-21
Time	09:00:00	13:00:00	13:00:00
Hz	108	19	23.3

Project BWD
Project maintainer -
Time frame 2023-12-01 00:00 - 2023-12-31 00:00 (Australia/Sydney)

NB!
Chart data is aggregated by 1 hour.

BWD_4_106845, [REDACTED] C22 (replace HW), C22, Serial number: 106845, Calibrated: 2021-06-01,



X-span 2023-12-01 00:00 - 2023-12-31 00:00
Y-span V, L, T : mm/s: 0 - 5

	V	L	T
Max	2.65 mm/s	3.2 mm/s	3.3 mm/s
Date	2023-12-05	2023-12-07	2023-12-06
Time	22:00:00	22:00:00	01:00:00
Hz	114	58.5	158

Interval report

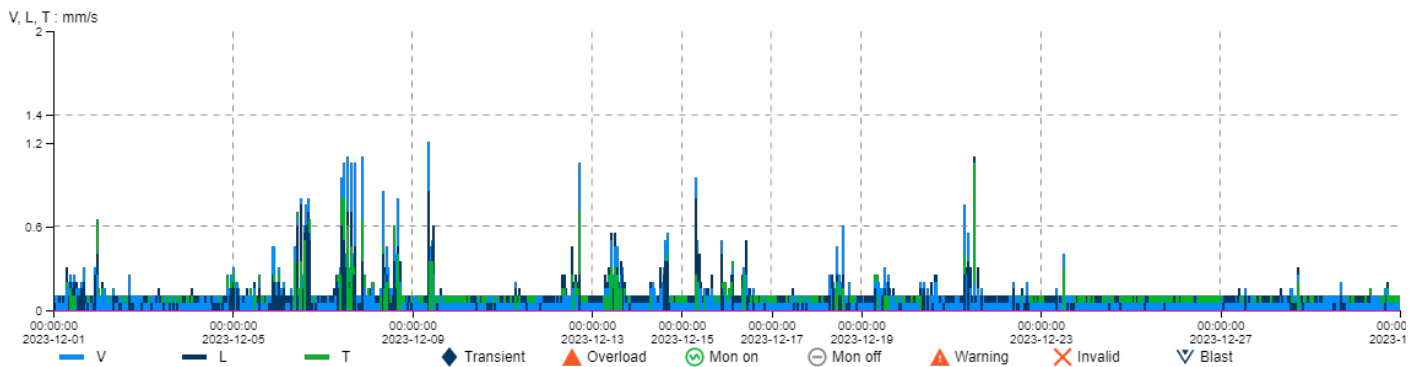
Project BWD
Project maintainer -
Time frame 2023-12-01 00:00 - 2023-12-31 00:00 (Australia/Sydney)

NB!

Chart data is aggregated by 1 hour.

Measuring point BWD_3_107781
Description XXXXXXXXXX C22 107781
Sensor type C22
Sensor serial no. 107781
Master(s) serial no. 107781
Latest calibration 2021-10-19
Aggregate max
Unit mm/s
Quantity Velocity
Interval time 2 minutes
Frequency weighting OFF
Aggregated time 1 hour

Max V: 1.2 mm/s, L: 1.1 mm/s, T: 1.05 mm/s



X-span 2023-12-01 00:00 - 2023-12-31 00:00

Y-span V, L, T : mm/s: 0 - 2

	V	L	T
Max	1.2 mm/s	1.1 mm/s	1.05 mm/s
Date	2023-12-09	2023-12-21	2023-12-21
Time	09:00:00	13:00:00	13:00:00

Interval report

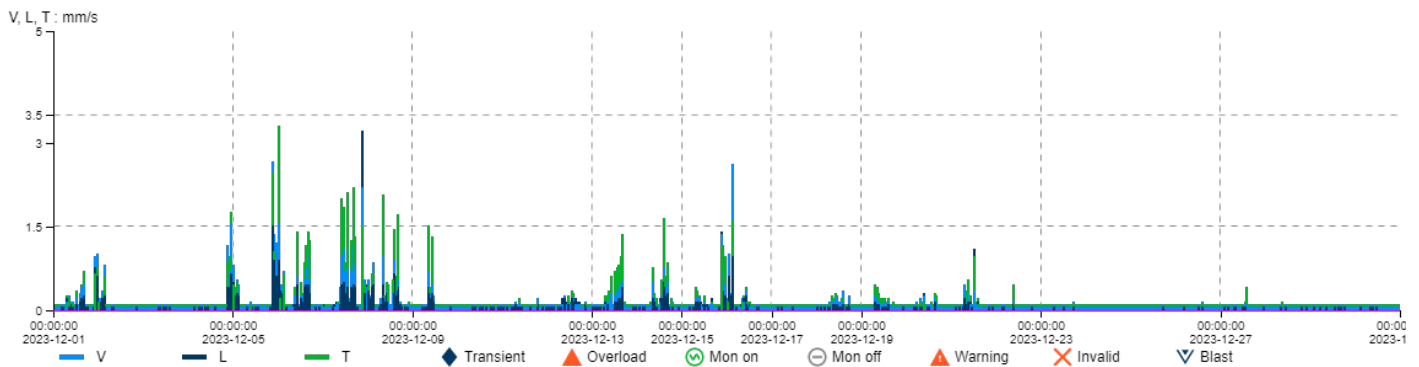
Project BWD
Project maintainer -
Time frame 2023-12-01 00:00 - 2023-12-31 00:00 (Australia/Sydney)

NB!

Chart data is aggregated by 1 hour.

Measuring point BWD_4_106845
Description XXXXXXXXXX C22 (replace HW)
Sensor type C22
Sensor serial no. 106845
Master(s) serial no. 106845
Latest calibration 2021-06-01
Aggregate max
Unit mm/s
Quantity Velocity
Interval time 5 seconds
Frequency weighting OFF
Aggregated time 1 hour

Max V: 2.65 mm/s, L: 3.2 mm/s, T: 3.3 mm/s



X-span 2023-12-01 00:00 - 2023-12-31 00:00

Y-span V, L, T : mm/s: 0 - 5

	V	L	T
Max	2.65 mm/s	3.2 mm/s	3.3 mm/s
Date	2023-12-05	2023-12-07	2023-12-06
Time	22:00:00	22:00:00	01:00:00

AFJV Central Tunnel Package

Vibration Monitoring Event Report

Monitoring Information			
Test Location		Unsound heritage structure	YES ☐ NO ☒
Works Monitoring	FDK East	Distance between geophone and works (m)	1m
Conducted by		Attended monitoring	YES ☐ NO ☒
Date/s	01.12.2023 – 31.12.2023		
Instrumentation & Test Procedure			
Instrument	Sigicom V12		
Calibrator	Sigicom		
Calibration Date	26/07/2023	Calibration Due	26/07/2025
Monitor Serial #	V12 106845		

Preferred Criteria (circle criteria relevant to monitoring event)						
	Reinforced or framed structures	Unreinforced or light framed structures	Heritage structurally sound	Heritage structurally unsound	Residential human comfort Day	Residential human comfort Night
Peak Particle Velocity (PPV mm/s)	25	7.5	7.5	2.5	-	-
Vibration Dose Value (VDV m/s ^{1.75})	-	-	-	-	0.4	0.26

Monitoring Results						
Start Time	00:00		Duration		31 Days	
Trigger value (mm/s)	5mm/s		# of vibration triggers		0	
	Trans (y)		Vert (z)		Long (x)	
	Value	Freq (Hz)	Value	Freq (Hz)	Value	Freq (Hz)
Peak Particle Velocity (PPV mm/s)	3.3	158	2.65	114	3.2	58.5
Vibration Dose Value (VDV mm/s ^{1.75})	-	-	-	-	-	-
Below preferred criteria?			YES ☒ NO ☐ If "NO", provide explanation and corrective actions taken in next section			

AFJV Central Tunnel Package

Notes and Diagram/Map, Photos and Graphs

Geophones located inside [REDACTED] building against wall.



List of activities during the month:

- TBM breakthrough
- Rocking hammering
- Concrete pours
- Spoil loadout

Project FDK
Project maintainer -
Time frame 2023-12-01 00:00 - 2023-12-31 00:00 (Australia/Sydney)

NB!
Chart data is aggregated by 1 hour.

FDK_2, [REDACTED] V12, Serial number: 33760, Calibrated: 2023-07-26, true



X-span 2023-12-01 00:00 - 2023-12-31 00:00

Y-span V, L, T : mm/s: 0 - 5

	V	L	T
Max	0.65 mm/s	3.25 mm/s	4.85 mm/s
Date	2023-12-03	2023-12-03	2023-12-03
Time	20:00:00	20:00:00	20:00:00
Hz			

Multi report

Project FDK
Project maintainer -
Time frame 2023-12-01 00:00 - 2023-12-31 00:00 (Australia/Sydney)

NB!

Chart data is aggregated by 1 hour.

FDK_2 AFJV unit switch, [REDACTED] C22, Serial number: 106845, Calibrated: 2021-06-01,



X-span 2023-12-01 00:00 - 2023-12-31 00:00

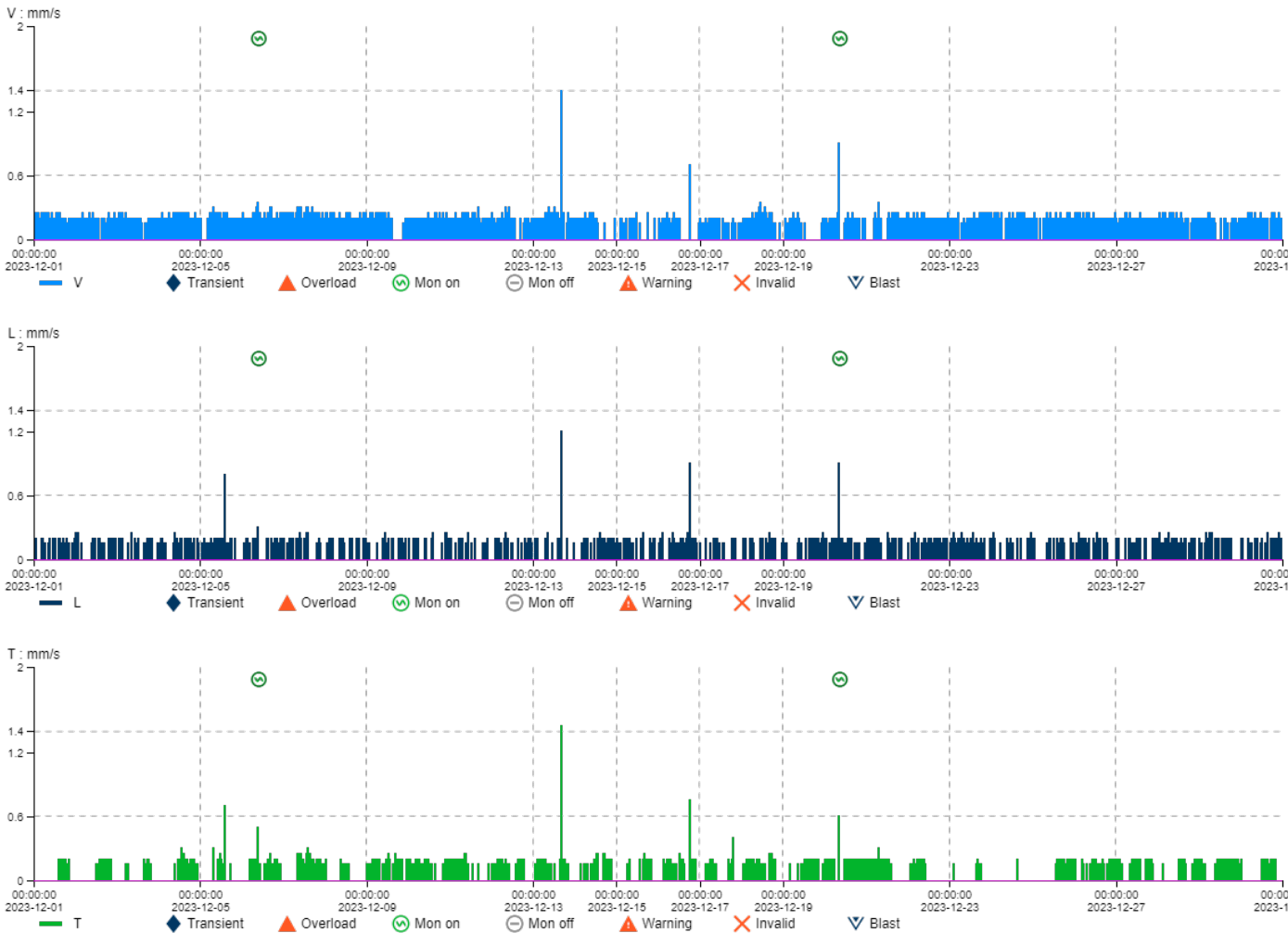
Y-span V, L, T : mm/s: 0 - 5

	V	L	T
Max	2.65 mm/s	3.2 mm/s	3.3 mm/s
Date	2023-12-05	2023-12-07	2023-12-06
Time	22:00:00	22:00:00	01:00:00
Hz	114	58.5	158

Project FDK
Project maintainer -
Time frame 2023-12-01 00:00 - 2023-12-31 00:00 (Australia/Sydney)

NB!
Chart data is aggregated by 1 hour.

FDK_3, St Albans Church vib, V12, Serial number: 33730, Calibrated: 2023-07-25, true



X-span 2023-12-01 00:00 - 2023-12-31 00:00
Y-span V, L, T : mm/s: 0 - 2

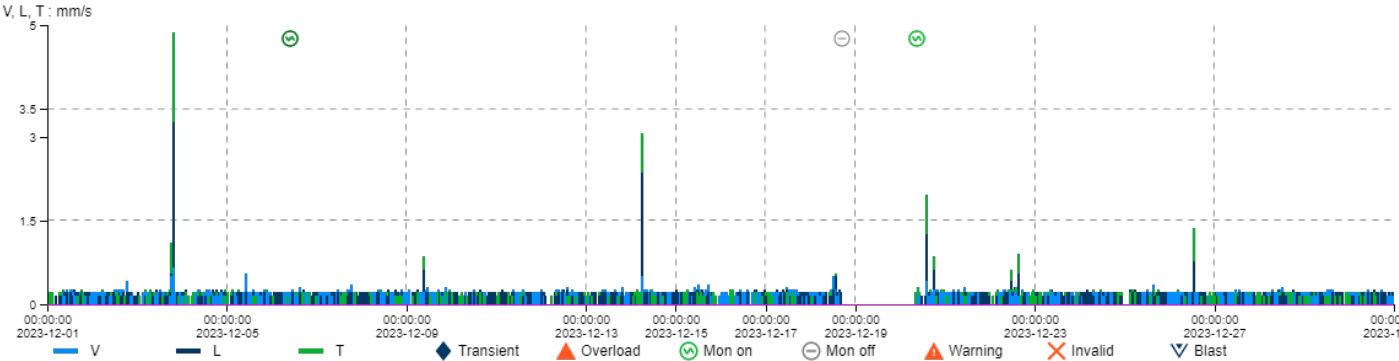
	V	L	T
Max	1.4 mm/s	1.2 mm/s	1.45 mm/s
Date	2023-12-13	2023-12-13	2023-12-13
Time	17:00:00	17:00:00	17:00:00
Hz			

Project FDK
Project maintainer -
Time frame 2023-12-01 00:00 - 2023-12-31 00:00 (Australia/Sydney)

NB!
Chart data is aggregated by 1 hour.

Measuring point FDK_2
Description XXXXXXXXXX
Sensor type V12
Sensor serial no. 33760
Master(s) serial no. 107964
Latest calibration 2023-07-26
Aggregate max
Standard (18) DIN4150-3 + Freq 250 mm/s 1-315Hz
Unit mm/s
Quantity Velocity
Interval time 2 minutes
Aggregated time 1 hour

Max V: 0.65 mm/s, L: 3.25 mm/s, T: 4.85 mm/s



X-span 2023-12-01 00:00 - 2023-12-31 00:00
Y-span V, L, T : mm/s: 0 - 5

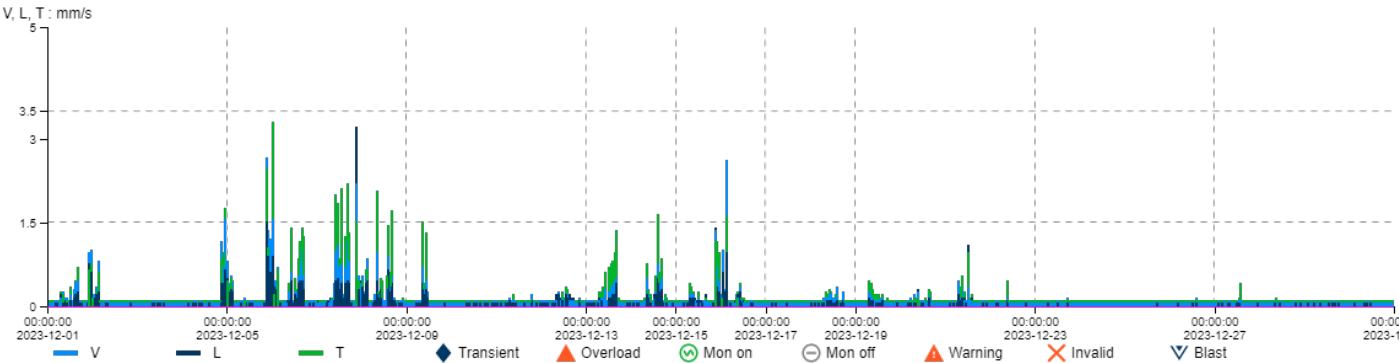
	V	L	T
Max	0.65 mm/s	3.25 mm/s	4.85 mm/s
Date	2023-12-03	2023-12-03	2023-12-03
Time	20:00:00	20:00:00	20:00:00

Project FDK
Project maintainer -
Time frame 2023-12-01 00:00 - 2023-12-31 00:00 (Australia/Sydney)

NB!
Chart data is aggregated by 1 hour.

Measuring point FDK_2 AFJV unit switch
Description
Sensor type C22
Sensor serial no. 106845
Master(s) serial no. 106845
Latest calibration 2021-06-01
Aggregate max
Unit mm/s
Quantity Velocity
Interval time 5 seconds
Frequency weighting OFF
Aggregated time 1 hour

Max V: 2.65 mm/s, L: 3.2 mm/s, T: 3.3 mm/s



X-span 2023-12-01 00:00 - 2023-12-31 00:00
Y-span V, L, T : mm/s: 0 - 5

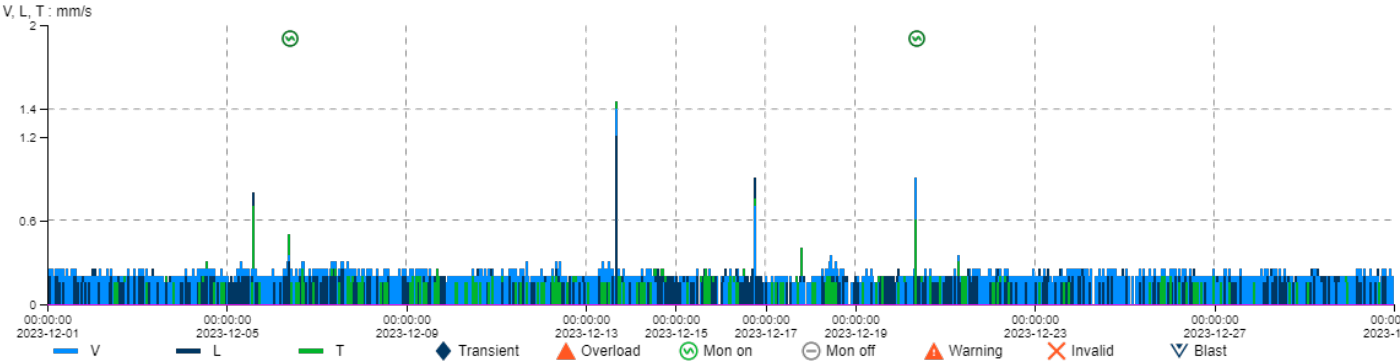
	V	L	T
Max	2.65 mm/s	3.2 mm/s	3.3 mm/s
Date	2023-12-05	2023-12-07	2023-12-06
Time	22:00:00	22:00:00	01:00:00

Project FDK
Project maintainer -
Time frame 2023-12-01 00:00 - 2023-12-31 00:00 (Australia/Sydney)

NB!
Chart data is aggregated by 1 hour.

Measuring point FDK_3
Description St Albans Church vib
Sensor type V12
Sensor serial no. 33730
Master(s) serial no. 107963
Latest calibration 2023-07-25
Aggregate max
Standard (18) DIN4150-3 + Freq 250 mm/s 1-315Hz
Unit mm/s
Quantity Velocity
Interval time 2 minutes
Aggregated time 1 hour

Max V: 1.4 mm/s, L: 1.2 mm/s, T: 1.45 mm/s



X-span 2023-12-01 00:00 - 2023-12-31 00:00
Y-span V, L, T : mm/s: 0 - 2

	V	L	T
Max	1.4 mm/s	1.2 mm/s	1.45 mm/s
Date	2023-12-13	2023-12-13	2023-12-13
Time	17:00:00	17:00:00	17:00:00

AFJV Central Tunnel Package

Vibration Monitoring Event Report

Monitoring Information			
Test Location		Unsound heritage structure	YES ☐ NO ☒
Works Monitoring	NST Site	Distance between geophone and works (m)	5m
Conducted by		Attended monitoring	YES ☐ NO ☒
Date/s	01.12.2023 – 31.12.2023		
Instrumentation & Test Procedure			
Instrument	Sigicom V12		
Calibrator	Sigicom		
Calibration Date	25/07/2023	Calibration Due	25/07/2025
Monitor Serial #	V12- 33720		

Preferred Criteria (circle criteria relevant to monitoring event)						
	Reinforced or framed structures	Unreinforced or light framed structures	Heritage structurally sound	Heritage structurally unsound	Residential human comfort Day	Residential human comfort Night
Peak Particle Velocity (PPV mm/s)	25	7.5	7.5	2.5	-	-
Vibration Dose Value (VDV m/s ^{1.75})	-	-	-	-	0.4	0.26

Monitoring Results						
Start Time	00:00		Duration		31 Days	
Trigger value (mm/s)	5mm/s		# of vibration triggers		0	
	Trans (y)		Vert (z)		Long (x)	
	Value	Freq (Hz)	Value	Freq (Hz)	Value	Freq (Hz)
Peak Particle Velocity (PPV mm/s)	0.8	137	1.3	120	0.9	128
Vibration Dose Value (VDV mm/s ^{1.75})	-	-	-	-	-	-
Below preferred criteria?			YES ☒ NO ☐ If "NO", provide explanation and corrective actions taken in next section			

AFJV Central Tunnel Package

Notes and Diagram/Map, Photos and Graphs

Geophones located inside [REDACTED] against building wall.



List of Activities during the month:

- Rocking hammering
- Spoil loadout
- excavation

Project NST
Project maintainer -
Time frame 2023-12-01 00:00 - 2023-12-31 00:00 (Australia/Sydney)

NST_2 #33720, NST V12, V12, Serial number: 33720, Calibrated: 2023-07-25, true



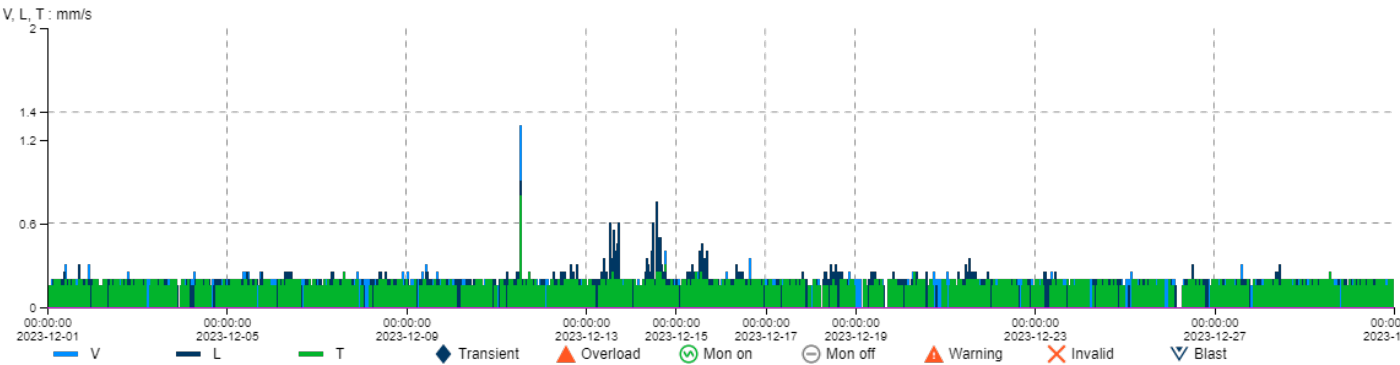
X-span 2023-12-01 00:00 - 2023-12-31 00:00
Y-span V, L, T : mm/s: 0 - 2

	V	L	T
Max	1.3 mm/s	0.9 mm/s	0.8 mm/s
Date	2023-12-11	2023-12-11	2023-12-11
Time	12:48:00	12:48:00	12:48:00
Hz	120	128	137

Project NST
Project maintainer -
Time frame 2023-12-01 00:00 - 2023-12-31 00:00 (Australia/Sydney)

Measuring point NST_2 #33720
Description NST V12
Sensor type V12
Sensor serial no. 33720
Master(s) serial no. 108061
Latest calibration 2023-07-25
Standard (18) DIN4150-3 + Freq 250 mm/s 1-315Hz
Unit mm/s
Quantity Velocity
Interval time 2 minutes

Max V: 1.3 mm/s, L: 0.9 mm/s, T: 0.8 mm/s



X-span 2023-12-01 00:00 - 2023-12-31 00:00
Y-span V, L, T : mm/s: 0 - 2

	V	L	T
Max	1.3 mm/s	0.9 mm/s	0.8 mm/s
Date	2023-12-11	2023-12-11	2023-12-11
Time	12:48:00	12:48:00	12:48:00

APPENDIX C - SURFACE WATER MONITORING

Sydney Metro West - Central Tunnelling Package
Surface Water Monitoring

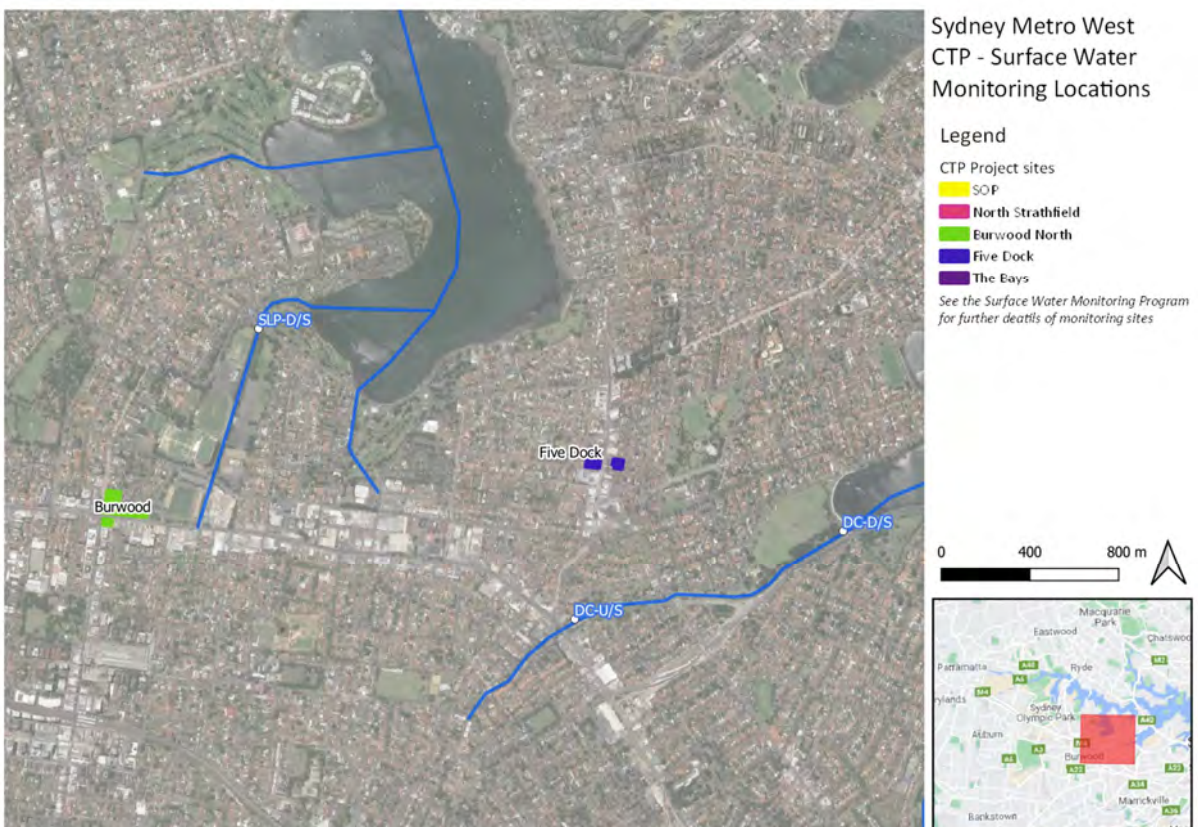
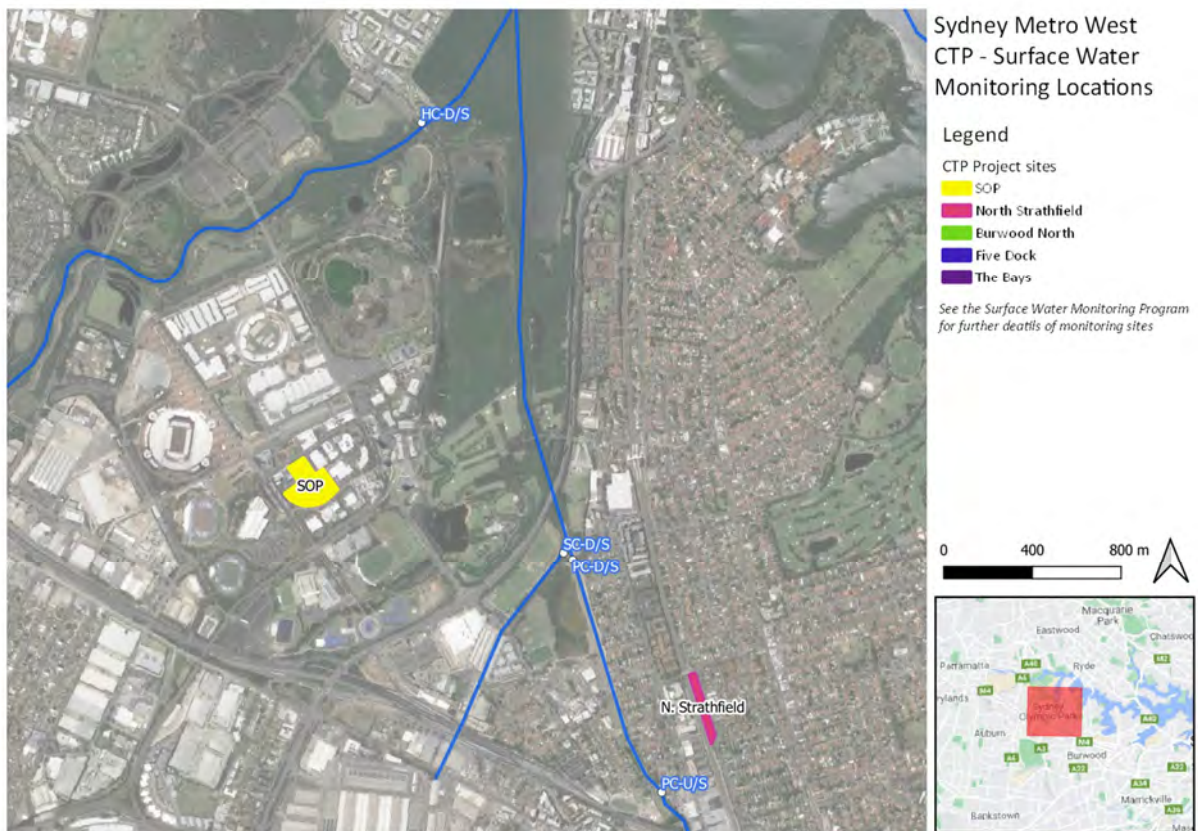
TABLE 6.4 TELEMETRY TRIGGER VALUES TO MAINTAIN WATER QUALITY OBJECTIVES					
Receiving watercourse type (WQOT)	Turbidity	pH	Dissolved Oxygen	Oil and grease	Electrical conductivity/salinity
Aquatic Ecosystem (Estuaries)	0.5-10 NTU	7.0-8.5	95-100%	None visible on surface	Loading rate: 125-2200 µS/cm

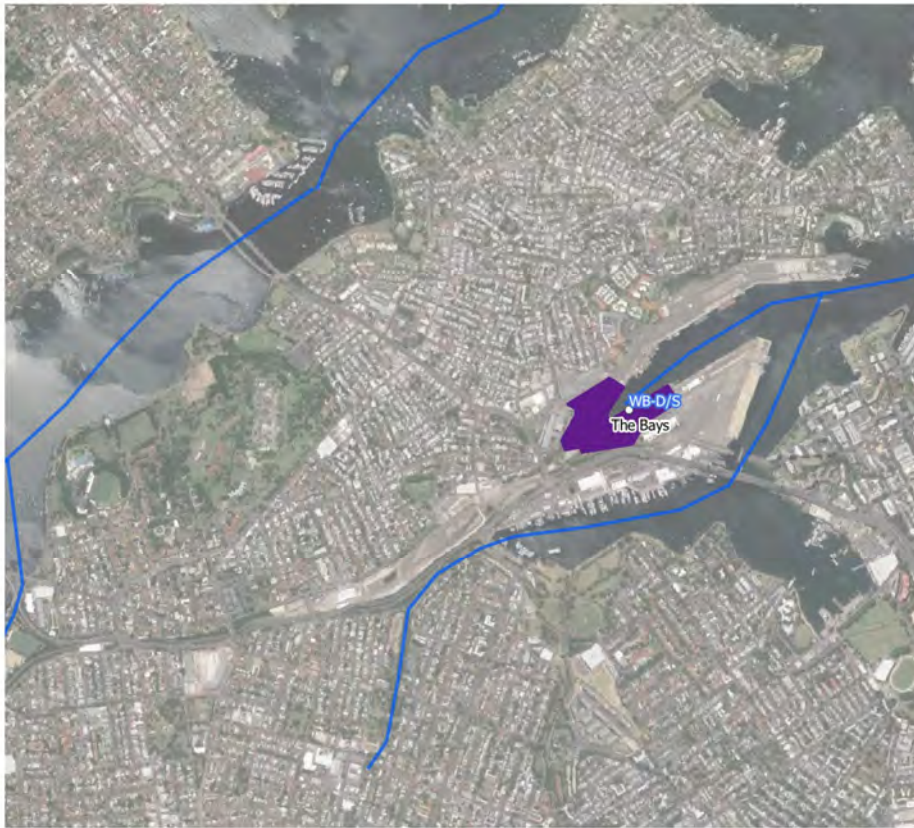
Rev: 00 Last Updated: 29/02/2024

LEGEND
Preliminary Trigger Value Exceedance

SW Monitoring ID	Waterway Name	Coordinates	Date	Person (Undertaking Measurements)	Sample Time	Monitoring Category	Field Measurement										Rainfall in last 24hrs Sydney (Observatory Hill) (mm)	Rainfall in last 24hrs ydney Olympic Park AWS (Archery Centre) (mm)	Additional Comments	Brand of Instrument	Model of Instrument	Monitoring Equipment	
							pH	Temp (degrees)	DO (mg/L)	DO (%)	Electrical Conductivity (mS/cm)	Electrical Conductivity (µS/cm)	Turbidity (NTU)	Visual Inspection (Oil & Grease)	Current Weather Conditions	Serial No						Calibration Certification	
WB-D/s	White Bay	-33.866245° S, 151.180450° E	28/07/2023		2:41pm	Monthly Monitoring/ Post-Rainfall Monitoring								None	Sunny		0	0	Due to low tide and safety issue couldn't get a sample.	Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
DC-D/S	Dobroyd Canal / Iron Cove Creek	-33.870604° S, 151.141474° E	28/07/2023		11:10 AM	Monthly Monitoring/ Post-Rainfall Monitoring	8.12	17.9	8.68	102.8	31.3	31300	10.1	None	Sunny		0	0		Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
DC-U/S	Dobroyd Canal / Iron Cove Creek	-33.873828° S, 151.128243° E	28/07/2023		10:32 AM	Monthly Monitoring/ Post-Rainfall Monitoring	8.12	17.48	6.82	81.7	36	36000	37.6	None	Sunny		0	0		Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
SLP-D/S	St Lukes Park Canal	-33.861571° S, 151.113347° E	28/07/2023		10:15 AM	Monthly Monitoring/ Post-Rainfall Monitoring	9.4	17.41	11.42	120.1	2.31	2310	25.8	None	Sunny		0	0		Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
PC-U/S	Powells Creek	-33.862145° S, 151.086294° E	28/07/2023		11:20 AM	Monthly Monitoring/ Post-Rainfall Monitoring								None	Sunny		0	0	Dry stream, couldn't get a sample.	Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
PC-D/S	Powells Creek	-33.852589° S, 151.082359° E	28/07/2023		10:00 AM	Monthly Monitoring/ Post-Rainfall Monitoring	8.66	18.64	7.95	87.2	7.45	7450	126	None	Sunny		0	0		Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
SC-D/S	Saladays Creek	-33.852282° S, 151.081934° E	28/07/2023		12:30 PM	Monthly Monitoring/ Post-Rainfall Monitoring	8.04	17.36	10.33	130.1	48.4	484005.4	5.4	None	Sunny		0	0		Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
HC-D/S	Haslams Creek	-33.834564° S, 151.075772° E	28/07/2023		12:56PM	Monthly Monitoring/ Post-Rainfall Monitoring								None	Sunny		0	0	Dry stream, couldn't get a sample.	Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
WB-D/s	White Bay	-33.866245° S, 151.180450° E	28/08/2023		1:30 AM	Monthly Monitoring/ Post-Rainfall Monitoring								None	Sunny		0	0	Due to low tide and safety issue couldn't get a sample.	Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
DC-D/S	Dobroyd Canal / Iron Cove Creek	-33.870604° S, 151.141474° E	28/08/2023		2:15 AM	Monthly Monitoring/ Post-Rainfall Monitoring								None	Sunny		0	0	Dry stream, couldn't get a sample.	Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
DC-U/S	Dobroyd Canal / Iron Cove Creek	-33.873828° S, 151.128243° E	28/08/2023		11:35 AM	Monthly Monitoring/ Post-Rainfall Monitoring								None	Sunny		0	0	Dry stream, couldn't get a sample.	Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
SLP-D/S	St Lukes Park Canal	-33.861571° S, 151.113347° E	28/08/2023		2:10 AM	Monthly Monitoring/ Post-Rainfall Monitoring								None	Sunny		0	0	Dry stream, couldn't get a sample.	Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
PC-U/S	Powells Creek	-33.862145° S, 151.086294° E	28/08/2023		1:10 AM	Monthly Monitoring/ Post-Rainfall Monitoring	9.76	19.3		160.1	9.1	910	5.91	None	Sunny		0	0		Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
PC-D/S	Powells Creek	-33.852589° S, 151.082359° E	28/08/2023		1:20 AM	Monthly Monitoring/ Post-Rainfall Monitoring	8.06	23.7		144.4	35.78	35780	23.2	None	Sunny		0	0		Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
SC-D/S	Saladays Creek	-33.852282° S, 151.081934° E	28/08/2023		12:15 PM	Monthly Monitoring/ Post-Rainfall Monitoring	7.79	24.9		107.3	69.934	69934	25.95	None	Sunny		0	0		Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
HC-D/S	Haslams Creek	-33.834564° S, 151.075772° E	28/08/2023		12:30PM	Monthly Monitoring/ Post-Rainfall Monitoring	7.33	19.1		59.8	47.324	47324	30.758	None	Sunny		0	0		Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
WB-D/s	White Bay	-33.866245° S, 151.180450° E	29/09/2023		1:30 PM	Monthly Monitoring/ Post-Rainfall Monitoring	8.33	21.99	7.51	104.3	51.2	51200	9.6	None	Sunny		0	0		Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
DC-D/S	Dobroyd Canal / Iron Cove Creek	-33.870604° S, 151.141474° E	29/09/2023		1:00 AM	Monthly Monitoring/ Post-Rainfall Monitoring								None	Sunny		0	0	Dry stream, couldn't get a sample.	Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
DC-U/S	Dobroyd Canal / Iron Cove Creek	-33.873828° S, 151.128243° E	29/09/2023		2:15 AM	Monthly Monitoring/ Post-Rainfall Monitoring		24.5	7.38	102.1	40.3	40300	12.6	None	Sunny		0	0		Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
SLP-D/S	St Lukes Park Canal	-33.861571° S, 151.113347° E	29/09/2023		1:10 AM	Monthly Monitoring/ Post-Rainfall Monitoring	8.39	23.92	10.94	135.2	3.12	3120	26.4	None	Sunny		0	0		Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
PC-U/S	Powells Creek	-33.862145° S, 151.086294° E	29/09/2023		1:55 AM	Monthly Monitoring/ Post-Rainfall Monitoring								None	Sunny		0	0	Dry stream, couldn't get a sample.	Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
PC-D/S	Powells Creek	-33.852589° S, 151.082359° E	29/09/2023		2:35 AM	Monthly Monitoring/ Post-Rainfall Monitoring	7.72	20.86	12.61	155	26.4	26400	18.7	None	Sunny		0	0		Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
SC-D/S	Saladays Creek	-33.852282° S, 151.081934° E	29/09/2023		2:45 AM	Monthly Monitoring/ Post-Rainfall Monitoring	7.83	22.43	10.4	120	0.008	8	26.7	None	Sunny		0	0		Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
HC-D/S	Haslams Creek	-33.834564° S, 151.075772° E	29/09/2023		3:05	Monthly Monitoring/ Post-Rainfall Monitoring	8.01	20.42	9.89	152	29.7	29700	18.2	None	Sunny		0	0		Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
WB-D/s	White Bay	-33.866245° S, 151.180450° E	11/10/2023			Monthly Monitoring											0	0		Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
DC-D/S	Dobroyd Canal / Iron Cove Creek	-33.870604° S, 151.141474° E	11/10/2023		3:26 PM	Monthly Monitoring	8.22	22.8	13.01	152.2	2.3	2300	9.3	None	Calm		0	0		Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
DC-U/S	Dobroyd Canal / Iron Cove Creek	-33.873828° S, 151.128243° E	11/10/2023			Monthly Monitoring											0	0	Dry stream, couldn't get a sample.	Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
SLP-D/S	St Lukes Park Canal	-33.861571° S, 151.113347° E	11/10/2023		3:44 PM	Monthly Monitoring	6.17	22.82	10.54	122.5	0.002	2	60.8	Froth in the water	Calm		0	0	Froth in the water	Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
PC-U/S	Powells Creek	-33.862145° S, 151.086294° E	11/10/2023		3:14 PM	Monthly Monitoring	7.89	23.1	9.76	131.5	39	39000	27	None	Calm		0	0		Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
PC-D/S	Powells Creek	-33.852589° S, 151.082359° E	11/10/2023		3:11 PM	Monthly Monitoring	8.23	24.61	10.15	140.2	38.6	38600	28.9	None	Calm		0	0		Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
SC-D/S	Saladays Creek	-33.852282° S, 151.081934° E	11/10/2023		4:06 PM	Monthly Monitoring	6.01	22.28	12.78	147	20	2000	29.6	None	Calm		0	0		Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
HC-D/S	Haslams Creek	-33.834564° S, 151.075772° E	11/10/2023		2:53 PM	Monthly Monitoring	8.03	23.29	11.31	158.3	47.4	47400	10.2	None	Calm		0	0		Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
WB-D/s	White Bay	-33.866245° S, 151.180450° E	14/11/2023		11:00 AM	Monthly Monitoring	7.47	23.25	7.11	103.4	50.3	50300	2.9	None	Calm		0	0	high tide, clear water	Horiba	NU90SAUM	NU90SAUM	10.09 Project Management/12. Equipment Register/02 Calibration Records/Horiba U-52 WQM - NU90SAUM
DC-D/S	Dobroyd Canal / Iron Cove Creek	-33.870604° S, 151.141474° E	14/11/2023		11:30 AM	Monthly Monitoring	7.69	24.9	8.43	126.8	51.												

Surface water monitoring locations:





Sydney Metro West CTP - Surface Water Monitoring Locations

Legend

CTP Project sites

SOP

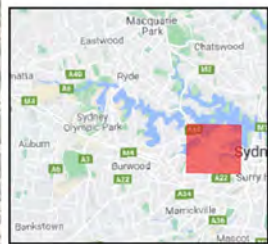
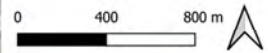
North Strathfield

Eurwood North

Five Dock

The Bays

See the Surface Water Monitoring Program
for further details of monitoring sites



APPENDIX D - GROUNDWATER MONITORING

Monitoring Methodology

7.1 OVERVIEW

The methodology for monitoring groundwater for the project includes:

- Assessment of groundwater level (measurement and datalogger download)
- Assessment of groundwater salinity as EC (datalogger download)
- Assessment of groundwater quality at key locations
- Assessment of WTP discharge water quality (grab samples for lab analysis and field measurements)
- Assessment of groundwater inflows (pump flow meter data)
- Implementation of quality control plan including appropriate chain-of-custody for laboratory analysis and provision of appropriate documentation.

Groundwater monitoring is to be undertaken by suitably qualified personnel at all times.

Groundwater monitoring will be undertaken in accordance with the following monitoring regime:

- Baseline monitoring will be gathered from all bores for at least two consecutive months prior to construction commencing that will interact with groundwater
- Construction monitoring will occur monthly for the first three months of construction and then quarterly thereafter
- Construction monitoring will occur at smaller intervals where the Revised Groundwater Modelling Report indicates it is required
- Continuous groundwater level and EC monitoring will only occur where recommended by the Revised Groundwater Modelling Report
- WTP discharge monitoring is outlined in Section 7.5
- Groundwater inflow monitoring is outlined in Section 7.6.

7.2 MANUAL GROUNDWATER LEVEL MEASUREMENTS

Groundwater monitoring will be overseen by personnel with appropriate qualifications and experience. Trained field personnel will complete monitoring rounds using appropriate personal protective equipment (PPE) and monitoring equipment.

The static groundwater level will be measured and recorded at each standpipe groundwater monitoring bore using an electronic groundwater level dip meter (dipper) to verify the continuous data recorded by dataloggers. The level (to the nearest millimetre) will be referenced to a known (and consistent) surveyed point at the top of the bore casing (mTOC). This measurement will be corrected to mAHD using survey data. Recorded groundwater level will be tabulated in both metres below top of bore casing (mBTC) and mAHD.

The base of the bore will be measured and recorded periodically by lowering the dipper to the base of the bore until it touches the bottom, where possible.

7.3 CONTINUOUS GROUNDWATER LEVEL AND QUALITY (EC) MEASUREMENTS

Groundwater level (as pressure) and EC will be measured automatically by calibrated dataloggers at key monitoring locations and VWPs (pore pressure only). Continuous data (recorded every 6 hours) will be periodically validated by manual measurements. Continuous groundwater level and EC monitoring will only occur in those bores where recommended in the Revised Groundwater Modelling Report, otherwise they will be monitored quarterly.

Groundwater level/pressure measurement will be converted to mAHD using calibration coefficients, installation data, and survey data. Spreadsheets will be maintained detailing the conversion and converted groundwater level measurement.

The dataloggers will be downloaded quarterly. Dataloggers will be checked and maintained as necessary before being re-calibrated and then returned to the monitoring bore at a known depth below the top of casing.

7.4 MANUAL GROUNDWATER QUALITY SAMPLING

Groundwater quality sampling will be carried out by suitably qualified personnel at all times, in accordance with AS/NZS 5667.11:1998, and will follow these general principles:

- Sampling equipment should not change the water quality in any way; particular effort should be made to avoid cross contamination between bores and sampling equipment
- Sufficient water should be removed to ensure the sample is newly derived from the aquifer itself rather than from water that sits in the bore
- Methods of collection and storage in bottles and transportation to the laboratory should suit the type of analysis required.

Groundwater sampling may produce a potentially large volume of purged water. This water will be captured in containers and treated in the construction's WTP's or disposed of in accordance with the Waste Management Plan. To avoid large volumes of purged water, low-flow monitoring is recommended where possible. Passive sampling or no-purge sampling may be suitable in some of the monitoring bores, however, these sampling methods will only be carried out where recommended by the subject matter expert.



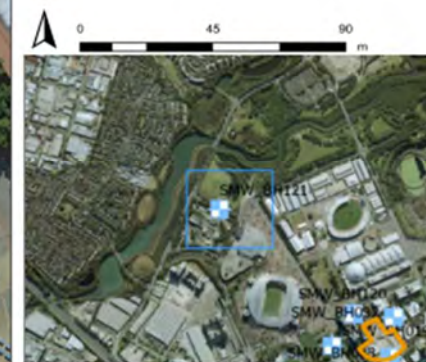
Sydney Metro West - CTP
Tunnel North West of SOP

Legend

Site boundary



Groundwater well



This map is shown for reference purposes only. Arcadis Formosa JV provides this information "as is" with the understanding that it is not guaranteed to be accurate, correct or complete and conclusions drawn from such information are the responsibility of the user. While every effort is made to ensure the information displayed is as accurate and current as possible, Arcadis Formosa JV will not be held responsible for any loss, damage or inconvenience caused as a result of reliance on such information or data.





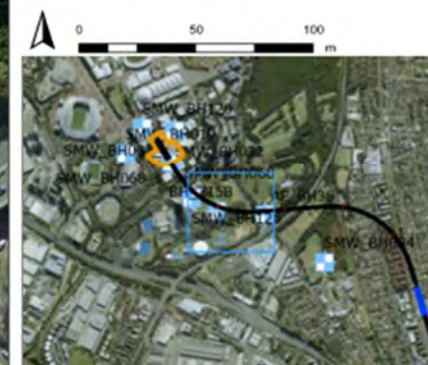
Sydney Metro West - CTP

Tunnel - Sydney Olympic Park to Nort...

Legend

Site boundary

Groundwater well



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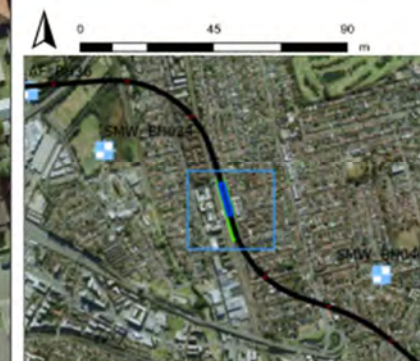
Sydney Metro West - CTP

North Strathfield

Legend

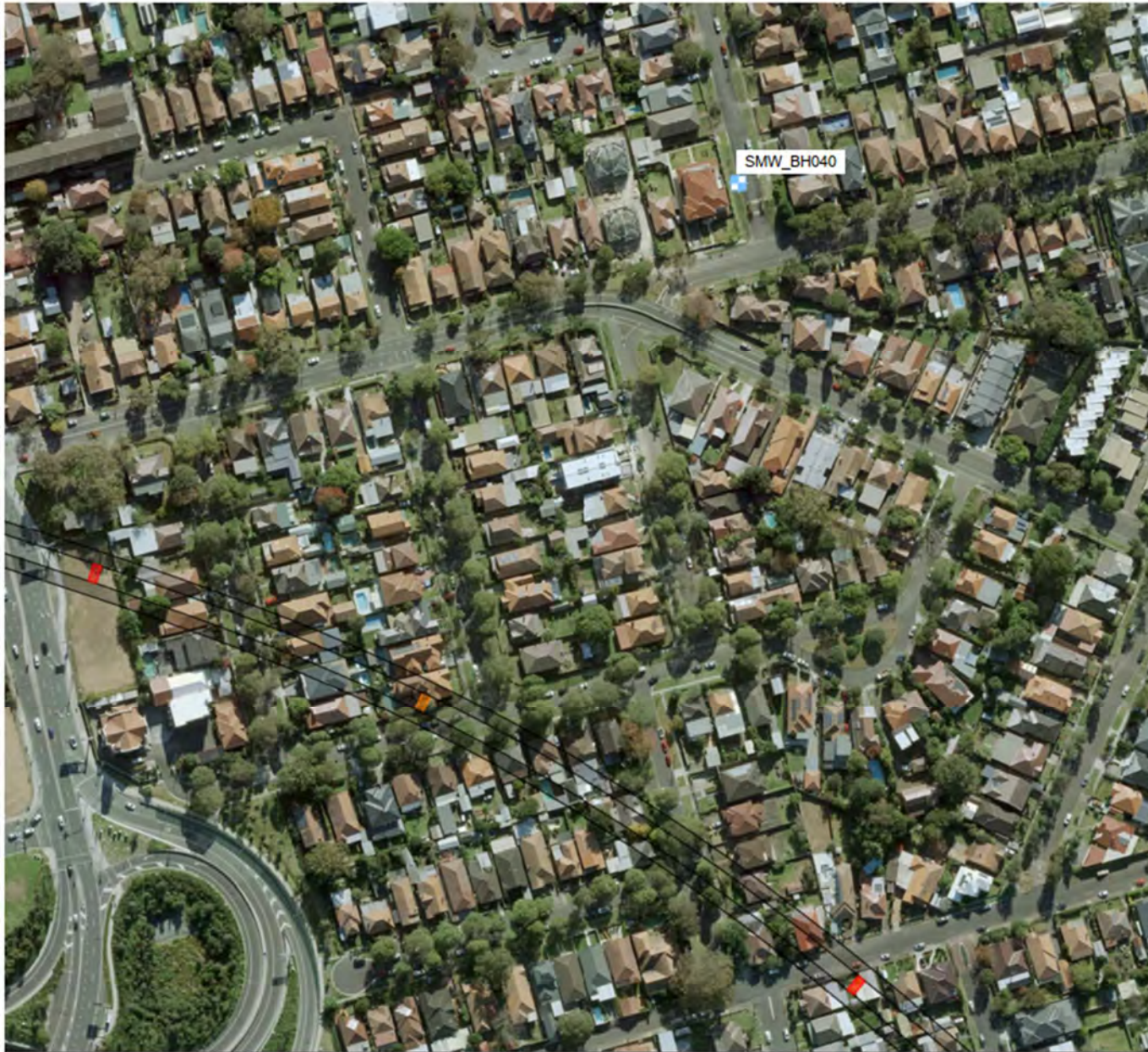
Site boundary

Groundwater well



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Sydney Metro West - CTP

Tunnel - NST to BWD

Legend

Site boundary

Groundwater well



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Sydney Metro West - CTP

Burwood North

Legend

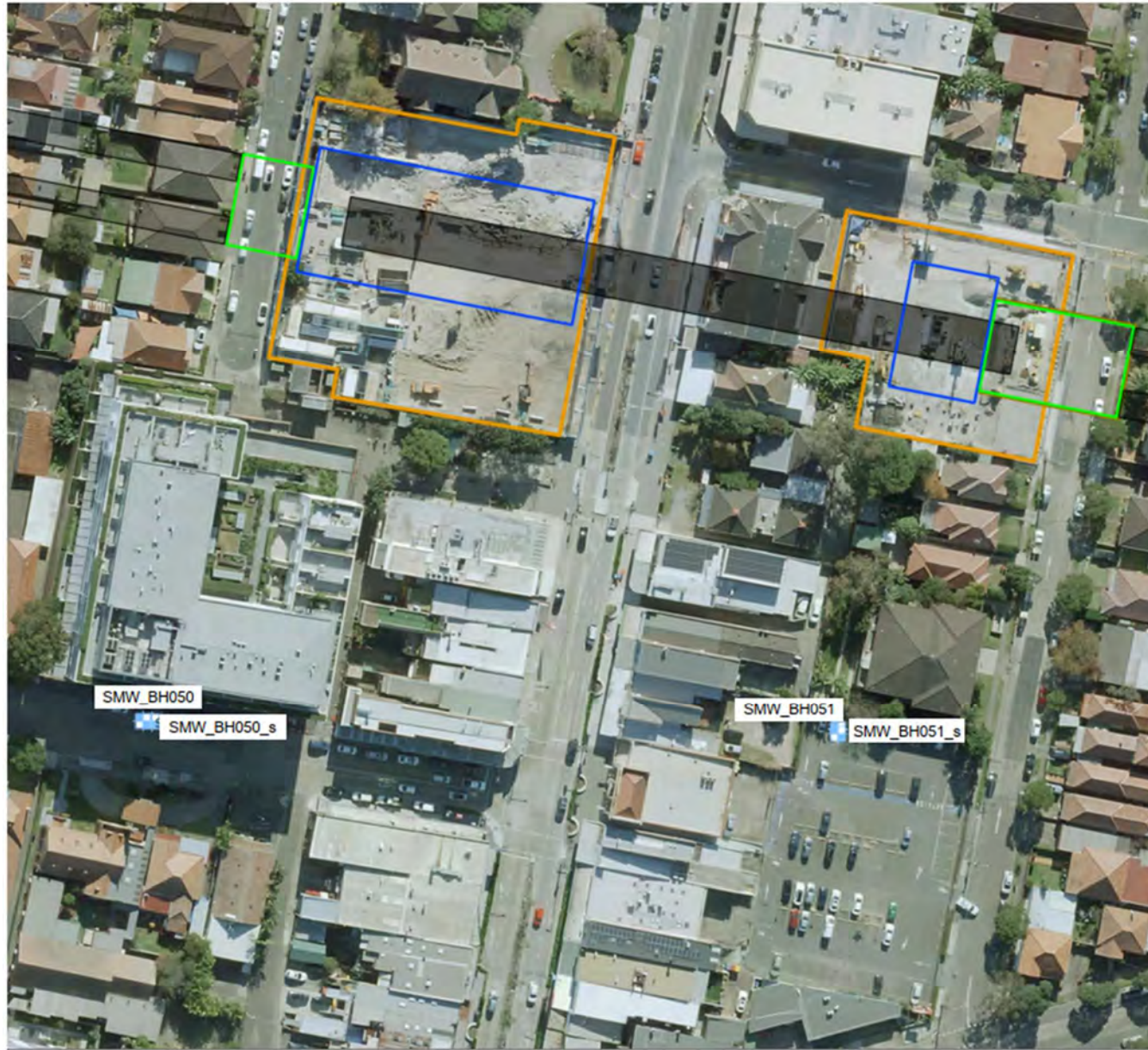
Site boundary

Groundwater well



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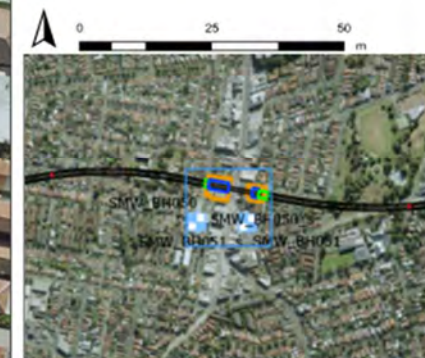
Sydney Metro West - CTP

Five Dock

Legend

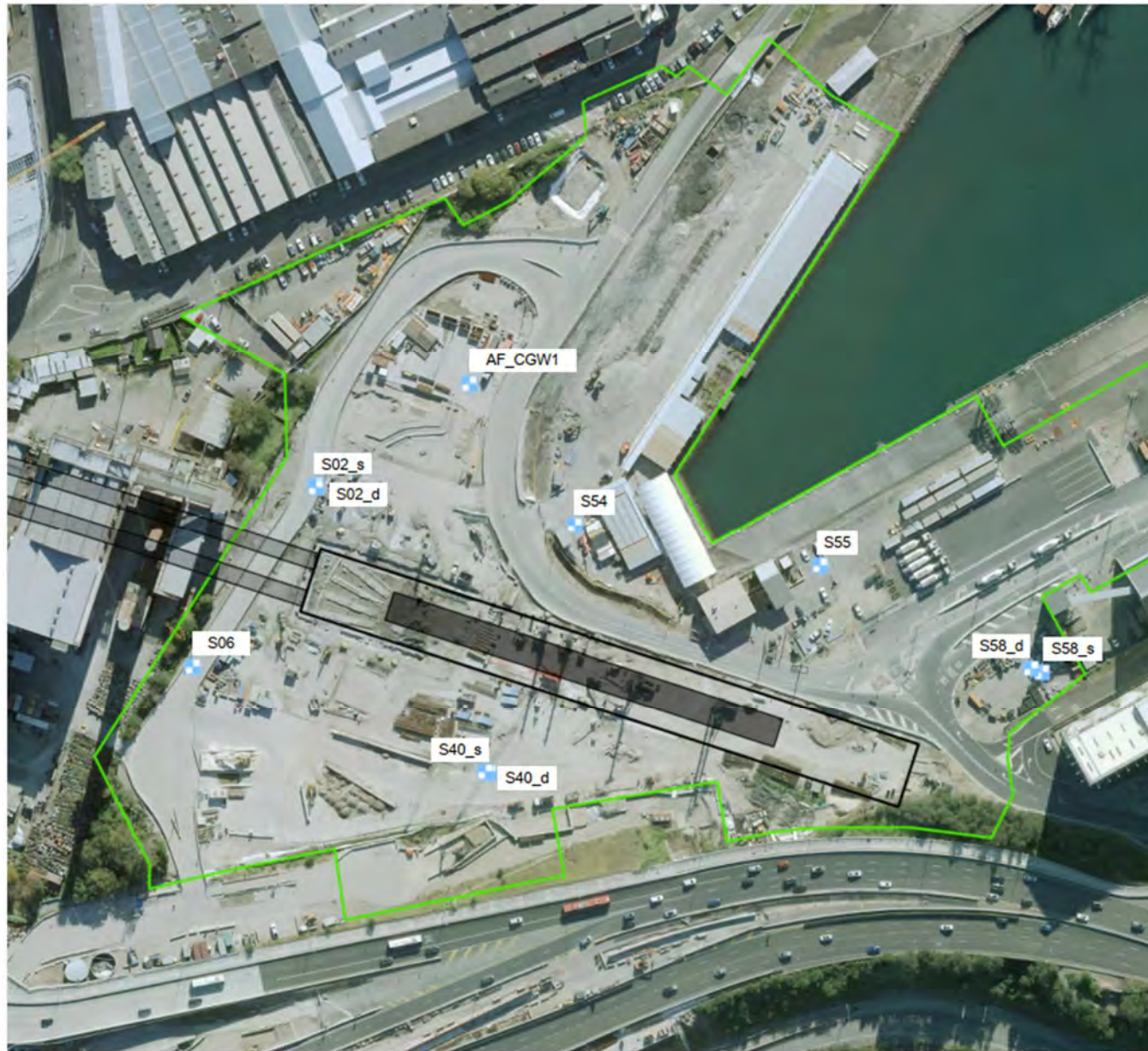
Site boundary

Groundwater well



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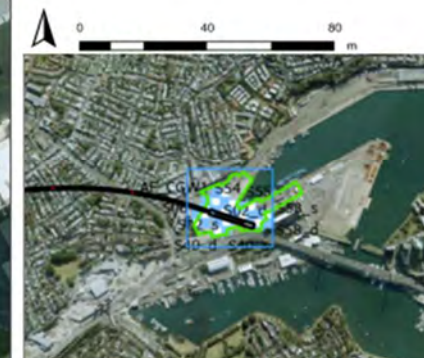


Sydney Metro West - CTP

The Bays

Legend

- Site boundary
- Groundwater well



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Location of data loggers:

The Bays:





Five Dock:

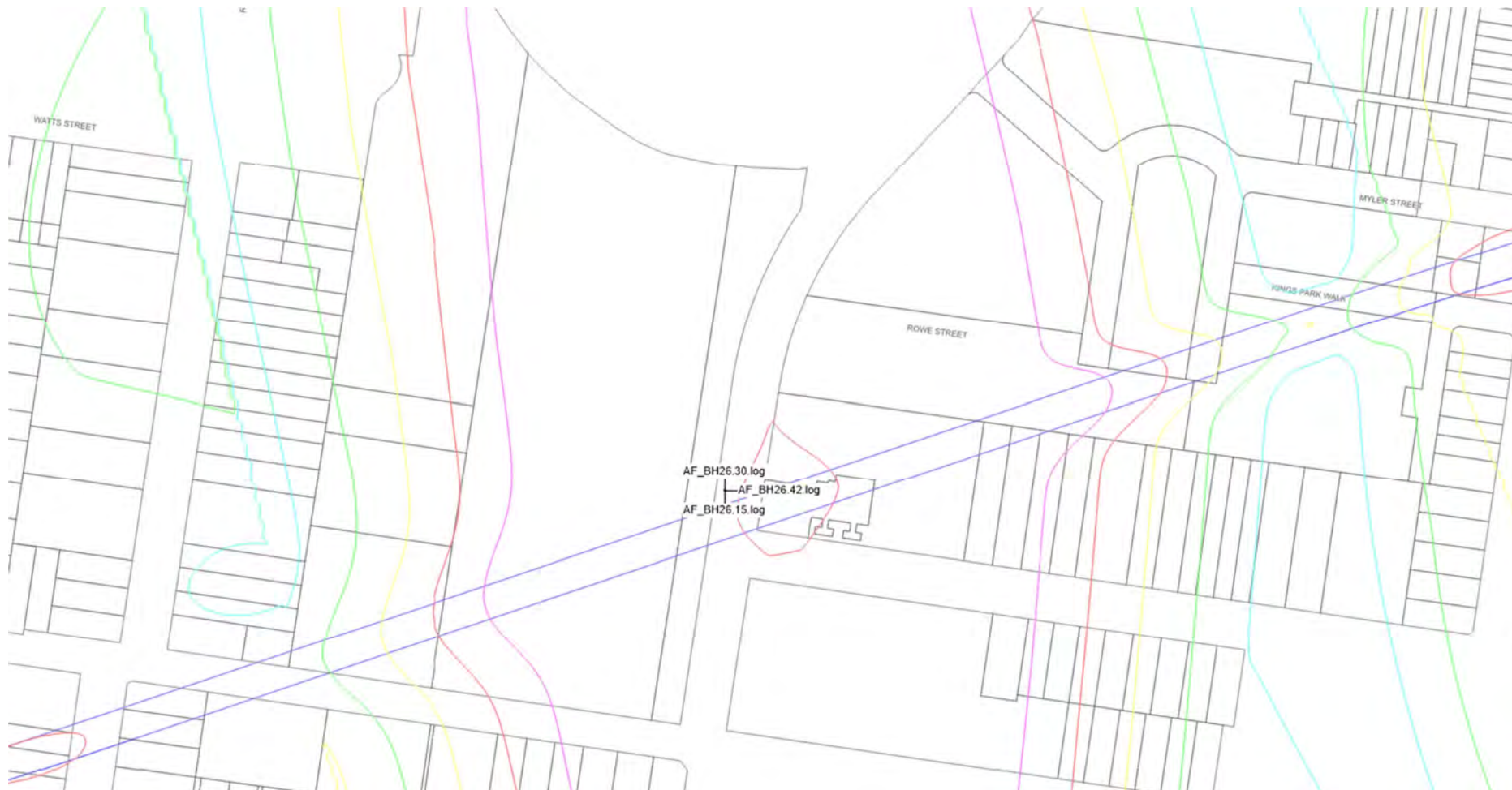






Burwood:





North Strathfield:





Sydney Olympic Park:





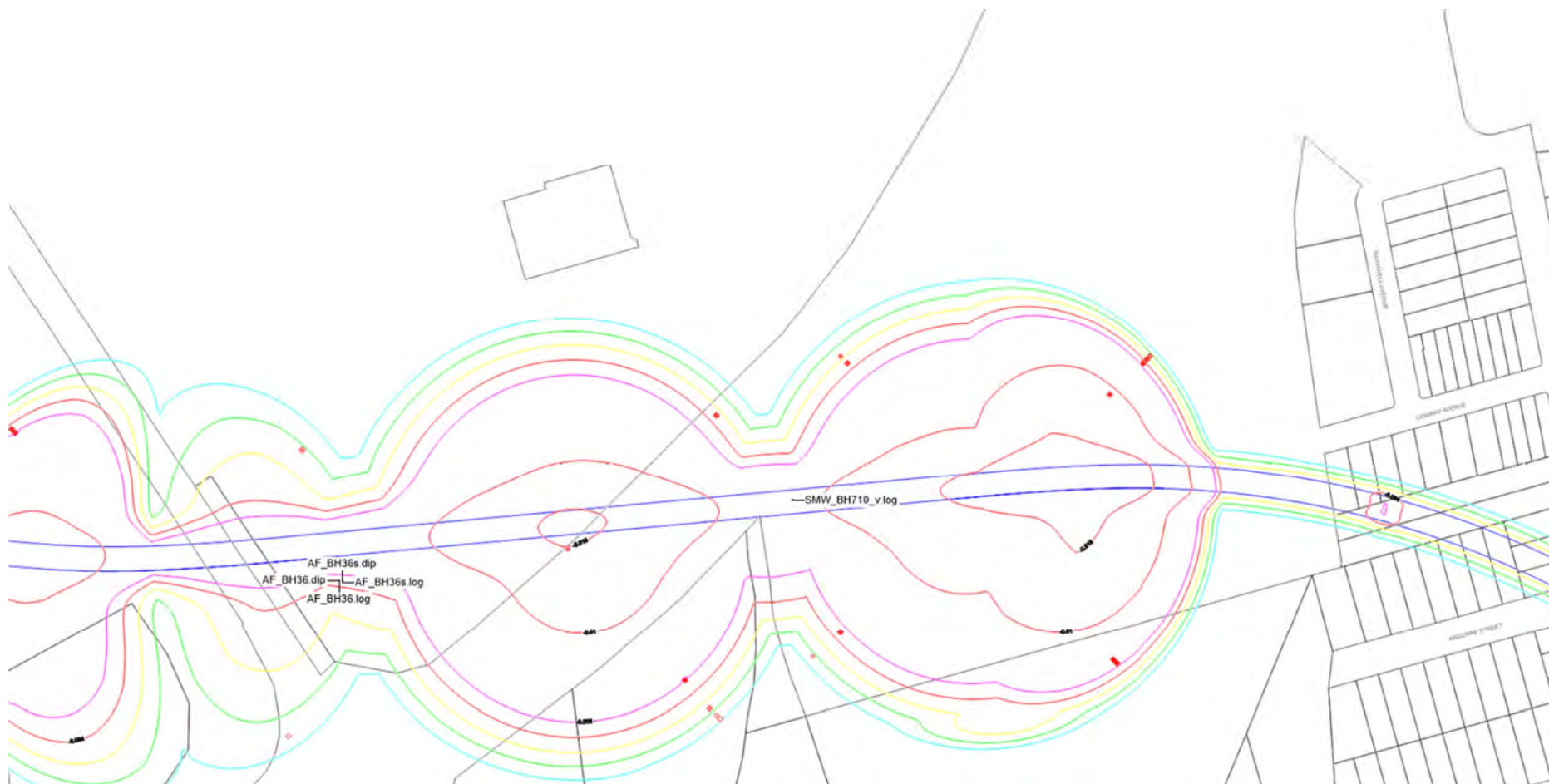


TABLE 6-3. AFJV GROUNDWATER BORE LOCATION AND MONITORING DETAILS

Location	Bore ID	Depth classification	Ground surface elevation (mAHD)	Screened interval (m)	Screened aquifer	Monitoring*	Comments
Tunnel – NW of SOP	SMW_BH070	Deep Rock	4.85	27–7 - 30.7	Siltstone/sandstone	Nil	Not found. Possibly decommissioned.
	SMW_BH121	Deep Rock	4.15	–3 - 16	Siltstone	WQ/EC/L	
Sydney Olympic Park	SMW_BH120	Deep Rock	17.38	22–5 - 25.5	Siltstone/sandstone	WQ/EC/L	
	SMW_BH019	Deep Rock	17.33	22–5 - 25.5	Siltstone	Nil	Not found. Possibly decommissioned.
	SMW_BH015	Deep Rock	22.94	25–2 - 28.2	Siltstone	Nil	Has been decommissioned during construction.
	SMW_BH015_s	Shallow Rock	22.02	1–5 - 4.5	Siltstone/sandstone	Nil	Has been decommissioned during construction.
	SMW_BH032	Deep Rock	19.74	–8 - 22	Siltstone	EC/L	WQ will be sampled in pre-construction baseline sampling.
	SMW_BH032_s	Shallow Rock	19.76	3.5 – 7.25	Siltstone	EC/L	Likely to be dry and unable to be sampled.
	SMW_BH068	Deep Rock	23.64	22.2 – 25.1	Siltstone/sandstone	Nil	Located inside site, and decommissioned due to construction purposes.

Location	Bore ID	Depth classification	Ground surface elevation (mAHD)	Screened interval (m)	Screened aquifer	Monitoring*	Comments
	SMW_BH068_s	Shallow Rock	23.36	2.6 – 4.3	Siltstone/sandstone	Nil	Located inside site, and decommissioned due to construction purposes.
	SMW_BH126	Deep Rock	11.4	9.2 -12.2	Fill/ Siltstone	WQ/EC/L	
Tunnel – SOP to NS	SMW_BH069	Deep Rock	7.96	19.4 – 22.4	Unknown	Nil	No monitoring proposed.
	SMW_BH033	Deep Rock	6.82	8.5 – 11.5	Siltstone	Nil	No monitoring proposed.
	SMW_BH034	Deep Rock	2.44	26.2 – 29.2	Sandstone	Nil	No monitoring proposed.
	SMW_BH036		4.28			WQ/EC/L	
North Strathfield	SMW_BH038	Deep Rock	9.91	26.0 – 32.0	Siltstone/sandstone	WQ/EC/L	
	SMW_BH009	Deep Rock	18.45	37.45 – 40.45	Sandstone	L	
	SMW_BH009_s	Shallow Rock	18.6	1.0 – 5.0	Gravelly clay/siltstone	L	
	SMW_BH073	Shallow Rock	18.93	10.2 – 13.2	Siltstone	Nil	D Decommissioned during construction – No monitoring proposed.

Location	Bore ID	Depth classification	Ground surface elevation (mAHD)	Screened interval (m)	Screened aquifer	Monitoring*	Comments
	SMW_BH035	Deep Rock	26.74	33.5 – 45.5	Siltstone/sandstone	WQ/EC/L	
	SMW_BH035_s	Shallow Rock	26.62	1.7 – 3.2	Siltstone	WQ/EC/L	
Tunnel – NS to B	SMW_BH040	Deep Rock	23.06	45.0 – 54.0	Sandstone	EC/L	
Burwood	SMW_BH044	Deep Rock	22.6	22.5 – 34.5	Siltstone/sandstone	WQ/EC/L	
	SMW_BH046	Deep Rock	6.47	6.0 – 15.0	Siltstone/sandstone	Nil	Has been decommissioned due to Concord Oval works.
	SMW_BH046_s	Shallow Sediments	6.47	1.3 – 3.1	Clay	L	Depth measured by live datalogger.
	SMW_BH046_R		7.26			WQ/EC/L	Replaced BH046_S for monitoring purposes.
Five Dock	SMW_BH050	Deep Rock	24.34	9.0 – 24.5	Siltstone/sandstone	WQ/EC/L	
	SMW_BH050_s	Shallow Sediments	24.35	0.4 – 1.3	Gravelly clay	WQ/EC/L	Likely to be dry and unable to be sampled.
	SMW_BH082	Deep Rock	18.04	9.3 – 12.4	Siltstone/sandstone	Nil	Has been decommissioned during construction.

Location	Bore ID	Depth classification	Ground surface elevation (mAHD)	Screened interval (m)	Screened aquifer	Monitoring*	Comments
	SMW_BH051	Deep Rock	21.68	7.0 – 10.0	Siltstone/sandstone	WQ/EC/L	Likely to be dry and unable to be sampled.
	SMW_BH051_s	Shallow Sediments	21.66	0.8 – 2.0	Silty clay	WQ/EC/L	Likely to be dry and unable to be sampled.
The Bays	SMW_ENV020	Deep Sediments	2.94	9.0 – 15.0	Sand/ Silty clay/ Sand/ Silt	Nil	Has been destroyed during construction.
	SMW_ENV020_s	Shallow Sediments	2.94	2.5 – 5.5	Sand/ Silty sand	Nil	Has been destroyed during construction.
	SMW_ENV021	Deep Sediments	3.09	9.4 – 14.4	Core loss/ Sand	Nil	Has been damaged due to pre-excavation grouting. Not sampled.
	SMW_ENV021_s	Shallow Sediments	3.09	2.2 – 4.6	Silty sand/ Sand	Nil	Has been damaged due to pre-excavation grouting. Not sampled.
	SMW_ENV026	Shallow Sediments	4.23	3.5 – 6.5	Sand/ Silty sand	Nil	Has been destroyed during construction.
	SMW_ENV027	Shallow Sediments	3.58	2.0 – 5.0	Fill/ Sand/ Clay	Nil	Has been destroyed during construction.
	SMW_BH066	Deep Rock	4.14	27.2 – 30.2	Sandstone	Nil	Has been destroyed during construction.

Location	Bore ID	Depth classification	Ground surface elevation (mAHD)	Screened interval (m)	Screened aquifer	Monitoring*	Comments
	SMW_BH066_s	Shallow Sediments	4.14	2.0 – 6.0	Fill/ Sand/ Silty sand	Nil	Has been destroyed during construction.
	SMW_ENV034	Deep Sediments	3.17	7.9 – 9.3	Sand/Sandy clay/ Clayey sand	Nil	Has been decommissioned during construction.
	SMW_BH067	Deep Rock	2.93	12.5 – 15.5	Sandstone	Nil	Has been decommissioned during construction.
	SMW_BH067_s	Shallow Rock	2.92	2.5 – 6.0	Sandstone	Nil	Has been destroyed during construction.
	S02_s	Shallow sediment	3.11	0.7 – 6		WQ/EC/L	
	S02_d	Deep Rock	3.11	11 – 15.1	Fill/ Sand/ Silty sand	WQ/EC/L	
	S06	Deep Rock	3.13	13.5 – 20.44	Sandstone	WQ/EC/L	
	S40_s	Shallow sediments	3.60	0.5 – 8	Fill/ Sand/ Silty sand	WQ/EC/L	Under boundary handover. ETP after
	S40_d	Deep rock	3.68	8.7 – 15.2	Sandstone	WQ/EC/L	Under boundary handover. ETP after
	S51	Shallow sediments	4.15	0.8 – 6.2	Fill/ Sand/ Silty sand	Nil	Has been decommissioned due to construction.

Location	Bore ID	Depth classification	Ground surface elevation (mAHD)	Screened interval (m)	Screened aquifer	Monitoring*	Comments
	AF_CGW1	Shallow sediments	4.15	4.5-10	Alluvium	WQ/EC/L	Replacement for S51. Shallow well, unable to extract sample.
	S54	Deep rock	3.59	12 – 17.5	Sandstone	WQ/EC/L	
	S55	Shallow sediments	3.13	0.5 – 6.22	Fill/ Sand/ Silty sand	Nil	Under boundary handover. ETP after
	S58_s	Shallow sediment	3.24	0.7 – 6	Fill/ Sand/ Silty sand	Nil	Under boundary handover. ETP after
	S58_d	Deep rock	3.22	18 – 21.5	Sandstone	Nil	Under boundary handover. ETP after

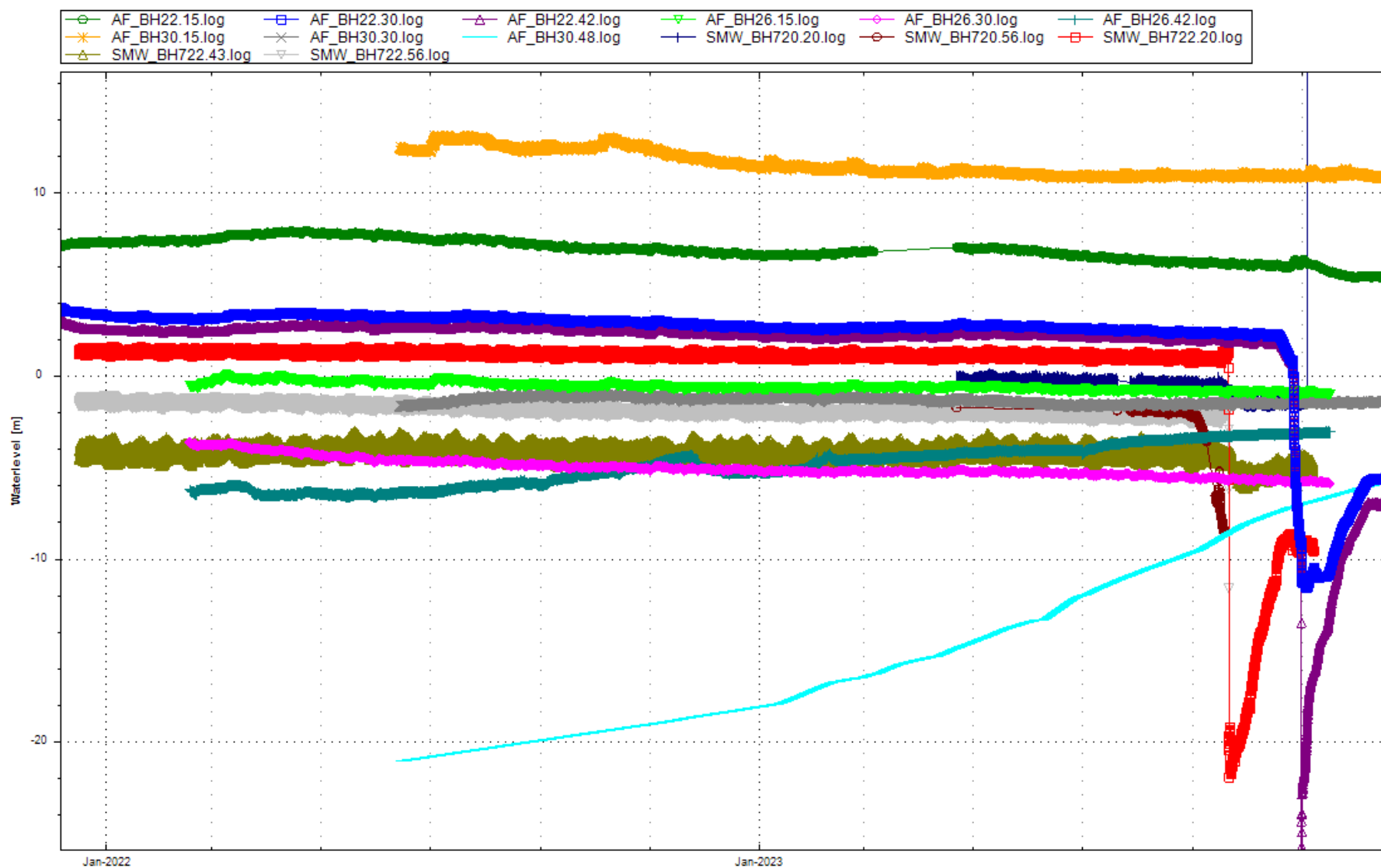
WQ = Water Quality Monitoring. EC = Electrical Conductivity Monitoring. L = Groundwater level monitoring

*Due to a number of monitoring bores being located within the extent of the station boxes or tunnel alignment, which will be destroyed during construction, these monitoring wells will not be monitored during construction. Monitoring may still occur at these locations prior to construction to assist in gathering baseline information.

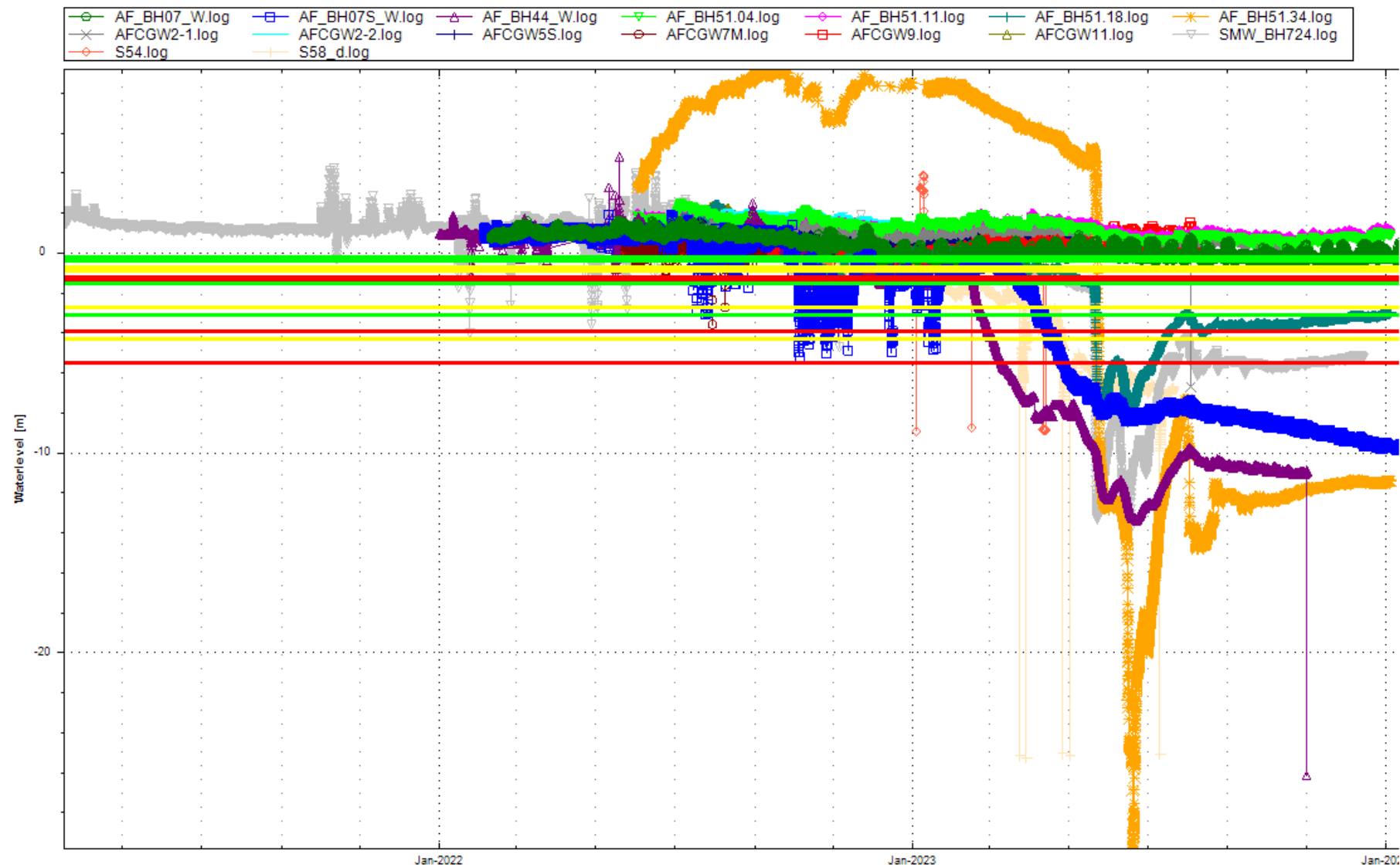
LIVE DATALOGGER BOREHOLES					
TBM Alignment Water Levels	THE BAYS	FIVE DOCK	BURWOOD	NORTH STRATHFIELD	SYDNEY OLYMPIC PARK
AF_BH22.15	AF_BH07_W	SMW_BH050_s	SMW_BH044w	SMW_BH009_s	SMW_BH019_w
AF_BH22.30	AF_BH07S_W	SMW_BH050_w	SMW_BH046s	SMW_BH009_w	SMW_BH032_S
AF_BH22.42	AF_BH44_W	SMW_BH051_s	SMW_BH046w	SMW_BH035_s	SMW_BH032_W
AF_BH26.15	AF_BH51.04	SMW_BH051_w	BH1326	SMW_BH035_w	SMW_BH068
AF_BH26.30	AF_BH51.11	R248_3103_BH141A	BH1336	SMW_BH038_w	SMW_BH068S
AF_BH26.42	AF_BH51.18	SMW_BH719	BH714_s		SMW_BH120_W
AF_BH30.15	AF_BH51.34		BH714_w		SMW_ENV712d
AF_BH30.30	AF_BHCGW2-1		SMW_BHCINT01		SMW_ENV712s
AF_BH30.48	AFGW2-2		SMW_BHCINT02		SMW_ENV714_W
AF_BH36	AFGW2-1		SMW_BHCINT03		SMW_ENV715
AF_BH36s	AFGW5S				
AF_BH37	AFGW7M				
AF_BH37s	AFGW9				
AF_BH38	AFGW11				
AF_BH38s	SMW_BH724				
SMW_BH062.032	S54				
SMW_BH062.062	S58_d				
SMW_BH062.104					
SMW_BH069_w					
SMW_BH126_w					
SMW_BH710_v					
SMW_BH720.20					
SMW_BH720.56					
SMW_BH722.20					
SMW_BH722.43					
SMW_BH722.56					
BN_W1					
SMW_ENV715B_w					
SOP_W1					

Month	Location	Borehole Number	Temperature	Ph	Electrical Conductivity (	Dissolved Oxygen (mg/l)	Redox (mV)	Visual (turbidity, odc	Water level (mTOC)	Sampled/ Gauged	Monitoring
June	BWD	BH046s	21.6	6.5	10111	22.5	-23.2		-14.4	sampled	WQ/EC/L
November	BWD	BH046s	21.9	6.68	10368	29.52	ND	Light Turbidity	14.5	Sampled	WQ/EC/L
September	FDK	BH050_d	21.3	5.96	7291	1.4	-63.3	Turbid, grey water	6.23	Sampled	WQ/EC/L
November	FDK	BH050_d	-	-	-	-	-	-	25.4	Gauged	WQ/EC/L
November	FDK	BH050_s	22.1	6.17	402.1	23.14	152.2	Mild Turbidity	0.2	Sampled	WQ/EC/L
June	FDK	BH051_d	21	6.3	1209	7.82	-138.9		23.6	sampled	WQ/EC/L
September	FDK	BH051_d	21.2	6.9	9515	4.31	-140.5	Turbid water	23.99	Sampled	WQ/EC/L
September	FDK	BH051_s	16.6	6.07	481.2	2.72	-3.9	Turbid water	0.745	Sampled	WQ/EC/L
November	FDK	BH051_s	20.3	6.5	277.5	72.88	162	Clear Water	5.5	Sampled	WQ/EC/L
November	NST	BH009s	23.7	6.74	1097	45.08	157	odour, slightly turbid	4.2	Sampled	WQ/EC/L
September	NST	BH035d	19.8	6.47	16423	1.84	-172	odour, slightly turbid	>30 m	Sampled	WQ/EC/L
November	NST	BH035d	20.7	6.53	14953	29.92	172.1	odour, slightly turbid	>30 m	Sampled	WQ/EC/L
September	NST	BH035s	20.2	5.11	4374	2.44	-44.5	High Turbidity	1.711	Sampled	WQ/EC/L
November	NST	BH035s	21.5	5.19	4334	34.44	119	High Turbidity	2	Sampled	WQ/EC/L
November	NST	BH038	20.7	11.66	2817	71.95	54.6	odour, No turbidity	16.6	Sampled	WQ/EC/L
June	SOP	BH019	22.1	6.56	1302	7.6	-167		15.9	Sampled	WQ/EC/L
September	SOP	BH019	22.9	6.92	720	4.3	-120.8		15.823	Sampled	WQ/EC/L
December	SOP	BH019	22.2	6.79	4994	30.32	-1973	r smell, low turbidity	16.36	Sampled	WQ/EC/L
June	SOP	BH032	21	6.5	1139	2.6	-156		8.91	Sampled	WQ/EC/L
September	SOP	BH032	20.7	6.6	3678	1.96	-223.5		9	Sampled	WQ/EC/L
June	SOP	BH036	19	6	5402	2.9	-138.2		5.3	Sampled	WQ/EC/L
September	SOP	BH036	19.8	5.63	2368	19.95	-57.6		5.291	Sampled	WQ/EC/L
December	SOP	BH036	21.9	6	342	56.2	-60		5.43	Sampled	WQ/EC/L
June	SOP	BH120	21	6.62	11169	14.6	-20		21.2	Sampled	WQ/EC/L
September	SOP	BH120	21.1	6.61	18159	2.76	-38		20.7	Sampled	WQ/EC/L
December	SOP	BH120	22	6.44	10609	48.5	9		21.89	Sampled	WQ/EC/L
June	SOP	BH126	22	7.6	9505	13.6	120.2		4.1	Sampled	WQ/EC/L
September	SOP	BH126	22.5	7.83	8906	1.13	51.4		4.16	Sampled	WQ/EC/L
December	SOP	BH126	21.9	7.52	14230	19.95	-2.2		3.68	Sampled	WQ/EC/L
September	SOP	BH715b	21.1	6.9	15230	4.59	-18.3		12.81	Sampled	WQ/EC/L
December	SOP	BH715b	22.5	6.69	18681	47.08	-91.3		13.6	Sampled	WQ/EC/L
June	TBY	S02d	21	7.5	1019	7.91	-22.6		5	sampled	WQ/EC/L
September	TBY	S02d	20.2	7.73	1016	1.69	-11.6	-	4.66	Sampled	WQ/EC/L
June	TBY	S02s	20.2	7.5	1112	19.9	-56.6		2.9	Sampled	WQ/EC/L
September	TBY	S02s	-	-	-	-	-	-	2.82	Gauged	WQ/EC/L
December	TBY	S02s	20.7	7.35	3595	14.7	-22.6	Sulfur smell,, Turbid	4.36	Sampled	WQ/EC/L
September	TBY	S06	22.77	7.12	1022	6.19	1.94		4.94	Sampled	WQ/EC/L
December	TBY	S06	21.1	6.74	624	9	-270	-	3.98	Sampled	WQ/EC/L
December	TBY	S54	-	-	-	-	-	-	4.41	Gauged	WQ/EC/L

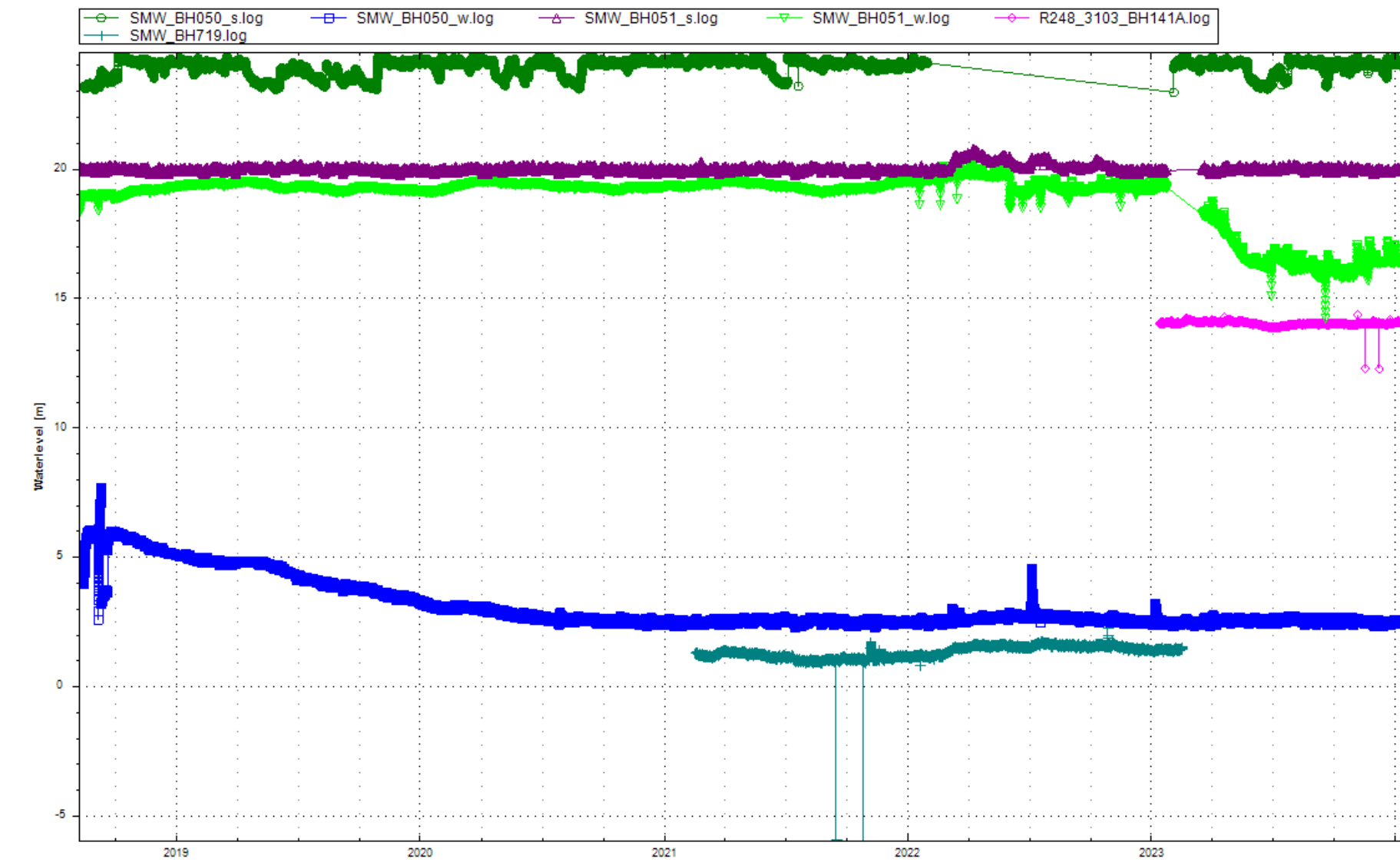
TBM Alignment water levels



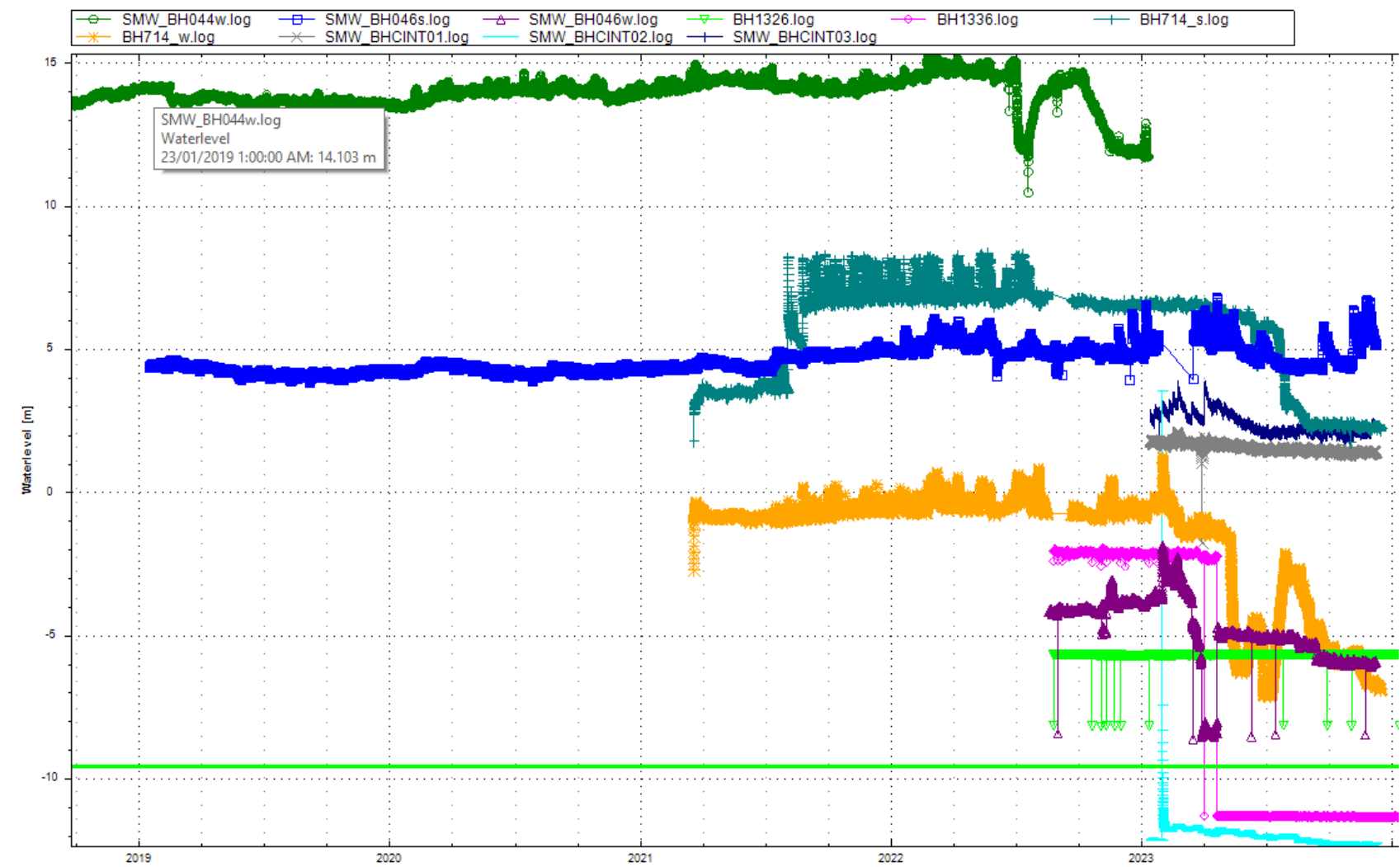
TBY Water Levels



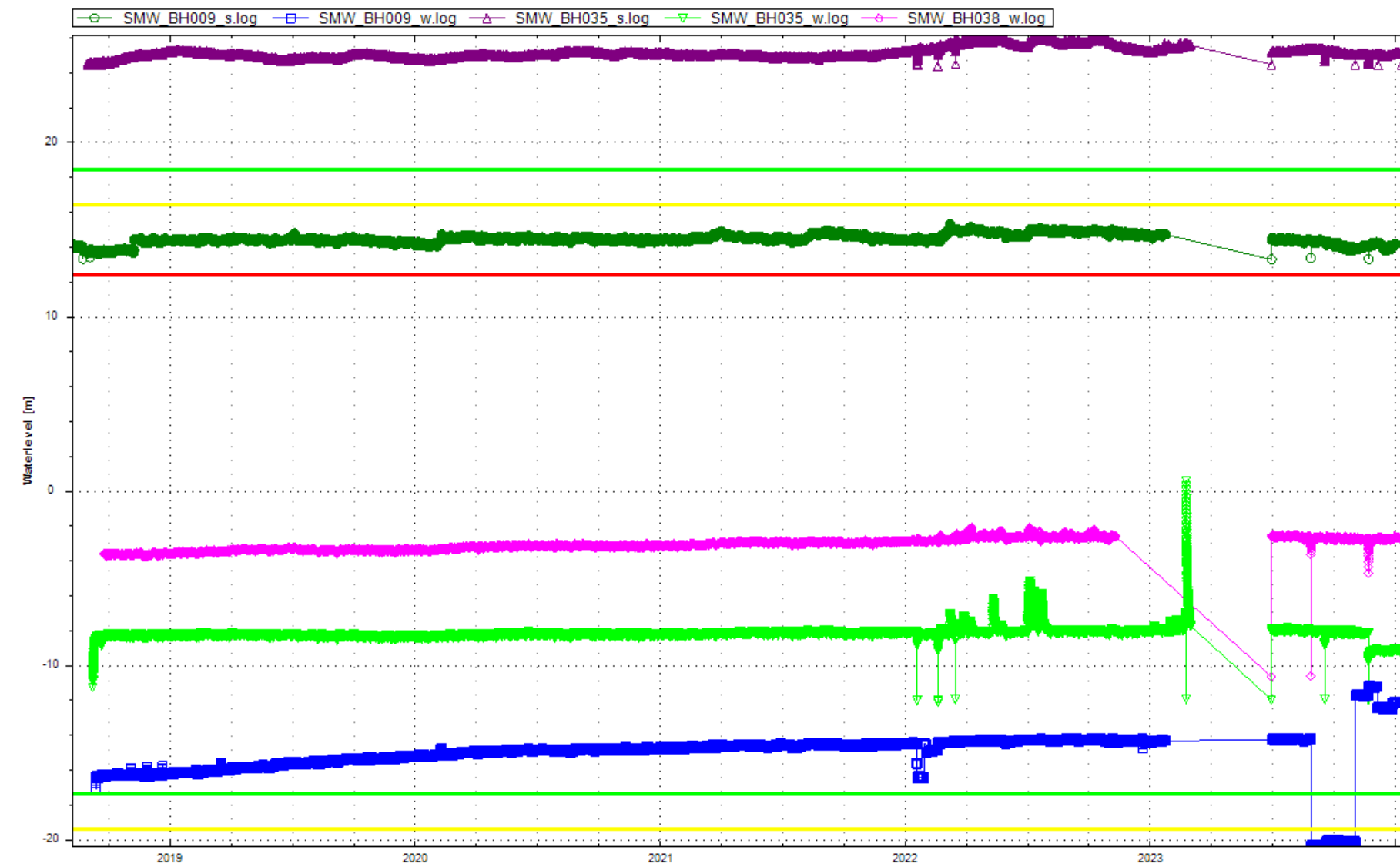
FDK Water Levels



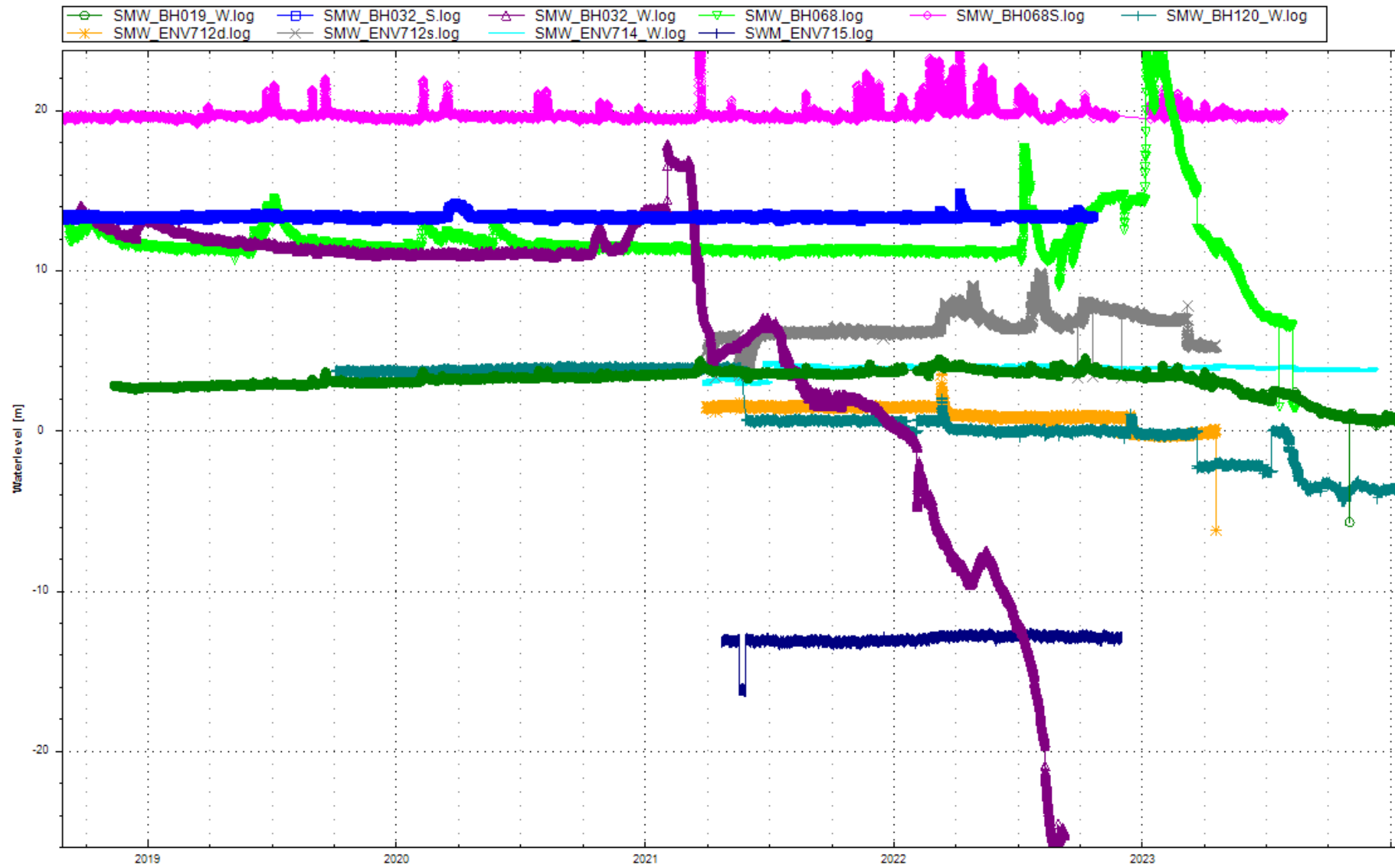
Burwood Water Levels



North Strathfield



Sydney Olympic Park Water Levels



[illegible]

[illegible]

System name	Type	Size	1997-1999										1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031	2031-2032	2032-2033	2033-2034	2034-2035	2035-2036	2036-2037	2037-2038	2038-2039	2039-2040	2040-2041	2041-2042	2042-2043	2043-2044	2044-2045	2045-2046	2046-2047	2047-2048	2048-2049	2049-2050	2050-2051	2051-2052	2052-2053	2053-2054	2054-2055	2055-2056	2056-2057	2057-2058	2058-2059	2059-2060	2060-2061	2061-2062	2062-2063	2063-2064	2064-2065	2065-2066	2066-2067	2067-2068	2068-2069	2069-2070	2070-2071	2071-2072	2072-2073	2073-2074	2074-2075	2075-2076	2076-2077	2077-2078	2078-2079	2079-2080	2080-2081	2081-2082	2082-2083	2083-2084	2084-2085	2085-2086	2086-2087	2087-2088	2088-2089	2089-2090	2090-2091	2091-2092	2092-2093	2093-2094	2094-2095	2095-2096	2096-2097	2097-2098	2098-2099	2099-2100	2100-2101	2101-2102	2102-2103	2103-2104	2104-2105	2105-2106	2106-2107	2107-2108	2108-2109	2109-2110	2110-2111	2111-2112	2112-2113	2113-2114	2114-2115	2115-2116	2116-2117	2117-2118	2118-2119	2119-2120	2120-2121	2121-2122	2122-2123	2123-2124	2124-2125	2125-2126	2126-2127	2127-2128	2128-2129	2129-2130	2130-2131	2131-2132	2132-2133	2133-2134	2134-2135	2135-2136	2136-2137	2137-2138	2138-2139	2139-2140	2140-2141	2141-2142	2142-2143	2143-2144	2144-2145	2145-2146	2146-2147	2147-2148	2148-2149	2149-2150	2150-2151	2151-2152	2152-2153	2153-2154	2154-2155	2155-2156	2156-2157	2157-2158	2158-2159	2159-2160	2160-2161	2161-2162	2162-2163	2163-2164	2164-2165	2165-2166	2166-2167	2167-2168	2168-2169	2169-2170	2170-2171	2171-2172	2172-2173	2173-2174	2174-2175	2175-2176	2176-2177	2177-2178	2178-2179	2179-2180	2180-2181	2181-2182	2182-2183	2183-2184	2184-2185	2185-2186	2186-2187	2187-2188	2188-2189	2189-2190	2190-2191	2191-2192	2192-2193	2193-2194	2194-2195	2195-2196	2196-2197	2197-2198	2198-2199	2199-2200	2200-2201	2201-2202	2202-2203	2203-2204	2204-2205	2205-2206	2206-2207	2207-2208	2208-2209	2209-2210	2210-2211	2211-2212	2212-2213	2213-2214	2214-2215	2215-2216	2216-2217	2217-2218	2218-2219	2219-2220	2220-2221	2221-2222	2222-2223	2223-2224	2224-2225	2225-2226	2226-2227	2227-2228	2228-2229	2229-2230	2230-2231	2231-2232	2232-2233	2233-2234	2234-2235	2235-2236	2236-2237	2237-2238	2238-2239	2239-2240	2240-2241	2241-2242	2242-2243	2243-2244	2244-2245	2245-2246	2246-2247	2247-2248	2248-2249	2249-2250	2250-2251	2251-2252	2252-2253	2253-2254	2254-2255	2255-2256	2256-2257	2257-2258	2258-2259	2259-2260	2260-2261	2261-2262	2262-2263	2263-2264	2264-2265	2265-2266	2266-2267	2267-2268	2268-2269	2269-2270	2270-2271	2271-2272	2272-2273	2273-2274	2274-2275	2275-2276	2276-2277	2277-2278	2278-2279	2279-2280	2280-2281	2281-2282	2282-2283	2283-2284	2284-2285	2285-2286	2286-2287	2287-2288	2288-2289	2289-2290	2290-2291	2291-2292	2292-2293	2293-2294	2294-2295	2295-2296	2296-2297	2297-2298	2298-2299	2299-2300	2300-2301	2301-2302	2302-2303	2303-2304	2304-2305	2305-2306	2306-2307	2307-2308	2308-2309	2309-2310	2310-2311	2311-2312	2312-2313	2313-2314	2314-2315	2315-2316	2316-2317	2317-2318	2318-2319	2319-2320	2320-2321	2321-2322	2322-2323	2323-2324	2324-2325	2325-2326	2326-2327	2327-2328	2328-2329	2329-2330	2330-2331	2331-2332	2332-2333	2333-2334	2334-2335	2335-2336	2336-2337	2337-2338	2338-2339	2339-2340	2340-2341	2341-2342	2342-2343	2343-2344	2344-2345	2345-2346	2346-2347	2347-2348	2348-2349	2349-2350	2350-2351	2351-2352	2352-2353	2353-2354	2354-2355	2355-2356	2356-2357	2357-2358	2358-2359	2359-2360	2360-2361	2361-2362	2362-2363	2363-2364	2364-2365	2365-2366	2366-2367	2367-2368	2368-2369	2369-2370	2370-2371	2371-2372	2372-2373	2373-2374	2374-2375	2375-2376	2376-2377	2377-2378	2378-2379	2379-2380	2380-2381	2381-2382	2382-2383	2383-2384	2384-2385	2385-2386	2386-2387	2387-2388	2388-2389	2389-2390	2390-2391	2391-2392	2392-2393	2393-2394	2394-2395	2395-2396	2396-2397	2397-2398	2398-2399	2399-2400	2400-2401	2401-2402	2402-2403	2403-2404	2404-2405	2405-2406	2406-2407	2407-2408	2408-2409	2409-2410	2410-2411	2411-2412	2412-2413	2413-2414	2414-2415	2415-2416	2416-2417	2417-2418	2418-2419	2419-2420	2420-2421	2421-2422	2422-2423	2423-2424	2424-2425	2425-2426	2426-2427	2427-2428	2428-2429	2429-2430	2430-2431	2431-2432	2432-2433	2433-2434	2434-2435	2435-2436	2436-2437	2437-2438	2438-2439	2439-2440	2440-2441	2441-2442	2442-2443	2443-2444	2444-2445	2445-2446	2446-2447	2447-2448	2448-2449	2449-2450	2450-2451	2451-2452	2452-2453	2453-2454	2454-2455	2455-2456	2456-2457	2457-2458	2458-2459	2459-2460	2460-2461	2461-2462	2462-2463	2463-2464	2464-2465	2465-2466	2466-2467	2467-2468	2468-2469	2469-2470	2470-2471	2471-2472	2472-2473	2473-2474	2474-2475	2475-2476	2476-2477	2477-2478	2478-2479	2479-2480	2480-2481	2481-2482	2482-2483	2483-2484	2484-2485	2485-2486	2486-2487	2487-2488	2488-2489	2489-2490	2490-2491	2491-2492	2492-2493	2493-2494	2494-2495	2495-2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Entity		Year		2013-2014		2014-2015		2015-2016		2016-2017		2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		2022-2023		2023-2024		2024-2025		2025-2026		2026-2027		2027-2028		2028-2029		2029-2030		2030-2031		2031-2032		2032-2033		2033-2034		2034-2035		2035-2036		2036-2037		2037-2038		2038-2039		2039-2040		2040-2041		2041-2042		2042-2043		2043-2044		2044-2045		2045-2046		2046-2047		2047-2048		2048-2049		2049-2050		2050-2051		2051-2052		2052-2053		2053-2054		2054-2055		2055-2056		2056-2057		2057-2058		2058-2059		2059-2060		2060-2061		2061-2062		2062-2063		2063-2064		2064-2065		2065-2066		2066-2067		2067-2068		2068-2069		2069-2070		2070-2071		2071-2072		2072-2073		2073-2074		2074-2075		2075-2076		2076-2077		2077-2078		2078-2079		2079-2080		2080-2081		2081-2082		2082-2083		2083-2084		2084-2085		2085-2086		2086-2087		2087-2088		2088-2089		2089-2090		2090-2091		2091-2092		2092-2093		2093-2094		2094-2095		2095-2096		2096-2097		2097-2098		2098-2099		2099-2100		2100-2101		2101-2102		2102-2103		2103-2104		2104-2105		2105-2106		2106-2107		2107-2108		2108-2109		2109-2110		2110-2111		2111-2112		2112-2113		2113-2114		2114-2115		2115-2116		2116-2117		2117-2118		2118-2119		2119-2120		2120-2121		2121-2122		2122-2123		2123-2124		2124-2125		2125-2126		2126-2127		2127-2128		2128-2129		2129-2130		2130-2131		2131-2132		2132-2133		2133-2134		2134-2135		2135-2136		2136-2137		2137-2138		2138-2139		2139-2140		2140-2141		2141-2142		2142-2143		2143-2144		2144-2145		2145-2146		2146-2147		2147-2148		2148-2149		2149-2150		2150-2151		2151-2152		2152-2153		2153-2154		2154-2155		2155-2156		2156-2157		2157-2158		2158-2159		2159-2160		2160-2161		2161-2162		2162-2163		2163-2164		2164-2165		2165-2166		2166-2167		2167-2168		2168-2169		2169-2170		2170-2171		2171-2172		2172-2173		2173-2174		2174-2175		2175-2176		2176-2177		2177-2178		2178-2179		2179-2180		2180-2181		2181-2182		2182-2183		2183-2184		2184-2185		2185-2186		2186-2187		2187-2188		2188-2189		2189-2190		2190-2191		2191-2192		2192-2193		2193-2194		2194-2195		2195-2196		2196-2197		2197-2198		2198-2199		2199-2200		2200-2201		2201-2202		2202-2203		2203-2204		2204-2205		2205-2206		2206-2207		2207-2208		2208-2209		2209-2210		2210-2211		2211-2212		2212-2213		2213-2214		2214-2215		2215-2216		2216-2217		2217-2218		2218-2219		2219-2220		2220-2221		2221-2222		2222-2223		2223-2224		2224-2225		2225-2226		2226-2227		2227-2228		2228-2229		2229-2230		2230-2231		2231-2232		2232-2233		2233-2234		2234-2235		2235-2236		2236-2237		2237-2238		2238-2239		2239-2240		2240-2241		2241-2242		2242-2243		2243-2244		2244-2245		2245-2246		2246-2247		2247-2248		2248-2249		2249-2250		2250-2251		2251-2252		2252-2253		2253-2254		2254-2255		2255-2256		2256-2257		2257-2258		2258-2259		2259-2260		2260-2261		2261-2262		2262-2263		2263-2264		2264-2265		2265-2266		2266-2267		2267-2268		2268-2269		2269-2270		2270-2271		2271-2272		2272-2273		2273-2274		2274-2275		2275-2276		2276-2277		2277-2278		2278-2279		2279-2280		2280-2281		2281-2282		2282-2283		2283-2284		2284-2285		2285-2286		2286-2287		2287-2288		2288-2289		2289-2290		2290-2291		2291-2292		2292-2293		2293-2294		2294-2295		2295-2296		2296-2297		2297-2298		2298-2299		2299-2300		2300-2301		2301-2302		2302-2303		2303-2304		2304-2305		2305-2306		2306-2307		2307-2308		2308-2309		2309-2310		2310-2311		2311-2312		2312-2313		2313-2314		2314-2315		2315-2316		2316-2317		2317-2318		2318-2319		2319-2320		2320-2321		2321-2322		2322-2323		2323-2324		2324-2325		2325-2326		2326-2327		2327-2328		2328-2329		2329-2330		2330-2331		2331-2332		2332-2333		2333-2334		2334-2335		2335-2336		2336-2337		2337-2338		2338-2339		2339-2340		2340-2341		2341-2342		2342-2343		2343-2344		2344-2345		2345-2346		2346-2347		2347-2348		2348-2349		2349-2350		2350-2351		2351-2352		2352-2353		2353-2354		2354-2355		2355-2356		2356-2357		2357-2358		2358-2359		2359-2360		2360-2361		2361-2362		2362-2363		2363-2364		2364-2365		2365-2366		2366-2367		2367-2368		2368-2369		2369-2370		2370-2371		2371-2372		2372-2373		2373-2374		2374-2375		2375-2376		2376-2377		2377-2378		2378-2379		2379-2380		2380-2381		2381-2382		2382-2383		2383-2384		2384-2385		2385-2386		2386-2387		2387-2388		2388-2389		2389-2390		2390-2391		2391-2392		2392-2393		2393-2394		2394-2395		2395-2396		2396-2397		2397-2398		2398-2399		2399-2400		2400-2401		2401-2402		2402-2403		2403-2404		2404-2405		2405-2406		2406-2407		2407-2408		2408-2409		2409-2410		2410-2411		2411-2412		2412-2413		2413-2414		2414-2415		2415-2416		2416-2417		2417-2418		2418-2419		2419-2420		2420-2421		2421-2422		2422-2423		2423-2424		2424-2425		2425-2426		2426-2427		2427-2428		2428-2429		2429-2430		2430-2431		2431-2432		2432-2433		2433-2434		2434-2435		2435-2436		2436-2437		2437-2438		2438-2439		2439-2440		2440-2441		2441-2442		2442-2443		2443-2444		2444-2445		2445-2446		2446-2447		2447-2448		2448-2449		2449-2450		2450-2451		2451-2452		2452-2453		2453-2454		2454-2455		2455-2456		2456-2457		2457-2458		2458-2459		2459-2460		2460-2461		2461-2462		2462-2463		2463-2464		2464-2465		2465-2466		246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CERTIFICATE OF ANALYSIS 326799

Client Details

Client	CTP AFJV
Attention	
Address	7 Figtree Dr, SYDNEY OLYMPIC PARK, NSW, 2127

Sample Details

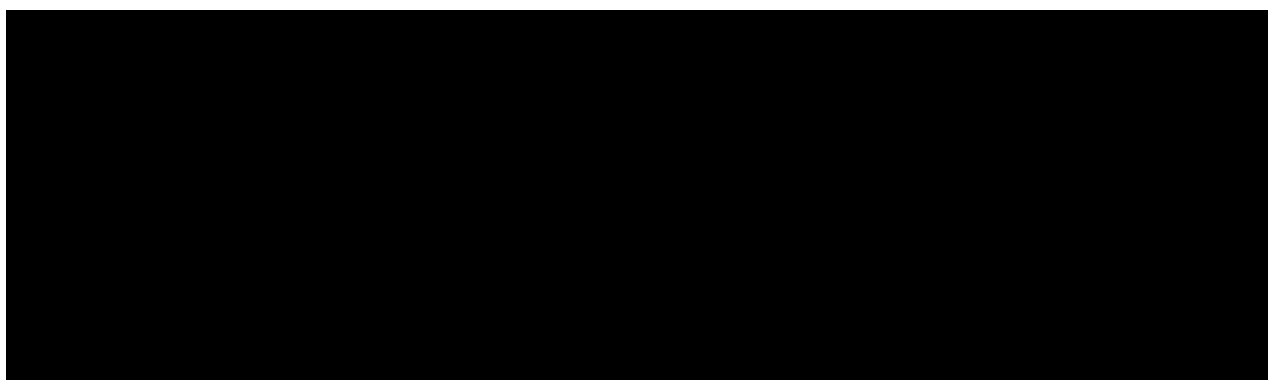
Your Reference	<u>CTP Groundwater Monitoring</u>
Number of Samples	12 Water
Date samples received	28/06/2023
Date completed instructions received	29/06/2023

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	06/07/2023
Date of Issue	06/07/2023
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Client Reference: CTP Groundwater Monitoring

VOCs in water						
Our Reference		326799-1	326799-2	326799-3	326799-4	326799-5
Your Reference	UNITS	BH120	BH032d	BH121	BH126	BH_715B
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	30/06/2023	30/06/2023	30/06/2023	30/06/2023	30/06/2023
Date analysed	-	03/07/2023	03/07/2023	03/07/2023	03/07/2023	03/07/2023
Dichlorodifluoromethane	µg/L	<10	<10	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<1	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1	2	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1
Benzene	µg/L	<1	<1	<1	18	<1
Dibromomethane	µg/L	<1	<1	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1	9.9	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
Bromoform	µg/L	<1	<1	<1	<1	<1

Client Reference: CTP Groundwater Monitoring

VOCs in water						
Our Reference		326799-1	326799-2	326799-3	326799-4	326799-5
Your Reference	UNITS	BH120	BH032d	BH121	BH126	BH_715B
Type of sample		Water	Water	Water	Water	Water
m+p-xylene	µg/L	<2	<2	<2	<2	<2
Styrene	µg/L	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
o-xylene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1	1	<1
Bromobenzene	µg/L	<1	<1	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	109	110	111	105	104
Surrogate toluene-d8	%	98	98	100	99	96
Surrogate 4-BFB	%	104	104	105	104	105

Client Reference: CTP Groundwater Monitoring

VOCs in water						
Our Reference	UNITS	326799-6	326799-7	326799-8	326799-9	326799-10
Your Reference		AF_BH36	MW001S	MW001d	MW003S	SOP_W2
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	30/06/2023	30/06/2023	30/06/2023	30/06/2023	30/06/2023
Date analysed	-	03/07/2023	03/07/2023	03/07/2023	03/07/2023	03/07/2023
Dichlorodifluoromethane	µg/L	<10	<10	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<1	<1	1
2,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1
Benzene	µg/L	<1	<1	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	1	<1	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
Bromoform	µg/L	<1	<1	<1	<1	<1

Client Reference: CTP Groundwater Monitoring

VOCs in water						
Our Reference		326799-6	326799-7	326799-8	326799-9	326799-10
Your Reference	UNITS	AF_BH36	MW001S	MW001d	MW003S	SOP_W2
Type of sample		Water	Water	Water	Water	Water
m+p-xylene	µg/L	<2	<2	<2	<2	<2
Styrene	µg/L	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
o-xylene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	109	112	111	112	109
Surrogate toluene-d8	%	98	97	100	98	97
Surrogate 4-BFB	%	103	106	104	104	105

VOCs in water		
Our Reference		326799-11
Your Reference	UNITS	MW003d
Type of sample		Water
Date extracted	-	30/06/2023
Date analysed	-	03/07/2023
Dichlorodifluoromethane	µg/L	<10
Chloromethane	µg/L	<10
Vinyl Chloride	µg/L	<10
Bromomethane	µg/L	<10
Chloroethane	µg/L	<10
Trichlorofluoromethane	µg/L	<10
1,1-Dichloroethene	µg/L	<1
Trans-1,2-dichloroethene	µg/L	<1
1,1-dichloroethane	µg/L	<1
Cis-1,2-dichloroethene	µg/L	<1
Bromochloromethane	µg/L	<1
Chloroform	µg/L	<1
2,2-dichloropropane	µg/L	<1
1,2-dichloroethane	µg/L	<1
1,1,1-trichloroethane	µg/L	<1
1,1-dichloropropene	µg/L	<1
Cyclohexane	µg/L	<1
Carbon tetrachloride	µg/L	<1
Benzene	µg/L	<1
Dibromomethane	µg/L	<1
1,2-dichloropropane	µg/L	<1
Trichloroethene	µg/L	<1
Bromodichloromethane	µg/L	<1
trans-1,3-dichloropropene	µg/L	<1
cis-1,3-dichloropropene	µg/L	<1
1,1,2-trichloroethane	µg/L	<1
Toluene	µg/L	<1
1,3-dichloropropane	µg/L	<1
Dibromochloromethane	µg/L	<1
1,2-dibromoethane	µg/L	<1
Tetrachloroethene	µg/L	<1
1,1,1,2-tetrachloroethane	µg/L	<1
Chlorobenzene	µg/L	<1
Ethylbenzene	µg/L	<1
Bromoform	µg/L	<1

VOCs in water		
Our Reference		326799-11
Your Reference	UNITS	MW003d
Type of sample		Water
m+p-xylene	µg/L	<2
Styrene	µg/L	<1
1,1,2,2-tetrachloroethane	µg/L	<1
o-xylene	µg/L	<1
1,2,3-trichloropropane	µg/L	<1
Isopropylbenzene	µg/L	<1
Bromobenzene	µg/L	<1
n-propyl benzene	µg/L	<1
2-chlorotoluene	µg/L	<1
4-chlorotoluene	µg/L	<1
1,3,5-trimethyl benzene	µg/L	<1
Tert-butyl benzene	µg/L	<1
1,2,4-trimethyl benzene	µg/L	<1
1,3-dichlorobenzene	µg/L	<1
Sec-butyl benzene	µg/L	<1
1,4-dichlorobenzene	µg/L	<1
4-isopropyl toluene	µg/L	<1
1,2-dichlorobenzene	µg/L	<1
n-butyl benzene	µg/L	<1
1,2-dibromo-3-chloropropane	µg/L	<1
1,2,4-trichlorobenzene	µg/L	<1
Hexachlorobutadiene	µg/L	<1
1,2,3-trichlorobenzene	µg/L	<1
Surrogate Dibromofluoromethane	%	110
Surrogate toluene-d8	%	99
Surrogate 4-BFB	%	103

Client Reference: CTP Groundwater Monitoring

vTRH(C6-C10)/BTEXN in Water						
Our Reference	UNITS	326799-1	326799-2	326799-3	326799-4	326799-5
Your Reference		BH120	BH032d	BH121	BH126	BH_715B
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	30/06/2023	30/06/2023	30/06/2023	30/06/2023	30/06/2023
Date analysed	-	03/07/2023	03/07/2023	03/07/2023	03/07/2023	03/07/2023
TRH C ₆ - C ₉	µg/L	<10	<10	<10	45	<10
TRH C ₆ - C ₁₀	µg/L	<10	<10	<10	49	<10
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	<10	<10	<10	26	<10
Benzene	µg/L	<1	<1	<1	23	<1
Toluene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
o-xylene	µg/L	<1	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	2	<1
Surrogate Dibromofluoromethane	%	109	110	111	105	104
Surrogate toluene-d8	%	98	98	100	99	96
Surrogate 4-BFB	%	104	104	105	104	105

vTRH(C6-C10)/BTEXN in Water						
Our Reference	UNITS	326799-6	326799-7	326799-8	326799-9	326799-10
Your Reference		AF_BH36	MW001S	MW001d	MW003S	SOP_W2
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	30/06/2023	30/06/2023	30/06/2023	30/06/2023	30/06/2023
Date analysed	-	03/07/2023	03/07/2023	03/07/2023	03/07/2023	03/07/2023
TRH C ₆ - C ₉	µg/L	<10	<10	<10	<10	<10
TRH C ₆ - C ₁₀	µg/L	<10	<10	<10	<10	<10
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	<10	<10	<10	<10	<10
Benzene	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
o-xylene	µg/L	<1	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	109	112	111	112	109
Surrogate toluene-d8	%	98	97	100	98	97
Surrogate 4-BFB	%	103	106	104	104	105

vTRH(C6-C10)/BTEXN in Water		
Our Reference		326799-11
Your Reference	UNITS	MW003d
Type of sample		Water
Date extracted	-	30/06/2023
Date analysed	-	03/07/2023
TRH C ₆ - C ₉	µg/L	<10
TRH C ₆ - C ₁₀	µg/L	<10
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	110
Surrogate toluene-d8	%	99
Surrogate 4-BFB	%	103

Client Reference: CTP Groundwater Monitoring

svTRH (C10-C40) in Water						
Our Reference		326799-1	326799-2	326799-3	326799-4	326799-5
Your Reference	UNITS	BH120	BH032d	BH121	BH126	BH_715B
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	30/06/2023	30/06/2023	30/06/2023	30/06/2023	30/06/2023
Date analysed	-	01/07/2023	01/07/2023	01/07/2023	01/07/2023	01/07/2023
TRH C ₁₀ - C ₁₄	µg/L	<50	110	<50	280	<50
TRH C ₁₅ - C ₂₈	µg/L	<100	170	<100	740	<100
TRH C ₂₉ - C ₃₆	µg/L	<100	<100	<100	100	<100
Total +ve TRH (C10-C36)	µg/L	<50	280	<50	1,100	<50
TRH >C ₁₀ - C ₁₆	µg/L	<50	140	<50	360	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	<50	140	<50	360	<50
TRH >C ₁₆ - C ₃₄	µg/L	<100	130	<100	690	<100
TRH >C ₃₄ - C ₄₀	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	270	<50	1,100	<50
Surrogate o-Terphenyl	%	77	80	86	72	71

svTRH (C10-C40) in Water						
Our Reference		326799-6	326799-7	326799-8	326799-9	326799-10
Your Reference	UNITS	AF_BH36	MW001S	MW001d	MW003S	SOP_W2
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	30/06/2023	30/06/2023	30/06/2023	30/06/2023	30/06/2023
Date analysed	-	01/07/2023	01/07/2023	01/07/2023	01/07/2023	01/07/2023
TRH C ₁₀ - C ₁₄	µg/L	180	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	µg/L	150	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	330	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆	µg/L	190	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	190	<50	<50	<50	<50
TRH >C ₁₆ - C ₃₄	µg/L	140	<100	<100	<100	<100
TRH >C ₃₄ - C ₄₀	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	320	<50	<50	<50	<50
Surrogate o-Terphenyl	%	82	78	77	73	69

svTRH (C10-C40) in Water		
Our Reference		326799-11
Your Reference	UNITS	MW003d
Type of sample		Water
Date extracted	-	30/06/2023
Date analysed	-	01/07/2023
TRH C ₁₀ - C ₁₄	µg/L	<50
TRH C ₁₅ - C ₂₈	µg/L	<100
TRH C ₂₉ - C ₃₆	µg/L	<100
Total +ve TRH (C10-C36)	µg/L	<50
TRH >C ₁₀ - C ₁₆	µg/L	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	<50
TRH >C ₁₆ - C ₃₄	µg/L	<100
TRH >C ₃₄ - C ₄₀	µg/L	<100
Total +ve TRH (>C10-C40)	µg/L	<50
Surrogate o-Terphenyl	%	81

Client Reference: CTP Groundwater Monitoring

PAHs in Water						
Our Reference		326799-1	326799-2	326799-3	326799-4	326799-5
Your Reference	UNITS	BH120	BH032d	BH121	BH126	BH_715B
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	30/06/2023	30/06/2023	30/06/2023	04/07/2023	04/07/2023
Date analysed	-	01/07/2023	01/07/2023	01/07/2023	04/07/2023	04/07/2023
Naphthalene	µg/L	<0.2	<0.2	<0.2	2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1	1.9	<0.1
Surrogate <i>p</i> -Terphenyl-d14	%	95	94	101	83	103

Client Reference: CTP Groundwater Monitoring

PAHs in Water						
Our Reference		326799-6	326799-7	326799-8	326799-9	326799-10
Your Reference	UNITS	AF_BH36	MW001S	MW001d	MW003S	SOP_W2
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	04/07/2023	04/07/2023	04/07/2023	04/07/2023	04/07/2023
Date analysed	-	04/07/2023	04/07/2023	04/07/2023	04/07/2023	04/07/2023
Naphthalene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	95	105	99	91	87

PAHs in Water		
Our Reference		326799-11
Your Reference	UNITS	MW003d
Type of sample		Water
Date extracted	-	04/07/2023
Date analysed	-	04/07/2023
Naphthalene	µg/L	<0.2
Acenaphthylene	µg/L	<0.1
Acenaphthene	µg/L	<0.1
Fluorene	µg/L	<0.1
Phenanthrene	µg/L	<0.1
Anthracene	µg/L	<0.1
Fluoranthene	µg/L	<0.1
Pyrene	µg/L	<0.1
Benzo(a)anthracene	µg/L	<0.1
Chrysene	µg/L	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2
Benzo(a)pyrene	µg/L	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5
Total +ve PAH's	µg/L	<0.1
Surrogate <i>p</i> -Terphenyl-d14	%	100

Client Reference: CTP Groundwater Monitoring

All metals in water-dissolved						
Our Reference		326799-1	326799-2	326799-3	326799-4	326799-5
Your Reference	UNITS	BH120	BH032d	BH121	BH126	BH_715B
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	30/06/2023	30/06/2023	30/06/2023	30/06/2023	30/06/2023
Date analysed	-	30/06/2023	30/06/2023	30/06/2023	30/06/2023	30/06/2023
Arsenic-Dissolved	µg/L	<1	<1	<1	2	1
Boron-Dissolved	µg/L	100	40	400	870	70
Barium-Dissolved	µg/L	110	39	170	540	69
Beryllium-Dissolved	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium-Dissolved	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1	11	<1
Copper-Dissolved	µg/L	11	<1	1,300	2	4
Cobalt-Dissolved	µg/L	<1	<1	<1	5	4
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Manganese-Dissolved	µg/L	23	130	33	51	270
Molybdenum-Dissolved	µg/L	9	<1	17	4	9
Nickel-Dissolved	µg/L	18	9	10	22	9
Lead-Dissolved	µg/L	<1	<1	<1	<1	<1
Antimony-Dissolved	µg/L	2	<1	2	<1	<1
Selenium-Dissolved	µg/L	<1	<1	<1	<1	<1
Tin-Dissolved	µg/L	<1	<1	<1	<1	<1
Zinc-Dissolved	µg/L	180	7	32	24	23
Iron-Dissolved	µg/L	<10	980	<10	2,000	20

Client Reference: CTP Groundwater Monitoring

All metals in water-dissolved						
Our Reference		326799-6	326799-7	326799-8	326799-9	326799-10
Your Reference	UNITS	AF_BH36	MW001S	MW001d	MW003S	SOP_W2
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	30/06/2023	30/06/2023	30/06/2023	30/06/2023	30/06/2023
Date analysed	-	30/06/2023	30/06/2023	30/06/2023	30/06/2023	30/06/2023
Arsenic-Dissolved	µg/L	2	4	<1	3	<1
Boron-Dissolved	µg/L	40	50	70	50	100
Barium-Dissolved	µg/L	200	20	62	38	100
Beryllium-Dissolved	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1	<1	<1
Copper-Dissolved	µg/L	2	2	<1	<1	<1
Cobalt-Dissolved	µg/L	<1	6	<1	19	5
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Manganese-Dissolved	µg/L	<5	1,400	87	2,100	250
Molybdenum-Dissolved	µg/L	26	1	4	1	8
Nickel-Dissolved	µg/L	4	10	2	16	6
Lead-Dissolved	µg/L	<1	<1	<1	<1	<1
Antimony-Dissolved	µg/L	4	<1	<1	<1	<1
Selenium-Dissolved	µg/L	<1	<1	<1	<1	<1
Tin-Dissolved	µg/L	<1	<1	<1	<1	<1
Zinc-Dissolved	µg/L	2	42	5	19	34
Iron-Dissolved	µg/L	10	<10	<10	210	30

All metals in water-dissolved		
Our Reference		326799-11
Your Reference	UNITS	MW003d
Type of sample		Water
Date prepared	-	30/06/2023
Date analysed	-	30/06/2023
Arsenic-Dissolved	µg/L	<1
Boron-Dissolved	µg/L	50
Barium-Dissolved	µg/L	40
Beryllium-Dissolved	µg/L	1
Cadmium-Dissolved	µg/L	0.1
Chromium-Dissolved	µg/L	<1
Copper-Dissolved	µg/L	1
Cobalt-Dissolved	µg/L	71
Mercury-Dissolved	µg/L	<0.05
Manganese-Dissolved	µg/L	4,400
Molybdenum-Dissolved	µg/L	<1
Nickel-Dissolved	µg/L	37
Lead-Dissolved	µg/L	<1
Antimony-Dissolved	µg/L	<1
Selenium-Dissolved	µg/L	<1
Tin-Dissolved	µg/L	<1
Zinc-Dissolved	µg/L	120
Iron-Dissolved	µg/L	<10

Client Reference: CTP Groundwater Monitoring

All metals in water - total						
Our Reference		326799-1	326799-2	326799-3	326799-4	326799-5
Your Reference	UNITS	BH120	BH032d	BH121	BH126	BH_715B
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	30/06/2023	30/06/2023	30/06/2023	30/06/2023	30/06/2023
Date analysed	-	01/07/2023	01/07/2023	01/07/2023	01/07/2023	01/07/2023
Arsenic-Total	µg/L	1	<1	2	3	2
Boron-Total	µg/L	100	30	440	850	50
Barium-Total	µg/L	150	38	200	540	92
Beryllium-Total	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium-Total	µg/L	0.2	<0.1	<0.1	<0.1	<0.1
Chromium-Total	µg/L	33	5	12	30	39
Copper-Total	µg/L	41	13	2,100	17	13
Cobalt-Total	µg/L	4	2	<1	6	7
Mercury-Total	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Manganese-Total	µg/L	200	140	47	68	300
Molybdenum-Total	µg/L	9	1	20	5	11
Nickel-Total	µg/L	36	17	21	29	34
Lead-Total	µg/L	10	2	<1	7	2
Antimony-Total	µg/L	2	<1	2	<1	<1
Selenium-Total	µg/L	<1	<1	<1	<1	<1
Tin-Total	µg/L	<1	<1	<1	<1	<1
Zinc-Total	µg/L	300	99	51	150	130
Iron-Total	µg/L	5,700	2,800	480	6,600	1,600

Client Reference: CTP Groundwater Monitoring

All metals in water - total						
Our Reference		326799-6	326799-7	326799-8	326799-9	326799-10
Your Reference	UNITS	AF_BH36	MW001S	MW001d	MW003S	SOP_W2
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	30/06/2023	30/06/2023	30/06/2023	30/06/2023	30/06/2023
Date analysed	-	01/07/2023	01/07/2023	01/07/2023	01/07/2023	01/07/2023
Arsenic-Total	µg/L	2	3	<1	4	13
Boron-Total	µg/L	30	30	50	30	100
Barium-Total	µg/L	220	18	55	150	1,000
Beryllium-Total	µg/L	<0.5	<0.5	<0.5	1	3
Cadmium-Total	µg/L	<0.1	<0.1	<0.1	0.2	0.3
Chromium-Total	µg/L	6	3	2	22	27
Copper-Total	µg/L	14	4	1	14	120
Cobalt-Total	µg/L	<1	6	<1	30	40
Mercury-Total	µg/L	<0.05	<0.05	<0.05	<0.05	0.2
Manganese-Total	µg/L	<5	1,300	84	2,200	2,800
Molybdenum-Total	µg/L	25	2	4	2	12
Nickel-Total	µg/L	6	11	3	34	56
Lead-Total	µg/L	<1	<1	<1	8	48
Antimony-Total	µg/L	3	<1	<1	<1	<1
Selenium-Total	µg/L	<1	<1	<1	<1	1
Tin-Total	µg/L	<1	<1	<1	<1	<1
Zinc-Total	µg/L	17	51	6	81	270
Iron-Total	µg/L	190	470	150	7,800	83,000

All metals in water - total		
Our Reference		326799-11
Your Reference	UNITS	MW003d
Type of sample		Water
Date prepared	-	30/06/2023
Date analysed	-	01/07/2023
Arsenic-Total	µg/L	<1
Boron-Total	µg/L	30
Barium-Total	µg/L	36
Beryllium-Total	µg/L	1
Cadmium-Total	µg/L	0.1
Chromium-Total	µg/L	3
Copper-Total	µg/L	1
Cobalt-Total	µg/L	67
Mercury-Total	µg/L	<0.05
Manganese-Total	µg/L	4,100
Molybdenum-Total	µg/L	<1
Nickel-Total	µg/L	36
Lead-Total	µg/L	<1
Antimony-Total	µg/L	<1
Selenium-Total	µg/L	<1
Tin-Total	µg/L	<1
Zinc-Total	µg/L	130
Iron-Total	µg/L	310

Client Reference: CTP Groundwater Monitoring

Metals in Waters - Total

Our Reference		326799-1	326799-2	326799-3	326799-4	326799-5
Your Reference	UNITS	BH120	BH032d	BH121	BH126	BH_715B
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	30/06/2023	30/06/2023	30/06/2023	30/06/2023	30/06/2023
Date analysed	-	01/07/2023	01/07/2023	01/07/2023	01/07/2023	01/07/2023
Phosphorus - Total	mg/L	0.1	0.08	0.1	0.3	0.3

Metals in Waters - Total

Our Reference		326799-6	326799-7	326799-8	326799-9	326799-10
Your Reference	UNITS	AF_BH36	MW001S	MW001d	MW003S	SOP_W2
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	30/06/2023	30/06/2023	30/06/2023	30/06/2023	30/06/2023
Date analysed	-	01/07/2023	01/07/2023	01/07/2023	01/07/2023	30/06/2023
Phosphorus - Total	mg/L	<0.05	<0.05	<0.05	0.2	1.8

Metals in Waters - Total

Our Reference		326799-11
Your Reference	UNITS	MW003d
Type of sample		Water
Date prepared	-	30/06/2023
Date analysed	-	30/06/2023
Phosphorus - Total	mg/L	<0.05

Client Reference: CTP Groundwater Monitoring

Miscellaneous Inorganics						
Our Reference		326799-1	326799-2	326799-3	326799-4	326799-5
Your Reference	UNITS	BH120	BH032d	BH121	BH126	BH_715B
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	29/06/2023	29/06/2023	29/06/2023	29/06/2023	29/06/2023
Date analysed	-	29/06/2023	29/06/2023	29/06/2023	29/06/2023	29/06/2023
Ammonia as N in water	mg/L	0.016	0.83	5.0	110	0.14
Nitrate as N in water	mg/L	2.7	0.15	0.17	3.1	1.7
Total Nitrogen in water	mg/L	3.0	1.1	5.7	120	2.0
pH	pH Units	7.3	6.8	6.0	7.6	7.5
Electrical Conductivity	µS/cm	17,000	460	40,000	7,300	3,600

Miscellaneous Inorganics						
Our Reference		326799-6	326799-7	326799-8	326799-9	326799-10
Your Reference	UNITS	AF_BH36	MW001S	MW001d	MW003S	SOP_W2
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	29/06/2023	29/06/2023	29/06/2023	29/06/2023	29/06/2023
Date analysed	-	29/06/2023	29/06/2023	29/06/2023	29/06/2023	29/06/2023
Ammonia as N in water	mg/L	2.0	0.076	0.041	0.074	1.8
Nitrate as N in water	mg/L	0.01	2.5	0.75	0.13	0.50
Total Nitrogen in water	mg/L	3.1	2.7	1.1	0.2	2.1
pH	pH Units	9.2	7.4	7.8	6.9	6.9
Electrical Conductivity	µS/cm	6,200	6,900	9,700	6,500	9,900

Miscellaneous Inorganics		
Our Reference		326799-11
Your Reference	UNITS	MW003d
Type of sample		Water
Date prepared	-	29/06/2023
Date analysed	-	29/06/2023
Ammonia as N in water	mg/L	0.012
Nitrate as N in water	mg/L	0.11
Total Nitrogen in water	mg/L	0.1
pH	pH Units	7.2
Electrical Conductivity	µS/cm	5,300

Client Reference: CTP Groundwater Monitoring

Ion Balance						
Our Reference		326799-1	326799-2	326799-3	326799-4	326799-5
Your Reference	UNITS	BH120	BH032d	BH121	BH126	BH_715B
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	29/06/2023	29/06/2023	29/06/2023	29/06/2023	29/06/2023
Date analysed	-	29/06/2023	29/06/2023	29/06/2023	29/06/2023	29/06/2023
Calcium - Dissolved	mg/L	250	41	1,300	29	120
Potassium - Dissolved	mg/L	52	12	310	210	46
Sodium - Dissolved	mg/L	2,900	34	8,900	920	480
Magnesium - Dissolved	mg/L	420	4	130	40	30
Hardness	mgCaCO ₃ /L	2,300	120	3,800	240	410
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5	<5	<5	<5	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	570	160	18	770	250
Carbonate Alkalinity as CaCO ₃	mg/L	<5	<5	<5	<5	<5
Total Alkalinity as CaCO ₃	mg/L	570	160	18	770	250
Sulphate, SO ₄	mg/L	550	17	2,300	3	110
Chloride, Cl	mg/L	6,200	44	17,000	1,900	950
Ionic Balance	%	-6.0	-7.0	-4.0	-16	-6.0

Ion Balance						
Our Reference		326799-6	326799-7	326799-8	326799-9	326799-10
Your Reference	UNITS	AF_BH36	MW001S	MW001d	MW003S	SOP_W2
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	29/06/2023	29/06/2023	29/06/2023	29/06/2023	29/06/2023
Date analysed	-	29/06/2023	29/06/2023	29/06/2023	29/06/2023	29/06/2023
Calcium - Dissolved	mg/L	20	69	83	93	230
Potassium - Dissolved	mg/L	66	41	42	21	27
Sodium - Dissolved	mg/L	1,000	1,200	1,700	940	1,600
Magnesium - Dissolved	mg/L	3	84	120	130	200
Hardness	mgCaCO ₃ /L	64	520	700	760	1,400
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5	<5	<5	<5	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	60	640	310	390	550
Carbonate Alkalinity as CaCO ₃	mg/L	27	<5	<5	<5	<5
Total Alkalinity as CaCO ₃	mg/L	87	640	310	390	550
Sulphate, SO ₄	mg/L	170	610	780	390	980
Chloride, Cl	mg/L	1,900	1,800	3,000	2,000	2,900
Ionic Balance	%	-10	-9.0	-9.0	-12	-8.0

Ion Balance		
Our Reference		326799-11
Your Reference	UNITS	MW003d
Type of sample		Water
Date prepared	-	29/06/2023
Date analysed	-	29/06/2023
Calcium - Dissolved	mg/L	65
Potassium - Dissolved	mg/L	16
Sodium - Dissolved	mg/L	820
Magnesium - Dissolved	mg/L	96
Hardness	mgCaCO ₃ /L	560
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	550
Carbonate Alkalinity as CaCO ₃	mg/L	<5
Total Alkalinity as CaCO ₃	mg/L	550
Sulphate, SO ₄	mg/L	280
Chloride, Cl	mg/L	1,500
Ionic Balance	%	-11

Client Reference: CTP Groundwater Monitoring

PFAS in Waters Extended						
Our Reference		326799-1	326799-2	326799-3	326799-4	326799-5
Your Reference	UNITS	BH120	BH032d	BH121	BH126	BH_715B
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	30/06/2023	30/06/2023	30/06/2023	30/06/2023	30/06/2023
Date analysed	-	30/06/2023	30/06/2023	30/06/2023	30/06/2023	30/06/2023
Perfluorobutanesulfonic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoropentanesulfonic acid	µg/L	<0.01	<0.01	<0.01	0.06	<0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01	<0.01	<0.01	0.14	<0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01	<0.01	<0.01	0.12	<0.01
Perfluorodecanesulfonic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid	µg/L	<0.02	0.03	<0.02	0.83	<0.02
Perfluoropentanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid	µg/L	<0.01	0.01	0.01	0.32	0.01
Perfluoroheptanoic acid	µg/L	<0.01	<0.01	<0.01	0.08	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01	<0.01	<0.01	0.27	<0.01
Perfluorononanoic acid	µg/L	<0.01	<0.01	<0.01	0.04	<0.01
Perfluorodecanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
4:2 FTS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
6:2 FTS	µg/L	<0.01	0.01	0.05	0.04	<0.01
8:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
10:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctanesulfonamide	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02	0.05	<0.02
Surrogate ¹³ C ₈ PFOS	%	96	96	95	98	99
Surrogate ¹³ C ₂ PFOA	%	101	102	109	110	107
Extracted ISTD ¹³ C ₃ PFBS	%	101	99	99	95	101
Extracted ISTD ¹⁸ O ₂ PFHxS	%	106	108	105	100	102
Extracted ISTD ¹³ C ₄ PFOS	%	100	101	101	105	101
Extracted ISTD ¹³ C ₄ PFBA	%	101	98	81	42	91
Extracted ISTD ¹³ C ₃ PFPeA	%	110	113	103	86	115

PFAS in Waters Extended						
Our Reference		326799-1	326799-2	326799-3	326799-4	326799-5
Your Reference	UNITS	BH120	BH032d	BH121	BH126	BH_715B
Type of sample		Water	Water	Water	Water	Water
Extracted ISTD ¹³ C ₂ PFHxA	%	106	110	105	90	106
Extracted ISTD ¹³ C ₄ PFHpA	%	99	100	97	99	103
Extracted ISTD ¹³ C ₄ PFOA	%	109	110	100	123	116
Extracted ISTD ¹³ C ₅ PFNA	%	101	105	96	108	105
Extracted ISTD ¹³ C ₂ PFDA	%	108	116	99	123	106
Extracted ISTD ¹³ C ₂ PFUnDA	%	103	98	95	115	103
Extracted ISTD ¹³ C ₂ PFDoDA	%	97	101	91	116	96
Extracted ISTD ¹³ C ₂ PFTeDA	%	78	74	70	75	73
Extracted ISTD ¹³ C ₂ 4:2FTS	%	94	119	87	178	115
Extracted ISTD ¹³ C ₂ 6:2FTS	%	104	125	87	#	126
Extracted ISTD ¹³ C ₂ 8:2FTS	%	107	136	87	#	110
Extracted ISTD ¹³ C ₈ FOSA	%	96	91	87	75	92
Extracted ISTD d ₃ N MeFOSA	%	89	90	89	86	92
Extracted ISTD d ₅ N EtFOSA	%	85	85	86	84	86
Extracted ISTD d ₇ N MeFOSE	%	96	90	92	85	91
Extracted ISTD d ₉ N EtFOSE	%	104	94	96	89	100
Extracted ISTD d ₃ N MeFOSAA	%	92	94	83	120	95
Extracted ISTD d ₅ N EtFOSAA	%	97	98	85	120	97
Total Positive PFHxS & PFOS	µg/L	<0.01	<0.01	<0.01	0.25	<0.01
Total Positive PFOA & PFOS	µg/L	<0.01	<0.01	<0.01	0.38	<0.01
Total Positive PFAS	µg/L	<0.01	0.06	0.06	1.9	0.01

Client Reference: CTP Groundwater Monitoring

PFAS in Waters Extended						
Our Reference		326799-6	326799-7	326799-8	326799-9	326799-10
Your Reference	UNITS	AF_BH36	MW001S	MW001d	MW003S	SOP_W2
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	30/06/2023	30/06/2023	30/06/2023	30/06/2023	30/06/2023
Date analysed	-	30/06/2023	30/06/2023	30/06/2023	30/06/2023	30/06/2023
Perfluorobutanesulfonic acid	µg/L	<0.01	<0.01	<0.01	0.03	0.01
Perfluoropentanesulfonic acid	µg/L	<0.01	<0.01	<0.01	0.02	<0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.02	<0.01	<0.01	0.01	<0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecanesulfonic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid	µg/L	<0.02	<0.02	<0.02	0.04	<0.02
Perfluoropentanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptanoic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
4:2 FTS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
6:2 FTS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
10:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctanesulfonamide	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
N-Me perfluorooctanesulfonamid ethanol	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Et perfluorooctanesulfonamid ethanol	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Surrogate ¹³ C ₈ PFOS	%	95	100	97	97	99
Surrogate ¹³ C ₂ PFOA	%	109	108	107	104	103
Extracted ISTD ¹³ C ₃ PFBS	%	97	102	99	102	99
Extracted ISTD ¹⁸ O ₂ PFHxS	%	99	108	104	102	98
Extracted ISTD ¹³ C ₄ PFOS	%	101	99	101	99	95
Extracted ISTD ¹³ C ₄ PFBA	%	41	90	92	91	105
Extracted ISTD ¹³ C ₃ PFPeA	%	99	111	107	112	109

Client Reference: CTP Groundwater Monitoring

PFAS in Waters Extended						
Our Reference		326799-6	326799-7	326799-8	326799-9	326799-10
Your Reference	UNITS	AF_BH36	MW001S	MW001d	MW003S	SOP_W2
Type of sample		Water	Water	Water	Water	Water
Extracted ISTD ¹³ C ₂ PFHxA	%	61	105	103	107	104
Extracted ISTD ¹³ C ₄ PFHpA	%	84	95	93	98	97
Extracted ISTD ¹³ C ₄ PFOA	%	126	103	102	102	100
Extracted ISTD ¹³ C ₅ PFNA	%	100	98	98	97	94
Extracted ISTD ¹³ C ₂ PFDA	%	130	103	96	105	103
Extracted ISTD ¹³ C ₂ PFUnDA	%	131	102	97	103	102
Extracted ISTD ¹³ C ₂ PFDoDA	%	120	92	90	98	94
Extracted ISTD ¹³ C ₂ PFTeDA	%	72	67	66	68	65
Extracted ISTD ¹³ C ₂ 4:2FTS	%	#	98	95	107	123
Extracted ISTD ¹³ C ₂ 6:2FTS	%	#	99	97	101	99
Extracted ISTD ¹³ C ₂ 8:2FTS	%	#	110	96	113	105
Extracted ISTD ¹³ C ₈ FOSA	%	85	89	86	93	90
Extracted ISTD d ₃ N MeFOSA	%	98	91	90	90	88
Extracted ISTD d ₅ N EtFOSA	%	95	88	87	86	86
Extracted ISTD d ₇ N MeFOSE	%	90	88	85	95	92
Extracted ISTD d ₉ N EtFOSE	%	97	89	88	104	91
Extracted ISTD d ₃ N MeFOSAA	%	158	97	94	93	91
Extracted ISTD d ₅ N EtFOSAA	%	154	100	91	96	92
Total Positive PFHxS & PFOS	µg/L	0.02	<0.01	<0.01	0.01	<0.01
Total Positive PFOA & PFOS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Total Positive PFAS	µg/L	0.02	<0.01	<0.01	0.10	0.01

PFAS in Waters Extended		
Our Reference		326799-11
Your Reference	UNITS	MW003d
Type of sample		Water
Date prepared	-	30/06/2023
Date analysed	-	30/06/2023
Perfluorobutanesulfonic acid	µg/L	0.03
Perfluoropentanesulfonic acid	µg/L	0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01
Perfluorodecanesulfonic acid	µg/L	<0.02
Perfluorobutanoic acid	µg/L	0.02
Perfluoropentanoic acid	µg/L	<0.02
Perfluorohexanoic acid	µg/L	<0.01
Perfluoroheptanoic acid	µg/L	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01
Perfluorononanoic acid	µg/L	<0.01
Perfluorodecanoic acid	µg/L	<0.02
Perfluoroundecanoic acid	µg/L	<0.02
Perfluorododecanoic acid	µg/L	<0.05
Perfluorotridecanoic acid	µg/L	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5
4:2 FTS	µg/L	<0.01
6:2 FTS	µg/L	<0.01
8:2 FTS	µg/L	<0.02
10:2 FTS	µg/L	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05
N-Ethyl perfluorooctanesulfonamide	µg/L	<0.1
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.05
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02
Surrogate ¹³ C ₈ PFOS	%	97
Surrogate ¹³ C ₂ PFOA	%	98
Extracted ISTD ¹³ C ₃ PFBS	%	99
Extracted ISTD ¹⁸ O ₂ PFHxS	%	98
Extracted ISTD ¹³ C ₄ PFOS	%	95
Extracted ISTD ¹³ C ₄ PFBA	%	88
Extracted ISTD ¹³ C ₃ PFPeA	%	107

PFAS in Waters Extended		
Our Reference		326799-11
Your Reference	UNITS	MW003d
Type of sample		Water
Extracted ISTD ¹³ C ₂ PFHxA	%	106
Extracted ISTD ¹³ C ₄ PFHpA	%	93
Extracted ISTD ¹³ C ₄ PFOA	%	104
Extracted ISTD ¹³ C ₅ PFNA	%	93
Extracted ISTD ¹³ C ₂ PFDA	%	104
Extracted ISTD ¹³ C ₂ PFUnDA	%	103
Extracted ISTD ¹³ C ₂ PFDoDA	%	97
Extracted ISTD ¹³ C ₂ PFTeDA	%	67
Extracted ISTD ¹³ C ₂ 4:2FTS	%	105
Extracted ISTD ¹³ C ₂ 6:2FTS	%	100
Extracted ISTD ¹³ C ₂ 8:2FTS	%	103
Extracted ISTD ¹³ C ₈ FOSA	%	88
Extracted ISTD d ₃ N MeFOSA	%	85
Extracted ISTD d ₅ N EtFOSA	%	84
Extracted ISTD d ₇ N MeFOSE	%	90
Extracted ISTD d ₉ N EtFOSE	%	96
Extracted ISTD d ₃ N MeFOSAA	%	95
Extracted ISTD d ₅ N EtFOSAA	%	98
Total Positive PFHxS & PFOS	µg/L	0.01
Total Positive PFOA & PFOS	µg/L	<0.01
Total Positive PFAS	µg/L	0.07

Client Reference: CTP Groundwater Monitoring

Dissolved Gases in Water

Our Reference		326799-1	326799-2	326799-3	326799-4	326799-5
Your Reference	UNITS	BH120	BH032d	BH121	BH126	BH_715B
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	04/07/2023	04/07/2023	04/07/2023	04/07/2023	04/07/2023
Date analysed	-	04/07/2023	04/07/2023	04/07/2023	04/07/2023	04/07/2023
Methane	µg/L	<5	54	<5	3,700	390

Dissolved Gases in Water

Our Reference		326799-6	326799-7	326799-8	326799-9	326799-10
Your Reference	UNITS	AF_BH36	MW001S	MW001d	MW003S	SOP_W2
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	04/07/2023	04/07/2023	04/07/2023	04/07/2023	04/07/2023
Date analysed	-	04/07/2023	04/07/2023	04/07/2023	04/07/2023	04/07/2023
Methane	µg/L	20	<5	<5	<5	<5

Dissolved Gases in Water

Our Reference		326799-11
Your Reference	UNITS	MW003d
Type of sample		Water
Date prepared	-	04/07/2023
Date analysed	-	04/07/2023
Methane	µg/L	<5

Client Reference: CTP Groundwater Monitoring

Method ID	Methodology Summary
AT-006	Dissolved gases determined by GC-FID based on draft method USEPA SOP RSK175
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% ie total anions = total cations +/-15%.
Inorg-055	Nitrate - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-055/062/127	Total Nitrogen - Calculation sum of TKN and oxidised Nitrogen. Alternatively analysed by combustion and chemiluminescence.
Inorg-057	Ammonia - determined colourimetrically, based on APHA latest edition 4500-NH3 F. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a KCl extraction.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
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.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

Client Reference: CTP Groundwater Monitoring

Method ID	Methodology Summary
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			30/06/2023	[NT]	[NT]	[NT]	[NT]	30/06/2023	[NT]
Date analysed	-			03/07/2023	[NT]	[NT]	[NT]	[NT]	03/07/2023	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromomethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromoform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Styrene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	112	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate toluene-d8	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate 4-BFB	%		Org-023	105	[NT]	[NT]	[NT]	[NT]	99	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			30/06/2023	[NT]	[NT]	[NT]	[NT]	30/06/2023	[NT]
Date analysed	-			03/07/2023	[NT]	[NT]	[NT]	[NT]	03/07/2023	[NT]
TRH C ₆ - C ₉	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH C ₆ - C ₁₀	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	104	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	111	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	100	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	112	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate toluene-d8	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate 4-BFB	%		Org-023	105	[NT]	[NT]	[NT]	[NT]	99	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	326799-2
Date extracted	-			30/06/2023	1	30/06/2023	30/06/2023		30/06/2023	30/06/2023
Date analysed	-			01/07/2023	1	01/07/2023	01/07/2023		01/07/2023	01/07/2023
TRH C ₁₀ - C ₁₄	µg/L	50	Org-020	<50	1	<50	<50	0	108	113
TRH C ₁₅ - C ₂₈	µg/L	100	Org-020	<100	1	<100	<100	0	115	124
TRH C ₂₉ - C ₃₆	µg/L	100	Org-020	<100	1	<100	<100	0	100	101
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-020	<50	1	<50	<50	0	108	113
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-020	<100	1	<100	<100	0	115	124
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-020	<100	1	<100	<100	0	100	101
Surrogate o-Terphenyl	%		Org-020	84	1	77	77	0	91	90

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	30/06/2023	30/06/2023		[NT]	[NT]
Date analysed	-			[NT]	11	01/07/2023	01/07/2023		[NT]	[NT]
TRH C ₁₀ - C ₁₄	µg/L	50	Org-020	[NT]	11	<50	<50	0	[NT]	[NT]
TRH C ₁₅ - C ₂₈	µg/L	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
TRH C ₂₉ - C ₃₆	µg/L	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-020	[NT]	11	<50	<50	0	[NT]	[NT]
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	11	81	76	6	[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	326799-2
Date extracted	-			30/06/2023	1	30/06/2023	30/06/2023		30/06/2023	30/06/2023
Date analysed	-			01/07/2023	1	01/07/2023	01/07/2023		01/07/2023	01/07/2023
Naphthalene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	80	80
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	74	72
Fluorene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	73	73
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	75	73
Anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	77	77
Pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	83	83
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	72	71
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	115	119
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	96	1	95	87	9	82	101

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	04/07/2023	04/07/2023		[NT]	[NT]
Date analysed	-			[NT]	11	04/07/2023	06/07/2023		[NT]	[NT]
Naphthalene	µg/L	0.2	Org-022/025	[NT]	11	<0.2	<0.2	0	[NT]	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluorene	µg/L	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Anthracene	µg/L	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Pyrene	µg/L	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	[NT]	11	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	11	100	80	22	[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: All metals in water-dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	326799-2
Date prepared	-			30/06/2023	1	30/06/2023	30/06/2023		30/06/2023	30/06/2023
Date analysed	-			30/06/2023	1	30/06/2023	30/06/2023		30/06/2023	30/06/2023
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	87	85
Boron-Dissolved	µg/L	20	Metals-022	<20	1	100	100	0	98	92
Barium-Dissolved	µg/L	1	Metals-022	<1	1	110	110	0	85	78
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	1	<0.5	<0.5	0	84	87
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	0.1	<0.1	0	91	91
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	92	91
Copper-Dissolved	µg/L	1	Metals-022	<1	1	11	11	0	83	83
Cobalt-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	96	87
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	111	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	<5	1	23	25	8	94	99
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	1	9	9	0	88	84
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	18	18	0	91	90
Lead-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	90	81
Antimony-Dissolved	µg/L	1	Metals-022	<1	1	2	1	67	87	74
Selenium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	85	82
Tin-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	100	99
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	180	180	0	86	92
Iron-Dissolved	µg/L	10	Metals-022	<10	1	<10	<10	0	92	#

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: All metals in water-dissolved					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	326799-3
Date prepared	-			[NT]	[NT]	[NT]	[NT]	[NT]	[NT]	30/06/2023
Date analysed	-			[NT]	[NT]	[NT]	[NT]	[NT]	[NT]	30/06/2023
Mercury-Dissolved	µg/L	0.05	Metals-021	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]	96

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: All metals in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	326799-2
Date prepared	-			30/06/2023	1	30/06/2023	30/06/2023		30/06/2023	30/06/2023
Date analysed	-			01/07/2023	1	01/07/2023	01/07/2023		01/07/2023	01/07/2023
Arsenic-Total	µg/L	1	Metals-022	<1	1	1	2	67	87	[NT]
Boron-Total	µg/L	20	Metals-022	<20	1	100	100	0	84	[NT]
Barium-Total	µg/L	1	Metals-022	<1	1	150	150	0	85	[NT]
Beryllium-Total	µg/L	0.5	Metals-022	<0.5	1	<0.5	<0.5	0	84	[NT]
Cadmium-Total	µg/L	0.1	Metals-022	<0.1	1	0.2	0.1	67	89	[NT]
Chromium-Total	µg/L	1	Metals-022	<1	1	33	33	0	82	[NT]
Copper-Total	µg/L	1	Metals-022	<1	1	41	42	2	87	[NT]
Cobalt-Total	µg/L	1	Metals-022	<1	1	4	3	29	83	[NT]
Mercury-Total	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	113	111
Manganese-Total	µg/L	5	Metals-022	<5	1	200	190	5	86	[NT]
Molybdenum-Total	µg/L	1	Metals-022	<1	1	9	9	0	88	[NT]
Nickel-Total	µg/L	1	Metals-022	<1	1	36	37	3	87	[NT]
Lead-Total	µg/L	1	Metals-022	<1	1	10	10	0	90	[NT]
Antimony-Total	µg/L	1	Metals-022	<1	1	2	2	0	99	[NT]
Selenium-Total	µg/L	1	Metals-022	<1	1	<1	<1	0	89	[NT]
Tin-Total	µg/L	1	Metals-022	<1	1	<1	<1	0	96	[NT]
Zinc-Total	µg/L	1	Metals-022	<1	1	300	300	0	91	[NT]
Iron-Total	µg/L	10	Metals-022	<10	1	5700	5600	2	89	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: All metals in water - total					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	326799-3
Date prepared	-			[NT]	10	30/06/2023	30/06/2023		[NT]	30/06/2023
Date analysed	-			[NT]	10	01/07/2023	01/07/2023		[NT]	01/07/2023
Arsenic-Total	µg/L	1	Metals-022	[NT]	10	13	[NT]		[NT]	106
Boron-Total	µg/L	20	Metals-022	[NT]	10	100	[NT]		[NT]	#
Barium-Total	µg/L	1	Metals-022	[NT]	10	1000	[NT]		[NT]	#
Beryllium-Total	µg/L	0.5	Metals-022	[NT]	10	3	[NT]		[NT]	110
Cadmium-Total	µg/L	0.1	Metals-022	[NT]	10	0.3	[NT]		[NT]	105
Chromium-Total	µg/L	1	Metals-022	[NT]	10	27	[NT]		[NT]	106
Copper-Total	µg/L	1	Metals-022	[NT]	10	120	[NT]		[NT]	#
Cobalt-Total	µg/L	1	Metals-022	[NT]	10	40	[NT]		[NT]	103
Mercury-Total	µg/L	0.05	Metals-021	[NT]	10	0.2	0.2	0	[NT]	[NT]
Manganese-Total	µg/L	5	Metals-022	[NT]	10	2800	[NT]		[NT]	107
Molybdenum-Total	µg/L	1	Metals-022	[NT]	10	12	[NT]		[NT]	114
Nickel-Total	µg/L	1	Metals-022	[NT]	10	56	[NT]		[NT]	99
Lead-Total	µg/L	1	Metals-022	[NT]	10	48	[NT]		[NT]	97
Antimony-Total	µg/L	1	Metals-022	[NT]	10	<1	[NT]		[NT]	118
Selenium-Total	µg/L	1	Metals-022	[NT]	10	1	[NT]		[NT]	96
Tin-Total	µg/L	1	Metals-022	[NT]	10	<1	[NT]		[NT]	123
Zinc-Total	µg/L	1	Metals-022	[NT]	10	270	[NT]		[NT]	93
Iron-Total	µg/L	10	Metals-022	[NT]	10	83000	[NT]		[NT]	#

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: All metals in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	30/06/2023	30/06/2023		[NT]	[NT]
Date analysed	-			[NT]	11	01/07/2023	01/07/2023		[NT]	[NT]
Arsenic-Total	µg/L	1	Metals-022	[NT]	11	<1	[NT]		[NT]	[NT]
Boron-Total	µg/L	20	Metals-022	[NT]	11	30	[NT]		[NT]	[NT]
Barium-Total	µg/L	1	Metals-022	[NT]	11	36	[NT]		[NT]	[NT]
Beryllium-Total	µg/L	0.5	Metals-022	[NT]	11	1	[NT]		[NT]	[NT]
Cadmium-Total	µg/L	0.1	Metals-022	[NT]	11	0.1	[NT]		[NT]	[NT]
Chromium-Total	µg/L	1	Metals-022	[NT]	11	3	[NT]		[NT]	[NT]
Copper-Total	µg/L	1	Metals-022	[NT]	11	1	[NT]		[NT]	[NT]
Cobalt-Total	µg/L	1	Metals-022	[NT]	11	67	[NT]		[NT]	[NT]
Mercury-Total	µg/L	0.05	Metals-021	[NT]	11	<0.05	<0.05	0	[NT]	[NT]
Manganese-Total	µg/L	5	Metals-022	[NT]	11	4100	[NT]		[NT]	[NT]
Molybdenum-Total	µg/L	1	Metals-022	[NT]	11	<1	[NT]		[NT]	[NT]
Nickel-Total	µg/L	1	Metals-022	[NT]	11	36	[NT]		[NT]	[NT]
Lead-Total	µg/L	1	Metals-022	[NT]	11	<1	[NT]		[NT]	[NT]
Antimony-Total	µg/L	1	Metals-022	[NT]	11	<1	[NT]		[NT]	[NT]
Selenium-Total	µg/L	1	Metals-022	[NT]	11	<1	[NT]		[NT]	[NT]
Tin-Total	µg/L	1	Metals-022	[NT]	11	<1	[NT]		[NT]	[NT]
Zinc-Total	µg/L	1	Metals-022	[NT]	11	130	[NT]		[NT]	[NT]
Iron-Total	µg/L	10	Metals-022	[NT]	11	310	[NT]		[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Metals in Waters - Total					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	326799-2
Date prepared	-			30/06/2023	1	30/06/2023	30/06/2023		30/06/2023	30/06/2023
Date analysed	-			01/07/2023	1	01/07/2023	01/07/2023		01/07/2023	01/07/2023
Phosphorus - Total	mg/L	0.05	Metals-020	<0.05	1	0.1	0.1	0	105	111

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Miscellaneous Inorganics					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	326799-2
Date prepared	-			29/06/2023	1	29/06/2023	29/06/2023		29/06/2023	29/06/2023
Date analysed	-			29/06/2023	1	29/06/2023	29/06/2023		29/06/2023	29/06/2023
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	1	0.016	0.015	6	103	112
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	1	2.7	2.8	4	100	96
Total Nitrogen in water	mg/L	0.1	Inorg-055/062/127	<0.1	1	3.0	3.0	0	99	98
pH	pH Units		Inorg-001	[NT]	1	7.3	7.4	1	100	[NT]
Electrical Conductivity	µS/cm	1	Inorg-002	<1	1	17000	17000	0	99	[NT]

QUALITY CONTROL: Miscellaneous Inorganics					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	29/06/2023	29/06/2023		[NT]	[NT]
Date analysed	-			[NT]	11	29/06/2023	29/06/2023		[NT]	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	[NT]	11	0.012	0.01	18	[NT]	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	[NT]	11	0.11	0.092	18	[NT]	[NT]
Total Nitrogen in water	mg/L	0.1	Inorg-055/062/127	[NT]	11	0.1	0.1	0	[NT]	[NT]
pH	pH Units		Inorg-001	[NT]	11	7.2	7.2	0	[NT]	[NT]
Electrical Conductivity	µS/cm	1	Inorg-002	[NT]	11	5300	5200	2	[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	326799-5
Date prepared	-			29/06/2023	1	29/06/2023	29/06/2023		29/06/2023	29/06/2023
Date analysed	-			29/06/2023	1	29/06/2023	29/06/2023		29/06/2023	29/06/2023
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	250	[NT]		112	#
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	52	[NT]		101	123
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	2900	[NT]		96	#
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	420	[NT]		115	93
Hardness	mgCaCO ₃ /L	3	Metals-020	[NT]	1	2300	[NT]		[NT]	[NT]
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	5	Inorg-006	<5	1	<5	<5	0	[NT]	[NT]
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	1	570	580	2	[NT]	[NT]
Carbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	1	<5	<5	0	[NT]	[NT]
Total Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	1	570	580	2	100	[NT]
Sulphate, SO ₄	mg/L	1	Inorg-081	<1	1	550	550	0	91	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	1	6200	6200	0	84	[NT]
Ionic Balance	%		Inorg-040	[NT]	1	-6.0	[NT]		[NT]	[NT]

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	4	29/06/2023	29/06/2023		[NT]	[NT]
Date analysed	-			[NT]	4	29/06/2023	29/06/2023		[NT]	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	[NT]	4	29	28	4	[NT]	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	[NT]	4	210	210	0	[NT]	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	[NT]	4	920	920	0	[NT]	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	[NT]	4	40	39	3	[NT]	[NT]
Hardness	mgCaCO ₃ /L	3	Metals-020	[NT]	4	240	230	4	[NT]	[NT]
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	5	Inorg-006	[NT]	4	<5	[NT]		[NT]	[NT]
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	4	770	[NT]		[NT]	[NT]
Carbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	4	<5	[NT]		[NT]	[NT]
Total Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	4	770	[NT]		[NT]	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	[NT]	4	3	[NT]		[NT]	[NT]
Chloride, Cl	mg/L	1	Inorg-081	[NT]	4	1900	[NT]		[NT]	[NT]
Ionic Balance	%		Inorg-040	[NT]	4	-16	[NT]		[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	29/06/2023	29/06/2023		[NT]	[NT]
Date analysed	-			[NT]	11	29/06/2023	29/06/2023		[NT]	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	[NT]	11	65	[NT]		[NT]	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	[NT]	11	16	[NT]		[NT]	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	[NT]	11	820	[NT]		[NT]	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	[NT]	11	96	[NT]		[NT]	[NT]
Hardness	mgCaCO ₃ /L	3	Metals-020	[NT]	11	560	[NT]		[NT]	[NT]
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	5	Inorg-006	[NT]	11	<5	<5	0	[NT]	[NT]
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	11	550	550	0	[NT]	[NT]
Carbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	11	<5	<5	0	[NT]	[NT]
Total Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	11	550	550	0	[NT]	[NT]
Sulphate, SO ₄	mg/L	1	Inorg-081	[NT]	11	280	280	0	[NT]	[NT]
Chloride, Cl	mg/L	1	Inorg-081	[NT]	11	1500	1500	0	[NT]	[NT]
Ionic Balance	%		Inorg-040	[NT]	11	-11	[NT]		[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	326799-2
Date prepared	-			30/06/2023	1	30/06/2023	30/06/2023		30/06/2023	30/06/2023
Date analysed	-			30/06/2023	1	30/06/2023	30/06/2023		30/06/2023	30/06/2023
Perfluorobutanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	110	98
Perfluoropentanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	105	102
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	102	97
Perfluoroheptanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	94	94
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	103	96
Perfluorodecanesulfonic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	95	86
Perfluorobutanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	108	90
Perfluoropentanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	107	97
Perfluorohexanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	107	101
Perfluoroheptanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	110	98
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	104	93
Perfluorononanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	108	97
Perfluorodecanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	101	93
Perfluoroundecanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	106	93
Perfluorododecanoic acid	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	100	88
Perfluorotridecanoic acid	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	90	85
Perfluorotetradecanoic acid	µg/L	0.5	Org-029	<0.5	1	<0.5	<0.5	0	101	94
4:2 FTS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	105	94
6:2 FTS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	102	95
8:2 FTS	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	114	91
10:2 FTS	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	93	63
Perfluorooctane sulfonamide	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	122	114
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	108	100
N-Ethyl perfluorooctanesulfon amide	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	114	102
N-Me perfluorooctanesulfonamid oethanol	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	70	69
N-Et perfluorooctanesulfonamid oethanol	µg/L	0.5	Org-029	<0.5	1	<0.5	<0.5	0	97	95
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	113	97
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	94	88
Surrogate ¹³ C ₈ PFOS	%		Org-029	96	1	96	100	4	97	97
Surrogate ¹³ C ₂ PFOA	%		Org-029	103	1	101	102	1	103	106

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	326799-2
Extracted ISTD ¹³ C ₃ PFBS	%		Org-029	96	1	101	101	0	95	100
Extracted ISTD ¹⁸ O ₂ PFHxS	%		Org-029	102	1	106	110	4	103	100
Extracted ISTD ¹³ C ₄ PFOS	%		Org-029	99	1	100	102	2	96	100
Extracted ISTD ¹³ C ₄ PFBA	%		Org-029	109	1	101	100	1	105	98
Extracted ISTD ¹³ C ₃ PFPeA	%		Org-029	109	1	110	106	4	107	113
Extracted ISTD ¹³ C ₂ PFHxA	%		Org-029	106	1	106	106	0	106	108
Extracted ISTD ¹³ C ₄ PFHpA	%		Org-029	99	1	99	96	3	95	100
Extracted ISTD ¹³ C ₄ PFOA	%		Org-029	105	1	109	103	6	102	112
Extracted ISTD ¹³ C ₅ PFNA	%		Org-029	97	1	101	99	2	97	104
Extracted ISTD ¹³ C ₂ PFDA	%		Org-029	102	1	108	102	6	100	112
Extracted ISTD ¹³ C ₂ PFUnDA	%		Org-029	96	1	103	106	3	98	103
Extracted ISTD ¹³ C ₂ PFDoDA	%		Org-029	97	1	97	97	0	92	99
Extracted ISTD ¹³ C ₂ PFTeDA	%		Org-029	68	1	78	76	3	67	72
Extracted ISTD ¹³ C ₂ 4:2FTS	%		Org-029	109	1	94	98	4	103	119
Extracted ISTD ¹³ C ₂ 6:2FTS	%		Org-029	110	1	104	104	0	101	119
Extracted ISTD ¹³ C ₂ 8:2FTS	%		Org-029	112	1	107	105	2	98	141
Extracted ISTD ¹³ C ₈ FOSA	%		Org-029	90	1	96	95	1	87	88
Extracted ISTD d ₃ N MeFOSA	%		Org-029	86	1	89	94	5	85	89
Extracted ISTD d ₅ N EtFOSA	%		Org-029	81	1	85	90	6	80	85
Extracted ISTD d ₇ N MeFOSE	%		Org-029	92	1	96	97	1	91	91

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	326799-2
Extracted ISTD d ₉ N EtFOSE	%		Org-029	96	1	104	101	3	98	92
Extracted ISTD d ₃ N MeFOSAA	%		Org-029	91	1	92	93	1	93	102
Extracted ISTD d ₅ N EtFOSAA	%		Org-029	99	1	97	95	2	97	104

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	30/06/2023	30/06/2023		[NT]	[NT]
Date analysed	-			[NT]	11	30/06/2023	30/06/2023		[NT]	[NT]
Perfluorobutanesulfonic acid	µg/L	0.01	Org-029	[NT]	11	0.03	0.03	0	[NT]	[NT]
Perfluoropentanesulfonic acid	µg/L	0.01	Org-029	[NT]	11	0.01	0.02	67	[NT]	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	[NT]	11	0.01	0.01	0	[NT]	[NT]
Perfluoroheptanesulfonic acid	µg/L	0.01	Org-029	[NT]	11	<0.01	<0.01	0	[NT]	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	[NT]	11	<0.01	<0.01	0	[NT]	[NT]
Perfluorodecanesulfonic acid	µg/L	0.02	Org-029	[NT]	11	<0.02	<0.02	0	[NT]	[NT]
Perfluorobutanoic acid	µg/L	0.02	Org-029	[NT]	11	0.02	<0.02	0	[NT]	[NT]
Perfluoropentanoic acid	µg/L	0.02	Org-029	[NT]	11	<0.02	<0.02	0	[NT]	[NT]
Perfluorohexanoic acid	µg/L	0.01	Org-029	[NT]	11	<0.01	<0.01	0	[NT]	[NT]
Perfluoroheptanoic acid	µg/L	0.01	Org-029	[NT]	11	<0.01	<0.01	0	[NT]	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	[NT]	11	<0.01	<0.01	0	[NT]	[NT]
Perfluorononanoic acid	µg/L	0.01	Org-029	[NT]	11	<0.01	<0.01	0	[NT]	[NT]
Perfluorodecanoic acid	µg/L	0.02	Org-029	[NT]	11	<0.02	<0.02	0	[NT]	[NT]
Perfluoroundecanoic acid	µg/L	0.02	Org-029	[NT]	11	<0.02	<0.02	0	[NT]	[NT]
Perfluorododecanoic acid	µg/L	0.05	Org-029	[NT]	11	<0.05	<0.05	0	[NT]	[NT]
Perfluorotridecanoic acid	µg/L	0.1	Org-029	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Perfluorotetradecanoic acid	µg/L	0.5	Org-029	[NT]	11	<0.5	<0.5	0	[NT]	[NT]
4:2 FTS	µg/L	0.01	Org-029	[NT]	11	<0.01	<0.01	0	[NT]	[NT]
6:2 FTS	µg/L	0.01	Org-029	[NT]	11	<0.01	<0.01	0	[NT]	[NT]
8:2 FTS	µg/L	0.02	Org-029	[NT]	11	<0.02	<0.02	0	[NT]	[NT]
10:2 FTS	µg/L	0.02	Org-029	[NT]	11	<0.02	<0.02	0	[NT]	[NT]
Perfluorooctane sulfonamide	µg/L	0.1	Org-029	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	[NT]	11	<0.05	<0.05	0	[NT]	[NT]
N-Ethyl perfluorooctanesulfon amide	µg/L	0.1	Org-029	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
N-Me perfluorooctanesulfonamid oethanol	µg/L	0.05	Org-029	[NT]	11	<0.05	<0.05	0	[NT]	[NT]
N-Et perfluorooctanesulfonamid oethanol	µg/L	0.5	Org-029	[NT]	11	<0.5	<0.5	0	[NT]	[NT]
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	[NT]	11	<0.02	<0.02	0	[NT]	[NT]
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	[NT]	11	<0.02	<0.02	0	[NT]	[NT]
Surrogate ¹³ C ₈ PFOS	%		Org-029	[NT]	11	97	100	3	[NT]	[NT]
Surrogate ¹³ C ₂ PFOA	%		Org-029	[NT]	11	98	105	7	[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Extracted ISTD ¹³ C ₃ PFBS	%		Org-029	[NT]	11	99	99	0	[NT]	[NT]
Extracted ISTD ¹⁸ O ₂ PFHxS	%		Org-029	[NT]	11	98	98	0	[NT]	[NT]
Extracted ISTD ¹³ C ₄ PFOS	%		Org-029	[NT]	11	95	96	1	[NT]	[NT]
Extracted ISTD ¹³ C ₄ PFBA	%		Org-029	[NT]	11	88	91	3	[NT]	[NT]
Extracted ISTD ¹³ C ₃ PFPeA	%		Org-029	[NT]	11	107	109	2	[NT]	[NT]
Extracted ISTD ¹³ C ₂ PFHxA	%		Org-029	[NT]	11	106	107	1	[NT]	[NT]
Extracted ISTD ¹³ C ₄ PFHpA	%		Org-029	[NT]	11	93	98	5	[NT]	[NT]
Extracted ISTD ¹³ C ₄ PFOA	%		Org-029	[NT]	11	104	102	2	[NT]	[NT]
Extracted ISTD ¹³ C ₅ PFNA	%		Org-029	[NT]	11	93	94	1	[NT]	[NT]
Extracted ISTD ¹³ C ₂ PFDA	%		Org-029	[NT]	11	104	103	1	[NT]	[NT]
Extracted ISTD ¹³ C ₂ PFUnDA	%		Org-029	[NT]	11	103	101	2	[NT]	[NT]
Extracted ISTD ¹³ C ₂ PFDoDA	%		Org-029	[NT]	11	97	93	4	[NT]	[NT]
Extracted ISTD ¹³ C ₂ PFTeDA	%		Org-029	[NT]	11	67	74	10	[NT]	[NT]
Extracted ISTD ¹³ C ₂ 4:2FTS	%		Org-029	[NT]	11	105	99	6	[NT]	[NT]
Extracted ISTD ¹³ C ₂ 6:2FTS	%		Org-029	[NT]	11	100	102	2	[NT]	[NT]
Extracted ISTD ¹³ C ₂ 8:2FTS	%		Org-029	[NT]	11	103	97	6	[NT]	[NT]
Extracted ISTD ¹³ C ₈ FOSA	%		Org-029	[NT]	11	88	91	3	[NT]	[NT]
Extracted ISTD d ₃ N MeFOSA	%		Org-029	[NT]	11	85	89	5	[NT]	[NT]
Extracted ISTD d ₅ N EtFOSA	%		Org-029	[NT]	11	84	89	6	[NT]	[NT]
Extracted ISTD d ₇ N MeFOSE	%		Org-029	[NT]	11	90	89	1	[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Extracted ISTD d ₉ N EtFOSE	%		Org-029	[NT]	11	96	103	7	[NT]	[NT]
Extracted ISTD d ₃ N MeFOSAA	%		Org-029	[NT]	11	95	88	8	[NT]	[NT]
Extracted ISTD d ₅ N EtFOSAA	%		Org-029	[NT]	11	98	98	0	[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Dissolved Gases in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			04/07/2023	1	04/07/2023	04/07/2023		04/07/2023	[NT]
Date analysed	-			04/07/2023	1	04/07/2023	04/07/2023		04/07/2023	[NT]
Methane	µg/L	5	AT-006	<5	1	<5	<5	0	102	[NT]

QUALITY CONTROL: Dissolved Gases in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	04/07/2023	04/07/2023		[NT]	[NT]
Date analysed	-			[NT]	11	04/07/2023	04/07/2023		[NT]	[NT]
Methane	µg/L	5	AT-006	[NT]	11	<5	<5	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

All metals 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.

Dissolved Metals: no filtered, preserved sample was received, therefore the unpreserved sample was filtered through 0.45µm filter at the lab.

Note: there is a possibility some elements may be underestimated.

PFAS: For PFAS Extracted Internal Standards denoted with # or outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).

Ion Balance - # 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.

All metals 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.

The mass imbalance may be caused by other ions that have not been measured.

CERTIFICATE OF ANALYSIS 327066

Client Details

Client	CTP AFJV
Attention	
Address	7 Figtree Dr, SYDNEY OLYMPIC PARK, NSW, 2127

Sample Details

Your Reference	<u>CTP Groundwater Monitoring</u>
Number of Samples	3 Water
Date samples received	30/06/2023
Date completed instructions received	04/07/2023

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	11/07/2023
Date of Issue	11/07/2023
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 *	

Client Reference: CTP Groundwater Monitoring

VOCs in water				
Our Reference		327066-1	327066-2	327066-3
Your Reference	UNITS	BH044	BH046R	BH051
Type of sample		Water	Water	Water
Date extracted	-	05/07/2023	05/07/2023	05/07/2023
Date analysed	-	06/07/2023	06/07/2023	06/07/2023
Dichlorodifluoromethane	µg/L	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1
Chloroform	µg/L	<1	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1
Benzene	µg/L	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1
Toluene	µg/L	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1
Bromoform	µg/L	<1	<1	<1

Client Reference: CTP Groundwater Monitoring

VOCs in water				
Our Reference		327066-1	327066-2	327066-3
Your Reference	UNITS	BH044	BH046R	BH051
Type of sample		Water	Water	Water
m+p-xylene	µg/L	<2	<2	<2
Styrene	µg/L	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1
o-xylene	µg/L	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1
Surrogate Dibromofluoromethane	%	106	105	104
Surrogate toluene-d8	%	96	97	96
Surrogate 4-BFB	%	108	108	109

Client Reference: CTP Groundwater Monitoring

vTRH(C6-C10)/BTEXN in Water				
Our Reference		327066-1	327066-2	327066-3
Your Reference	UNITS	BH044	BH046R	BH051
Type of sample		Water	Water	Water
Date extracted	-	05/07/2023	05/07/2023	05/07/2023
Date analysed	-	06/07/2023	06/07/2023	06/07/2023
TRH C ₆ - C ₉	µg/L	<10	<10	<10
TRH C ₆ - C ₁₀	µg/L	<10	<10	<10
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	<10	<10	<10
Benzene	µg/L	<1	<1	<1
Toluene	µg/L	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2
o-xylene	µg/L	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1
Surrogate Dibromofluoromethane	%	106	105	104
Surrogate toluene-d8	%	96	97	96
Surrogate 4-BFB	%	108	108	109

Client Reference: CTP Groundwater Monitoring

svTRH (C10-C40) in Water				
Our Reference		327066-1	327066-2	327066-3
Your Reference	UNITS	BH044	BH046R	BH051
Type of sample		Water	Water	Water
Date extracted	-	05/07/2023	05/07/2023	05/07/2023
Date analysed	-	06/07/2023	06/07/2023	06/07/2023
TRH C ₁₀ - C ₁₄	µg/L	<50	<50	<50
TRH C ₁₅ - C ₂₈	µg/L	<100	<100	130
TRH C ₂₉ - C ₃₆	µg/L	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	130
TRH >C ₁₀ - C ₁₆	µg/L	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	<50	<50	<50
TRH >C ₁₆ - C ₃₄	µg/L	<100	<100	180
TRH >C ₃₄ - C ₄₀	µg/L	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	180
Surrogate o-Terphenyl	%	76	75	65

Client Reference: CTP Groundwater Monitoring

PAHs in Water				
Our Reference		327066-1	327066-2	327066-3
Your Reference	UNITS	BH044	BH046R	BH051
Type of sample		Water	Water	Water
Date extracted	-	05/07/2023	05/07/2023	05/07/2023
Date analysed	-	05/07/2023	05/07/2023	05/07/2023
Naphthalene	µg/L	<0.2	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1
Surrogate <i>p</i> -Terphenyl-d14	%	95	96	80

Client Reference: CTP Groundwater Monitoring

All metals in water-dissolved				
Our Reference		327066-1	327066-2	327066-3
Your Reference	UNITS	BH044	BH046R	BH051
Type of sample		Water	Water	Water
Date prepared	-	05/07/2023	05/07/2023	05/07/2023
Date analysed	-	05/07/2023	05/07/2023	05/07/2023
Arsenic-Dissolved	µg/L	<1	<1	1
Boron-Dissolved	µg/L	30	90	60
Barium-Dissolved	µg/L	21	36	69
Beryllium-Dissolved	µg/L	<0.5	<0.5	<0.5
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1
Copper-Dissolved	µg/L	5	33	<1
Cobalt-Dissolved	µg/L	<1	<1	120
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05
Manganese-Dissolved	µg/L	<5	850	44,000
Molybdenum-Dissolved	µg/L	2	3	3
Nickel-Dissolved	µg/L	<1	8	100
Lead-Dissolved	µg/L	<1	<1	<1
Antimony-Dissolved	µg/L	<1	<1	<1
Selenium-Dissolved	µg/L	<1	<1	<1
Tin-Dissolved	µg/L	<1	<1	<1
Zinc-Dissolved	µg/L	1	10	82
Iron-Dissolved	µg/L	<10	<10	700

Client Reference: CTP Groundwater Monitoring

All metals in water - total				
Our Reference		327066-1	327066-2	327066-3
Your Reference	UNITS	BH044	BH046R	BH051
Type of sample		Water	Water	Water
Date prepared	-	04/07/2023	04/07/2023	04/07/2023
Date analysed	-	05/07/2023	05/07/2023	05/07/2023
Arsenic-Total	µg/L	<1	9	9
Boron-Total	µg/L	40	80	60
Barium-Total	µg/L	64	160	230
Beryllium-Total	µg/L	<0.5	0.9	3
Cadmium-Total	µg/L	<0.1	0.1	1.5
Chromium-Total	µg/L	8	7	50
Copper-Total	µg/L	17	290	200
Cobalt-Total	µg/L	<1	5	250
Mercury-Total	µg/L	<0.05	<0.05	0.08
Manganese-Total	µg/L	92	1,000	70,000
Molybdenum-Total	µg/L	3	3	4
Nickel-Total	µg/L	6	26	190
Lead-Total	µg/L	3	9	48
Antimony-Total	µg/L	1	<1	2
Selenium-Total	µg/L	<1	<1	<1
Tin-Total	µg/L	<1	<1	7
Zinc-Total	µg/L	36	44	830
Iron-Total	µg/L	3,000	11,000	13,000

Client Reference: CTP Groundwater Monitoring

Metals in Waters - Total				
Our Reference		327066-1	327066-2	327066-3
Your Reference	UNITS	BH044	BH046R	BH051
Type of sample		Water	Water	Water
Date prepared	-	04/07/2023	04/07/2023	04/07/2023
Date analysed	-	05/07/2023	05/07/2023	05/07/2023
Phosphorus - Total	mg/L	0.1	0.08	1.4

Client Reference: CTP Groundwater Monitoring

Miscellaneous Inorganics				
Our Reference		327066-1	327066-2	327066-3
Your Reference	UNITS	BH044	BH046R	BH051
Type of sample		Water	Water	Water
Date prepared	-	04/07/2023	04/07/2023	04/07/2023
Date analysed	-	04/07/2023	04/07/2023	04/07/2023
Ammonia as N in water	mg/L	<0.005	0.46	0.76
Nitrate as N in water	mg/L	0.63	0.02	1.7
Total Nitrogen in water	mg/L	0.6	1.2	6.7
pH	pH Units	8.0	6.6	6.2
Electrical Conductivity	µS/cm	320	13,000	6,700

Client Reference: CTP Groundwater Monitoring

Ion Balance				
Our Reference		327066-1	327066-2	327066-3
Your Reference	UNITS	BH044	BH046R	BH051
Type of sample		Water	Water	Water
Date prepared	-	04/07/2023	04/07/2023	04/07/2023
Date analysed	-	04/07/2023	04/07/2023	04/07/2023
Calcium - Dissolved	mg/L	22	160	59
Potassium - Dissolved	mg/L	2	35	20
Sodium - Dissolved	mg/L	28	2,200	1,100
Magnesium - Dissolved	mg/L	2	270	86
Hardness	mgCaCO ₃ /L	63	1,500	500
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5	<5	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	66	530	250
Carbonate Alkalinity as CaCO ₃	mg/L	<5	<5	<5
Total Alkalinity as CaCO ₃	mg/L	66	530	250
Sulphate, SO ₄	mg/L	33	540	480
Chloride, Cl	mg/L	44	4,000	1,800
Ionic Balance	%	-12	-2.0	-6.0

Client Reference: CTP Groundwater Monitoring

PFAS in Waters Extended				
Our Reference		327066-1	327066-2	327066-3
Your Reference	UNITS	BH044	BH046R	BH051
Type of sample		Water	Water	Water
Date prepared	-	05/07/2023	05/07/2023	05/07/2023
Date analysed	-	05/07/2023	05/07/2023	05/07/2023
Perfluorobutanesulfonic acid	µg/L	<0.01	<0.01	<0.01
Perfluoropentanesulfonic acid	µg/L	<0.01	<0.01	<0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01	<0.01	<0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01	<0.01	<0.01
Perfluorodecanesulfonic acid	µg/L	<0.02	<0.02	<0.02
Perfluorobutanoic acid	µg/L	<0.02	<0.02	<0.02
Perfluoropentanoic acid	µg/L	<0.02	<0.02	<0.02
Perfluorohexanoic acid	µg/L	<0.01	<0.01	<0.01
Perfluoroheptanoic acid	µg/L	<0.01	<0.01	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01	<0.01	<0.01
Perfluorononanoic acid	µg/L	<0.01	<0.01	<0.01
Perfluorodecanoic acid	µg/L	<0.02	<0.02	<0.02
Perfluoroundecanoic acid	µg/L	<0.02	<0.02	<0.02
Perfluorododecanoic acid	µg/L	<0.05	<0.05	<0.05
Perfluorotridecanoic acid	µg/L	<0.1	<0.1	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5	<0.5	<0.5
4:2 FTS	µg/L	<0.01	<0.01	<0.01
6:2 FTS	µg/L	<0.01	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02	<0.02
10:2 FTS	µg/L	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1	<0.1	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05	<0.05	<0.05
N-Ethyl perfluorooctanesulfonamide	µg/L	<0.1	<0.1	<0.1
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.05	<0.05	<0.05
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.5	<0.5	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02
Surrogate ¹³ C ₈ PFOS	%	96	99	98
Surrogate ¹³ C ₂ PFOA	%	98	99	104
Extracted ISTD ¹³ C ₃ PFBS	%	104	100	101
Extracted ISTD ¹⁸ O ₂ PFHxS	%	102	102	106
Extracted ISTD ¹³ C ₄ PFOS	%	109	102	107
Extracted ISTD ¹³ C ₄ PFBA	%	99	84	84
Extracted ISTD ¹³ C ₃ PFPeA	%	111	94	104

PFAS in Waters Extended				
Our Reference		327066-1	327066-2	327066-3
Your Reference	UNITS	BH044	BH046R	BH051
Type of sample		Water	Water	Water
Extracted ISTD ¹³ C ₂ PFHxA	%	104	89	101
Extracted ISTD ¹³ C ₄ PFHpA	%	107	97	104
Extracted ISTD ¹³ C ₄ PFOA	%	111	101	105
Extracted ISTD ¹³ C ₅ PFNA	%	118	105	110
Extracted ISTD ¹³ C ₂ PFDA	%	120	101	105
Extracted ISTD ¹³ C ₂ PFUnDA	%	118	104	100
Extracted ISTD ¹³ C ₂ PFDoDA	%	130	110	121
Extracted ISTD ¹³ C ₂ PFTeDA	%	108	97	107
Extracted ISTD ¹³ C ₂ 4:2FTS	%	129	69	84
Extracted ISTD ¹³ C ₂ 6:2FTS	%	123	77	92
Extracted ISTD ¹³ C ₂ 8:2FTS	%	127	103	112
Extracted ISTD ¹³ C ₈ FOSA	%	114	108	114
Extracted ISTD d ₃ N MeFOSA	%	101	99	98
Extracted ISTD d ₅ N EtFOSA	%	104	102	108
Extracted ISTD d ₇ N MeFOSE	%	99	96	104
Extracted ISTD d ₉ N EtFOSE	%	105	97	100
Extracted ISTD d ₃ N MeFOSAA	%	127	110	116
Extracted ISTD d ₅ N EtFOSAA	%	111	95	106
Total Positive PFHxS & PFOS	µg/L	<0.01	<0.01	<0.01
Total Positive PFOA & PFOS	µg/L	<0.01	<0.01	<0.01
Total Positive PFAS	µg/L	<0.01	<0.01	<0.01

Client Reference: CTP Groundwater Monitoring

Dissolved Gases in Water				
Our Reference		327066-1	327066-2	327066-3
Your Reference	UNITS	BH044	BH046R	BH051
Type of sample		Water	Water	Water
Date prepared	-	06/07/2023	06/07/2023	06/07/2023
Date analysed	-	06/07/2023	06/07/2023	06/07/2023
Methane	µg/L	<5	<5	<5

Client Reference: CTP Groundwater Monitoring

Method ID	Methodology Summary
AT-006	Dissolved gases determined by GC-FID based on draft method USEPA SOP RSK175
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% ie total anions = total cations +/-15%.
Inorg-055	Nitrate - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-055/062/127	Total Nitrogen - Calculation sum of TKN and oxidised Nitrogen. Alternatively analysed by combustion and chemiluminescence.
Inorg-057	Ammonia - determined colourimetrically, based on APHA latest edition 4500-NH3 F. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a KCl extraction.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
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.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

Client Reference: CTP Groundwater Monitoring

Method ID	Methodology Summary
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			05/07/2023	[NT]	[NT]	[NT]	[NT]	05/07/2023	[NT]
Date analysed	-			06/07/2023	[NT]	[NT]	[NT]	[NT]	06/07/2023	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	91	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromomethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	83	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	83	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromoform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Styrene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	105	[NT]	[NT]	[NT]	[NT]	97	[NT]
Surrogate toluene-d8	%		Org-023	96	[NT]	[NT]	[NT]	[NT]	98	[NT]
Surrogate 4-BFB	%		Org-023	108	[NT]	[NT]	[NT]	[NT]	102	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			05/07/2023	[NT]	[NT]	[NT]	[NT]	05/07/2023	[NT]
Date analysed	-			06/07/2023	[NT]	[NT]	[NT]	[NT]	06/07/2023	[NT]
TRH C ₆ - C ₉	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	95	[NT]
TRH C ₆ - C ₁₀	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	95	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	99	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	105	[NT]	[NT]	[NT]	[NT]	97	[NT]
Surrogate toluene-d8	%		Org-023	96	[NT]	[NT]	[NT]	[NT]	98	[NT]
Surrogate 4-BFB	%		Org-023	108	[NT]	[NT]	[NT]	[NT]	102	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	327066-2
Date extracted	-			05/07/2023	1	05/07/2023	05/07/2023		05/07/2023	05/07/2023
Date analysed	-			06/07/2023	1	06/07/2023	06/07/2023		06/07/2023	06/07/2023
TRH C ₁₀ - C ₁₄	µg/L	50	Org-020	<50	1	<50	<50	0	105	118
TRH C ₁₅ - C ₂₈	µg/L	100	Org-020	<100	1	<100	<100	0	100	123
TRH C ₂₉ - C ₃₆	µg/L	100	Org-020	<100	1	<100	<100	0	100	102
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-020	<50	1	<50	<50	0	105	118
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-020	<100	1	<100	<100	0	100	123
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-020	<100	1	<100	<100	0	100	102
Surrogate o-Terphenyl	%		Org-020	87	1	76	70	8	82	85

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PAHs in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	327066-2
Date extracted	-			05/07/2023	1	05/07/2023	05/07/2023		05/07/2023	05/07/2023
Date analysed	-			05/07/2023	1	05/07/2023	05/07/2023		05/07/2023	05/07/2023
Naphthalene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	88	100
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	78	93
Fluorene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	83	94
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	81	95
Anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	92
Pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	99
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	78	92
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	71	82
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	106	1	95	91	4	99	95

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: All metals in water-dissolved					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W5	[NT]
Date prepared	-			05/07/2023	[NT]	[NT]	[NT]	[NT]	05/07/2023	[NT]
Date analysed	-			05/07/2023	[NT]	[NT]	[NT]	[NT]	05/07/2023	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	81	[NT]
Boron-Dissolved	µg/L	20	Metals-022	<20	[NT]	[NT]	[NT]	[NT]	85	[NT]
Barium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	81	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	87	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	83	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	83	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	100	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	<5	[NT]	[NT]	[NT]	[NT]	86	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	83	[NT]
Antimony-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Tin-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Iron-Dissolved	µg/L	10	Metals-022	<10	[NT]	[NT]	[NT]	[NT]	82	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: All metals in water - total					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	327066-2
Date prepared	-			04/07/2023	1	04/07/2023	04/07/2023		04/07/2023	04/07/2023
Date analysed	-			05/07/2023	1	05/07/2023	05/07/2023		05/07/2023	05/07/2023
Arsenic-Total	µg/L	1	Metals-022	<1	1	<1	<1	0	101	[NT]
Boron-Total	µg/L	20	Metals-022	<20	1	40	40	0	98	[NT]
Barium-Total	µg/L	1	Metals-022	<1	1	64	57	12	98	[NT]
Beryllium-Total	µg/L	0.5	Metals-022	<0.5	1	<0.5	<0.5	0	101	[NT]
Cadmium-Total	µg/L	0.1	Metals-022	<0.1	1	<0.1	<0.1	0	105	[NT]
Chromium-Total	µg/L	1	Metals-022	<1	1	8	8	0	101	[NT]
Copper-Total	µg/L	1	Metals-022	<1	1	17	17	0	97	[NT]
Cobalt-Total	µg/L	1	Metals-022	<1	1	<1	<1	0	98	[NT]
Mercury-Total	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	111	83
Manganese-Total	µg/L	5	Metals-022	<5	1	92	93	1	104	[NT]
Molybdenum-Total	µg/L	1	Metals-022	<1	1	3	3	0	94	[NT]
Nickel-Total	µg/L	1	Metals-022	<1	1	6	6	0	98	[NT]
Lead-Total	µg/L	1	Metals-022	<1	1	3	3	0	100	[NT]
Antimony-Total	µg/L	1	Metals-022	<1	1	1	1	0	98	[NT]
Selenium-Total	µg/L	1	Metals-022	<1	1	<1	<1	0	108	[NT]
Tin-Total	µg/L	1	Metals-022	<1	1	<1	<1	0	108	[NT]
Zinc-Total	µg/L	1	Metals-022	<1	1	36	37	3	112	[NT]
Iron-Total	µg/L	10	Metals-022	<10	1	3000	3000	0	103	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: All metals in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	3	04/07/2023	04/07/2023		[NT]	[NT]
Date analysed	-			[NT]	3	05/07/2023	05/07/2023		[NT]	[NT]
Arsenic-Total	µg/L	1	Metals-022	[NT]	3	9	[NT]		[NT]	[NT]
Boron-Total	µg/L	20	Metals-022	[NT]	3	60	[NT]		[NT]	[NT]
Barium-Total	µg/L	1	Metals-022	[NT]	3	230	[NT]		[NT]	[NT]
Beryllium-Total	µg/L	0.5	Metals-022	[NT]	3	3	[NT]		[NT]	[NT]
Cadmium-Total	µg/L	0.1	Metals-022	[NT]	3	1.5	[NT]		[NT]	[NT]
Chromium-Total	µg/L	1	Metals-022	[NT]	3	50	[NT]		[NT]	[NT]
Copper-Total	µg/L	1	Metals-022	[NT]	3	200	[NT]		[NT]	[NT]
Cobalt-Total	µg/L	1	Metals-022	[NT]	3	250	[NT]		[NT]	[NT]
Mercury-Total	µg/L	0.05	Metals-021	[NT]	3	0.08	0.05	46	[NT]	[NT]
Manganese-Total	µg/L	5	Metals-022	[NT]	3	70000	[NT]		[NT]	[NT]
Molybdenum-Total	µg/L	1	Metals-022	[NT]	3	4	[NT]		[NT]	[NT]
Nickel-Total	µg/L	1	Metals-022	[NT]	3	190	[NT]		[NT]	[NT]
Lead-Total	µg/L	1	Metals-022	[NT]	3	48	[NT]		[NT]	[NT]
Antimony-Total	µg/L	1	Metals-022	[NT]	3	2	[NT]		[NT]	[NT]
Selenium-Total	µg/L	1	Metals-022	[NT]	3	<1	[NT]		[NT]	[NT]
Tin-Total	µg/L	1	Metals-022	[NT]	3	7	[NT]		[NT]	[NT]
Zinc-Total	µg/L	1	Metals-022	[NT]	3	830	[NT]		[NT]	[NT]
Iron-Total	µg/L	10	Metals-022	[NT]	3	13000	[NT]		[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Metals in Waters - Total					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			04/07/2023	1	04/07/2023	04/07/2023		04/07/2023	[NT]
Date analysed	-			05/07/2023	1	05/07/2023	05/07/2023		05/07/2023	[NT]
Phosphorus - Total	mg/L	0.05	Metals-020	<0.05	1	0.1	0.1	0	106	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Miscellaneous Inorganics					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			04/07/2023	[NT]	[NT]	[NT]	[NT]	04/07/2023	[NT]
Date analysed	-			04/07/2023	[NT]	[NT]	[NT]	[NT]	04/07/2023	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	[NT]	[NT]	[NT]	[NT]	99	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NT]	[NT]	102	[NT]
Total Nitrogen in water	mg/L	0.1	Inorg-055/062/127	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
pH	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	100	[NT]
Electrical Conductivity	µS/cm	1	Inorg-002	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Ion Balance					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			04/07/2023	[NT]	[NT]	[NT]	[NT]	04/07/2023	[NT]
Date analysed	-			04/07/2023	[NT]	[NT]	[NT]	[NT]	04/07/2023	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	91	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	85	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	95	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	94	[NT]
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Total Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	104	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			05/07/2023	[NT]	[NT]	[NT]	[NT]	05/07/2023	[NT]
Date analysed	-			05/07/2023	[NT]	[NT]	[NT]	[NT]	05/07/2023	[NT]
Perfluorobutanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	111	[NT]
Perfluoropentanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	116	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	116	[NT]
Perfluoroheptanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	122	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	114	[NT]
Perfluorodecanesulfonic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	89	[NT]
Perfluorobutanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	119	[NT]
Perfluoropentanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	115	[NT]
Perfluorohexanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	117	[NT]
Perfluoroheptanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	107	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	109	[NT]
Perfluorononanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	116	[NT]
Perfluorodecanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	133	[NT]
Perfluoroundecanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	107	[NT]
Perfluorododecanoic acid	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	120	[NT]
Perfluorotridecanoic acid	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Perfluorotetradecanoic acid	µg/L	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	125	[NT]
4:2 FTS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	108	[NT]
6:2 FTS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	113	[NT]
8:2 FTS	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	122	[NT]
10:2 FTS	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	127	[NT]
Perfluorooctane sulfonamide	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	123	[NT]
N-Ethyl perfluorooctanesulfon amide	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]
N-Me perfluorooctanesulfonamid oethanol	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	127	[NT]
N-Et perfluorooctanesulfonamid oethanol	µg/L	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	114	[NT]
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	108	[NT]
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	115	[NT]
Surrogate ¹³ C ₈ PFOS	%		Org-029	97	[NT]	[NT]	[NT]	[NT]	102	[NT]
Surrogate ¹³ C ₂ PFOA	%		Org-029	96	[NT]	[NT]	[NT]	[NT]	99	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Extracted ISTD ¹³ C ₃ PFBS	%		Org-029	97	[NT]	[NT]	[NT]	[NT]	98	[NT]
Extracted ISTD ¹⁸ O ₂ PFHxS	%		Org-029	98	[NT]	[NT]	[NT]	[NT]	96	[NT]
Extracted ISTD ¹³ C ₄ PFOS	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	102	[NT]
Extracted ISTD ¹³ C ₄ PFBA	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	101	[NT]
Extracted ISTD ¹³ C ₃ PFPeA	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	99	[NT]
Extracted ISTD ¹³ C ₂ PFHxA	%		Org-029	101	[NT]	[NT]	[NT]	[NT]	95	[NT]
Extracted ISTD ¹³ C ₄ PFHpA	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	101	[NT]
Extracted ISTD ¹³ C ₄ PFOA	%		Org-029	108	[NT]	[NT]	[NT]	[NT]	104	[NT]
Extracted ISTD ¹³ C ₅ PFNA	%		Org-029	106	[NT]	[NT]	[NT]	[NT]	100	[NT]
Extracted ISTD ¹³ C ₂ PFDA	%		Org-029	103	[NT]	[NT]	[NT]	[NT]	99	[NT]
Extracted ISTD ¹³ C ₂ PFUnDA	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	109	[NT]
Extracted ISTD ¹³ C ₂ PFDoDA	%		Org-029	108	[NT]	[NT]	[NT]	[NT]	112	[NT]
Extracted ISTD ¹³ C ₂ PFTeDA	%		Org-029	90	[NT]	[NT]	[NT]	[NT]	96	[NT]
Extracted ISTD ¹³ C ₂ 4:2FTS	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	108	[NT]
Extracted ISTD ¹³ C ₂ 6:2FTS	%		Org-029	107	[NT]	[NT]	[NT]	[NT]	108	[NT]
Extracted ISTD ¹³ C ₂ 8:2FTS	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	110	[NT]
Extracted ISTD ¹³ C ₈ FOSA	%		Org-029	109	[NT]	[NT]	[NT]	[NT]	103	[NT]
Extracted ISTD d ₃ N MeFOSA	%		Org-029	92	[NT]	[NT]	[NT]	[NT]	94	[NT]
Extracted ISTD d ₅ N EtFOSA	%		Org-029	101	[NT]	[NT]	[NT]	[NT]	101	[NT]
Extracted ISTD d ₇ N MeFOSE	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	95	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Extracted ISTD d ₉ N EtFOSE	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	99	[NT]
Extracted ISTD d ₃ N MeFOSAA	%		Org-029	121	[NT]	[NT]	[NT]	[NT]	113	[NT]
Extracted ISTD d ₅ N EtFOSAA	%		Org-029	105	[NT]	[NT]	[NT]	[NT]	102	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Dissolved Gases in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			06/07/2023	1	06/07/2023	06/07/2023		06/07/2023	[NT]
Date analysed	-			06/07/2023	1	06/07/2023	06/07/2023		06/07/2023	[NT]
Methane	µg/L	5	AT-006	<5	1	<5	<5	0	97	[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

Samples received in good order: Holding time exceedance

Dissolved Metals: no filtered, preserved sample was received, therefore the unpreserved sample was filtered through 0.45µm filter at the lab.

Note: there is a possibility some elements may be underestimated.

CERTIFICATE OF ANALYSIS 331657

Client Details

Client	CTP AFJV
Attention	
Address	7 Figtree Dr, SYDNEY OLYMPIC PARK, NSW, 2127

Sample Details

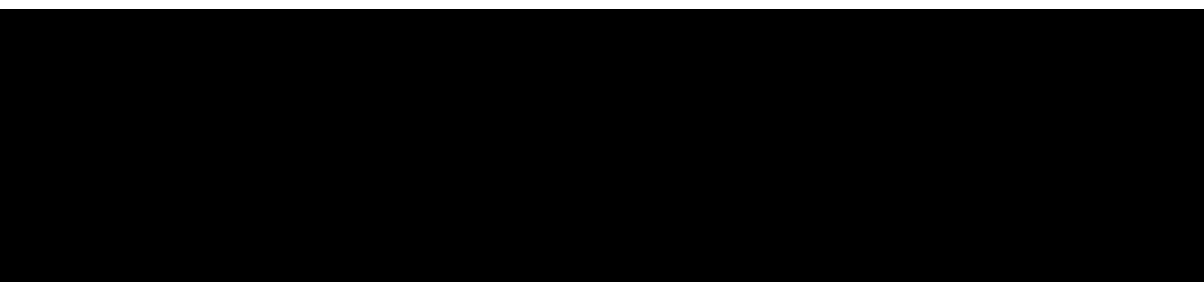
Your Reference	<u>CTP Groundwater Monitoring</u>
Number of Samples	2 Water
Date samples received	29/08/2023
Date completed instructions received	29/08/2023

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	05/09/2023
Date of Issue	05/09/2023
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Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	



Client Reference: CTP Groundwater Monitoring

VOCs in water			
Our Reference		331657-1	331657-2
Your Reference	UNITS	SMW_BH009S	SMW_BH038
Date Sampled		28/08/2023	28/08/2023
Type of sample		Water	Water
Date Extracted	-	30/08/2023	30/08/2023
Date Analysed	-	31/08/2023	31/08/2023
Dichlorodifluoromethane	µg/L	<10	<10
Chloromethane	µg/L	<10	<10
Vinyl Chloride	µg/L	<10	<10
Bromomethane	µg/L	<10	<10
Chloroethane	µg/L	<10	<10
Trichlorofluoromethane	µg/L	<10	<10
1,1-Dichloroethene	µg/L	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1
1,1-dichloroethane	µg/L	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1
Bromochloromethane	µg/L	<1	<1
Chloroform	µg/L	<1	<1
2,2-dichloropropane	µg/L	<1	<1
1,2-dichloroethane	µg/L	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1
1,1-dichloropropene	µg/L	<1	<1
Cyclohexane	µg/L	<1	<1
Carbon tetrachloride	µg/L	<1	<1
Benzene	µg/L	<1	<1
Dibromomethane	µg/L	<1	<1
1,2-dichloropropane	µg/L	<1	<1
Trichloroethene	µg/L	<1	<1
Bromodichloromethane	µg/L	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1
Toluene	µg/L	<1	<1
1,3-dichloropropane	µg/L	<1	<1
Dibromochloromethane	µg/L	<1	<1
1,2-dibromoethane	µg/L	<1	<1
Tetrachloroethene	µg/L	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1
Chlorobenzene	µg/L	<1	<1
Ethylbenzene	µg/L	<1	<1

VOCs in water			
Our Reference		331657-1	331657-2
Your Reference	UNITS	SMW_BH009S	SMW_BH038
Date Sampled		28/08/2023	28/08/2023
Type of sample		Water	Water
Bromoform	µg/L	<1	<1
m+p-xylene	µg/L	<2	<2
Styrene	µg/L	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1
o-xylene	µg/L	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1
Isopropylbenzene	µg/L	<1	<1
Bromobenzene	µg/L	<1	<1
n-propyl benzene	µg/L	<1	<1
2-chlorotoluene	µg/L	<1	<1
4-chlorotoluene	µg/L	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1
Tert-butyl benzene	µg/L	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1
Sec-butyl benzene	µg/L	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1
4-isopropyl toluene	µg/L	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1
n-butyl benzene	µg/L	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1
Hexachlorobutadiene	µg/L	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1
Surrogate Dibromofluoromethane	%	102	103
Surrogate Toluene-d8	%	97	97
Surrogate 4-Bromofluorobenzene	%	104	104

vTRH(C6-C10)/BTEXN in Water			
Our Reference		331657-1	331657-2
Your Reference	UNITS	SMW_BH009S	SMW_BH038
Date Sampled		28/08/2023	28/08/2023
Type of sample		Water	Water
Date extracted	-	30/08/2023	30/08/2023
Date analysed	-	31/08/2023	31/08/2023
TRH C ₆ - C ₉	µg/L	<10	<10
TRH C ₆ - C ₁₀	µg/L	<10	<10
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	<10	<10
Benzene	µg/L	<1	<1
Toluene	µg/L	<1	<1
Ethylbenzene	µg/L	<1	<1
m+p-xylene	µg/L	<2	<2
o-xylene	µg/L	<1	<1
Naphthalene	µg/L	<1	<1
Surrogate Dibromofluoromethane	%	102	103
Surrogate Toluene-d8	%	97	97
Surrogate 4-Bromofluorobenzene	%	104	104

svTRH (C10-C40) in Water			
Our Reference		331657-1	331657-2
Your Reference	UNITS	SMW_BH009S	SMW_BH038
Date Sampled		28/08/2023	28/08/2023
Type of sample		Water	Water
Date extracted	-	30/08/2023	30/08/2023
Date analysed	-	30/08/2023	30/08/2023
TRH C ₁₀ - C ₁₄	µg/L	<50	<50
TRH C ₁₅ - C ₂₈	µg/L	<100	<100
TRH C ₂₉ - C ₃₆	µg/L	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50
TRH >C ₁₀ - C ₁₆	µg/L	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	<50	<50
TRH >C ₁₆ - C ₃₄	µg/L	<100	<100
TRH >C ₃₄ - C ₄₀	µg/L	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50
Surrogate o-Terphenyl	%	80	63

PAHs in Water			
Our Reference		331657-1	331657-2
Your Reference	UNITS	SMW_BH009S	SMW_BH038
Date Sampled		28/08/2023	28/08/2023
Type of sample		Water	Water
Date extracted	-	30/08/2023	30/08/2023
Date analysed	-	30/08/2023	30/08/2023
Naphthalene	µg/L	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1
Surrogate <i>p</i> -Terphenyl-d14	%	80	65

Client Reference: CTP Groundwater Monitoring

All metals in water-dissolved			
Our Reference		331657-1	331657-2
Your Reference	UNITS	SMW_BH009S	SMW_BH038
Date Sampled		28/08/2023	28/08/2023
Type of sample		Water	Water
Date prepared	-	31/08/2023	31/08/2023
Date analysed	-	31/08/2023	31/08/2023
Arsenic-Dissolved	µg/L	<1	9
Boron-Dissolved	µg/L	100	60
Barium-Dissolved	µg/L	62	76
Beryllium-Dissolved	µg/L	<0.5	<0.5
Cadmium-Dissolved	µg/L	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1
Copper-Dissolved	µg/L	10	<1
Cobalt-Dissolved	µg/L	10	<1
Mercury-Dissolved	µg/L	<0.05	<0.05
Manganese-Dissolved	µg/L	1,400	7
Molybdenum-Dissolved	µg/L	2	7
Nickel-Dissolved	µg/L	19	1
Lead-Dissolved	µg/L	<1	<1
Antimony-Dissolved	µg/L	<1	<1
Selenium-Dissolved	µg/L	<1	<1
Tin-Dissolved	µg/L	1	<1
Zinc-Dissolved	µg/L	96	1
Iron-Dissolved	µg/L	170	<10

Client Reference: CTP Groundwater Monitoring

All metals in water - total			
Our Reference		331657-1	331657-2
Your Reference	UNITS	SMW_BH009S	SMW_BH038
Date Sampled		28/08/2023	28/08/2023
Type of sample		Water	Water
Date prepared	-	30/08/2023	30/08/2023
Date analysed	-	30/08/2023	30/08/2023
Arsenic-Total	µg/L	1	10
Boron-Total	µg/L	90	50
Barium-Total	µg/L	84	81
Beryllium-Total	µg/L	<0.5	<0.5
Cadmium-Total	µg/L	<0.1	<0.1
Chromium-Total	µg/L	1	3
Copper-Total	µg/L	12	<1
Cobalt-Total	µg/L	11	<1
Mercury-Total	µg/L	0.08	<0.05
Manganese-Total	µg/L	1,600	21
Molybdenum-Total	µg/L	1	7
Nickel-Total	µg/L	23	3
Lead-Total	µg/L	2	<1
Antimony-Total	µg/L	<1	<1
Selenium-Total	µg/L	<1	<1
Tin-Total	µg/L	<1	<1
Zinc-Total	µg/L	110	2
Iron-Total	µg/L	970	290

Client Reference: CTP Groundwater Monitoring

Metals in Waters - Total			
Our Reference		331657-1	331657-2
Your Reference	UNITS	SMW_BH009S	SMW_BH038
Date Sampled		28/08/2023	28/08/2023
Type of sample		Water	Water
Date prepared	-	30/08/2023	30/08/2023
Date analysed	-	30/08/2023	30/08/2023
Phosphorus - Total	mg/L	0.09	<0.05

Client Reference: CTP Groundwater Monitoring

Miscellaneous Inorganics			
Our Reference		331657-1	331657-2
Your Reference	UNITS	SMW_BH009S	SMW_BH038
Date Sampled		28/08/2023	28/08/2023
Type of sample		Water	Water
Date prepared	-	29/08/2023	29/08/2023
Date analysed	-	29/08/2023	29/08/2023
Ammonia as N in water	mg/L	0.027	2.2
Nitrate as N in water	mg/L	0.01	0.19
Total Nitrogen in water	mg/L	0.1	2.7

Ion Balance			
Our Reference		331657-1	331657-2
Your Reference	UNITS	SMW_BH009S	SMW_BH038
Date Sampled		28/08/2023	28/08/2023
Type of sample		Water	Water
Date prepared	-	29/08/2023	29/08/2023
Date analysed	-	29/08/2023	29/08/2023
Calcium - Dissolved	mg/L	55	98
Potassium - Dissolved	mg/L	4	22
Sodium - Dissolved	mg/L	100	1,200
Magnesium - Dissolved	mg/L	16	170
Hardness	mgCaCO ₃ /L	200	960
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	200	370
Carbonate Alkalinity as CaCO ₃	mg/L	<5	<5
Total Alkalinity as CaCO ₃	mg/L	200	370
Sulphate, SO ₄	mg/L	91	230
Chloride, Cl	mg/L	78	2,100
Ionic Balance	%	3.0	1.0

PFAS in Waters Extended			
Our Reference		331657-1	331657-2
Your Reference	UNITS	SMW_BH009S	SMW_BH038
Date Sampled		28/08/2023	28/08/2023
Type of sample		Water	Water
Date prepared	-	29/08/2023	29/08/2023
Date analysed	-	29/08/2023	29/08/2023
Perfluorobutanesulfonic acid	µg/L	<0.01	<0.01
Perfluoropentanesulfonic acid	µg/L	<0.01	<0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	0.02	<0.01
Perfluorodecanesulfonic acid	µg/L	<0.02	<0.02
Perfluorobutanoic acid	µg/L	<0.02	<0.02
Perfluoropentanoic acid	µg/L	<0.02	<0.02
Perfluorohexanoic acid	µg/L	<0.01	0.02
Perfluoroheptanoic acid	µg/L	<0.01	<0.01
Perfluorooctanoic acid PFOA	µg/L	0.01	<0.01
Perfluorononanoic acid	µg/L	<0.01	<0.01
Perfluorodecanoic acid	µg/L	<0.02	<0.02
Perfluoroundecanoic acid	µg/L	<0.02	<0.02
Perfluorododecanoic acid	µg/L	<0.05	<0.05
Perfluorotridecanoic acid	µg/L	<0.1	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5	<0.5
4:2 FTS	µg/L	<0.01	<0.01
6:2 FTS	µg/L	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02
10:2 FTS	µg/L	<0.02	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05	<0.05
N-Ethyl perfluorooctanesulfonamide	µg/L	<0.1	<0.1
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.05	<0.05
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.5	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02
Surrogate ¹³ C ₈ PFOS	%	101	103
Surrogate ¹³ C ₂ PFOA	%	97	98
Extracted ISTD ¹³ C ₃ PFBS	%	96	92
Extracted ISTD ¹⁸ O ₂ PFHxS	%	98	91
Extracted ISTD ¹³ C ₄ PFOS	%	109	110
Extracted ISTD ¹³ C ₄ PFBA	%	82	52

PFAS in Waters Extended			
Our Reference		331657-1	331657-2
Your Reference	UNITS	SMW_BH009S	SMW_BH038
Date Sampled		28/08/2023	28/08/2023
Type of sample		Water	Water
Extracted ISTD ¹³ C ₃ PFPeA	%	102	75
Extracted ISTD ¹³ C ₂ PFHxA	%	96	69
Extracted ISTD ¹³ C ₄ PFHpA	%	100	80
Extracted ISTD ¹³ C ₄ PFOA	%	111	100
Extracted ISTD ¹³ C ₅ PFNA	%	110	103
Extracted ISTD ¹³ C ₂ PFDA	%	121	122
Extracted ISTD ¹³ C ₂ PFUnDA	%	137	125
Extracted ISTD ¹³ C ₂ PFDoDA	%	135	128
Extracted ISTD ¹³ C ₂ PFTeDA	%	111	117
Extracted ISTD ¹³ C ₂ 4:2FTS	%	75	32
Extracted ISTD ¹³ C ₂ 6:2FTS	%	96	58
Extracted ISTD ¹³ C ₂ 8:2FTS	%	135	99
Extracted ISTD ¹³ C ₈ FOSA	%	103	94
Extracted ISTD d ₃ N MeFOSA	%	115	116
Extracted ISTD d ₅ N EtFOSA	%	118	120
Extracted ISTD d ₇ N MeFOSE	%	108	106
Extracted ISTD d ₉ N EtFOSE	%	111	109
Extracted ISTD d ₃ N MeFOSAA	%	108	86
Extracted ISTD d ₅ N EtFOSAA	%	126	102
Total Positive PFHxS & PFOS	µg/L	0.03	0.01
Total Positive PFOA & PFOS	µg/L	0.03	<0.01
Total Positive PFAS	µg/L	0.04	0.03

Client Reference: CTP Groundwater Monitoring

Method ID	Methodology Summary
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% ie total anions = total cations +/-15%.
Inorg-055	Nitrate - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-055/062/127	Total Nitrogen - Calculation sum of TKN and oxidised Nitrogen. Alternatively analysed by combustion and chemiluminescence.
Inorg-057	Ammonia - determined colourimetrically, based on APHA latest edition 4500-NH3 F. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a KCl extraction.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
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.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

Client Reference: CTP Groundwater Monitoring

Method ID	Methodology Summary
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date Extracted	-			30/08/2023	1	30/08/2023	31/08/2023		30/08/2023	[NT]
Date Analysed	-			31/08/2023	1	31/08/2023	01/09/2023		31/08/2023	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	91	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	1	<1	<1	0	96	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	98	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	92	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Dibromomethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	93	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	89	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	83	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	101	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromoform	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	[NT]	[NT]
Styrene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	99	1	102	103	1	96	[NT]
Surrogate Toluene-d8	%		Org-023	97	1	97	97	0	99	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	102	1	104	104	0	98	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			30/08/2023	1	30/08/2023	31/08/2023		30/08/2023	[NT]
Date analysed	-			31/08/2023	1	31/08/2023	01/09/2023		31/08/2023	[NT]
TRH C ₆ - C ₉	µg/L	10	Org-023	<10	1	<10	<10	0	96	[NT]
TRH C ₆ - C ₁₀	µg/L	10	Org-023	<10	1	<10	<10	0	96	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	97	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	101	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	90	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	95	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	93	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	99	1	102	103	1	96	[NT]
Surrogate Toluene-d8	%		Org-023	97	1	97	97	0	99	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	102	1	104	104	0	98	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			30/08/2023	[NT]	[NT]	[NT]	[NT]	30/08/2023	[NT]
Date analysed	-			30/08/2023	[NT]	[NT]	[NT]	[NT]	30/08/2023	[NT]
TRH C ₁₀ - C ₁₄	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	97	[NT]
TRH C ₁₅ - C ₂₈	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	93	[NT]
TRH C ₂₉ - C ₃₆	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	97	[NT]
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	93	[NT]
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
Surrogate o-Terphenyl	%		Org-020	71	[NT]	[NT]	[NT]	[NT]	88	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PAHs in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			30/08/2023	[NT]	[NT]	[NT]	[NT]	30/08/2023	[NT]
Date analysed	-			30/08/2023	[NT]	[NT]	[NT]	[NT]	30/08/2023	[NT]
Naphthalene	µg/L	0.1	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	85	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	81	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	81	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	81	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	68	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	78	[NT]	[NT]	[NT]	[NT]	98	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: All metals in water-dissolved					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			31/08/2023	1	31/08/2023	31/08/2023		31/08/2023	[NT]
Date analysed	-			31/08/2023	1	31/08/2023	31/08/2023		31/08/2023	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	98	[NT]
Boron-Dissolved	µg/L	20	Metals-022	<20	1	100	90	11	84	[NT]
Barium-Dissolved	µg/L	1	Metals-022	<1	1	62	61	2	97	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	1	<0.5	<0.5	0	95	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	<0.1	<0.1	0	96	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	95	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	1	10	10	0	98	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	<1	1	10	9	11	96	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	[NT]		95	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	<5	1	1400	1400	0	88	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	1	2	2	0	91	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	19	19	0	90	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	95	[NT]
Antimony-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	99	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	97	[NT]
Tin-Dissolved	µg/L	1	Metals-022	<1	1	1	<1	0	92	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	96	95	1	96	[NT]
Iron-Dissolved	µg/L	10	Metals-022	<10	1	170	160	6	88	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: All metals in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	331657-2
Date prepared	-			30/08/2023	1	30/08/2023	30/08/2023		30/08/2023	30/08/2023
Date analysed	-			30/08/2023	1	30/08/2023	30/08/2023		30/08/2023	30/08/2023
Arsenic-Total	µg/L	1	Metals-022	<1	1	1	[NT]		93	[NT]
Boron-Total	µg/L	20	Metals-022	<20	1	90	[NT]		94	[NT]
Barium-Total	µg/L	1	Metals-022	<1	1	84	[NT]		97	[NT]
Beryllium-Total	µg/L	0.5	Metals-022	<0.5	1	<0.5	[NT]		103	[NT]
Cadmium-Total	µg/L	0.1	Metals-022	<0.1	1	<0.1	[NT]		92	[NT]
Chromium-Total	µg/L	1	Metals-022	<1	1	1	[NT]		88	[NT]
Copper-Total	µg/L	1	Metals-022	<1	1	12	[NT]		95	[NT]
Cobalt-Total	µg/L	1	Metals-022	<1	1	11	[NT]		95	[NT]
Mercury-Total	µg/L	0.05	Metals-021	<0.05	1	0.08	0.09	12	92	86
Manganese-Total	µg/L	5	Metals-022	<5	1	1600	[NT]		92	[NT]
Molybdenum-Total	µg/L	1	Metals-022	<1	1	1	[NT]		93	[NT]
Nickel-Total	µg/L	1	Metals-022	<1	1	23	[NT]		92	[NT]
Lead-Total	µg/L	1	Metals-022	<1	1	2	[NT]		95	[NT]
Antimony-Total	µg/L	1	Metals-022	<1	1	<1	[NT]		99	[NT]
Selenium-Total	µg/L	1	Metals-022	<1	1	<1	[NT]		94	[NT]
Tin-Total	µg/L	1	Metals-022	<1	1	<1	[NT]		94	[NT]
Zinc-Total	µg/L	1	Metals-022	<1	1	110	[NT]		94	[NT]
Iron-Total	µg/L	10	Metals-022	<10	1	970	[NT]		91	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Metals in Waters - Total					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			30/08/2023	1	30/08/2023	30/08/2023		30/08/2023	[NT]
Date analysed	-			30/08/2023	1	30/08/2023	30/08/2023		30/08/2023	[NT]
Phosphorus - Total	mg/L	0.05	Metals-020	<0.05	1	0.09	0.09	0	100	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Miscellaneous Inorganics					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			29/08/2023	[NT]	[NT]	[NT]	[NT]	29/08/2023	[NT]
Date analysed	-			29/08/2023	[NT]	[NT]	[NT]	[NT]	29/08/2023	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	[NT]	[NT]	[NT]	[NT]	98	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NT]	[NT]	103	[NT]
Total Nitrogen in water	mg/L	0.1	Inorg-055/062/127	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Ion Balance					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			29/08/2023	1	29/08/2023	29/08/2023		29/08/2023	[NT]
Date analysed	-			29/08/2023	1	29/08/2023	29/08/2023		29/08/2023	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	55	[NT]		100	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	4	[NT]		93	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	100	[NT]		93	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	16	[NT]		102	[NT]
Hardness	mgCaCO ₃ /L	3	Metals-020	[NT]	1	200	[NT]		[NT]	[NT]
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	5	Inorg-006	<5	1	<5	<5	0	[NT]	[NT]
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	1	200	200	0	[NT]	[NT]
Carbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	1	<5	<5	0	[NT]	[NT]
Total Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	1	200	200	0	109	[NT]
Sulphate, SO ₄	mg/L	1	Inorg-081	<1	1	91	[NT]		100	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	1	78	[NT]		92	[NT]
Ionic Balance	%		Inorg-040	[NT]	1	3.0	[NT]		[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			29/08/2023	[NT]	[NT]	[NT]	[NT]	29/08/2023	[NT]
Date analysed	-			29/08/2023	[NT]	[NT]	[NT]	[NT]	29/08/2023	[NT]
Perfluorobutanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	110	[NT]
Perfluoropentanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	110	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	106	[NT]
Perfluoroheptanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	115	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	104	[NT]
Perfluorodecanesulfonic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	100	[NT]
Perfluorobutanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	108	[NT]
Perfluoropentanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	107	[NT]
Perfluorohexanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	105	[NT]
Perfluoroheptanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	109	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	109	[NT]
Perfluorononanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	102	[NT]
Perfluorodecanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	107	[NT]
Perfluoroundecanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	115	[NT]
Perfluorododecanoic acid	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	103	[NT]
Perfluorotridecanoic acid	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	119	[NT]
Perfluorotetradecanoic acid	µg/L	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	115	[NT]
4:2 FTS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	111	[NT]
6:2 FTS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	109	[NT]
8:2 FTS	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	110	[NT]
10:2 FTS	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	118	[NT]
Perfluorooctane sulfonamide	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	113	[NT]
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	108	[NT]
N-Ethyl perfluorooctanesulfon amide	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	107	[NT]
N-Me perfluorooctanesulfonamid oethanol	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	115	[NT]
N-Et perfluorooctanesulfonamid oethanol	µg/L	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	120	[NT]
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	110	[NT]
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate ¹³ C ₈ PFOS	%		Org-029	105	[NT]	[NT]	[NT]	[NT]	102	[NT]
Surrogate ¹³ C ₂ PFOA	%		Org-029	98	[NT]	[NT]	[NT]	[NT]	96	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Extracted ISTD ¹³ C ₃ PFBS	%		Org-029	98	[NT]	[NT]	[NT]	[NT]	94	[NT]
Extracted ISTD ¹⁸ O ₂ PFHxS	%		Org-029	101	[NT]	[NT]	[NT]	[NT]	96	[NT]
Extracted ISTD ¹³ C ₄ PFOS	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	101	[NT]
Extracted ISTD ¹³ C ₄ PFBA	%		Org-029	108	[NT]	[NT]	[NT]	[NT]	103	[NT]
Extracted ISTD ¹³ C ₃ PFPeA	%		Org-029	112	[NT]	[NT]	[NT]	[NT]	104	[NT]
Extracted ISTD ¹³ C ₂ PFHxA	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	99	[NT]
Extracted ISTD ¹³ C ₄ PFHpA	%		Org-029	100	[NT]	[NT]	[NT]	[NT]	95	[NT]
Extracted ISTD ¹³ C ₄ PFOA	%		Org-029	112	[NT]	[NT]	[NT]	[NT]	107	[NT]
Extracted ISTD ¹³ C ₅ PFNA	%		Org-029	115	[NT]	[NT]	[NT]	[NT]	102	[NT]
Extracted ISTD ¹³ C ₂ PFDA	%		Org-029	118	[NT]	[NT]	[NT]	[NT]	114	[NT]
Extracted ISTD ¹³ C ₂ PFUnDA	%		Org-029	126	[NT]	[NT]	[NT]	[NT]	113	[NT]
Extracted ISTD ¹³ C ₂ PFDoDA	%		Org-029	115	[NT]	[NT]	[NT]	[NT]	112	[NT]
Extracted ISTD ¹³ C ₂ PFTeDA	%		Org-029	110	[NT]	[NT]	[NT]	[NT]	102	[NT]
Extracted ISTD ¹³ C ₂ 4:2FTS	%		Org-029	108	[NT]	[NT]	[NT]	[NT]	100	[NT]
Extracted ISTD ¹³ C ₂ 6:2FTS	%		Org-029	108	[NT]	[NT]	[NT]	[NT]	104	[NT]
Extracted ISTD ¹³ C ₂ 8:2FTS	%		Org-029	141	[NT]	[NT]	[NT]	[NT]	126	[NT]
Extracted ISTD ¹³ C ₈ FOSA	%		Org-029	113	[NT]	[NT]	[NT]	[NT]	101	[NT]
Extracted ISTD d ₃ N MeFOSA	%		Org-029	108	[NT]	[NT]	[NT]	[NT]	106	[NT]
Extracted ISTD d ₅ N EtFOSA	%		Org-029	112	[NT]	[NT]	[NT]	[NT]	107	[NT]
Extracted ISTD d ₇ N MeFOSE	%		Org-029	106	[NT]	[NT]	[NT]	[NT]	102	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Extracted ISTD d ₉ N EtFOSE	%		Org-029	112	[NT]	[NT]	[NT]	[NT]	105	[NT]
Extracted ISTD d ₃ N MeFOSAA	%		Org-029	112	[NT]	[NT]	[NT]	[NT]	109	[NT]
Extracted ISTD d ₅ N EtFOSAA	%		Org-029	124	[NT]	[NT]	[NT]	[NT]	121	[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

CERTIFICATE OF ANALYSIS 331895

Client Details

Client	CTP AFJV
Attention	
Address	7 Figtree Dr, SYDNEY OLYMPIC PARK, NSW, 2127

Sample Details

Your Reference	<u>CTP Groundwater Monitoring</u>
Number of Samples	1 Water
Date samples received	31/08/2023
Date completed instructions received	31/08/2023

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	07/09/2023
Date of Issue	06/09/2023
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Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

VOCs in water		
Our Reference		331895-1
Your Reference	UNITS	BH046R
Date Sampled		29/08/2023
Type of sample		Water
Date Extracted	-	01/09/2023
Date Analysed	-	04/09/2023
Dichlorodifluoromethane	µg/L	<10
Chloromethane	µg/L	<10
Vinyl Chloride	µg/L	<10
Bromomethane	µg/L	<10
Chloroethane	µg/L	<10
Trichlorofluoromethane	µg/L	<10
1,1-Dichloroethene	µg/L	<1
Trans-1,2-dichloroethene	µg/L	<1
1,1-dichloroethane	µg/L	<1
Cis-1,2-dichloroethene	µg/L	<1
Bromochloromethane	µg/L	<1
Chloroform	µg/L	<1
2,2-dichloropropane	µg/L	<1
1,2-dichloroethane	µg/L	<1
1,1,1-trichloroethane	µg/L	<1
1,1-dichloropropene	µg/L	<1
Cyclohexane	µg/L	<1
Carbon tetrachloride	µg/L	<1
Benzene	µg/L	<1
Dibromomethane	µg/L	<1
1,2-dichloropropane	µg/L	<1
Trichloroethene	µg/L	<1
Bromodichloromethane	µg/L	<1
trans-1,3-dichloropropene	µg/L	<1
cis-1,3-dichloropropene	µg/L	<1
1,1,2-trichloroethane	µg/L	<1
Toluene	µg/L	<1
1,3-dichloropropane	µg/L	<1
Dibromochloromethane	µg/L	<1
1,2-dibromoethane	µg/L	<1
Tetrachloroethene	µg/L	<1
1,1,1,2-tetrachloroethane	µg/L	<1
Chlorobenzene	µg/L	<1
Ethylbenzene	µg/L	<1

VOCs in water		
Our Reference		331895-1
Your Reference	UNITS	BH046R
Date Sampled		29/08/2023
Type of sample		Water
Bromoform	µg/L	<1
m+p-xylene	µg/L	<2
Styrene	µg/L	<1
1,1,2,2-tetrachloroethane	µg/L	<1
o-xylene	µg/L	<1
1,2,3-trichloropropane	µg/L	<1
Isopropylbenzene	µg/L	<1
Bromobenzene	µg/L	<1
n-propyl benzene	µg/L	<1
2-chlorotoluene	µg/L	<1
4-chlorotoluene	µg/L	<1
1,3,5-trimethyl benzene	µg/L	<1
Tert-butyl benzene	µg/L	<1
1,2,4-trimethyl benzene	µg/L	<1
1,3-dichlorobenzene	µg/L	<1
Sec-butyl benzene	µg/L	<1
1,4-dichlorobenzene	µg/L	<1
4-isopropyl toluene	µg/L	<1
1,2-dichlorobenzene	µg/L	<1
n-butyl benzene	µg/L	<1
1,2-dibromo-3-chloropropane	µg/L	<1
1,2,4-trichlorobenzene	µg/L	<1
Hexachlorobutadiene	µg/L	<1
1,2,3-trichlorobenzene	µg/L	<1
Surrogate Dibromofluoromethane	%	103
Surrogate Toluene-d8	%	97
Surrogate 4-Bromofluorobenzene	%	104

vTRH(C6-C10)/BTEXN in Water		
Our Reference		331895-1
Your Reference	UNITS	BH046R
Date Sampled		29/08/2023
Type of sample		Water
Date extracted	-	01/09/2023
Date analysed	-	04/09/2023
TRH C ₆ - C ₉	µg/L	<10
TRH C ₆ - C ₁₀	µg/L	<10
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	103
Surrogate Toluene-d8	%	97
Surrogate 4-Bromofluorobenzene	%	104

svTRH (C10-C40) in Water		
Our Reference		331895-1
Your Reference	UNITS	BH046R
Date Sampled		29/08/2023
Type of sample		Water
Date extracted	-	01/09/2023
Date analysed	-	02/09/2023
TRH C ₁₀ - C ₁₄	µg/L	<50
TRH C ₁₅ - C ₂₈	µg/L	<100
TRH C ₂₉ - C ₃₆	µg/L	<100
Total +ve TRH (C10-C36)	µg/L	<50
TRH >C ₁₀ - C ₁₆	µg/L	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	<50
TRH >C ₁₆ - C ₃₄	µg/L	<100
TRH >C ₃₄ - C ₄₀	µg/L	<100
Total +ve TRH (>C10-C40)	µg/L	<50
Surrogate o-Terphenyl	%	75

PAHs in Water		
Our Reference		331895-1
Your Reference	UNITS	BH046R
Date Sampled		29/08/2023
Type of sample		Water
Date extracted	-	01/09/2023
Date analysed	-	02/09/2023
Naphthalene	µg/L	<0.2
Acenaphthylene	µg/L	<0.1
Acenaphthene	µg/L	<0.1
Fluorene	µg/L	<0.1
Phenanthrene	µg/L	<0.1
Anthracene	µg/L	<0.1
Fluoranthene	µg/L	<0.1
Pyrene	µg/L	<0.1
Benzo(a)anthracene	µg/L	<0.1
Chrysene	µg/L	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2
Benzo(a)pyrene	µg/L	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5
Total +ve PAH's	µg/L	<0.1
Surrogate <i>p</i> -Terphenyl-d14	%	86

All metals in water-dissolved		
Our Reference		331895-1
Your Reference	UNITS	BH046R
Date Sampled		29/08/2023
Type of sample		Water
Date prepared	-	01/09/2023
Date analysed	-	01/09/2023
Arsenic-Dissolved	µg/L	1
Boron-Dissolved	µg/L	100
Barium-Dissolved	µg/L	37
Beryllium-Dissolved	µg/L	<0.5
Cadmium-Dissolved	µg/L	0.1
Chromium-Dissolved	µg/L	<1
Copper-Dissolved	µg/L	12
Cobalt-Dissolved	µg/L	2
Mercury-Dissolved	µg/L	<0.05
Manganese-Dissolved	µg/L	880
Molybdenum-Dissolved	µg/L	4
Nickel-Dissolved	µg/L	28
Lead-Dissolved	µg/L	<1
Antimony-Dissolved	µg/L	<1
Selenium-Dissolved	µg/L	<1
Tin-Dissolved	µg/L	1
Zinc-Dissolved	µg/L	21
Iron-Dissolved	µg/L	10

All metals in water - total		
Our Reference		331895-1
Your Reference	UNITS	BH046R
Date Sampled		29/08/2023
Type of sample		Water
Date prepared	-	01/09/2023
Date analysed	-	01/09/2023
Arsenic-Total	µg/L	20
Boron-Total	µg/L	100
Barium-Total	µg/L	220
Beryllium-Total	µg/L	2
Cadmium-Total	µg/L	0.2
Chromium-Total	µg/L	17
Copper-Total	µg/L	1,400
Cobalt-Total	µg/L	15
Mercury-Total	µg/L	<0.05
Manganese-Total	µg/L	1,100
Molybdenum-Total	µg/L	4
Nickel-Total	µg/L	90
Lead-Total	µg/L	24
Antimony-Total	µg/L	1
Selenium-Total	µg/L	<1
Tin-Total	µg/L	2
Zinc-Total	µg/L	110
Iron-Total	µg/L	22,000

Client Reference: CTP Groundwater Monitoring

Metals in Waters - Total		
Our Reference		331895-1
Your Reference	UNITS	BH046R
Date Sampled		29/08/2023
Type of sample		Water
Date prepared	-	01/09/2023
Date analysed	-	01/09/2023
Phosphorus - Total	mg/L	0.2

Miscellaneous Inorganics		
Our Reference	UNITS	331895-1
Your Reference		BH046R
Date Sampled		29/08/2023
Type of sample		Water
Date prepared	-	31/08/2023
Date analysed	-	31/08/2023
Ammonia as N in water	mg/L	0.45
Nitrate as N in water	mg/L	<0.005
Total Nitrogen in water	mg/L	0.5

Ion Balance		
Our Reference		331895-1
Your Reference	UNITS	BH046R
Date Sampled		29/08/2023
Type of sample		Water
Date prepared	-	31/08/2023
Date analysed	-	31/08/2023
Calcium - Dissolved	mg/L	150
Potassium - Dissolved	mg/L	36
Sodium - Dissolved	mg/L	2,000
Magnesium - Dissolved	mg/L	280
Hardness	mgCaCO ₃ /L	1,500
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	550
Carbonate Alkalinity as CaCO ₃	mg/L	<5
Total Alkalinity as CaCO ₃	mg/L	550
Sulphate, SO ₄	mg/L	360
Chloride, Cl	mg/L	2,600
Ionic Balance	%	13

PFAS in Waters Extended		
Our Reference		331895-1
Your Reference	UNITS	BH046R
Date Sampled		29/08/2023
Type of sample		Water
Date prepared	-	01/09/2023
Date analysed	-	01/09/2023
Perfluorobutanesulfonic acid	µg/L	<0.01
Perfluoropentanesulfonic acid	µg/L	<0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01
Perfluorodecanesulfonic acid	µg/L	<0.02
Perfluorobutanoic acid	µg/L	<0.02
Perfluoropentanoic acid	µg/L	<0.02
Perfluorohexanoic acid	µg/L	<0.01
Perfluoroheptanoic acid	µg/L	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01
Perfluorononanoic acid	µg/L	<0.01
Perfluorodecanoic acid	µg/L	<0.02
Perfluoroundecanoic acid	µg/L	<0.02
Perfluorododecanoic acid	µg/L	<0.05
Perfluorotridecanoic acid	µg/L	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5
4:2 FTS	µg/L	<0.01
6:2 FTS	µg/L	<0.01
8:2 FTS	µg/L	<0.02
10:2 FTS	µg/L	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05
N-Ethyl perfluorooctanesulfonamide	µg/L	<0.1
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.05
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02
Surrogate ¹³ C ₈ PFOS	%	94
Surrogate ¹³ C ₂ PFOA	%	98
Extracted ISTD ¹³ C ₃ PFBS	%	92
Extracted ISTD ¹⁸ O ₂ PFHxS	%	96
Extracted ISTD ¹³ C ₄ PFOS	%	101
Extracted ISTD ¹³ C ₄ PFBA	%	96

PFAS in Waters Extended		
Our Reference		331895-1
Your Reference	UNITS	BH046R
Date Sampled		29/08/2023
Type of sample		Water
Extracted ISTD ¹³ C ₃ PFPeA	%	104
Extracted ISTD ¹³ C ₂ PFHxA	%	97
Extracted ISTD ¹³ C ₄ PFHpA	%	93
Extracted ISTD ¹³ C ₄ PFOA	%	102
Extracted ISTD ¹³ C ₅ PFNA	%	104
Extracted ISTD ¹³ C ₂ PFDA	%	99
Extracted ISTD ¹³ C ₂ PFUnDA	%	103
Extracted ISTD ¹³ C ₂ PFDoDA	%	95
Extracted ISTD ¹³ C ₂ PFTeDA	%	72
Extracted ISTD ¹³ C ₂ 4:2FTS	%	82
Extracted ISTD ¹³ C ₂ 6:2FTS	%	100
Extracted ISTD ¹³ C ₂ 8:2FTS	%	116
Extracted ISTD ¹³ C ₈ FOSA	%	96
Extracted ISTD d ₃ N MeFOSA	%	94
Extracted ISTD d ₅ N EtFOSA	%	92
Extracted ISTD d ₇ N MeFOSE	%	95
Extracted ISTD d ₉ N EtFOSE	%	92
Extracted ISTD d ₃ N MeFOSAA	%	94
Extracted ISTD d ₅ N EtFOSAA	%	97
Total Positive PFHxS & PFOS	µg/L	<0.01
Total Positive PFOA & PFOS	µg/L	<0.01
Total Positive PFAS	µg/L	<0.01

Client Reference: CTP Groundwater Monitoring

Method ID	Methodology Summary
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% ie total anions = total cations +/-15%.
Inorg-055	Nitrate - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-055/062/127	Total Nitrogen - Calculation sum of TKN and oxidised Nitrogen. Alternatively analysed by combustion and chemiluminescence.
Inorg-057	Ammonia - determined colourimetrically, based on APHA latest edition 4500-NH3 F. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a KCl extraction.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
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.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

Client Reference: CTP Groundwater Monitoring

Method ID	Methodology Summary
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date Extracted	-			01/09/2023	[NT]	[NT]	[NT]	[NT]	01/09/2023	[NT]
Date Analysed	-			04/09/2023	[NT]	[NT]	[NT]	[NT]	04/09/2023	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Dibromomethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	91	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	85	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Bromoform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	96	[NT]
Styrene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	101	[NT]	[NT]	[NT]	[NT]	97	[NT]
Surrogate Toluene-d8	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	103	[NT]	[NT]	[NT]	[NT]	101	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			01/09/2023	[NT]	[NT]	[NT]	[NT]	01/09/2023	[NT]
Date analysed	-			04/09/2023	[NT]	[NT]	[NT]	[NT]	04/09/2023	[NT]
TRH C ₆ - C ₉	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH C ₆ - C ₁₀	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	98	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	91	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	96	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	101	[NT]	[NT]	[NT]	[NT]	97	[NT]
Surrogate Toluene-d8	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	103	[NT]	[NT]	[NT]	[NT]	101	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			01/09/2023	[NT]	[NT]	[NT]	[NT]	01/09/2023	[NT]
Date analysed	-			02/09/2023	[NT]	[NT]	[NT]	[NT]	02/09/2023	[NT]
TRH C ₁₀ - C ₁₄	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH C ₁₅ - C ₂₈	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	115	[NT]
TRH C ₂₉ - C ₃₆	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	115	[NT]
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate o-Terphenyl	%		Org-020	73	[NT]	[NT]	[NT]	[NT]	76	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PAHs in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			01/09/2023	[NT]	[NT]	[NT]	[NT]	01/09/2023	[NT]
Date analysed	-			02/09/2023	[NT]	[NT]	[NT]	[NT]	02/09/2023	[NT]
Naphthalene	µg/L	0.1	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	75	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	73	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	70	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	73	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	73	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	73	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	73	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	76	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	72	[NT]	[NT]	[NT]	[NT]	78	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: All metals in water-dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			01/09/2023	[NT]	[NT]	[NT]	[NT]	01/09/2023	[NT]
Date analysed	-			01/09/2023	[NT]	[NT]	[NT]	[NT]	01/09/2023	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Boron-Dissolved	µg/L	20	Metals-022	<20	[NT]	[NT]	[NT]	[NT]	90	[NT]
Barium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	96	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	100	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	<5	[NT]	[NT]	[NT]	[NT]	92	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Antimony-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Tin-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Iron-Dissolved	µg/L	10	Metals-022	<10	[NT]	[NT]	[NT]	[NT]	93	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: All metals in water - total					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			01/09/2023	[NT]	[NT]	[NT]	[NT]	01/09/2023	[NT]
Date analysed	-			01/09/2023	[NT]	[NT]	[NT]	[NT]	01/09/2023	[NT]
Arsenic-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Boron-Total	µg/L	20	Metals-022	<20	[NT]	[NT]	[NT]	[NT]	90	[NT]
Barium-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Beryllium-Total	µg/L	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	91	[NT]
Cadmium-Total	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Chromium-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Copper-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Cobalt-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Mercury-Total	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	92	[NT]
Manganese-Total	µg/L	5	Metals-022	<5	[NT]	[NT]	[NT]	[NT]	91	[NT]
Molybdenum-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Nickel-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Lead-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Antimony-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Selenium-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Tin-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Zinc-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Iron-Total	µg/L	10	Metals-022	<10	[NT]	[NT]	[NT]	[NT]	100	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Metals in Waters - Total					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			01/09/2023	[NT]	[NT]	[NT]	[NT]	01/09/2023	[NT]
Date analysed	-			01/09/2023	[NT]	[NT]	[NT]	[NT]	01/09/2023	[NT]
Phosphorus - Total	mg/L	0.05	Metals-020	<0.05	[NT]	[NT]	[NT]	[NT]	106	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Miscellaneous Inorganics					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			31/08/2023	[NT]	[NT]	[NT]	[NT]	31/08/2023	[NT]
Date analysed	-			31/08/2023	[NT]	[NT]	[NT]	[NT]	31/08/2023	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	[NT]	[NT]	[NT]	[NT]	109	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NT]	[NT]	110	[NT]
Total Nitrogen in water	mg/L	0.1	Inorg-055/062/127	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Ion Balance					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			31/08/2023	[NT]	[NT]	[NT]	[NT]	31/08/2023	[NT]
Date analysed	-			31/08/2023	[NT]	[NT]	[NT]	[NT]	31/08/2023	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	94	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	92	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	91	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	97	[NT]
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Total Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	106	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	82	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			01/09/2023	[NT]	[NT]	[NT]	[NT]	01/09/2023	[NT]
Date analysed	-			01/09/2023	[NT]	[NT]	[NT]	[NT]	01/09/2023	[NT]
Perfluorobutanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	109	[NT]
Perfluoropentanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	105	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	106	[NT]
Perfluoroheptanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	112	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	103	[NT]
Perfluorodecanesulfonic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	84	[NT]
Perfluorobutanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	109	[NT]
Perfluoropentanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	106	[NT]
Perfluorohexanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	111	[NT]
Perfluoroheptanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	106	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	113	[NT]
Perfluorononanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	105	[NT]
Perfluorodecanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	110	[NT]
Perfluoroundecanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	109	[NT]
Perfluorododecanoic acid	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	98	[NT]
Perfluorotridecanoic acid	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Perfluorotetradecanoic acid	µg/L	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	111	[NT]
4:2 FTS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	120	[NT]
6:2 FTS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	110	[NT]
8:2 FTS	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	107	[NT]
10:2 FTS	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	98	[NT]
Perfluorooctane sulfonamide	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	113	[NT]
N-Ethyl perfluorooctanesulfon amide	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
N-Me perfluorooctanesulfonamid oethanol	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	108	[NT]
N-Et perfluorooctanesulfonamid oethanol	µg/L	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	106	[NT]
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	114	[NT]
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	108	[NT]
Surrogate ¹³ C ₈ PFOS	%		Org-029	94	[NT]	[NT]	[NT]	[NT]	95	[NT]
Surrogate ¹³ C ₂ PFOA	%		Org-029	103	[NT]	[NT]	[NT]	[NT]	100	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Extracted ISTD ¹³ C ₃ PFBS	%		Org-029	96	[NT]	[NT]	[NT]	[NT]	94	[NT]
Extracted ISTD ¹⁸ O ₂ PFHxS	%		Org-029	100	[NT]	[NT]	[NT]	[NT]	96	[NT]
Extracted ISTD ¹³ C ₄ PFOS	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	99	[NT]
Extracted ISTD ¹³ C ₄ PFBA	%		Org-029	106	[NT]	[NT]	[NT]	[NT]	105	[NT]
Extracted ISTD ¹³ C ₃ PFPeA	%		Org-029	105	[NT]	[NT]	[NT]	[NT]	104	[NT]
Extracted ISTD ¹³ C ₂ PFHxA	%		Org-029	97	[NT]	[NT]	[NT]	[NT]	96	[NT]
Extracted ISTD ¹³ C ₄ PFHpA	%		Org-029	96	[NT]	[NT]	[NT]	[NT]	95	[NT]
Extracted ISTD ¹³ C ₄ PFOA	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	99	[NT]
Extracted ISTD ¹³ C ₅ PFNA	%		Org-029	107	[NT]	[NT]	[NT]	[NT]	104	[NT]
Extracted ISTD ¹³ C ₂ PFDA	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	102	[NT]
Extracted ISTD ¹³ C ₂ PFUnDA	%		Org-029	107	[NT]	[NT]	[NT]	[NT]	102	[NT]
Extracted ISTD ¹³ C ₂ PFDoDA	%		Org-029	97	[NT]	[NT]	[NT]	[NT]	98	[NT]
Extracted ISTD ¹³ C ₂ PFTeDA	%		Org-029	76	[NT]	[NT]	[NT]	[NT]	67	[NT]
Extracted ISTD ¹³ C ₂ 4:2FTS	%		Org-029	103	[NT]	[NT]	[NT]	[NT]	92	[NT]
Extracted ISTD ¹³ C ₂ 6:2FTS	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	104	[NT]
Extracted ISTD ¹³ C ₂ 8:2FTS	%		Org-029	125	[NT]	[NT]	[NT]	[NT]	132	[NT]
Extracted ISTD ¹³ C ₈ FOSA	%		Org-029	98	[NT]	[NT]	[NT]	[NT]	91	[NT]
Extracted ISTD d ₃ N MeFOSA	%		Org-029	95	[NT]	[NT]	[NT]	[NT]	90	[NT]
Extracted ISTD d ₅ N EtFOSA	%		Org-029	93	[NT]	[NT]	[NT]	[NT]	88	[NT]
Extracted ISTD d ₇ N MeFOSE	%		Org-029	96	[NT]	[NT]	[NT]	[NT]	92	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Extracted ISTD d ₉ N EtFOSE	%		Org-029	92	[NT]	[NT]	[NT]	[NT]	89	[NT]
Extracted ISTD d ₃ N MeFOSAA	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	104	[NT]
Extracted ISTD d ₅ N EtFOSAA	%		Org-029	105	[NT]	[NT]	[NT]	[NT]	107	[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

CERTIFICATE OF ANALYSIS 333430

Client Details

Client	CTP AFJV
Attention	
Address	7 Figtree Dr, SYDNEY OLYMPIC PARK, NSW, 2127

Sample Details

Your Reference	<u>CTP Groundwater Monitoring</u>
Number of Samples	7 Water
Date samples received	19/09/2023
Date completed instructions received	19/09/2023

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	26/09/2023
Date of Issue	26/09/2023
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Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Client Reference: CTP Groundwater Monitoring

VOCs in water						
Our Reference		333430-1	333430-2	333430-3	333430-4	333430-5
Your Reference	UNITS	BH035	BH035d	BH044	BH050d	BH051s
Date Sampled		18/09/2023	18/09/2023	18/09/2023	18/09/2023	18/09/2023
Type of sample		Water	Water	Water	Water	Water
Date Extracted	-	20/09/2023	20/09/2023	20/09/2023	20/09/2023	21/09/2023
Date Analysed	-	21/09/2023	21/09/2023	21/09/2023	21/09/2023	22/09/2023
Dichlorodifluoromethane	µg/L	<10	<10	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<1	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1
Benzene	µg/L	<1	<1	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1

Client Reference: CTP Groundwater Monitoring

VOCs in water						
Our Reference		333430-1	333430-2	333430-3	333430-4	333430-5
Your Reference	UNITS	BH035	BH035d	BH044	BH050d	BH051s
Date Sampled		18/09/2023	18/09/2023	18/09/2023	18/09/2023	18/09/2023
Type of sample		Water	Water	Water	Water	Water
Bromoform	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
Styrene	µg/L	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
o-xylene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	103	104	103	104	103
Surrogate Toluene-d8	%	97	98	97	97	97
Surrogate 4-Bromofluorobenzene	%	104	105	105	105	104

Client Reference: CTP Groundwater Monitoring

VOCs in water			
Our Reference		333430-6	333430-7
Your Reference	UNITS	BH051d	DS-1
Date Sampled		18/09/2023	18/09/2023
Type of sample		Water	Water
Date Extracted	-	20/09/2023	20/09/2023
Date Analysed	-	21/09/2023	21/09/2023
Dichlorodifluoromethane	µg/L	<10	<10
Chloromethane	µg/L	<10	<10
Vinyl Chloride	µg/L	<10	<10
Bromomethane	µg/L	<10	<10
Chloroethane	µg/L	<10	<10
Trichlorofluoromethane	µg/L	<10	<10
1,1-Dichloroethene	µg/L	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1
1,1-dichloroethane	µg/L	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1
Bromochloromethane	µg/L	<1	<1
Chloroform	µg/L	<1	<1
2,2-dichloropropane	µg/L	<1	<1
1,2-dichloroethane	µg/L	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1
1,1-dichloropropene	µg/L	<1	<1
Cyclohexane	µg/L	<1	<1
Carbon tetrachloride	µg/L	<1	<1
Benzene	µg/L	<1	<1
Dibromomethane	µg/L	<1	<1
1,2-dichloropropane	µg/L	<1	<1
Trichloroethene	µg/L	<1	<1
Bromodichloromethane	µg/L	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1
Toluene	µg/L	<1	<1
1,3-dichloropropane	µg/L	<1	<1
Dibromochloromethane	µg/L	<1	<1
1,2-dibromoethane	µg/L	<1	<1
Tetrachloroethene	µg/L	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1
Chlorobenzene	µg/L	<1	<1
Ethylbenzene	µg/L	<1	<1

Client Reference: CTP Groundwater Monitoring

VOCs in water			
Our Reference		333430-6	333430-7
Your Reference	UNITS	BH051d	DS-1
Date Sampled		18/09/2023	18/09/2023
Type of sample		Water	Water
Bromoform	µg/L	<1	<1
m+p-xylene	µg/L	<2	<2
Styrene	µg/L	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1
o-xylene	µg/L	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1
Isopropylbenzene	µg/L	<1	<1
Bromobenzene	µg/L	<1	<1
n-propyl benzene	µg/L	<1	<1
2-chlorotoluene	µg/L	<1	<1
4-chlorotoluene	µg/L	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1
Tert-butyl benzene	µg/L	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1
Sec-butyl benzene	µg/L	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1
4-isopropyl toluene	µg/L	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1
n-butyl benzene	µg/L	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1
Hexachlorobutadiene	µg/L	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1
Surrogate Dibromofluoromethane	%	104	103
Surrogate Toluene-d8	%	97	97
Surrogate 4-Bromofluorobenzene	%	104	105

Client Reference: CTP Groundwater Monitoring

vTRH(C6-C10)/BTEXN in Water						
Our Reference		333430-1	333430-2	333430-3	333430-4	333430-5
Your Reference	UNITS	BH035	BH035d	BH044	BH050d	BH051s
Date Sampled		18/09/2023	18/09/2023	18/09/2023	18/09/2023	18/09/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	20/09/2023	20/09/2023	20/09/2023	20/09/2023	21/09/2023
Date analysed	-	21/09/2023	21/09/2023	21/09/2023	21/09/2023	22/09/2023
TRH C ₆ - C ₉	µg/L	<10	<10	<10	<10	<10
TRH C ₆ - C ₁₀	µg/L	<10	<10	<10	<10	<10
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	<10	<10	<10	<10	<10
Benzene	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
o-xylene	µg/L	<1	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	103	104	103	104	103
Surrogate Toluene-d8	%	97	98	97	97	97
Surrogate 4-Bromofluorobenzene	%	104	105	105	105	104

vTRH(C6-C10)/BTEXN in Water			
Our Reference		333430-6	333430-7
Your Reference	UNITS	BH051d	DS-1
Date Sampled		18/09/2023	18/09/2023
Type of sample		Water	Water
Date extracted	-	20/09/2023	20/09/2023
Date analysed	-	21/09/2023	21/09/2023
TRH C ₆ - C ₉	µg/L	<10	<10
TRH C ₆ - C ₁₀	µg/L	<10	<10
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	<10	<10
Benzene	µg/L	<1	<1
Toluene	µg/L	<1	<1
Ethylbenzene	µg/L	<1	<1
m+p-xylene	µg/L	<2	<2
o-xylene	µg/L	<1	<1
Naphthalene	µg/L	<1	<1
Surrogate Dibromofluoromethane	%	104	103
Surrogate Toluene-d8	%	97	97
Surrogate 4-Bromofluorobenzene	%	104	105

Client Reference: CTP Groundwater Monitoring

svTRH (C10-C40) in Water						
Our Reference	UNITS	333430-1	333430-2	333430-3	333430-4	333430-5
Your Reference		BH035	BH035d	BH044	BH050d	BH051s
Date Sampled		18/09/2023	18/09/2023	18/09/2023	18/09/2023	18/09/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
Date analysed	-	21/09/2023	21/09/2023	21/09/2023	21/09/2023	21/09/2023
TRH C ₁₀ - C ₁₄	µg/L	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	µg/L	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆	µg/L	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	<50	<50	<50	<50	<50
TRH >C ₁₆ - C ₃₄	µg/L	<100	<100	<100	130	<100
TRH >C ₃₄ - C ₄₀	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50	130	<50
Surrogate o-Terphenyl	%	107	104	94	90	80

svTRH (C10-C40) in Water			
Our Reference	UNITS	333430-6	333430-7
Your Reference		BH051d	DS-1
Date Sampled		18/09/2023	18/09/2023
Type of sample		Water	Water
Date extracted	-	20/09/2023	20/09/2023
Date analysed	-	21/09/2023	21/09/2023
TRH C ₁₀ - C ₁₄	µg/L	<50	<50
TRH C ₁₅ - C ₂₈	µg/L	<100	<100
TRH C ₂₉ - C ₃₆	µg/L	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50
TRH >C ₁₀ - C ₁₆	µg/L	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	<50	<50
TRH >C ₁₆ - C ₃₄	µg/L	<100	<100
TRH >C ₃₄ - C ₄₀	µg/L	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50
Surrogate o-Terphenyl	%	123	99

Client Reference: CTP Groundwater Monitoring

PAHs in Water						
Our Reference		333430-1	333430-2	333430-3	333430-4	333430-5
Your Reference	UNITS	BH035	BH035d	BH044	BH050d	BH051s
Date Sampled		18/09/2023	18/09/2023	18/09/2023	18/09/2023	18/09/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
Date analysed	-	22/09/2023	22/09/2023	22/09/2023	22/09/2023	22/09/2023
Naphthalene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	0.3	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	0.3	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	1.1	<0.1	<0.1
Surrogate <i>p</i> -Terphenyl-d14	%	111	108	93	102	98

PAHs in Water			
Our Reference		333430-6	333430-7
Your Reference	UNITS	BH051d	DS-1
Date Sampled		18/09/2023	18/09/2023
Type of sample		Water	Water
Date extracted	-	20/09/2023	20/09/2023
Date analysed	-	22/09/2023	22/09/2023
Naphthalene	µg/L	<0.1	<0.1
Acenaphthylene	µg/L	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	0.12
Surrogate <i>p</i> -Terphenyl-d14	%	124	116

Client Reference: CTP Groundwater Monitoring

All metals in water-dissolved						
Our Reference	UNITS	333430-1	333430-2	333430-3	333430-4	333430-5
Your Reference		BH035	BH035d	BH044	BH050d	BH051s
Date Sampled		18/09/2023	18/09/2023	18/09/2023	18/09/2023	18/09/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
Date analysed	-	20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
Arsenic-Dissolved	µg/L	<1	<1	1	3	<1
Boron-Dissolved	µg/L	50	70	80	60	70
Barium-Dissolved	µg/L	38	6,100	28	81	350
Beryllium-Dissolved	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium-Dissolved	µg/L	0.1	0.1	0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1	<1	<1
Copper-Dissolved	µg/L	<1	9	3	<1	<1
Cobalt-Dissolved	µg/L	66	7	<1	140	1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Manganese-Dissolved	µg/L	5,400	330	240	50,000	120
Molybdenum-Dissolved	µg/L	3	2	2	3	1
Nickel-Dissolved	µg/L	55	14	1	110	2
Lead-Dissolved	µg/L	<1	<1	<1	<1	<1
Antimony-Dissolved	µg/L	<1	<1	<1	<1	<1
Selenium-Dissolved	µg/L	<1	<1	<1	<1	<1
Tin-Dissolved	µg/L	<1	<1	<1	<1	<1
Zinc-Dissolved	µg/L	310	10	6	33	19
Iron-Dissolved	µg/L	4,800	3,800	2,300	6,500	220

All metals in water-dissolved			
Our Reference		333430-6	333430-7
Your Reference	UNITS	BH051d	DS-1
Date Sampled		18/09/2023	18/09/2023
Type of sample		Water	Water
Date prepared	-	20/09/2023	20/09/2023
Date analysed	-	20/09/2023	20/09/2023
Arsenic-Dissolved	µg/L	<1	<1
Boron-Dissolved	µg/L	70	40
Barium-Dissolved	µg/L	120	17
Beryllium-Dissolved	µg/L	<0.5	<0.5
Cadmium-Dissolved	µg/L	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1
Copper-Dissolved	µg/L	<1	4
Cobalt-Dissolved	µg/L	2	<1
Mercury-Dissolved	µg/L	<0.05	<0.05
Manganese-Dissolved	µg/L	250	39
Molybdenum-Dissolved	µg/L	4	2
Nickel-Dissolved	µg/L	2	1
Lead-Dissolved	µg/L	<1	<1
Antimony-Dissolved	µg/L	<1	<1
Selenium-Dissolved	µg/L	<1	<1
Tin-Dissolved	µg/L	<1	<1
Zinc-Dissolved	µg/L	3	8
Iron-Dissolved	µg/L	1,200	230

Client Reference: CTP Groundwater Monitoring

All metals in water - total						
Our Reference		333430-1	333430-2	333430-3	333430-4	333430-5
Your Reference	UNITS	BH035	BH035d	BH044	BH050d	BH051s
Date Sampled		18/09/2023	18/09/2023	18/09/2023	18/09/2023	18/09/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
Date analysed	-	20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
Arsenic-Total	µg/L	47	3	10	44	21
Boron-Total	µg/L	90	70	90	100	100
Barium-Total	µg/L	1,500	13,000	84	1,100	1,400
Beryllium-Total	µg/L	57	<0.5	1	15	12
Cadmium-Total	µg/L	2.6	<0.1	0.4	8.2	0.6
Chromium-Total	µg/L	170	15	16	250	24
Copper-Total	µg/L	950	9	52	1,100	120
Cobalt-Total	µg/L	230	10	8	1,000	10
Mercury-Total	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Manganese-Total	µg/L	9,200	420	320	190,000	310
Molybdenum-Total	µg/L	2	3	3	10	3
Nickel-Total	µg/L	300	23	22	790	17
Lead-Total	µg/L	220	6	19	260	99
Antimony-Total	µg/L	<1	<1	2	5	2
Selenium-Total	µg/L	3	<1	<1	3	4
Tin-Total	µg/L	2	2	5	13	2
Zinc-Total	µg/L	2,600	62	150	3,800	1,200
Iron-Total	µg/L	250,000	8,500	19,000	65,000	84,000

Client Reference: CTP Groundwater Monitoring

All metals in water - total			
Our Reference		333430-6	333430-7
Your Reference	UNITS	BH051d	DS-1
Date Sampled		18/09/2023	18/09/2023
Type of sample		Water	Water
Date prepared	-	20/09/2023	20/09/2023
Date analysed	-	20/09/2023	20/09/2023
Arsenic-Total	µg/L	170	10
Boron-Total	µg/L	100	80
Barium-Total	µg/L	1,900	92
Beryllium-Total	µg/L	21	1
Cadmium-Total	µg/L	2.0	0.5
Chromium-Total	µg/L	380	19
Copper-Total	µg/L	390	77
Cobalt-Total	µg/L	140	9
Mercury-Total	µg/L	<0.05	<0.05
Manganese-Total	µg/L	5,000	300
Molybdenum-Total	µg/L	17	3
Nickel-Total	µg/L	160	27
Lead-Total	µg/L	190	23
Antimony-Total	µg/L	1	2
Selenium-Total	µg/L	1	<1
Tin-Total	µg/L	7	6
Zinc-Total	µg/L	1,400	170
Iron-Total	µg/L	220,000	17,000

Client Reference: CTP Groundwater Monitoring

Metals in Waters - Total						
Our Reference		333430-1	333430-2	333430-3	333430-4	333430-5
Your Reference	UNITS	BH035	BH035d	BH044	BH050d	BH051s
Date Sampled		18/09/2023	18/09/2023	18/09/2023	18/09/2023	18/09/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
Date analysed	-	20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
Phosphorus - Total	mg/L	5.6	0.1	2.1	6.0	1.5

Metals in Waters - Total			
Our Reference		333430-6	333430-7
Your Reference	UNITS	BH051d	DS-1
Date Sampled		18/09/2023	18/09/2023
Type of sample		Water	Water
Date prepared	-	20/09/2023	20/09/2023
Date analysed	-	20/09/2023	20/09/2023
Phosphorus - Total	mg/L	3.1	1.7

Client Reference: CTP Groundwater Monitoring

Miscellaneous Inorganics						
Our Reference		333430-1	333430-2	333430-3	333430-4	333430-5
Your Reference	UNITS	BH035	BH035d	BH044	BH050d	BH051s
Date Sampled		18/09/2023	18/09/2023	18/09/2023	18/09/2023	18/09/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
Date analysed	-	20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
Ammonia as N in water	mg/L	0.17	2.1	0.38	0.77	0.063
Nitrate as N in water	mg/L	0.01	0.87	0.11	0.01	0.17
Total Nitrogen in water	mg/L	0.7	3.9	0.6	0.9	0.3

Miscellaneous Inorganics			
Our Reference		333430-6	333430-7
Your Reference	UNITS	BH051d	DS-1
Date Sampled		18/09/2023	18/09/2023
Type of sample		Water	Water
Date prepared	-	20/09/2023	20/09/2023
Date analysed	-	20/09/2023	20/09/2023
Ammonia as N in water	mg/L	0.030	0.33
Nitrate as N in water	mg/L	0.50	0.18
Total Nitrogen in water	mg/L	1.0	0.8

Client Reference: CTP Groundwater Monitoring

Ion Balance						
Our Reference		333430-1	333430-2	333430-3	333430-4	333430-5
Your Reference	UNITS	BH035	BH035d	BH044	BH050d	BH051s
Date Sampled		18/09/2023	18/09/2023	18/09/2023	18/09/2023	18/09/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
Date analysed	-	20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
Calcium - Dissolved	mg/L	60	410	58	53	43
Potassium - Dissolved	mg/L	7.1	39	24	23	5.2
Sodium - Dissolved	mg/L	770	2,500	1,100	1,300	76
Magnesium - Dissolved	mg/L	35	310	67	89	6.3
Hardness	mgCaCO ₃ /L	290	2,300	420	500	130
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5	<5	<5	<5	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	85	660	480	490	170
Carbonate Alkalinity as CaCO ₃	mg/L	<5	<5	<5	<5	<5
Total Alkalinity as CaCO ₃	mg/L	85	660	480	490	170
Sulphate, SO ₄	mg/L	530	13	380	570	15
Chloride, Cl	mg/L	1,100	6,100	1,900	2,400	24
Ionic Balance	%	-5.0	-8.0	-10	-15	16

Ion Balance			
Our Reference		333430-6	333430-7
Your Reference	UNITS	BH051d	DS-1
Date Sampled		18/09/2023	18/09/2023
Type of sample		Water	Water
Date prepared	-	20/09/2023	20/09/2023
Date analysed	-	20/09/2023	20/09/2023
Calcium - Dissolved	mg/L	180	35
Potassium - Dissolved	mg/L	25	6.0
Sodium - Dissolved	mg/L	1,300	220
Magnesium - Dissolved	mg/L	210	17
Hardness	mgCaCO ₃ /L	1,300	160
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	1,300	430
Carbonate Alkalinity as CaCO ₃	mg/L	<5	<5
Total Alkalinity as CaCO ₃	mg/L	1,300	430
Sulphate, SO ₄	mg/L	170	320
Chloride, Cl	mg/L	2,900	1,500
Ionic Balance	%	-13	-63

Client Reference: CTP Groundwater Monitoring

PFAS in Waters Extended						
Our Reference		333430-1	333430-2	333430-3	333430-4	333430-5
Your Reference	UNITS	BH035	BH035d	BH044	BH050d	BH051s
Date Sampled		18/09/2023	18/09/2023	18/09/2023	18/09/2023	18/09/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
Date analysed	-	21/09/2023	21/09/2023	21/09/2023	21/09/2023	21/09/2023
Perfluorobutanesulfonic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoropentanesulfonic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.02	<0.01	<0.01	<0.01	<0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecanesulfonic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptanoic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
4:2 FTS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
6:2 FTS	µg/L	<0.01	0.02	<0.01	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
10:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctanesulfonamide	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Surrogate ¹³ C ₈ PFOS	%	99	99	98	98	97
Surrogate ¹³ C ₂ PFOA	%	101	103	101	106	101
Extracted ISTD ¹³ C ₃ PFBS	%	96	96	95	97	94
Extracted ISTD ¹⁸ O ₂ PFHxS	%	93	96	98	90	97
Extracted ISTD ¹³ C ₄ PFOS	%	96	103	101	99	103
Extracted ISTD ¹³ C ₄ PFBA	%	45	105	79	83	102

Client Reference: CTP Groundwater Monitoring

PFAS in Waters Extended						
Our Reference		333430-1	333430-2	333430-3	333430-4	333430-5
Your Reference	UNITS	BH035	BH035d	BH044	BH050d	BH051s
Date Sampled		18/09/2023	18/09/2023	18/09/2023	18/09/2023	18/09/2023
Type of sample		Water	Water	Water	Water	Water
Extracted ISTD ¹³ C ₃ PFPeA	%	93	107	96	96	101
Extracted ISTD ¹³ C ₂ PFHxA	%	93	95	94	92	96
Extracted ISTD ¹³ C ₄ PFHpA	%	87	92	89	89	91
Extracted ISTD ¹³ C ₄ PFOA	%	99	111	98	98	100
Extracted ISTD ¹³ C ₅ PFNA	%	97	103	94	99	99
Extracted ISTD ¹³ C ₂ PFDA	%	97	108	96	97	98
Extracted ISTD ¹³ C ₂ PFUnDA	%	101	104	103	101	98
Extracted ISTD ¹³ C ₂ PFDoDA	%	87	68	90	92	92
Extracted ISTD ¹³ C ₂ PFTeDA	%	70	72	70	64	73
Extracted ISTD ¹³ C ₂ 4:2FTS	%	91	89	84	88	90
Extracted ISTD ¹³ C ₂ 6:2FTS	%	92	127	92	100	101
Extracted ISTD ¹³ C ₂ 8:2FTS	%	109	163	101	113	110
Extracted ISTD ¹³ C ₈ FOSA	%	92	94	94	92	95
Extracted ISTD d ₃ N MeFOSA	%	99	96	101	101	98
Extracted ISTD d ₅ N EtFOSA	%	100	100	100	98	98
Extracted ISTD d ₇ N MeFOSE	%	91	90	92	90	95
Extracted ISTD d ₉ N EtFOSE	%	87	81	84	83	85
Extracted ISTD d ₃ N MeFOSAA	%	92	98	90	94	100
Extracted ISTD d ₅ N EtFOSAA	%	92	97	88	92	96
Total Positive PFHxS & PFOS	µg/L	0.02	<0.01	<0.01	<0.01	<0.01
Total Positive PFOA & PFOS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Total Positive PFAS	µg/L	0.02	0.02	<0.01	<0.01	<0.01

PFAS in Waters Extended			
Our Reference		333430-6	333430-7
Your Reference	UNITS	BH051d	DS-1
Date Sampled		18/09/2023	18/09/2023
Type of sample		Water	Water
Date prepared	-	20/09/2023	20/09/2023
Date analysed	-	21/09/2023	21/09/2023
Perfluorobutanesulfonic acid	µg/L	<0.01	<0.01
Perfluoropentanesulfonic acid	µg/L	<0.01	<0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01	<0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01	<0.01
Perfluorodecanesulfonic acid	µg/L	<0.02	<0.02
Perfluorobutanoic acid	µg/L	<0.02	<0.02
Perfluoropentanoic acid	µg/L	<0.02	<0.02
Perfluorohexanoic acid	µg/L	<0.01	<0.01
Perfluoroheptanoic acid	µg/L	<0.01	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01	<0.01
Perfluorononanoic acid	µg/L	<0.01	<0.01
Perfluorodecanoic acid	µg/L	<0.02	<0.02
Perfluoroundecanoic acid	µg/L	<0.02	<0.02
Perfluorododecanoic acid	µg/L	<0.05	<0.05
Perfluorotridecanoic acid	µg/L	<0.1	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5	<0.5
4:2 FTS	µg/L	<0.01	<0.01
6:2 FTS	µg/L	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02
10:2 FTS	µg/L	<0.02	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05	<0.05
N-Ethyl perfluorooctanesulfonamide	µg/L	<0.1	<0.1
N-Me perfluorooctanesulfonamidethanol	µg/L	<0.05	<0.05
N-Et perfluorooctanesulfonamidethanol	µg/L	<0.5	<0.5
MePerfluorooctanesulfonamidacetic acid	µg/L	<0.02	<0.02
EtPerfluorooctanesulfonamidacetic acid	µg/L	<0.02	<0.02
Surrogate ¹³ C ₈ PFOS	%	100	97
Surrogate ¹³ C ₂ PFOA	%	103	104
Extracted ISTD ¹³ C ₃ PFBS	%	94	96
Extracted ISTD ¹⁸ O ₂ PFHxS	%	93	94
Extracted ISTD ¹³ C ₄ PFOS	%	95	100
Extracted ISTD ¹³ C ₄ PFBA	%	94	90

PFAS in Waters Extended			
Our Reference		333430-6	333430-7
Your Reference	UNITS	BH051d	DS-1
Date Sampled		18/09/2023	18/09/2023
Type of sample		Water	Water
Extracted ISTD ¹³ C ₃ PFPeA	%	96	98
Extracted ISTD ¹³ C ₂ PFHxA	%	91	93
Extracted ISTD ¹³ C ₄ PFHpA	%	87	90
Extracted ISTD ¹³ C ₄ PFOA	%	98	100
Extracted ISTD ¹³ C ₅ PFNA	%	99	98
Extracted ISTD ¹³ C ₂ PFDA	%	97	98
Extracted ISTD ¹³ C ₂ PFUnDA	%	102	102
Extracted ISTD ¹³ C ₂ PFDoDA	%	91	86
Extracted ISTD ¹³ C ₂ PFTeDA	%	64	64
Extracted ISTD ¹³ C ₂ 4:2FTS	%	85	100
Extracted ISTD ¹³ C ₂ 6:2FTS	%	99	103
Extracted ISTD ¹³ C ₂ 8:2FTS	%	120	118
Extracted ISTD ¹³ C ₈ FOSA	%	94	94
Extracted ISTD d ₃ N MeFOSA	%	96	96
Extracted ISTD d ₅ N EtFOSA	%	96	93
Extracted ISTD d ₇ N MeFOSE	%	91	88
Extracted ISTD d ₉ N EtFOSE	%	82	80
Extracted ISTD d ₃ N MeFOSAA	%	97	100
Extracted ISTD d ₅ N EtFOSAA	%	102	101
Total Positive PFHxS & PFOS	µg/L	<0.01	<0.01
Total Positive PFOA & PFOS	µg/L	<0.01	<0.01
Total Positive PFAS	µg/L	<0.01	<0.01

Client Reference: CTP Groundwater Monitoring

Method ID	Methodology Summary
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% ie total anions = total cations +/-15%.
Inorg-055	Nitrate - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-055/062/127	Total Nitrogen - Calculation sum of TKN and oxidised Nitrogen. Alternatively analysed by combustion and chemiluminescence.
Inorg-057	Ammonia - determined colourimetrically, based on APHA latest edition 4500-NH3 F. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a KCl extraction.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
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.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

Client Reference: CTP Groundwater Monitoring

Method ID	Methodology Summary
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date Extracted	-			21/09/2023	1	20/09/2023	22/09/2023		21/09/2023	[NT]
Date Analysed	-			22/09/2023	1	21/09/2023	22/09/2023		22/09/2023	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	92	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	1	<1	<1	0	92	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	97	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	91	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	83	[NT]
Dibromomethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	91	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	87	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	96	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	97	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	99	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	100	[NT]
Bromoform	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	102	[NT]
Styrene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	99	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	102	1	103	104	1	101	[NT]
Surrogate Toluene-d8	%		Org-023	97	1	97	97	0	102	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	104	1	104	105	1	100	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			21/09/2023	1	20/09/2023	22/09/2023		21/09/2023	[NT]
Date analysed	-			22/09/2023	1	21/09/2023	22/09/2023		22/09/2023	[NT]
TRH C ₆ - C ₉	µg/L	10	Org-023	<10	1	<10	<10	0	97	[NT]
TRH C ₆ - C ₁₀	µg/L	10	Org-023	<10	1	<10	<10	0	97	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	83	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	96	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	100	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	102	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	99	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	102	1	103	104	1	101	[NT]
Surrogate Toluene-d8	%		Org-023	97	1	97	97	0	102	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	104	1	104	105	1	100	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	333430-2
Date extracted	-			20/09/2023	1	20/09/2023	20/09/2023		20/09/2023	20/09/2023
Date analysed	-			21/09/2023	1	21/09/2023	21/09/2023		21/09/2023	21/09/2023
TRH C ₁₀ - C ₁₄	µg/L	50	Org-020	<50	1	<50	<50	0	122	109
TRH C ₁₅ - C ₂₈	µg/L	100	Org-020	<100	1	<100	<100	0	138	108
TRH C ₂₉ - C ₃₆	µg/L	100	Org-020	<100	1	<100	<100	0	129	119
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-020	<50	1	<50	<50	0	122	109
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-020	<100	1	<100	<100	0	138	108
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-020	<100	1	<100	<100	0	129	119
Surrogate o-Terphenyl	%		Org-020	101	1	107	99	8	103	123

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PAHs in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	333430-2
Date extracted	-			20/09/2023	1	20/09/2023	20/09/2023		20/09/2023	20/09/2023
Date analysed	-			22/09/2023	1	22/09/2023	22/09/2023		22/09/2023	22/09/2023
Naphthalene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	75	87
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	75	79
Fluorene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	72	82
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	85
Anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	75	87
Pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	71	92
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	74	76
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	73	137
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	136	1	111	122	9	100	113

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: All metals in water-dissolved					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			20/09/2023	1	20/09/2023	20/09/2023		20/09/2023	[NT]
Date analysed	-			20/09/2023	1	20/09/2023	20/09/2023		20/09/2023	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	100	[NT]
Boron-Dissolved	µg/L	20	Metals-022	<20	1	50	50	0	84	[NT]
Barium-Dissolved	µg/L	1	Metals-022	<1	1	38	36	5	98	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	1	<0.5	<0.5	0	90	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	0.1	0.1	0	101	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	102	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	102	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	<1	1	66	65	2	99	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	101	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	<5	1	5400	5300	2	100	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	1	3	2	40	104	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	55	55	0	99	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	100	[NT]
Antimony-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	95	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	100	[NT]
Tin-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	102	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	310	300	3	101	[NT]
Iron-Dissolved	µg/L	10	Metals-022	<10	1	4800	4700	2	93	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: All metals in water-dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	3	20/09/2023	20/09/2023		[NT]	[NT]
Date analysed	-			[NT]	3	20/09/2023	20/09/2023		[NT]	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	[NT]	3	1	2	67	[NT]	[NT]
Boron-Dissolved	µg/L	20	Metals-022	[NT]	3	80	80	0	[NT]	[NT]
Barium-Dissolved	µg/L	1	Metals-022	[NT]	3	28	30	7	[NT]	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	[NT]	3	<0.5	<0.5	0	[NT]	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	[NT]	3	0.1	<0.1	0	[NT]	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	[NT]	3	<1	<1	0	[NT]	[NT]
Copper-Dissolved	µg/L	1	Metals-022	[NT]	3	3	5	50	[NT]	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	[NT]	3	<1	1	0	[NT]	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	[NT]	3	<0.05	<0.05	0	[NT]	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	[NT]	3	240	270	12	[NT]	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	[NT]	3	2	2	0	[NT]	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	[NT]	3	1	1	0	[NT]	[NT]
Lead-Dissolved	µg/L	1	Metals-022	[NT]	3	<1	<1	0	[NT]	[NT]
Antimony-Dissolved	µg/L	1	Metals-022	[NT]	3	<1	<1	0	[NT]	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	[NT]	3	<1	<1	0	[NT]	[NT]
Tin-Dissolved	µg/L	1	Metals-022	[NT]	3	<1	<1	0	[NT]	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	[NT]	3	6	7	15	[NT]	[NT]
Iron-Dissolved	µg/L	10	Metals-022	[NT]	3	2300	2600	12	[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: All metals in water-dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	7	20/09/2023	20/09/2023		[NT]	[NT]
Date analysed	-			[NT]	7	20/09/2023	20/09/2023		[NT]	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	[NT]	7	<1	<1	0	[NT]	[NT]
Boron-Dissolved	µg/L	20	Metals-022	[NT]	7	40	50	22	[NT]	[NT]
Barium-Dissolved	µg/L	1	Metals-022	[NT]	7	17	20	16	[NT]	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	[NT]	7	<0.5	<0.5	0	[NT]	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	[NT]	7	<0.1	<0.1	0	[NT]	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	[NT]	7	<1	<1	0	[NT]	[NT]
Copper-Dissolved	µg/L	1	Metals-022	[NT]	7	4	3	29	[NT]	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	[NT]	7	<1	<1	0	[NT]	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	[NT]	7	<0.05	<0.05	0	[NT]	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	[NT]	7	39	110	95	[NT]	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	[NT]	7	2	2	0	[NT]	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	[NT]	7	1	2	67	[NT]	[NT]
Lead-Dissolved	µg/L	1	Metals-022	[NT]	7	<1	<1	0	[NT]	[NT]
Antimony-Dissolved	µg/L	1	Metals-022	[NT]	7	<1	<1	0	[NT]	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	[NT]	7	<1	<1	0	[NT]	[NT]
Tin-Dissolved	µg/L	1	Metals-022	[NT]	7	<1	<1	0	[NT]	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	[NT]	7	8	6	29	[NT]	[NT]
Iron-Dissolved	µg/L	10	Metals-022	[NT]	7	230	810	112	[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: All metals in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	333430-2
Date prepared	-			20/09/2023	1	20/09/2023	20/09/2023		20/09/2023	20/09/2023
Date analysed	-			20/09/2023	1	20/09/2023	20/09/2023		20/09/2023	20/09/2023
Arsenic-Total	µg/L	1	Metals-022	<1	1	47	[NT]		99	[NT]
Boron-Total	µg/L	20	Metals-022	<20	1	90	[NT]		97	[NT]
Barium-Total	µg/L	1	Metals-022	<1	1	1500	[NT]		98	[NT]
Beryllium-Total	µg/L	0.5	Metals-022	<0.5	1	57	[NT]		93	[NT]
Cadmium-Total	µg/L	0.1	Metals-022	<0.1	1	2.6	[NT]		99	[NT]
Chromium-Total	µg/L	1	Metals-022	<1	1	170	[NT]		94	[NT]
Copper-Total	µg/L	1	Metals-022	<1	1	950	[NT]		104	[NT]
Cobalt-Total	µg/L	1	Metals-022	<1	1	230	[NT]		101	[NT]
Mercury-Total	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	103	97
Manganese-Total	µg/L	5	Metals-022	<5	1	9200	[NT]		94	[NT]
Molybdenum-Total	µg/L	1	Metals-022	<1	1	2	[NT]		96	[NT]
Nickel-Total	µg/L	1	Metals-022	<1	1	300	[NT]		100	[NT]
Lead-Total	µg/L	1	Metals-022	<1	1	220	[NT]		101	[NT]
Antimony-Total	µg/L	1	Metals-022	<1	1	<1	[NT]		120	[NT]
Selenium-Total	µg/L	1	Metals-022	<1	1	3	[NT]		105	[NT]
Tin-Total	µg/L	1	Metals-022	<1	1	2	[NT]		100	[NT]
Zinc-Total	µg/L	1	Metals-022	<1	1	2600	[NT]		100	[NT]
Iron-Total	µg/L	10	Metals-022	<10	1	250000	[NT]		98	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Metals in Waters - Total					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			20/09/2023	[NT]	[NT]	[NT]	[NT]	20/09/2023	[NT]
Date analysed	-			20/09/2023	[NT]	[NT]	[NT]	[NT]	20/09/2023	[NT]
Phosphorus - Total	mg/L	0.05	Metals-020	<0.05	[NT]	[NT]	[NT]	[NT]	94	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			19/09/2023	1	20/09/2023	20/09/2023		19/09/2023	[NT]
Date analysed	-			19/09/2023	1	20/09/2023	20/09/2023		19/09/2023	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	1	0.17	0.17	0	93	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	1	0.01	0.01	0	98	[NT]
Total Nitrogen in water	mg/L	0.1	Inorg-055/062/127	<0.1	1	0.7	0.7	0	101	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Ion Balance					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	333430-2
Date prepared	-			20/09/2023	1	20/09/2023	20/09/2023		20/09/2023	20/09/2023
Date analysed	-			20/09/2023	1	20/09/2023	20/09/2023		20/09/2023	20/09/2023
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	60	71	17	84	#
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	7.1	8.2	14	85	106
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	770	790	3	94	#
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	35	42	18	83	#
Hardness	mgCaCO ₃ /L	3	Metals-020	[NT]	1	290	350	19	[NT]	[NT]
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	5	Inorg-006	<5	1	<5	<5	0	[NT]	[NT]
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	1	85	86	1	[NT]	[NT]
Carbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	1	<5	<5	0	[NT]	[NT]
Total Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	1	85	86	1	108	[NT]
Sulphate, SO ₄	mg/L	1	Inorg-081	<1	1	530	[NT]		115	114
Chloride, Cl	mg/L	1	Inorg-081	<1	1	1100	[NT]		111	#
Ionic Balance	%		Inorg-040	[NT]	1	-5.0	[NT]		[NT]	[NT]

QUALITY CONTROL: Ion Balance					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	3	20/09/2023	20/09/2023		[NT]	[NT]
Date analysed	-			[NT]	3	20/09/2023	20/09/2023		[NT]	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	[NT]	3	58	51	13	[NT]	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	[NT]	3	24	25	4	[NT]	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	[NT]	3	1100	1200	9	[NT]	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	[NT]	3	67	67	0	[NT]	[NT]
Hardness	mgCaCO ₃ /L	3	Metals-020	[NT]	3	420	400	5	[NT]	[NT]
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	5	Inorg-006	[NT]	3	<5	[NT]		[NT]	[NT]
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	3	480	[NT]		[NT]	[NT]
Carbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	3	<5	[NT]		[NT]	[NT]
Total Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	3	480	[NT]		[NT]	[NT]
Sulphate, SO ₄	mg/L	1	Inorg-081	[NT]	3	380	[NT]		[NT]	[NT]
Chloride, Cl	mg/L	1	Inorg-081	[NT]	3	1900	[NT]		[NT]	[NT]
Ionic Balance	%		Inorg-040	[NT]	3	-10	[NT]		[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	6	20/09/2023	20/09/2023		[NT]	[NT]
Date analysed	-			[NT]	6	20/09/2023	20/09/2023		[NT]	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	[NT]	6	180	160	12	[NT]	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	[NT]	6	25	23	8	[NT]	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	[NT]	6	1300	1400	7	[NT]	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	[NT]	6	210	190	10	[NT]	[NT]
Hardness	mgCaCO ₃ /L	3	Metals-020	[NT]	6	1300	1200	8	[NT]	[NT]
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	5	Inorg-006	[NT]	6	<5	[NT]		[NT]	[NT]
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	6	1300	[NT]		[NT]	[NT]
Carbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	6	<5	[NT]		[NT]	[NT]
Total Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	6	1300	[NT]		[NT]	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	[NT]	6	170	[NT]		[NT]	[NT]
Chloride, Cl	mg/L	1	Inorg-081	[NT]	6	2900	[NT]		[NT]	[NT]
Ionic Balance	%		Inorg-040	[NT]	6	-13	[NT]		[NT]	[NT]

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	7	20/09/2023	20/09/2023		[NT]	[NT]
Date analysed	-			[NT]	7	20/09/2023	20/09/2023		[NT]	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	[NT]	7	35	37	6	[NT]	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	[NT]	7	6.0	13	74	[NT]	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	[NT]	7	220	580	90	[NT]	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	[NT]	7	17	30	55	[NT]	[NT]
Hardness	mgCaCO ₃ /L	3	Metals-020	[NT]	7	160	210	27	[NT]	[NT]
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	5	Inorg-006	[NT]	7	<5	[NT]		[NT]	[NT]
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	7	430	[NT]		[NT]	[NT]
Carbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	7	<5	[NT]		[NT]	[NT]
Total Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	7	430	[NT]		[NT]	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	[NT]	7	320	[NT]		[NT]	[NT]
Chloride, Cl	mg/L	1	Inorg-081	[NT]	7	1500	[NT]		[NT]	[NT]
Ionic Balance	%		Inorg-040	[NT]	7	-63	[NT]		[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	333430-2
Date prepared	-			20/09/2023	1	20/09/2023	20/09/2023		20/09/2023	20/09/2023
Date analysed	-			21/09/2023	1	21/09/2023	21/09/2023		21/09/2023	21/09/2023
Perfluorobutanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	117	112
Perfluoropentanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	110	106
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	1	0.02	0.03	40	113	109
Perfluoroheptanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	125	119
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	105	98
Perfluorodecanesulfonic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	101	88
Perfluorobutanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	113	107
Perfluoropentanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	110	104
Perfluorohexanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	115	111
Perfluoroheptanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	107	111
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	112	106
Perfluorononanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	118	125
Perfluorodecanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	114	106
Perfluoroundecanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	109	103
Perfluorododecanoic acid	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	114	107
Perfluorotridecanoic acid	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	104	124
Perfluorotetradecanoic acid	µg/L	0.5	Org-029	<0.5	1	<0.5	<0.5	0	121	117
4:2 FTS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	121	117
6:2 FTS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	104	100
8:2 FTS	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	116	110
10:2 FTS	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	115	89
Perfluorooctane sulfonamide	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	118	116
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	113	108
N-Ethyl perfluorooctanesulfon amide	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	110	106
N-Me perfluorooctanesulfonamid oethanol	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	130	119
N-Et perfluorooctanesulfonamid oethanol	µg/L	0.5	Org-029	<0.5	1	<0.5	<0.5	0	129	119
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	107	101
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	115	114
Surrogate ¹³ C ₈ PFOS	%		Org-029	100	1	99	97	2	101	99
Surrogate ¹³ C ₂ PFOA	%		Org-029	104	1	101	105	4	105	106

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	333430-2
Extracted ISTD ¹³ C ₃ PFBS	%		Org-029	94	1	96	95	1	94	93
Extracted ISTD ¹⁸ O ₂ PFHxS	%		Org-029	90	1	93	93	0	93	94
Extracted ISTD ¹³ C ₄ PFOS	%		Org-029	98	1	96	99	3	97	100
Extracted ISTD ¹³ C ₄ PFBA	%		Org-029	100	1	45	45	0	99	101
Extracted ISTD ¹³ C ₃ PFPeA	%		Org-029	99	1	93	97	4	95	102
Extracted ISTD ¹³ C ₂ PFHxA	%		Org-029	91	1	93	95	2	90	91
Extracted ISTD ¹³ C ₄ PFHpA	%		Org-029	88	1	87	85	2	92	87
Extracted ISTD ¹³ C ₄ PFOA	%		Org-029	97	1	99	100	1	94	106
Extracted ISTD ¹³ C ₅ PFNA	%		Org-029	98	1	97	95	2	97	104
Extracted ISTD ¹³ C ₂ PFDA	%		Org-029	97	1	97	95	2	95	105
Extracted ISTD ¹³ C ₂ PFUnDA	%		Org-029	99	1	101	99	2	98	104
Extracted ISTD ¹³ C ₂ PFDoDA	%		Org-029	94	1	87	92	6	91	73
Extracted ISTD ¹³ C ₂ PFTeDA	%		Org-029	63	1	70	70	0	70	71
Extracted ISTD ¹³ C ₂ 4:2FTS	%		Org-029	87	1	91	91	0	83	87
Extracted ISTD ¹³ C ₂ 6:2FTS	%		Org-029	90	1	92	91	1	94	120
Extracted ISTD ¹³ C ₂ 8:2FTS	%		Org-029	107	1	109	107	2	104	162
Extracted ISTD ¹³ C ₈ FOSA	%		Org-029	94	1	92	93	1	89	89
Extracted ISTD d ₃ N MeFOSA	%		Org-029	101	1	99	99	0	97	96
Extracted ISTD d ₅ N EtFOSA	%		Org-029	96	1	100	100	0	98	99
Extracted ISTD d ₇ N MeFOSE	%		Org-029	91	1	91	94	3	91	91

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	333430-2
Extracted ISTD d ₉ N EtFOSE	%		Org-029	82	1	87	87	0	80	78
Extracted ISTD d ₃ N MeFOSAA	%		Org-029	93	1	92	90	2	91	98
Extracted ISTD d ₅ N EtFOSAA	%		Org-029	93	1	92	87	6	92	94

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

Ion Balance:

- # 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.
- Two filtered preserved bottles were received for #3 and #7. Both samples were tested and reported as #3, #3D, #7, #7D.
- The RPD for duplicate results is accepted due to results coming from two different bottles.

Dissolved Metals: The preserved sample provided for #1, 2, 4-6 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 for #1, 2, 4-6 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

Total metals: no unfiltered, preserved sample was received for #3,7, therefore analysis was conducted from the unpreserved sample bottle.

Note: there is a possibility some elements may be underestimated.

All metals in water-dissolved:

- Two filtered preserved bottles were received for #3 and #7. Both samples were tested and reported as #3,#3D,#7,#7D.
- The RPD for duplicate results is accepted due to results coming from two different bottles.

For PFAS Extracted Internal Standards denoted with # or outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).

The mass imbalance may be caused different preservation of the samples for the cations the preservation of HNO₃ and filtration was used while for anions the non-preservation of the bottle was used.

CERTIFICATE OF ANALYSIS 333837

Client Details

Client	CTP AFJV
Attention	
Address	7 Figtree Dr, SYDNEY OLYMPIC PARK, NSW, 2127

Sample Details

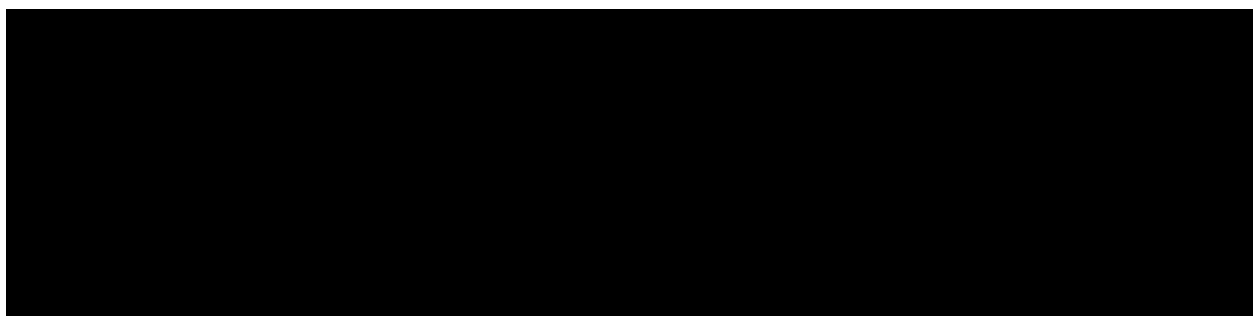
Your Reference	<u>CTP Groundwater Monitoring</u>
Number of Samples	6 Water
Date samples received	21/09/2023
Date completed instructions received	25/09/2023

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	03/10/2023
Date of Issue	03/10/2023
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Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	



Client Reference: CTP Groundwater Monitoring

VOCs in water						
Our Reference		333837-1	333837-2	333837-3	333837-4	333837-5
Your Reference	UNITS	BH120	BH068	BH715B	BH126	SMW_BH036
Date Sampled		20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
Type of sample		Water	Water	Water	Water	Water
Date Extracted	-	30/09/2023	03/10/2023	03/10/2023	30/09/2023	30/09/2023
Date Analysed	-	01/10/2023	03/10/2023	03/10/2023	01/10/2023	01/10/2023
Dichlorodifluoromethane	µg/L	<10	<10	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<1	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1	5	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1
Benzene	µg/L	<1	<1	<1	24	<1
Dibromomethane	µg/L	<1	<1	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1	14	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1

Client Reference: CTP Groundwater Monitoring

VOCs in water						
Our Reference		333837-1	333837-2	333837-3	333837-4	333837-5
Your Reference	UNITS	BH120	BH068	BH715B	BH126	SMW_BH036
Date Sampled		20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
Type of sample		Water	Water	Water	Water	Water
Bromoform	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
Styrene	µg/L	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
o-xylene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1	2	<1
Bromobenzene	µg/L	<1	<1	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1	2	<1
2-chlorotoluene	µg/L	<1	<1	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1	2	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	102	104	103	102	99
Surrogate Toluene-d8	%	100	100	100	101	99
Surrogate 4-Bromofluorobenzene	%	102	101	101	98	102

VOCs in water		
Our Reference		333837-6
Your Reference	UNITS	BH019
Date Sampled		20/09/2023
Type of sample		Water
Date Extracted	-	30/09/2023
Date Analysed	-	01/10/2023
Dichlorodifluoromethane	µg/L	<10
Chloromethane	µg/L	<10
Vinyl Chloride	µg/L	<10
Bromomethane	µg/L	<10
Chloroethane	µg/L	<10
Trichlorofluoromethane	µg/L	<10
1,1-Dichloroethene	µg/L	<1
Trans-1,2-dichloroethene	µg/L	<1
1,1-dichloroethane	µg/L	<1
Cis-1,2-dichloroethene	µg/L	<1
Bromochloromethane	µg/L	<1
Chloroform	µg/L	<1
2,2-dichloropropane	µg/L	<1
1,2-dichloroethane	µg/L	<1
1,1,1-trichloroethane	µg/L	<1
1,1-dichloropropene	µg/L	<1
Cyclohexane	µg/L	<1
Carbon tetrachloride	µg/L	<1
Benzene	µg/L	<1
Dibromomethane	µg/L	<1
1,2-dichloropropane	µg/L	<1
Trichloroethene	µg/L	<1
Bromodichloromethane	µg/L	<1
trans-1,3-dichloropropene	µg/L	<1
cis-1,3-dichloropropene	µg/L	<1
1,1,2-trichloroethane	µg/L	<1
Toluene	µg/L	<1
1,3-dichloropropane	µg/L	<1
Dibromochloromethane	µg/L	<1
1,2-dibromoethane	µg/L	<1
Tetrachloroethene	µg/L	<1
1,1,1,2-tetrachloroethane	µg/L	<1
Chlorobenzene	µg/L	<1
Ethylbenzene	µg/L	<1

VOCs in water		
Our Reference		333837-6
Your Reference	UNITS	BH019
Date Sampled		20/09/2023
Type of sample		Water
Bromoform	µg/L	<1
m+p-xylene	µg/L	<2
Styrene	µg/L	<1
1,1,2,2-tetrachloroethane	µg/L	<1
o-xylene	µg/L	<1
1,2,3-trichloropropane	µg/L	<1
Isopropylbenzene	µg/L	<1
Bromobenzene	µg/L	<1
n-propyl benzene	µg/L	<1
2-chlorotoluene	µg/L	<1
4-chlorotoluene	µg/L	<1
1,3,5-trimethyl benzene	µg/L	<1
Tert-butyl benzene	µg/L	<1
1,2,4-trimethyl benzene	µg/L	<1
1,3-dichlorobenzene	µg/L	<1
Sec-butyl benzene	µg/L	<1
1,4-dichlorobenzene	µg/L	<1
4-isopropyl toluene	µg/L	<1
1,2-dichlorobenzene	µg/L	<1
n-butyl benzene	µg/L	<1
1,2-dibromo-3-chloropropane	µg/L	<1
1,2,4-trichlorobenzene	µg/L	<1
Hexachlorobutadiene	µg/L	<1
1,2,3-trichlorobenzene	µg/L	<1
Surrogate Dibromofluoromethane	%	98
Surrogate Toluene-d8	%	99
Surrogate 4-Bromofluorobenzene	%	100

Client Reference: CTP Groundwater Monitoring

vTRH(C6-C10)/BTEXN in Water						
Our Reference		333837-1	333837-2	333837-3	333837-4	333837-5
Your Reference	UNITS	BH120	BH068	BH715B	BH126	SMW_BH036
Date Sampled		20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	30/09/2023	03/10/2023	03/10/2023	30/09/2023	30/09/2023
Date analysed	-	01/10/2023	03/10/2023	03/10/2023	01/10/2023	01/10/2023
TRH C ₆ - C ₉	µg/L	<10	<10	<10	110	<10
TRH C ₆ - C ₁₀	µg/L	<10	<10	<10	130	<10
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	<10	<10	<10	110	<10
Benzene	µg/L	<1	<1	<1	24	<1
Toluene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
o-xylene	µg/L	<1	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	3	<1
Surrogate Dibromofluoromethane	%	102	104	103	102	99
Surrogate Toluene-d8	%	100	100	100	101	99
Surrogate 4-Bromofluorobenzene	%	102	101	101	98	102

vTRH(C6-C10)/BTEXN in Water		
Our Reference		333837-6
Your Reference	UNITS	BH019
Date Sampled		20/09/2023
Type of sample		Water
Date extracted	-	30/09/2023
Date analysed	-	01/10/2023
TRH C ₆ - C ₉	µg/L	<10
TRH C ₆ - C ₁₀	µg/L	<10
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	98
Surrogate Toluene-d8	%	99
Surrogate 4-Bromofluorobenzene	%	100

Client Reference: CTP Groundwater Monitoring

svTRH (C10-C40) in Water						
Our Reference		333837-1	333837-2	333837-3	333837-4	333837-5
Your Reference	UNITS	BH120	BH068	BH715B	BH126	SMW_BH036
Date Sampled		20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	27/09/2023	27/09/2023	27/09/2023	27/09/2023	27/09/2023
Date analysed	-	28/09/2023	28/09/2023	28/09/2023	28/09/2023	28/09/2023
TRH C ₁₀ - C ₁₄	µg/L	<50	100	<50	1,100	<50
TRH C ₁₅ - C ₂₈	µg/L	<100	140	<100	2,300	<100
TRH C ₂₉ - C ₃₆	µg/L	<100	<100	<100	170	<100
Total +ve TRH (C10-C36)	µg/L	<50	240	<50	3,600	<50
TRH >C ₁₀ - C ₁₆	µg/L	<50	130	<50	1,400	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	<50	130	<50	1,400	<50
TRH >C ₁₆ - C ₃₄	µg/L	<100	100	<100	2,000	<100
TRH >C ₃₄ - C ₄₀	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	230	<50	3,400	<50
Surrogate o-Terphenyl	%	82	128	91	#	127

svTRH (C10-C40) in Water		
Our Reference		333837-6
Your Reference	UNITS	BH019
Date Sampled		20/09/2023
Type of sample		Water
Date extracted	-	27/09/2023
Date analysed	-	28/09/2023
TRH C ₁₀ - C ₁₄	µg/L	<50
TRH C ₁₅ - C ₂₈	µg/L	<100
TRH C ₂₉ - C ₃₆	µg/L	<100
Total +ve TRH (C10-C36)	µg/L	<50
TRH >C ₁₀ - C ₁₆	µg/L	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	<50
TRH >C ₁₆ - C ₃₄	µg/L	<100
TRH >C ₃₄ - C ₄₀	µg/L	<100
Total +ve TRH (>C10-C40)	µg/L	<50
Surrogate o-Terphenyl	%	101

Client Reference: CTP Groundwater Monitoring

PAHs in Water						
Our Reference		333837-1	333837-2	333837-3	333837-4	333837-5
Your Reference	UNITS	BH120	BH068	BH715B	BH126	SMW_BH036
Date Sampled		20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	27/09/2023	27/09/2023	27/09/2023	27/09/2023	27/09/2023
Date analysed	-	28/09/2023	28/09/2023	28/09/2023	28/09/2023	28/09/2023
Naphthalene	µg/L	<0.1	<0.1	<0.1	8.2	<0.1
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	0.2	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1	8.4	<0.1
Surrogate p-Terphenyl-d14	%	78	128	86	131	132

PAHs in Water		
Our Reference		333837-6
Your Reference	UNITS	BH019
Date Sampled		20/09/2023
Type of sample		Water
Date extracted	-	27/09/2023
Date analysed	-	28/09/2023
Naphthalene	µg/L	<0.1
Acenaphthylene	µg/L	<0.1
Acenaphthene	µg/L	<0.1
Fluorene	µg/L	<0.1
Phenanthrene	µg/L	<0.1
Anthracene	µg/L	<0.1
Fluoranthene	µg/L	<0.1
Pyrene	µg/L	<0.1
Benzo(a)anthracene	µg/L	<0.1
Chrysene	µg/L	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2
Benzo(a)pyrene	µg/L	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5
Total +ve PAH's	µg/L	<0.1
Surrogate <i>p</i> -Terphenyl-d14	%	93

Client Reference: CTP Groundwater Monitoring

All metals in water-dissolved						
Our Reference		333837-1	333837-2	333837-3	333837-4	333837-5
Your Reference	UNITS	BH120	BH068	BH715B	BH126	SMW_BH036
Date Sampled		20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	26/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Date analysed	-	26/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Arsenic-Dissolved	µg/L	<1	<1	<1	4	1
Boron-Dissolved	µg/L	100	30	50	1,800	100
Barium-Dissolved	µg/L	60	20	49	1,300	12
Beryllium-Dissolved	µg/L	<0.5	<0.5	<0.5	<0.5	2
Cadmium-Dissolved	µg/L	0.1	<0.1	<0.1	<0.1	0.1
Chromium-Dissolved	µg/L	<1	1	<1	19	<1
Copper-Dissolved	µg/L	7	2	<1	<1	3
Cobalt-Dissolved	µg/L	17	<1	16	16	36
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Manganese-Dissolved	µg/L	350	22	1,300	33	1,800
Molybdenum-Dissolved	µg/L	3	1	2	5	<1
Nickel-Dissolved	µg/L	9	8	11	42	25
Lead-Dissolved	µg/L	<1	<1	<1	1	<1
Antimony-Dissolved	µg/L	1	<1	<1	1	<1
Selenium-Dissolved	µg/L	<1	<1	<1	1	<1
Tin-Dissolved	µg/L	<1	<1	<1	<1	<1
Zinc-Dissolved	µg/L	15	40	27	8	110
Iron-Dissolved	µg/L	<10	340	20	280	10

All metals in water-dissolved		
Our Reference		333837-6
Your Reference	UNITS	BH019
Date Sampled		20/09/2023
Type of sample		Water
Date prepared	-	26/09/2023
Date analysed	-	26/09/2023
Arsenic-Dissolved	µg/L	8
Boron-Dissolved	µg/L	40
Barium-Dissolved	µg/L	30
Beryllium-Dissolved	µg/L	<0.5
Cadmium-Dissolved	µg/L	<0.1
Chromium-Dissolved	µg/L	<1
Copper-Dissolved	µg/L	3
Cobalt-Dissolved	µg/L	<1
Mercury-Dissolved	µg/L	<0.05
Manganese-Dissolved	µg/L	26
Molybdenum-Dissolved	µg/L	7
Nickel-Dissolved	µg/L	2
Lead-Dissolved	µg/L	<1
Antimony-Dissolved	µg/L	<1
Selenium-Dissolved	µg/L	<1
Tin-Dissolved	µg/L	<1
Zinc-Dissolved	µg/L	14
Iron-Dissolved	µg/L	140

Client Reference: CTP Groundwater Monitoring

All metals in water - total						
Our Reference		333837-1	333837-2	333837-3	333837-4	333837-5
Your Reference	UNITS	BH120	BH068	BH715B	BH126	SMW_BH036
Date Sampled		20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
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
Arsenic-Total	µg/L	1	<1	2	12	10
Boron-Total	µg/L	100	40	60	1,900	220
Barium-Total	µg/L	100	26	100	2,100	350
Beryllium-Total	µg/L	<0.5	<0.5	0.7	3	9
Cadmium-Total	µg/L	0.2	<0.1	0.2	1.6	0.6
Chromium-Total	µg/L	9	3	12	200	26
Copper-Total	µg/L	89	16	16	110	120
Cobalt-Total	µg/L	25	1	83	190	79
Mercury-Total	µg/L	<0.05	<0.05	<0.05	<0.05	0.05
Manganese-Total	µg/L	460	50	1,800	810	3,600
Molybdenum-Total	µg/L	4	2	2	3	1
Nickel-Total	µg/L	16	11	51	110	80
Lead-Total	µg/L	8	1	13	280	63
Antimony-Total	µg/L	1	<1	<1	2	<1
Selenium-Total	µg/L	1	<1	<1	1	<1
Tin-Total	µg/L	2	1	2	6	<1
Zinc-Total	µg/L	30	71	200	1,200	410
Iron-Total	µg/L	4,300	1,300	12,000	67,000	43,000

All metals in water - total		
Our Reference		333837-6
Your Reference	UNITS	BH019
Date Sampled		20/09/2023
Type of sample		Water
Date prepared	-	28/09/2023
Date analysed	-	28/09/2023
Arsenic-Total	µg/L	16
Boron-Total	µg/L	60
Barium-Total	µg/L	160
Beryllium-Total	µg/L	0.6
Cadmium-Total	µg/L	0.2
Chromium-Total	µg/L	19
Copper-Total	µg/L	45
Cobalt-Total	µg/L	6
Mercury-Total	µg/L	<0.05
Manganese-Total	µg/L	430
Molybdenum-Total	µg/L	8
Nickel-Total	µg/L	16
Lead-Total	µg/L	17
Antimony-Total	µg/L	1
Selenium-Total	µg/L	<1
Tin-Total	µg/L	1
Zinc-Total	µg/L	290
Iron-Total	µg/L	7,900

Client Reference: CTP Groundwater Monitoring

Metals in Waters - Total						
Our Reference		333837-1	333837-2	333837-3	333837-4	333837-5
Your Reference	UNITS	BH120	BH068	BH715B	BH126	SMW_BH036
Date Sampled		20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
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
Phosphorus - Total	mg/L	0.2	0.1	0.50	0.93	3.7

Metals in Waters - Total		
Our Reference		333837-6
Your Reference	UNITS	BH019
Date Sampled		20/09/2023
Type of sample		Water
Date prepared	-	28/09/2023
Date analysed	-	28/09/2023
Phosphorus - Total	mg/L	2.2

Client Reference: CTP Groundwater Monitoring

Miscellaneous Inorganics						
Our Reference		333837-1	333837-2	333837-3	333837-4	333837-5
Your Reference	UNITS	BH120	BH068	BH715B	BH126	SMW_BH036
Date Sampled		20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	25/09/2023	25/09/2023	25/09/2023	25/09/2023	25/09/2023
Date analysed	-	25/09/2023	25/09/2023	25/09/2023	25/09/2023	25/09/2023
Ammonia as N in water	mg/L	1.3	0.44	0.80	300	0.057
Nitrate as N in water	mg/L	0.32	0.56	0.59	<0.005	0.14
Total Nitrogen in water	mg/L	1.7	1.6	1.4	320	0.5

Miscellaneous Inorganics		
Our Reference		333837-6
Your Reference	UNITS	BH019
Date Sampled		20/09/2023
Type of sample		Water
Date prepared	-	25/09/2023
Date analysed	-	25/09/2023
Ammonia as N in water	mg/L	0.32
Nitrate as N in water	mg/L	0.062
Total Nitrogen in water	mg/L	1.4

Client Reference: CTP Groundwater Monitoring

Ion Balance						
Our Reference		333837-1	333837-2	333837-3	333837-4	333837-5
Your Reference	UNITS	BH120	BH068	BH715B	BH126	SMW_BH036
Date Sampled		20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	26/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Date analysed	-	26/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Calcium - Dissolved	mg/L	210	35	130	37	2
Potassium - Dissolved	mg/L	52	9.0	48	400	8.0
Sodium - Dissolved	mg/L	3,300	29	4,000	2,300	360
Magnesium - Dissolved	mg/L	470	3	400	81	8.6
Hardness	mgCaCO ₃ /L	2,500	99	2,000	430	40
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5	<5	<5	<5	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	670	130	500	1,600	81
Carbonate Alkalinity as CaCO ₃	mg/L	<5	<5	<5	<5	<5
Total Alkalinity as CaCO ₃	mg/L	670	130	500	1,600	81
Sulphate, SO ₄	mg/L	480	24	650	7	470
Chloride, Cl	mg/L	6,000	31	7,100	4,000	340
Ionic Balance	%	0	-7.0	-2.0	-10	-11

Ion Balance		
Our Reference		333837-6
Your Reference	UNITS	BH019
Date Sampled		20/09/2023
Type of sample		Water
Date prepared	-	26/09/2023
Date analysed	-	26/09/2023
Calcium - Dissolved	mg/L	26
Potassium - Dissolved	mg/L	12
Sodium - Dissolved	mg/L	90
Magnesium - Dissolved	mg/L	5.7
Hardness	mgCaCO ₃ /L	89
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	100
Carbonate Alkalinity as CaCO ₃	mg/L	<5
Total Alkalinity as CaCO ₃	mg/L	100
Sulphate, SO ₄	mg/L	44
Chloride, Cl	mg/L	120
Ionic Balance	%	-3.0

Client Reference: CTP Groundwater Monitoring

PFAS in Waters Extended						
Our Reference		333837-1	333837-2	333837-3	333837-4	333837-5
Your Reference	UNITS	BH120	BH068	BH715B	BH126	SMW_BH036
Date Sampled		20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	25/09/2023	25/09/2023	25/09/2023	25/09/2023	25/09/2023
Date analysed	-	25/09/2023	25/09/2023	25/09/2023	25/09/2023	25/09/2023
Perfluorobutanesulfonic acid	µg/L	<0.01	<0.01	<0.01	2.0	<0.01
Perfluoropentanesulfonic acid	µg/L	<0.01	<0.01	<0.01	0.13	<0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01	<0.01	<0.01	0.28	<0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01	<0.01	<0.01	0.17	<0.01
Perfluorodecanesulfonic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid	µg/L	<0.02	0.02	<0.02	2.1	<0.02
Perfluoropentanoic acid	µg/L	<0.02	<0.02	<0.02	0.30	<0.02
Perfluorohexanoic acid	µg/L	<0.01	<0.01	<0.01	0.80	<0.01
Perfluoroheptanoic acid	µg/L	<0.01	0.04	<0.01	0.23	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01	<0.01	<0.01	0.45	<0.01
Perfluorononanoic acid	µg/L	<0.01	<0.01	<0.01	0.06	<0.01
Perfluorodecanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
4:2 FTS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
6:2 FTS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
10:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctanesulfon amide	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02	0.09	<0.02
Surrogate ¹³ C ₈ PFOS	%	93	102	99	100	97
Surrogate ¹³ C ₂ PFOA	%	105	110	109	105	108
Extracted ISTD ¹³ C ₃ PFBS	%	96	94	95	87	93
Extracted ISTD ¹⁸ O ₂ PFHxS	%	97	93	94	87	91
Extracted ISTD ¹³ C ₄ PFOS	%	104	99	101	100	100
Extracted ISTD ¹³ C ₄ PFBA	%	74	93	73	53	52

Client Reference: CTP Groundwater Monitoring

PFAS in Waters Extended						
Our Reference		333837-1	333837-2	333837-3	333837-4	333837-5
Your Reference	UNITS	BH120	BH068	BH715B	BH126	SMW_BH036
Date Sampled		20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
Type of sample		Water	Water	Water	Water	Water
Extracted ISTD ¹³ C ₃ PFPeA	%	89	110	86	57	103
Extracted ISTD ¹³ C ₂ PFHxA	%	90	97	91	56	90
Extracted ISTD ¹³ C ₄ PFHpA	%	81	90	81	65	86
Extracted ISTD ¹³ C ₄ PFOA	%	98	106	94	122	106
Extracted ISTD ¹³ C ₅ PFNA	%	92	101	91	89	98
Extracted ISTD ¹³ C ₂ PFDA	%	95	102	94	78	103
Extracted ISTD ¹³ C ₂ PFUnDA	%	102	101	95	121	101
Extracted ISTD ¹³ C ₂ PFDoDA	%	99	103	97	113	101
Extracted ISTD ¹³ C ₂ PFTeDA	%	71	75	70	70	70
Extracted ISTD ¹³ C ₂ 4:2FTS	%	60	99	54	131	86
Extracted ISTD ¹³ C ₂ 6:2FTS	%	66	127	61	#	104
Extracted ISTD ¹³ C ₂ 8:2FTS	%	78	125	74	#	114
Extracted ISTD ¹³ C ₈ FOSA	%	89	90	91	78	89
Extracted ISTD d ₃ N MeFOSA	%	102	103	101	107	96
Extracted ISTD d ₅ N EtFOSA	%	99	102	98	101	99
Extracted ISTD d ₇ N MeFOSE	%	97	97	98	92	94
Extracted ISTD d ₉ N EtFOSE	%	96	92	94	94	91
Extracted ISTD d ₃ N MeFOSAA	%	80	108	76	111	98
Extracted ISTD d ₅ N EtFOSAA	%	75	100	70	110	101
Total Positive PFHxS & PFOS	µg/L	<0.01	<0.01	<0.01	0.45	<0.01
Total Positive PFOA & PFOS	µg/L	<0.01	<0.01	<0.01	0.62	<0.01
Total Positive PFAS	µg/L	<0.01	0.07	<0.01	6.7	<0.01

PFAS in Waters Extended		
Our Reference		333837-6
Your Reference	UNITS	BH019
Date Sampled		20/09/2023
Type of sample		Water
Date prepared	-	25/09/2023
Date analysed	-	25/09/2023
Perfluorobutanesulfonic acid	µg/L	<0.01
Perfluoropentanesulfonic acid	µg/L	<0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01
Perfluorodecanesulfonic acid	µg/L	<0.02
Perfluorobutanoic acid	µg/L	<0.02
Perfluoropentanoic acid	µg/L	0.02
Perfluorohexanoic acid	µg/L	0.02
Perfluoroheptanoic acid	µg/L	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01
Perfluorononanoic acid	µg/L	<0.01
Perfluorodecanoic acid	µg/L	<0.02
Perfluoroundecanoic acid	µg/L	<0.02
Perfluorododecanoic acid	µg/L	<0.05
Perfluorotridecanoic acid	µg/L	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5
4:2 FTS	µg/L	<0.01
6:2 FTS	µg/L	<0.01
8:2 FTS	µg/L	<0.02
10:2 FTS	µg/L	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05
N-Ethyl perfluorooctanesulfonamide	µg/L	<0.1
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.05
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02
Surrogate ¹³ C ₈ PFOS	%	97
Surrogate ¹³ C ₂ PFOA	%	111
Extracted ISTD ¹³ C ₃ PFBS	%	93
Extracted ISTD ¹⁸ O ₂ PFHxS	%	91
Extracted ISTD ¹³ C ₄ PFOS	%	101
Extracted ISTD ¹³ C ₄ PFBA	%	79

PFAS in Waters Extended		
Our Reference		333837-6
Your Reference	UNITS	BH019
Date Sampled		20/09/2023
Type of sample		Water
Extracted ISTD ¹³ C ₃ PFPeA	%	101
Extracted ISTD ¹³ C ₂ PFHxA	%	92
Extracted ISTD ¹³ C ₄ PFHpA	%	86
Extracted ISTD ¹³ C ₄ PFOA	%	103
Extracted ISTD ¹³ C ₅ PFNA	%	95
Extracted ISTD ¹³ C ₂ PFDA	%	101
Extracted ISTD ¹³ C ₂ PFUnDA	%	106
Extracted ISTD ¹³ C ₂ PFDoDA	%	97
Extracted ISTD ¹³ C ₂ PFTeDA	%	74
Extracted ISTD ¹³ C ₂ 4:2FTS	%	97
Extracted ISTD ¹³ C ₂ 6:2FTS	%	111
Extracted ISTD ¹³ C ₂ 8:2FTS	%	117
Extracted ISTD ¹³ C ₈ FOSA	%	92
Extracted ISTD d ₃ N MeFOSA	%	98
Extracted ISTD d ₅ N EtFOSA	%	98
Extracted ISTD d ₇ N MeFOSE	%	92
Extracted ISTD d ₉ N EtFOSE	%	91
Extracted ISTD d ₃ N MeFOSAA	%	99
Extracted ISTD d ₅ N EtFOSAA	%	100
Total Positive PFHxS & PFOS	µg/L	<0.01
Total Positive PFOA & PFOS	µg/L	<0.01
Total Positive PFAS	µg/L	0.04

Client Reference: CTP Groundwater Monitoring

Dissolved Gases in Water						
Our Reference		333837-1	333837-2	333837-3	333837-4	333837-5
Your Reference	UNITS	BH120	BH068	BH715B	BH126	SMW_BH036
Date Sampled		20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023
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
Methane	µg/L	16	67	240	5,900	<5

Dissolved Gases in Water		
Our Reference		333837-6
Your Reference	UNITS	BH019
Date Sampled		20/09/2023
Type of sample		Water
Date prepared	-	28/09/2023
Date analysed	-	28/09/2023
Methane	µg/L	25

Client Reference: CTP Groundwater Monitoring

Method ID	Methodology Summary
AT-006	Dissolved gases determined by GC-FID based on draft method USEPA SOP RSK175
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% ie total anions = total cations +/-15%.
Inorg-055	Nitrate - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-055/062/127	Total Nitrogen - Calculation sum of TKN and oxidised Nitrogen. Alternatively analysed by combustion and chemiluminescence.
Inorg-057	Ammonia - determined colourimetrically, based on APHA latest edition 4500-NH3 F. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a KCl extraction.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
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.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

Client Reference: CTP Groundwater Monitoring

Method ID	Methodology Summary
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date Extracted	-			30/09/2023	[NT]	[NT]	[NT]	[NT]	30/09/2023	[NT]
Date Analysed	-			01/10/2023	[NT]	[NT]	[NT]	[NT]	01/10/2023	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	120	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Dibromomethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Bromoform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	106	[NT]
Styrene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate Toluene-d8	%		Org-023	100	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	100	[NT]	[NT]	[NT]	[NT]	99	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			30/09/2023	[NT]	[NT]	[NT]	[NT]	30/09/2023	[NT]
Date analysed	-			01/10/2023	[NT]	[NT]	[NT]	[NT]	01/10/2023	[NT]
TRH C ₆ - C ₉	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	102	[NT]
TRH C ₆ - C ₁₀	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	102	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	106	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate Toluene-d8	%		Org-023	100	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	100	[NT]	[NT]	[NT]	[NT]	99	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			28/09/2023	[NT]	[NT]	[NT]	[NT]	28/09/2023	[NT]
Date analysed	-			28/09/2023	[NT]	[NT]	[NT]	[NT]	28/09/2023	[NT]
TRH C ₁₀ - C ₁₄	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH C ₁₅ - C ₂₈	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	106	[NT]
TRH C ₂₉ - C ₃₆	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	71	[NT]
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	106	[NT]
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	71	[NT]
Surrogate o-Terphenyl	%		Org-020	107	[NT]	[NT]	[NT]	[NT]	104	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PAHs in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			03/10/2023	[NT]	[NT]	[NT]	[NT]	27/09/2023	[NT]
Date analysed	-			03/10/2023	[NT]	[NT]	[NT]	[NT]	28/09/2023	[NT]
Naphthalene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	83	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	73	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	81	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	81	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	87	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	73	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	80	[NT]	[NT]	[NT]	[NT]	89	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: All metals in water-dissolved					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	333837-2
Date prepared	-			28/09/2023	1	26/09/2023	26/09/2023		28/09/2023	26/09/2023
Date analysed	-			28/09/2023	1	26/09/2023	26/09/2023		28/09/2023	26/09/2023
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	96	95
Boron-Dissolved	µg/L	20	Metals-022	<20	1	100	100	0	86	84
Barium-Dissolved	µg/L	1	Metals-022	<1	1	60	58	3	106	92
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	1	<0.5	<0.5	0	105	111
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	0.1	0.1	0	98	94
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	98	96
Copper-Dissolved	µg/L	1	Metals-022	<1	1	7	7	0	105	85
Cobalt-Dissolved	µg/L	1	Metals-022	<1	1	17	17	0	104	95
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	105	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	<5	1	350	350	0	100	97
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	1	3	3	0	99	94
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	9	9	0	103	100
Lead-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	106	92
Antimony-Dissolved	µg/L	1	Metals-022	<1	1	1	1	0	82	85
Selenium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	99	96
Tin-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	102	98
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	15	15	0	100	96
Iron-Dissolved	µg/L	10	Metals-022	<10	1	<10	<10	0	101	#

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: All metals in water-dissolved					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	333837-3
Date prepared	-			[NT]	[NT]	[NT]	[NT]	[NT]	[NT]	26/09/2023
Date analysed	-			[NT]	[NT]	[NT]	[NT]	[NT]	[NT]	26/09/2023
Mercury-Dissolved	µg/L	0.05	Metals-021	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]	101

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: All metals in water - total					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W5	[NT]
Date prepared	-			28/09/2023	1	28/09/2023	28/09/2023		28/09/2023	[NT]
Date analysed	-			28/09/2023	1	28/09/2023	28/09/2023		28/09/2023	[NT]
Arsenic-Total	µg/L	1	Metals-022	<1	1	1	1	0	98	[NT]
Boron-Total	µg/L	20	Metals-022	<20	1	100	100	0	109	[NT]
Barium-Total	µg/L	1	Metals-022	<1	1	100	97	3	112	[NT]
Beryllium-Total	µg/L	0.5	Metals-022	<0.5	1	<0.5	<0.5	0	101	[NT]
Cadmium-Total	µg/L	0.1	Metals-022	<0.1	1	0.2	0.2	0	98	[NT]
Chromium-Total	µg/L	1	Metals-022	<1	1	9	9	0	98	[NT]
Copper-Total	µg/L	1	Metals-022	<1	1	89	79	12	109	[NT]
Cobalt-Total	µg/L	1	Metals-022	<1	1	25	25	0	108	[NT]
Mercury-Total	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	98	[NT]
Manganese-Total	µg/L	5	Metals-022	<5	1	460	460	0	100	[NT]
Molybdenum-Total	µg/L	1	Metals-022	<1	1	4	4	0	98	[NT]
Nickel-Total	µg/L	1	Metals-022	<1	1	16	16	0	103	[NT]
Lead-Total	µg/L	1	Metals-022	<1	1	8	8	0	111	[NT]
Antimony-Total	µg/L	1	Metals-022	<1	1	1	1	0	103	[NT]
Selenium-Total	µg/L	1	Metals-022	<1	1	1	<1	0	101	[NT]
Tin-Total	µg/L	1	Metals-022	<1	1	2	1	67	101	[NT]
Zinc-Total	µg/L	1	Metals-022	<1	1	30	30	0	103	[NT]
Iron-Total	µg/L	10	Metals-022	<10	1	4300	4200	2	111	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Metals in Waters - Total					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	333837-2
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
Phosphorus - Total	mg/L	0.05	Metals-020	<0.05	1	0.2	0.2	0	103	97

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Miscellaneous Inorganics					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			25/09/2023	[NT]	[NT]	[NT]	[NT]	25/09/2023	[NT]
Date analysed	-			25/09/2023	[NT]	[NT]	[NT]	[NT]	25/09/2023	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	[NT]	[NT]	[NT]	[NT]	93	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NT]	[NT]	103	[NT]
Total Nitrogen in water	mg/L	0.1	Inorg-055/062/127	<0.1	[NT]	[NT]	[NT]	[NT]	89	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	333837-3
Date prepared	-			26/09/2023	1	26/09/2023	26/09/2023		26/09/2023	26/09/2023
Date analysed	-			26/09/2023	1	26/09/2023	26/09/2023		26/09/2023	26/09/2023
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	210	[NT]		106	#
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	52	[NT]		96	113
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	3300	[NT]		92	#
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	470	[NT]		107	#
Hardness	mgCaCO ₃ /L	3	Metals-020	[NT]	1	2500	[NT]		[NT]	[NT]
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	5	Inorg-006	<5	1	<5	<5	0	[NT]	[NT]
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	1	670	670	0	[NT]	[NT]
Carbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	1	<5	<5	0	[NT]	[NT]
Total Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	1	670	670	0	103	[NT]
Sulphate, SO ₄	mg/L	1	Inorg-081	<1	1	480	510	6	115	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	1	6000	6500	8	113	[NT]
Ionic Balance	%		Inorg-040	[NT]	1	0	[NT]		[NT]	[NT]

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	2	26/09/2023	26/09/2023		[NT]	[NT]
Date analysed	-			[NT]	2	26/09/2023	26/09/2023		[NT]	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	[NT]	2	35	36	3	[NT]	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	[NT]	2	9.0	9.2	2	[NT]	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	[NT]	2	29	29	0	[NT]	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	[NT]	2	3	3	0	[NT]	[NT]
Hardness	mgCaCO ₃ /L	3	Metals-020	[NT]	2	99	100	1	[NT]	[NT]
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	5	Inorg-006	[NT]	2	<5	[NT]		[NT]	[NT]
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	2	130	[NT]		[NT]	[NT]
Carbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	2	<5	[NT]		[NT]	[NT]
Total Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	2	130	[NT]		[NT]	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	[NT]	2	24	[NT]		[NT]	[NT]
Chloride, Cl	mg/L	1	Inorg-081	[NT]	2	31	[NT]		[NT]	[NT]
Ionic Balance	%		Inorg-040	[NT]	2	-7.0	[NT]		[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			25/09/2023	1	25/09/2023	25/09/2023		25/09/2023	[NT]
Date analysed	-			25/09/2023	1	25/09/2023	25/09/2023		25/09/2023	[NT]
Perfluorobutanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	111	[NT]
Perfluoropentanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	98	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	101	[NT]
Perfluoroheptanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	116	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	103	[NT]
Perfluorodecanesulfonic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	85	[NT]
Perfluorobutanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	110	[NT]
Perfluoropentanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	106	[NT]
Perfluorohexanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	112	[NT]
Perfluoroheptanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	112	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	108	[NT]
Perfluorononanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	114	[NT]
Perfluorodecanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	107	[NT]
Perfluoroundecanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	106	[NT]
Perfluorododecanoic acid	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	101	[NT]
Perfluorotridecanoic acid	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	86	[NT]
Perfluorotetradecanoic acid	µg/L	0.5	Org-029	<0.5	1	<0.5	<0.5	0	117	[NT]
4:2 FTS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	119	[NT]
6:2 FTS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	90	[NT]
8:2 FTS	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	97	[NT]
10:2 FTS	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	113	[NT]
Perfluorooctane sulfonamide	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	119	[NT]
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	109	[NT]
N-Ethyl perfluorooctanesulfon amide	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	106	[NT]
N-Me perfluorooctanesulfonamid oethanol	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	112	[NT]
N-Et perfluorooctanesulfonamid oethanol	µg/L	0.5	Org-029	<0.5	1	<0.5	<0.5	0	115	[NT]
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	107	[NT]
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	114	[NT]
Surrogate ¹³ C ₈ PFOS	%		Org-029	100	1	93	101	8	102	[NT]
Surrogate ¹³ C ₂ PFOA	%		Org-029	104	1	105	105	0	106	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Extracted ISTD ¹³ C ₃ PFBS	%		Org-029	93	1	96	89	8	91	[NT]
Extracted ISTD ¹⁸ O ₂ PFHxS	%		Org-029	96	1	97	94	3	95	[NT]
Extracted ISTD ¹³ C ₄ PFOS	%		Org-029	99	1	104	97	7	94	[NT]
Extracted ISTD ¹³ C ₄ PFBA	%		Org-029	99	1	74	72	3	94	[NT]
Extracted ISTD ¹³ C ₃ PFPeA	%		Org-029	99	1	89	86	3	95	[NT]
Extracted ISTD ¹³ C ₂ PFHxA	%		Org-029	96	1	90	90	0	92	[NT]
Extracted ISTD ¹³ C ₄ PFHpA	%		Org-029	89	1	81	79	2	87	[NT]
Extracted ISTD ¹³ C ₄ PFOA	%		Org-029	103	1	98	97	1	98	[NT]
Extracted ISTD ¹³ C ₅ PFNA	%		Org-029	99	1	92	91	1	95	[NT]
Extracted ISTD ¹³ C ₂ PFDA	%		Org-029	103	1	95	93	2	98	[NT]
Extracted ISTD ¹³ C ₂ PFUnDA	%		Org-029	101	1	102	97	5	98	[NT]
Extracted ISTD ¹³ C ₂ PFDoDA	%		Org-029	106	1	99	98	1	98	[NT]
Extracted ISTD ¹³ C ₂ PFTeDA	%		Org-029	68	1	71	71	0	62	[NT]
Extracted ISTD ¹³ C ₂ 4:2FTS	%		Org-029	99	1	60	56	7	82	[NT]
Extracted ISTD ¹³ C ₂ 6:2FTS	%		Org-029	111	1	66	62	6	109	[NT]
Extracted ISTD ¹³ C ₂ 8:2FTS	%		Org-029	119	1	78	79	1	113	[NT]
Extracted ISTD ¹³ C ₈ FOSA	%		Org-029	98	1	89	89	0	90	[NT]
Extracted ISTD d ₃ N MeFOSA	%		Org-029	98	1	102	100	2	94	[NT]
Extracted ISTD d ₅ N EtFOSA	%		Org-029	92	1	99	96	3	91	[NT]
Extracted ISTD d ₇ N MeFOSE	%		Org-029	100	1	97	96	1	94	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Extracted ISTD d ₉ N EtFOSE	%		Org-029	98	1	96	91	5	88	[NT]
Extracted ISTD d ₃ N MeFOSAA	%		Org-029	114	1	80	81	1	105	[NT]
Extracted ISTD d ₅ N EtFOSAA	%		Org-029	105	1	75	72	4	99	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Dissolved Gases in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			28/09/2023	1	28/09/2023	28/09/2023		28/09/2023	[NT]
Date analysed	-			28/09/2023	1	28/09/2023	28/09/2023		28/09/2023	[NT]
Methane	µg/L	5	AT-006	<5	1	16	14	13	94	[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: no filtered, preserved sample was received, therefore the unpreserved sample was filtered through 0.45µm filter at the lab.

Note: there is a possibility some elements may be underestimated.

All metals 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.

Ion Balance - # 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.

Total Metals: The preserved sample provided for #4-6 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

TRH Water(C10-C40) NEPM - # Percent recovery for the surrogate is not possible to report as the high concentration of analytes in sample 333837-4 have caused interference.

CERTIFICATE OF ANALYSIS 333427

Client Details

Client	CTP AFJV
Attention	
Address	7 Figtree Dr, SYDNEY OLYMPIC PARK, NSW, 2127

Sample Details

Your Reference	<u>CTP Groundwater Monitoring - TBY</u>
Number of Samples	2 Water
Date samples received	19/09/2023
Date completed instructions received	19/09/2023

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	26/09/2023
Date of Issue	26/09/2023
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 *	

VOCs in water			
Our Reference		333427-1	333427-2
Your Reference	UNITS	S02d	S06
Date Sampled		19/09/2023	19/09/2023
Type of sample		Water	Water
Date Extracted	-	22/09/2023	21/09/2023
Date Analysed	-	25/09/2023	22/09/2023
Dichlorodifluoromethane	µg/L	<100	<10
Chloromethane	µg/L	<100	<10
Vinyl Chloride	µg/L	<100	<10
Bromomethane	µg/L	<100	<10
Chloroethane	µg/L	<100	<10
Trichlorofluoromethane	µg/L	<100	<10
1,1-Dichloroethene	µg/L	<10	<1
Trans-1,2-dichloroethene	µg/L	<10	<1
1,1-dichloroethane	µg/L	<10	<1
Cis-1,2-dichloroethene	µg/L	<10	<1
Bromochloromethane	µg/L	<10	<1
Chloroform	µg/L	<10	<1
2,2-dichloropropane	µg/L	<10	<1
1,2-dichloroethane	µg/L	<10	<1
1,1,1-trichloroethane	µg/L	<10	<1
1,1-dichloropropene	µg/L	<10	<1
Cyclohexane	µg/L	<10	<1
Carbon tetrachloride	µg/L	<10	<1
Benzene	µg/L	<10	<1
Dibromomethane	µg/L	<10	<1
1,2-dichloropropane	µg/L	<10	<1
Trichloroethene	µg/L	<10	<1
Bromodichloromethane	µg/L	<10	<1
trans-1,3-dichloropropene	µg/L	<10	<1
cis-1,3-dichloropropene	µg/L	<10	<1
1,1,2-trichloroethane	µg/L	<10	<1
Toluene	µg/L	<10	<1
1,3-dichloropropane	µg/L	<10	<1
Dibromochloromethane	µg/L	<10	<1
1,2-dibromoethane	µg/L	<10	<1
Tetrachloroethene	µg/L	<10	<1
1,1,1,2-tetrachloroethane	µg/L	<10	<1
Chlorobenzene	µg/L	<10	<1
Ethylbenzene	µg/L	<10	<1

VOCs in water			
Our Reference		333427-1	333427-2
Your Reference	UNITS	S02d	S06
Date Sampled		19/09/2023	19/09/2023
Type of sample		Water	Water
Bromoform	µg/L	<10	<1
m+p-xylene	µg/L	<20	<2
Styrene	µg/L	<10	<1
1,1,2,2-tetrachloroethane	µg/L	<10	<1
o-xylene	µg/L	<10	<1
1,2,3-trichloropropane	µg/L	<10	<1
Isopropylbenzene	µg/L	<10	<1
Bromobenzene	µg/L	<10	<1
n-propyl benzene	µg/L	<10	<1
2-chlorotoluene	µg/L	<10	<1
4-chlorotoluene	µg/L	<10	<1
1,3,5-trimethyl benzene	µg/L	<10	<1
Tert-butyl benzene	µg/L	<10	<1
1,2,4-trimethyl benzene	µg/L	<10	2
1,3-dichlorobenzene	µg/L	<10	<1
Sec-butyl benzene	µg/L	<10	<1
1,4-dichlorobenzene	µg/L	<10	<1
4-isopropyl toluene	µg/L	<10	<1
1,2-dichlorobenzene	µg/L	<10	<1
n-butyl benzene	µg/L	<10	<1
1,2-dibromo-3-chloropropane	µg/L	<10	<1
1,2,4-trichlorobenzene	µg/L	<10	<1
Hexachlorobutadiene	µg/L	<10	<1
1,2,3-trichlorobenzene	µg/L	<10	<1
Surrogate Dibromofluoromethane	%	115	104
Surrogate Toluene-d8	%	109	97
Surrogate 4-Bromofluorobenzene	%	99	106

vTRH(C6-C10)/BTEXN in Water			
Our Reference		333427-1	333427-2
Your Reference	UNITS	S02d	S06
Date Sampled		19/09/2023	19/09/2023
Type of sample		Water	Water
Date extracted	-	22/09/2023	21/09/2023
Date analysed	-	25/09/2023	22/09/2023
TRH C ₆ - C ₉	µg/L	<100	<10
TRH C ₆ - C ₁₀	µg/L	<100	<10
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	<100	<10
Benzene	µg/L	<10	<1
Toluene	µg/L	<10	<1
Ethylbenzene	µg/L	<10	<1
m+p-xylene	µg/L	<20	<2
o-xylene	µg/L	<10	<1
Naphthalene	µg/L	<10	1
Surrogate Dibromofluoromethane	%	115	104
Surrogate Toluene-d8	%	109	97
Surrogate 4-Bromofluorobenzene	%	99	106

svTRH (C10-C40) in Water			
Our Reference		333427-1	333427-2
Your Reference	UNITS	S02d	S06
Date Sampled		19/09/2023	19/09/2023
Type of sample		Water	Water
Date extracted	-	21/09/2023	21/09/2023
Date analysed	-	22/09/2023	22/09/2023
TRH C ₁₀ - C ₁₄	µg/L	140	65
TRH C ₁₅ - C ₂₈	µg/L	700	260
TRH C ₂₉ - C ₃₆	µg/L	270	<100
Total +ve TRH (C10-C36)	µg/L	1,100	330
TRH >C ₁₀ - C ₁₆	µg/L	200	140
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	200	140
TRH >C ₁₆ - C ₃₄	µg/L	820	190
TRH >C ₃₄ - C ₄₀	µg/L	<100	<100
Total +ve TRH (>C10-C40)	µg/L	1,000	340
Surrogate o-Terphenyl	%	93	84

PAHs in Water			
Our Reference		333427-1	333427-2
Your Reference	UNITS	S02d	S06
Date Sampled		19/09/2023	19/09/2023
Type of sample		Water	Water
Date extracted	-	21/09/2023	21/09/2023
Date analysed	-	25/09/2023	25/09/2023
Naphthalene	µg/L	<0.1	<0.1
Acenaphthylene	µg/L	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1
Phenanthrene	µg/L	0.2	0.1
Anthracene	µg/L	<0.1	<0.1
Fluoranthene	µg/L	0.3	0.2
Pyrene	µg/L	0.3	0.2
Benzo(a)anthracene	µg/L	0.2	0.2
Chrysene	µg/L	0.2	0.1
Benzo(b,j+k)fluoranthene	µg/L	0.3	0.3
Benzo(a)pyrene	µg/L	0.2	0.2
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	0.1	0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5
Total +ve PAH's	µg/L	1.9	1.5
Surrogate <i>p</i> -Terphenyl-d14	%	73	69

All metals in water-dissolved			
Our Reference		333427-1	333427-2
Your Reference	UNITS	S02d	S06
Date Sampled		19/09/2023	19/09/2023
Type of sample		Water	Water
Date prepared	-	21/09/2023	21/09/2023
Date analysed	-	22/09/2023	22/09/2023
Arsenic-Dissolved	µg/L	3	<1
Boron-Dissolved	µg/L	670	900
Barium-Dissolved	µg/L	37	110
Beryllium-Dissolved	µg/L	<0.5	<0.5
Cadmium-Dissolved	µg/L	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1
Copper-Dissolved	µg/L	<1	<1
Cobalt-Dissolved	µg/L	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05
Manganese-Dissolved	µg/L	78	63
Molybdenum-Dissolved	µg/L	61	18
Nickel-Dissolved	µg/L	2	1
Lead-Dissolved	µg/L	<1	<1
Antimony-Dissolved	µg/L	9	<1
Selenium-Dissolved	µg/L	<1	<1
Tin-Dissolved	µg/L	<1	<1
Zinc-Dissolved	µg/L	<1	1
Iron-Dissolved	µg/L	10	10

All metals in water - total			
Our Reference		333427-1	333427-2
Your Reference	UNITS	S02d	S06
Date Sampled		19/09/2023	19/09/2023
Type of sample		Water	Water
Date prepared	-	21/09/2023	21/09/2023
Date analysed	-	21/09/2023	21/09/2023
Arsenic-Total	µg/L	340	32
Boron-Total	µg/L	1,000	970
Barium-Total	µg/L	9,500	1,200
Beryllium-Total	µg/L	52	5
Cadmium-Total	µg/L	15	1.6
Chromium-Total	µg/L	1,800	150
Copper-Total	µg/L	3,800	350
Cobalt-Total	µg/L	560	48
Mercury-Total	µg/L	5.0	<0.05
Manganese-Total	µg/L	23,000	2,000
Molybdenum-Total	µg/L	220	14
Nickel-Total	µg/L	870	88
Lead-Total	µg/L	2,400	330
Antimony-Total	µg/L	19	3
Selenium-Total	µg/L	11	3
Tin-Total	µg/L	300	7
Zinc-Total	µg/L	29,000	1,300
Iron-Total	µg/L	1,100,000	110,000

Metals in Waters - Total			
Our Reference		333427-1	333427-2
Your Reference	UNITS	S02d	S06
Date Sampled		19/09/2023	19/09/2023
Type of sample		Water	Water
Date prepared	-	21/09/2023	21/09/2023
Date analysed	-	21/09/2023	21/09/2023
Phosphorus - Total	mg/L	28	2.1

Miscellaneous Inorganics			
Our Reference		333427-1	333427-2
Your Reference	UNITS	S02d	S06
Date Sampled		19/09/2023	19/09/2023
Type of sample		Water	Water
Date prepared	-	19/09/2023	19/09/2023
Date analysed	-	19/09/2023	19/09/2023
Ammonia as N in water	mg/L	0.21	1.3
Nitrate as N in water	mg/L	<0.005	0.15
Total Nitrogen in water	mg/L	1	2.0

Ion Balance			
Our Reference		333427-1	333427-2
Your Reference	UNITS	S02d	S06
Date Sampled		19/09/2023	19/09/2023
Type of sample		Water	Water
Date prepared	-	22/09/2023	22/09/2023
Date analysed	-	22/09/2023	22/09/2023
Calcium - Dissolved	mg/L	51	50
Potassium - Dissolved	mg/L	22	30
Sodium - Dissolved	mg/L	200	140
Magnesium - Dissolved	mg/L	11	28
Hardness	mgCaCO ₃ /L	170	240
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	200	450
Carbonate Alkalinity as CaCO ₃	mg/L	<5	<5
Total Alkalinity as CaCO ₃	mg/L	200	450
Sulphate, SO ₄	mg/L	99	23
Chloride, Cl	mg/L	280	110
Ionic Balance	%	-4.0	-4.0

PFAS in Waters Extended			
Our Reference		333427-1	333427-2
Your Reference	UNITS	S02d	S06
Date Sampled		19/09/2023	19/09/2023
Type of sample		Water	Water
Date prepared	-	20/09/2023	20/09/2023
Date analysed	-	21/09/2023	21/09/2023
Perfluorobutanesulfonic acid	µg/L	<0.01	0.1
Perfluoropentanesulfonic acid	µg/L	<0.01	0.11
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01	0.76
Perfluoroheptanesulfonic acid	µg/L	<0.01	0.04
Perfluorooctanesulfonic acid PFOS	µg/L	0.02	1.1
Perfluorodecanesulfonic acid	µg/L	<0.02	<0.02
Perfluorobutanoic acid	µg/L	<0.02	0.03
Perfluoropentanoic acid	µg/L	<0.02	0.03
Perfluorohexanoic acid	µg/L	<0.01	0.15
Perfluoroheptanoic acid	µg/L	<0.01	0.02
Perfluorooctanoic acid PFOA	µg/L	<0.01	0.04
Perfluorononanoic acid	µg/L	<0.01	<0.01
Perfluorodecanoic acid	µg/L	<0.02	<0.02
Perfluoroundecanoic acid	µg/L	<0.02	<0.02
Perfluorododecanoic acid	µg/L	<0.05	<0.05
Perfluorotridecanoic acid	µg/L	<0.1	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5	<0.5
4:2 FTS	µg/L	<0.01	<0.01
6:2 FTS	µg/L	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02
10:2 FTS	µg/L	<0.02	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05	<0.05
N-Ethyl perfluorooctanesulfonamide	µg/L	<0.1	<0.1
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.05	<0.05
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.5	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02
Surrogate ¹³ C ₈ PFOS	%	99	94
Surrogate ¹³ C ₂ PFOA	%	101	105
Extracted ISTD ¹³ C ₃ PFBS	%	95	96
Extracted ISTD ¹⁸ O ₂ PFHxS	%	93	93
Extracted ISTD ¹³ C ₄ PFOS	%	102	99
Extracted ISTD ¹³ C ₄ PFBA	%	79	91

PFAS in Waters Extended			
Our Reference		333427-1	333427-2
Your Reference	UNITS	S02d	S06
Date Sampled		19/09/2023	19/09/2023
Type of sample		Water	Water
Extracted ISTD ¹³ C ₃ PFPeA	%	112	109
Extracted ISTD ¹³ C ₂ PFHxA	%	92	93
Extracted ISTD ¹³ C ₄ PFHpA	%	88	92
Extracted ISTD ¹³ C ₄ PFOA	%	123	110
Extracted ISTD ¹³ C ₅ PFNA	%	104	105
Extracted ISTD ¹³ C ₂ PFDA	%	111	102
Extracted ISTD ¹³ C ₂ PFUnDA	%	113	111
Extracted ISTD ¹³ C ₂ PFDoDA	%	114	111
Extracted ISTD ¹³ C ₂ PFTeDA	%	80	84
Extracted ISTD ¹³ C ₂ 4:2FTS	%	139	110
Extracted ISTD ¹³ C ₂ 6:2FTS	%	186	135
Extracted ISTD ¹³ C ₂ 8:2FTS	%	175	144
Extracted ISTD ¹³ C ₈ FOSA	%	84	90
Extracted ISTD d ₃ N MeFOSA	%	96	103
Extracted ISTD d ₅ N EtFOSA	%	88	96
Extracted ISTD d ₇ N MeFOSE	%	78	87
Extracted ISTD d ₉ N EtFOSE	%	71	79
Extracted ISTD d ₃ N MeFOSAA	%	138	125
Extracted ISTD d ₅ N EtFOSAA	%	127	109
Total Positive PFHxS & PFOS	µg/L	0.02	1.8
Total Positive PFOA & PFOS	µg/L	0.02	1.1
Total Positive PFAS	µg/L	0.02	2.4

Dissolved Gases in Water			
Our Reference		333427-1	333427-2
Your Reference	UNITS	S02d	S06
Date Sampled		19/09/2023	19/09/2023
Type of sample		Water	Water
Date prepared	-	26/09/2023	26/09/2023
Date analysed	-	26/09/2023	26/09/2023
Methane	µg/L	100	7,200

Client Reference: CTP Groundwater Monitoring - TBY

Method ID	Methodology Summary
AT-006	Dissolved gases determined by GC-FID based on draft method USEPA SOP RSK175
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% ie total anions = total cations +/-15%.
Inorg-055	Nitrate - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-055/062/127	Total Nitrogen - Calculation sum of TKN and oxidised Nitrogen. Alternatively analysed by combustion and chemiluminescence.
Inorg-057	Ammonia - determined colourimetrically, based on APHA latest edition 4500-NH3 F. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a KCl extraction.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
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.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

Method ID	Methodology Summary
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

Client Reference: CTP Groundwater Monitoring - TBY

QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date Extracted	-			21/09/2023	[NT]	[NT]	[NT]	[NT]	21/09/2023	[NT]
Date Analysed	-			22/09/2023	[NT]	[NT]	[NT]	[NT]	22/09/2023	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Dibromomethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Bromoform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	111	[NT]
Styrene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

Client Reference: CTP Groundwater Monitoring - TBY

QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	103	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate Toluene-d8	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	106	[NT]	[NT]	[NT]	[NT]	102	[NT]

Client Reference: CTP Groundwater Monitoring - TBY

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			21/09/2023	[NT]	[NT]	[NT]	[NT]	21/09/2023	[NT]
Date analysed	-			22/09/2023	[NT]	[NT]	[NT]	[NT]	22/09/2023	[NT]
TRH C ₆ - C ₉	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	105	[NT]
TRH C ₆ - C ₁₀	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	105	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	109	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	111	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	103	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate Toluene-d8	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	106	[NT]	[NT]	[NT]	[NT]	102	[NT]

Client Reference: CTP Groundwater Monitoring - TBY

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	333427-1
Date extracted	-			21/09/2023	[NT]	[NT]	[NT]	[NT]	21/09/2023	21/09/2023
Date analysed	-			22/09/2023	[NT]	[NT]	[NT]	[NT]	22/09/2023	22/09/2023
TRH C ₁₀ - C ₁₄	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	89	68
TRH C ₁₅ - C ₂₈	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	106	#
TRH C ₂₉ - C ₃₆	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	#
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	98	68
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	106	#
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	#
Surrogate o-Terphenyl	%		Org-020	85	[NT]	[NT]	[NT]	[NT]	97	81

Client Reference: CTP Groundwater Monitoring - TBY

QUALITY CONTROL: PAHs in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	333427-1
Date extracted	-			21/09/2023	[NT]	[NT]	[NT]	[NT]	21/09/2023	21/09/2023
Date analysed	-			25/09/2023	[NT]	[NT]	[NT]	[NT]	25/09/2023	25/09/2023
Naphthalene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	85	89
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	83	84
Fluorene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	83	87
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	88	85
Anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	91	80
Pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	95	83
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	81	75
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	103	105
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	96	[NT]	[NT]	[NT]	[NT]	107	90

Client Reference: CTP Groundwater Monitoring - TBY

QUALITY CONTROL: All metals in water-dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			21/09/2023	[NT]	[NT]	[NT]	[NT]	21/09/2023	[NT]
Date analysed	-			22/09/2023	[NT]	[NT]	[NT]	[NT]	22/09/2023	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Boron-Dissolved	µg/L	20	Metals-022	<20	[NT]	[NT]	[NT]	[NT]	114	[NT]
Barium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	105	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	103	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	<5	[NT]	[NT]	[NT]	[NT]	110	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Antimony-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Tin-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Iron-Dissolved	µg/L	10	Metals-022	<10	[NT]	[NT]	[NT]	[NT]	111	[NT]

Client Reference: CTP Groundwater Monitoring - TBY

QUALITY CONTROL: All metals in water - total						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			21/09/2023	[NT]	[NT]	[NT]	[NT]	21/09/2023	[NT]
Date analysed	-			21/09/2023	[NT]	[NT]	[NT]	[NT]	21/09/2023	[NT]
Arsenic-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Boron-Total	µg/L	20	Metals-022	<20	[NT]	[NT]	[NT]	[NT]	99	[NT]
Barium-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Beryllium-Total	µg/L	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	108	[NT]
Cadmium-Total	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Chromium-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Copper-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Cobalt-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Mercury-Total	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	97	[NT]
Manganese-Total	µg/L	5	Metals-022	<5	[NT]	[NT]	[NT]	[NT]	107	[NT]
Molybdenum-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Nickel-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Lead-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Antimony-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Selenium-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Tin-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Zinc-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Iron-Total	µg/L	10	Metals-022	<10	[NT]	[NT]	[NT]	[NT]	103	[NT]

Client Reference: CTP Groundwater Monitoring - TBY

QUALITY CONTROL: Metals in Waters - Total					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			21/09/2023	[NT]	[NT]	[NT]	[NT]	21/09/2023	[NT]
Date analysed	-			21/09/2023	[NT]	[NT]	[NT]	[NT]	21/09/2023	[NT]
Phosphorus - Total	mg/L	0.05	Metals-020	<0.05	[NT]	[NT]	[NT]	[NT]	101	[NT]

Client Reference: CTP Groundwater Monitoring - TBY

QUALITY CONTROL: Miscellaneous Inorganics					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			19/09/2023	[NT]	[NT]	[NT]	[NT]	19/09/2023	[NT]
Date analysed	-			19/09/2023	[NT]	[NT]	[NT]	[NT]	19/09/2023	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	[NT]	[NT]	[NT]	[NT]	107	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NT]	[NT]	98	[NT]
Total Nitrogen in water	mg/L	0.1	Inorg-055/062/127	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]

Client Reference: CTP Groundwater Monitoring - TBY

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	333427-2
Date prepared	-			22/09/2023	1	22/09/2023	22/09/2023		22/09/2023	22/09/2023
Date analysed	-			22/09/2023	1	22/09/2023	22/09/2023		22/09/2023	22/09/2023
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	51	[NT]		94	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	22	[NT]		92	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	200	[NT]		97	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	11	[NT]		91	[NT]
Hardness	mgCaCO ₃ /L	3	Metals-020	[NT]	1	170	[NT]		[NT]	[NT]
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	5	Inorg-006	<5	1	<5	[NT]		[NT]	[NT]
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	1	200	[NT]		[NT]	[NT]
Carbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	1	<5	[NT]		[NT]	[NT]
Total Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	1	200	[NT]		91	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	<1	1	99	100	1	105	123
Chloride, Cl	mg/L	1	Inorg-081	<1	1	280	290	4	99	117
Ionic Balance	%		Inorg-040	[NT]	1	-4.0	[NT]		[NT]	[NT]

Client Reference: CTP Groundwater Monitoring - TBY

QUALITY CONTROL: PFAS in Waters Extended						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			20/09/2023	[NT]	[NT]	[NT]	[NT]	20/09/2023	[NT]
Date analysed	-			21/09/2023	[NT]	[NT]	[NT]	[NT]	21/09/2023	[NT]
Perfluorobutanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	114	[NT]
Perfluoropentanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	111	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	110	[NT]
Perfluoroheptanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	120	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	104	[NT]
Perfluorodecanesulfonic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	105	[NT]
Perfluorobutanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	113	[NT]
Perfluoropentanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	108	[NT]
Perfluorohexanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	114	[NT]
Perfluoroheptanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	115	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	106	[NT]
Perfluorononanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	113	[NT]
Perfluorodecanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	110	[NT]
Perfluoroundecanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	113	[NT]
Perfluorododecanoic acid	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	106	[NT]
Perfluorotridecanoic acid	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Perfluorotetradecanoic acid	µg/L	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	118	[NT]
4:2 FTS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	117	[NT]
6:2 FTS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	106	[NT]
8:2 FTS	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	117	[NT]
10:2 FTS	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	115	[NT]
Perfluorooctane sulfonamide	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	113	[NT]
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	110	[NT]
N-Ethyl perfluorooctanesulfon amide	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	107	[NT]
N-Me perfluorooctanesulfonamid oethanol	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	128	[NT]
N-Et perfluorooctanesulfonamid oethanol	µg/L	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	122	[NT]
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	106	[NT]
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	114	[NT]
Surrogate ¹³ C ₈ PFOS	%		Org-029	101	[NT]	[NT]	[NT]	[NT]	104	[NT]
Surrogate ¹³ C ₂ PFOA	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	102	[NT]

Client Reference: CTP Groundwater Monitoring - TBY

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Extracted ISTD ¹³ C ₃ PFBS	%		Org-029	96	[NT]	[NT]	[NT]	[NT]	94	[NT]
Extracted ISTD ¹⁸ O ₂ PFHxS	%		Org-029	95	[NT]	[NT]	[NT]	[NT]	90	[NT]
Extracted ISTD ¹³ C ₄ PFOS	%		Org-029	96	[NT]	[NT]	[NT]	[NT]	95	[NT]
Extracted ISTD ¹³ C ₄ PFBA	%		Org-029	100	[NT]	[NT]	[NT]	[NT]	96	[NT]
Extracted ISTD ¹³ C ₃ PFPeA	%		Org-029	100	[NT]	[NT]	[NT]	[NT]	98	[NT]
Extracted ISTD ¹³ C ₂ PFHxA	%		Org-029	93	[NT]	[NT]	[NT]	[NT]	90	[NT]
Extracted ISTD ¹³ C ₄ PFHpA	%		Org-029	91	[NT]	[NT]	[NT]	[NT]	88	[NT]
Extracted ISTD ¹³ C ₄ PFOA	%		Org-029	97	[NT]	[NT]	[NT]	[NT]	98	[NT]
Extracted ISTD ¹³ C ₅ PFNA	%		Org-029	95	[NT]	[NT]	[NT]	[NT]	95	[NT]
Extracted ISTD ¹³ C ₂ PFDA	%		Org-029	94	[NT]	[NT]	[NT]	[NT]	95	[NT]
Extracted ISTD ¹³ C ₂ PFUnDA	%		Org-029	101	[NT]	[NT]	[NT]	[NT]	95	[NT]
Extracted ISTD ¹³ C ₂ PFDoDA	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	96	[NT]
Extracted ISTD ¹³ C ₂ PFTeDA	%		Org-029	74	[NT]	[NT]	[NT]	[NT]	71	[NT]
Extracted ISTD ¹³ C ₂ 4:2FTS	%		Org-029	97	[NT]	[NT]	[NT]	[NT]	94	[NT]
Extracted ISTD ¹³ C ₂ 6:2FTS	%		Org-029	96	[NT]	[NT]	[NT]	[NT]	96	[NT]
Extracted ISTD ¹³ C ₂ 8:2FTS	%		Org-029	97	[NT]	[NT]	[NT]	[NT]	95	[NT]
Extracted ISTD ¹³ C ₈ FOSA	%		Org-029	97	[NT]	[NT]	[NT]	[NT]	91	[NT]
Extracted ISTD d ₃ N MeFOSA	%		Org-029	106	[NT]	[NT]	[NT]	[NT]	100	[NT]
Extracted ISTD d ₅ N EtFOSA	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	99	[NT]
Extracted ISTD d ₇ N MeFOSE	%		Org-029	95	[NT]	[NT]	[NT]	[NT]	92	[NT]

Client Reference: CTP Groundwater Monitoring - TBY

QUALITY CONTROL: PFAS in Waters Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Extracted ISTD d ₉ N EtFOSE	%		Org-029	80	[NT]	[NT]	[NT]	[NT]	84	[NT]
Extracted ISTD d ₃ N MeFOSAA	%		Org-029	107	[NT]	[NT]	[NT]	[NT]	103	[NT]
Extracted ISTD d ₅ N EtFOSAA	%		Org-029	94	[NT]	[NT]	[NT]	[NT]	94	[NT]

QUALITY CONTROL: Dissolved Gases in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			26/09/2023	1	26/09/2023	26/09/2023		26/09/2023	[NT]
Date analysed	-			26/09/2023	1	26/09/2023	26/09/2023		26/09/2023	[NT]
Methane	µg/L	5	AT-006	<5	1	100	99	1	94	[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

For PFAS Extracted Internal Standards denoted with # or outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).

TRH Water(C10-C40) NEPM - # Percent recovery for the matrix spike is not possible to report as the high concentration of analytes in sample 333427-1ms have caused interference.

Chloride by IC: # Percent recovery is not applicable due to the high concentration of the analyte/s in the sample/s. However an acceptable recovery was obtained for the LCS.

For PFAS Extracted Internal Standards denoted with # or outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).

VOCs in water - The PQL for 333427-1 has been raised due to the sample matrix containing a high sediment load thereby requiring a dilution.

vTRH & BTEXN in Water NEPM - The PQL for 333427-1 has been raised due to the sample matrix containing a high sediment load thereby requiring a dilution.

CERTIFICATE OF ANALYSIS 338338

Client Details

Client	CTP AFJV
Attention	
Address	7 Figtree Dr, SYDNEY OLYMPIC PARK, NSW, 2127

Sample Details

Your Reference	<u>CTP Groundwater Monitoring - 21-11-23</u>
Number of Samples	5 Water
Date samples received	21/11/2023
Date completed instructions received	21/11/2023

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	28/11/2023
Date of Issue	28/11/2023
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VOCs in water						
Our Reference	UNITS	338338-1	338338-2	338338-3	338338-4	338338-5
Your Reference		MW03_D	DS1	MW03_S	BH_051	BH_050_S
Date Sampled		21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023
Type of sample		Water	Water	Water	Water	Water
Date Extracted	-	27/11/2023	27/11/2023	27/11/2023	27/11/2023	27/11/2023
Date Analysed	-	28/11/2023	28/11/2023	28/11/2023	28/11/2023	28/11/2023
Dichlorodifluoromethane	µg/L	<10	<10	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<1	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1
Benzene	µg/L	<1	<1	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1

VOCs in water						
Our Reference		338338-1	338338-2	338338-3	338338-4	338338-5
Your Reference	UNITS	MW03_D	DS1	MW03_S	BH_051	BH_050_S
Date Sampled		21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023
Type of sample		Water	Water	Water	Water	Water
Bromoform	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
Styrene	µg/L	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
o-xylene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	105	105	105	105	104
Surrogate Toluene-d8	%	100	99	100	99	99
Surrogate 4-Bromofluorobenzene	%	102	102	103	102	102

vTRH(C6-C10)/BTEXN in Water						
Our Reference	UNITS	338338-1	338338-2	338338-3	338338-4	338338-5
Your Reference		MW03_D	DS1	MW03_S	BH_051	BH_050_S
Date Sampled		21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	27/11/2023	27/11/2023	27/11/2023	27/11/2023	27/11/2023
Date analysed	-	28/11/2023	28/11/2023	28/11/2023	28/11/2023	28/11/2023
TRH C ₆ - C ₉	µg/L	<10	<10	<10	<10	<10
TRH C ₆ - C ₁₀	µg/L	<10	<10	<10	<10	<10
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	<10	<10	<10	<10	<10
Benzene	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
o-xylene	µg/L	<1	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	105	105	105	105	104
Surrogate Toluene-d8	%	100	99	100	99	99
Surrogate 4-Bromofluorobenzene	%	102	102	103	102	102

svTRH (C10-C40) in Water						
Our Reference	UNITS	338338-1	338338-2	338338-3	338338-4	338338-5
Your Reference		MW03_D	DS1	MW03_S	BH_051	BH_050_S
Date Sampled		21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023
Date analysed	-	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023
TRH C ₁₀ - C ₁₄	µg/L	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	µg/L	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆	µg/L	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	<50	<50	<50	<50	<50
TRH >C ₁₆ - C ₃₄	µg/L	<100	<100	<100	<100	<100
TRH >C ₃₄ - C ₄₀	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	99	88	100	92	81

PAHs in Water						
Our Reference		338338-1	338338-2	338338-3	338338-4	338338-5
Your Reference	UNITS	MW03_D	DS1	MW03_S	BH_051	BH_050_S
Date Sampled		21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023
Date analysed	-	27/11/2023	27/11/2023	27/11/2023	27/11/2023	27/11/2023
Naphthalene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate <i>p</i> -Terphenyl-d14	%	95	101	98	103	92

All metals in water-dissolved						
Our Reference		338338-1	338338-2	338338-3	338338-4	338338-5
Your Reference	UNITS	MW03_D	DS1	MW03_S	BH_051	BH_050_S
Date Sampled		21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023
Date analysed	-	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023
Arsenic-Dissolved	µg/L	<1	<1	<1	<1	<1
Boron-Dissolved	µg/L	50	40	40	20	100
Barium-Dissolved	µg/L	35	47	19	12	310
Beryllium-Dissolved	µg/L	2	2	0.7	<0.5	<0.5
Cadmium-Dissolved	µg/L	0.1	0.2	0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1	<1	<1
Copper-Dissolved	µg/L	1	<1	<1	12	1
Cobalt-Dissolved	µg/L	88	95	<1	5	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Manganese-Dissolved	µg/L	3,400	3,800	1,700	1,800	9
Molybdenum-Dissolved	µg/L	<1	<1	<1	1	<1
Nickel-Dissolved	µg/L	45	51	21	5	1
Lead-Dissolved	µg/L	<1	<1	<1	<1	<1
Antimony-Dissolved	µg/L	<1	<1	<1	<1	<1
Selenium-Dissolved	µg/L	<1	<1	<1	<1	<1
Tin-Dissolved	µg/L	<1	<1	<1	<1	<1
Zinc-Dissolved	µg/L	170	190	33	49	12
Iron-Dissolved	µg/L	<10	<10	20	10	<10

All metals in water - total						
Our Reference	UNITS	338338-1	338338-2	338338-3	338338-4	338338-5
Your Reference		MW03_D	DS1	MW03_S	BH_051	BH_050_S
Date Sampled		21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023
Date analysed	-	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023
Arsenic-Total	µg/L	<1	<1	<1	<1	5
Boron-Total	µg/L	30	30	30	<20	90
Barium-Total	µg/L	53	130	20	19	510
Beryllium-Total	µg/L	3	2	0.6	<0.5	0.9
Cadmium-Total	µg/L	0.2	0.3	0.1	<0.1	<0.1
Chromium-Total	µg/L	7	10	1	3	6
Copper-Total	µg/L	6	3	1	20	27
Cobalt-Total	µg/L	87	110	3	10	2
Mercury-Total	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Manganese-Total	µg/L	4,300	5,000	2,500	3,900	110
Molybdenum-Total	µg/L	1	1	<1	2	1
Nickel-Total	µg/L	48	53	21	9	3
Lead-Total	µg/L	1	<1	<1	2	13
Antimony-Total	µg/L	<1	<1	<1	1	1
Selenium-Total	µg/L	<1	<1	<1	<1	<1
Tin-Total	µg/L	1	<1	<1	2	1
Zinc-Total	µg/L	180	190	34	67	84
Iron-Total	µg/L	3,300	1,300	220	840	19,000

Metals in Waters - Total						
Our Reference		338338-1	338338-2	338338-3	338338-4	338338-5
Your Reference	UNITS	MW03_D	DS1	MW03_S	BH_051	BH_050_S
Date Sampled		21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023
Date analysed	-	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023
Phosphorus - Total	mg/L	<0.05	<0.05	<0.05	0.3	0.2

Miscellaneous Inorganics						
Our Reference		338338-1	338338-2	338338-3	338338-4	338338-5
Your Reference	UNITS	MW03_D	DS1	MW03_S	BH_051	BH_050_S
Date Sampled		21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023
Date analysed	-	21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023
Ammonia as N in water	mg/L	0.017	0.006	<0.005	0.017	<0.005
Nitrate as N in water	mg/L	0.059	0.074	0.04	2.1	0.14
Total Nitrogen in water	mg/L	0.6	0.3	0.4	2.0	0.3

Ion Balance						
Our Reference		338338-1	338338-2	338338-3	338338-4	338338-5
Your Reference	UNITS	MW03_D	DS1	MW03_S	BH_051	BH_050_S
Date Sampled		21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023
Date analysed	-	21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023
Calcium - Dissolved	mg/L	51	52	62	13	34
Potassium - Dissolved	mg/L	18	18	17	4	5.1
Sodium - Dissolved	mg/L	750	780	800	64	28
Magnesium - Dissolved	mg/L	78	81	81	4	2
Hardness	mgCaCO ₃ /L	450	460	490	48	95
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5	<5	<5	<5	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	480	500	330	54	160
Carbonate Alkalinity as CaCO ₃	mg/L	<5	<5	<5	<5	<5
Total Alkalinity as CaCO ₃	mg/L	480	500	330	54	160
Sulphate, SO ₄	mg/L	250	240	360	38	16
Chloride, Cl	mg/L	1,400	1,400	1,500	86	14
Ionic Balance	%	-11	-10	-11	-6.0	-10

PFAS in Waters Extended						
Our Reference		338338-1	338338-2	338338-3	338338-4	338338-5
Your Reference	UNITS	MW03_D	DS1	MW03_S	BH_051	BH_050_S
Date Sampled		21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	22/11/2023	22/11/2023	22/11/2023	22/11/2023	22/11/2023
Date analysed	-	22/11/2023	22/11/2023	22/11/2023	22/11/2023	22/11/2023
Perfluorobutanesulfonic acid	µg/L	0.03	0.03	0.06	<0.01	<0.01
Perfluoropentanesulfonic acid	µg/L	0.02	0.02	0.04	<0.01	<0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01	<0.01	0.04	<0.01	<0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecanesulfonic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid	µg/L	<0.02	<0.02	0.03	<0.02	<0.02
Perfluoropentanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid	µg/L	<0.01	<0.01	<0.01	<0.01	0.01
Perfluoroheptanoic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
4:2 FTS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
6:2 FTS	µg/L	<0.01	<0.01	<0.01	<0.01	0.02
8:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
10:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctanesulfonamide	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Surrogate ¹³ C ₈ PFOS	%	98	102	103	102	99
Surrogate ¹³ C ₂ PFOA	%	98	96	100	92	103
Extracted ISTD ¹³ C ₃ PFBS	%	95	96	95	94	95
Extracted ISTD ¹⁸ O ₂ PFHxS	%	96	101	98	95	100
Extracted ISTD ¹³ C ₄ PFOS	%	103	105	106	99	106
Extracted ISTD ¹³ C ₄ PFBA	%	101	101	101	112	114

PFAS in Waters Extended						
Our Reference		338338-1	338338-2	338338-3	338338-4	338338-5
Your Reference	UNITS	MW03_D	DS1	MW03_S	BH_051	BH_050_S
Date Sampled		21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023
Type of sample		Water	Water	Water	Water	Water
Extracted ISTD ¹³ C ₃ PFPeA	%	110	108	114	115	112
Extracted ISTD ¹³ C ₂ PFHxA	%	96	93	94	92	96
Extracted ISTD ¹³ C ₄ PFHpA	%	98	103	98	101	101
Extracted ISTD ¹³ C ₄ PFOA	%	117	119	121	128	115
Extracted ISTD ¹³ C ₅ PFNA	%	109	106	109	115	111
Extracted ISTD ¹³ C ₂ PFDA	%	116	117	126	125	118
Extracted ISTD ¹³ C ₂ PFUnDA	%	130	126	126	131	129
Extracted ISTD ¹³ C ₂ PFDoDA	%	133	141	141	145	140
Extracted ISTD ¹³ C ₂ PFTeDA	%	91	100	102	103	110
Extracted ISTD ¹³ C ₂ 4:2FTS	%	83	71	80	106	90
Extracted ISTD ¹³ C ₂ 6:2FTS	%	140	128	139	166	132
Extracted ISTD ¹³ C ₂ 8:2FTS	%	166	153	164	177	166
Extracted ISTD ¹³ C ₈ FOSA	%	104	105	104	102	103
Extracted ISTD d ₃ N MeFOSA	%	101	100	104	102	103
Extracted ISTD d ₅ N EtFOSA	%	90	96	96	93	99
Extracted ISTD d ₇ N MeFOSE	%	96	98	98	92	95
Extracted ISTD d ₉ N EtFOSE	%	95	95	94	92	98
Extracted ISTD d ₃ N MeFOSAA	%	116	111	113	112	117
Extracted ISTD d ₅ N EtFOSAA	%	118	118	114	108	113
Total Positive PFHxS & PFOS	µg/L	<0.01	<0.01	0.04	<0.01	<0.01
Total Positive PFOA & PFOS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Total Positive PFAS	µg/L	0.05	0.04	0.16	<0.01	0.03

Dissolved Gases in Water						
Our Reference		338338-1	338338-2	338338-3	338338-4	338338-5
Your Reference	UNITS	MW03_D	DS1	MW03_S	BH_051	BH_050_S
Date Sampled		21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	28/11/2023	28/11/2023	28/11/2023	28/11/2023	28/11/2023
Date analysed	-	28/11/2023	28/11/2023	28/11/2023	28/11/2023	28/11/2023
Methane	µg/L	<5	<5	<5	<5	<5

Method ID	Methodology Summary
AT-006	Dissolved gases determined by GC-FID based on draft method USEPA SOP RSK175
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% ie total anions = total cations +/-15%.
Inorg-055	Nitrate - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-055/062/127	Total Nitrogen - Calculation sum of TKN and oxidised Nitrogen. Alternatively analysed by combustion and chemiluminescence.
Inorg-057	Ammonia - determined colourimetrically, based on APHA latest edition 4500-NH3 F. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a KCl extraction.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
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.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

Method ID	Methodology Summary
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

Client Reference: CTP Groundwater Monitoring - 21-11-23

QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date Extracted	-			27/11/2023	[NT]	[NT]	[NT]	[NT]	27/11/2023	[NT]
Date Analysed	-			28/11/2023	[NT]	[NT]	[NT]	[NT]	28/11/2023	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Dibromomethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Bromoform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	93	[NT]
Styrene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	103	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate Toluene-d8	%		Org-023	100	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	101	[NT]	[NT]	[NT]	[NT]	97	[NT]

Client Reference: CTP Groundwater Monitoring - 21-11-23

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			27/11/2023	[NT]	[NT]	[NT]	[NT]	27/11/2023	[NT]
Date analysed	-			28/11/2023	[NT]	[NT]	[NT]	[NT]	28/11/2023	[NT]
TRH C ₆ - C ₉	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	92	[NT]
TRH C ₆ - C ₁₀	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	92	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	93	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	103	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate Toluene-d8	%		Org-023	100	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	101	[NT]	[NT]	[NT]	[NT]	97	[NT]

Client Reference: CTP Groundwater Monitoring - 21-11-23

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			24/11/2023	1	24/11/2023	24/11/2023		24/11/2023	[NT]
Date analysed	-			24/11/2023	1	24/11/2023	24/11/2023		24/11/2023	[NT]
TRH C ₁₀ - C ₁₄	µg/L	50	Org-020	<50	1	<50	<50	0	93	[NT]
TRH C ₁₅ - C ₂₈	µg/L	100	Org-020	<100	1	<100	<100	0	96	[NT]
TRH C ₂₉ - C ₃₆	µg/L	100	Org-020	<100	1	<100	<100	0	100	[NT]
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-020	<50	1	<50	<50	0	93	[NT]
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-020	<100	1	<100	<100	0	96	[NT]
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-020	<100	1	<100	<100	0	100	[NT]
Surrogate o-Terphenyl	%		Org-020	77	1	99	107	8	86	[NT]

Client Reference: CTP Groundwater Monitoring - 21-11-23

QUALITY CONTROL: PAHs in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			24/11/2023	1	24/11/2023	24/11/2023		24/11/2023	[NT]
Date analysed	-			27/11/2023	1	27/11/2023	27/11/2023		27/11/2023	[NT]
Naphthalene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	117	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	100	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	113	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	106	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	106	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	106	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	107	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	132	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	97	1	95	97	2	107	[NT]

Client Reference: CTP Groundwater Monitoring - 21-11-23

QUALITY CONTROL: All metals in water-dissolved					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W5	338338-2
Date prepared	-			24/11/2023	1	24/11/2023	24/11/2023		24/11/2023	24/11/2023
Date analysed	-			24/11/2023	1	24/11/2023	24/11/2023		24/11/2023	24/11/2023
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		97	[NT]
Boron-Dissolved	µg/L	20	Metals-022	<20	1	50	[NT]		105	[NT]
Barium-Dissolved	µg/L	1	Metals-022	<1	1	35	[NT]		120	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	1	2	[NT]		101	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	0.1	[NT]		97	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		106	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	1	1	[NT]		111	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	<1	1	88	[NT]		107	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	103	98
Manganese-Dissolved	µg/L	5	Metals-022	<5	1	3400	[NT]		113	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		101	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	45	[NT]		104	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		102	[NT]
Antimony-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		107	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		93	[NT]
Tin-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		108	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	170	[NT]		109	[NT]
Iron-Dissolved	µg/L	10	Metals-022	<10	1	<10	[NT]		108	[NT]

Client Reference: CTP Groundwater Monitoring - 21-11-23

QUALITY CONTROL: All metals in water - total					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	338338-3
Date prepared	-			23/11/2023	1	23/11/2023	23/11/2023		23/11/2023	23/11/2023
Date analysed	-			23/11/2023	1	23/11/2023	23/11/2023		23/11/2023	23/11/2023
Arsenic-Total	µg/L	1	Metals-022	<1	1	<1	<1	0	93	100
Boron-Total	µg/L	20	Metals-022	<20	1	30	30	0	81	78
Barium-Total	µg/L	1	Metals-022	<1	1	53	50	6	101	97
Beryllium-Total	µg/L	0.5	Metals-022	<0.5	1	3	3	0	82	88
Cadmium-Total	µg/L	0.1	Metals-022	<0.1	1	0.2	0.2	0	98	103
Chromium-Total	µg/L	1	Metals-022	<1	1	7	5	33	90	103
Copper-Total	µg/L	1	Metals-022	<1	1	6	6	0	96	98
Cobalt-Total	µg/L	1	Metals-022	<1	1	87	90	3	97	100
Mercury-Total	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	89	[NT]
Manganese-Total	µg/L	5	Metals-022	<5	1	4300	4500	5	90	#
Molybdenum-Total	µg/L	1	Metals-022	<1	1	1	<1	0	101	115
Nickel-Total	µg/L	1	Metals-022	<1	1	48	48	0	93	102
Lead-Total	µg/L	1	Metals-022	<1	1	1	1	0	96	87
Antimony-Total	µg/L	1	Metals-022	<1	1	<1	<1	0	107	105
Selenium-Total	µg/L	1	Metals-022	<1	1	<1	<1	0	90	93
Tin-Total	µg/L	1	Metals-022	<1	1	1	1	0	106	114
Zinc-Total	µg/L	1	Metals-022	<1	1	180	190	5	97	99
Iron-Total	µg/L	10	Metals-022	<10	1	3300	3100	6	101	#

Client Reference: CTP Groundwater Monitoring - 21-11-23

QUALITY CONTROL: Metals in Waters - Total					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	338338-2
Date prepared	-			23/11/2023	1	23/11/2023	23/11/2023		23/11/2023	23/11/2023
Date analysed	-			23/11/2023	1	23/11/2023	23/11/2023		23/11/2023	23/11/2023
Phosphorus - Total	mg/L	0.05	Metals-020	<0.05	1	<0.05	<0.05	0	84	82

Client Reference: CTP Groundwater Monitoring - 21-11-23

QUALITY CONTROL: Miscellaneous Inorganics					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			21/11/2023	1	21/11/2023	21/11/2023		21/11/2023	[NT]
Date analysed	-			21/11/2023	1	21/11/2023	21/11/2023		21/11/2023	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	1	0.017	[NT]		96	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	1	0.059	[NT]		98	[NT]
Total Nitrogen in water	mg/L	0.1	Inorg-055/062/127	<0.1	1	0.6	0.6	0	117	[NT]

Client Reference: CTP Groundwater Monitoring - 21-11-23

QUALITY CONTROL: Ion Balance						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			21/11/2023	[NT]	[NT]	[NT]	[NT]	21/11/2023	[NT]
Date analysed	-			21/11/2023	[NT]	[NT]	[NT]	[NT]	21/11/2023	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	88	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	106	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	98	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	85	[NT]
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Total Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	106	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	115	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]

Client Reference: CTP Groundwater Monitoring - 21-11-23

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	338338-2
Date prepared	-			22/11/2023	1	22/11/2023	22/11/2023		22/11/2023	22/11/2023
Date analysed	-			22/11/2023	1	22/11/2023	22/11/2023		22/11/2023	22/11/2023
Perfluorobutanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	0.03	0.03	0	121	116
Perfluoropentanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	0.02	0.02	0	112	109
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	117	115
Perfluoroheptanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	120	124
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	110	107
Perfluorodecanesulfonic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	94	95
Perfluorobutanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	109	109
Perfluoropentanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	114	108
Perfluorohexanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	110	116
Perfluoroheptanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	119	116
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	107	103
Perfluorononanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	128	126
Perfluorodecanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	105	105
Perfluoroundecanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	108	100
Perfluorododecanoic acid	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	102	96
Perfluorotridecanoic acid	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	104	102
Perfluorotetradecanoic acid	µg/L	0.5	Org-029	<0.5	1	<0.5	<0.5	0	118	117
4:2 FTS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	114	114
6:2 FTS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	96	94
8:2 FTS	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	113	114
10:2 FTS	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	125	130
Perfluorooctane sulfonamide	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	114	114
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	114	115
N-Ethyl perfluorooctanesulfon amide	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	111	113
N-Me perfluorooctanesulfonamid oethanol	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	97	95
N-Et perfluorooctanesulfonamid oethanol	µg/L	0.5	Org-029	<0.5	1	<0.5	<0.5	0	110	108
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	122	125
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	110	112
Surrogate ¹³ C ₈ PFOS	%		Org-029	99	1	98	97	1	94	100
Surrogate ¹³ C ₂ PFOA	%		Org-029	102	1	98	97	1	98	100

Client Reference: CTP Groundwater Monitoring - 21-11-23

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	338338-2
Extracted ISTD ¹³ C ₃ PFBS	%		Org-029	93	1	95	99	4	92	95
Extracted ISTD ¹⁸ O ₂ PFHxS	%		Org-029	98	1	96	99	3	98	96
Extracted ISTD ¹³ C ₄ PFOS	%		Org-029	107	1	103	108	5	107	108
Extracted ISTD ¹³ C ₄ PFBA	%		Org-029	116	1	101	102	1	113	100
Extracted ISTD ¹³ C ₃ PFPeA	%		Org-029	112	1	110	109	1	106	111
Extracted ISTD ¹³ C ₂ PFHxA	%		Org-029	101	1	96	91	5	101	93
Extracted ISTD ¹³ C ₄ PFHpA	%		Org-029	105	1	98	99	1	101	97
Extracted ISTD ¹³ C ₄ PFOA	%		Org-029	115	1	117	116	1	117	116
Extracted ISTD ¹³ C ₅ PFNA	%		Org-029	113	1	109	109	0	107	107
Extracted ISTD ¹³ C ₂ PFDA	%		Org-029	128	1	116	124	7	124	127
Extracted ISTD ¹³ C ₂ PFUnDA	%		Org-029	137	1	130	135	4	131	139
Extracted ISTD ¹³ C ₂ PFDoDA	%		Org-029	149	1	133	141	6	138	143
Extracted ISTD ¹³ C ₂ PFTeDA	%		Org-029	111	1	91	106	15	102	105
Extracted ISTD ¹³ C ₂ 4:2FTS	%		Org-029	98	1	83	80	4	91	81
Extracted ISTD ¹³ C ₂ 6:2FTS	%		Org-029	141	1	140	129	8	142	142
Extracted ISTD ¹³ C ₂ 8:2FTS	%		Org-029	169	1	166	151	9	173	173
Extracted ISTD ¹³ C ₈ FOSA	%		Org-029	108	1	104	105	1	106	106
Extracted ISTD d ₃ N MeFOSA	%		Org-029	108	1	101	103	2	105	105
Extracted ISTD d ₅ N EtFOSA	%		Org-029	99	1	90	97	7	97	96
Extracted ISTD d ₇ N MeFOSE	%		Org-029	102	1	96	99	3	102	99

Client Reference: CTP Groundwater Monitoring - 21-11-23

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	338338-2
Extracted ISTD d ₉ N EtFOSE	%		Org-029	103	1	95	98	3	99	99
Extracted ISTD d ₃ N MeFOSAA	%		Org-029	124	1	116	113	3	115	115
Extracted ISTD d ₅ N EtFOSAA	%		Org-029	117	1	118	107	10	116	110

Client Reference: CTP Groundwater Monitoring - 21-11-23

QUALITY CONTROL: Dissolved Gases in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			28/11/2023	1	28/11/2023	28/11/2023		28/11/2023	[NT]
Date analysed	-			28/11/2023	1	28/11/2023	28/11/2023		28/11/2023	[NT]
Methane	µg/L	5	AT-006	<5	1	<5	<5	0	100	[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

All metals 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.

Dissolved Metals: no filtered, preserved sample was received, therefore the unpreserved sample was filtered through 0.45µm filter at the lab.

Note: there is a possibility some elements may be underestimated.

For PFAS Extracted Internal Standards denoted with # or outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).

CERTIFICATE OF ANALYSIS 338593

Client Details

Client	CTP AFJV
Attention	
Address	7 Figtree Dr, SYDNEY OLYMPIC PARK, NSW, 2127

Sample Details

Your Reference	<u>CTP Groundwater Monitoring - 22-11-23</u>
Number of Samples	6 Water
Date samples received	22/11/2023
Date completed instructions received	22/11/2023

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	29/11/2023
Date of Issue	29/11/2023
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VOCs in water						
Our Reference	UNITS	338593-1	338593-2	338593-3	338593-4	338593-5
Your Reference		BH_046s	BH_018	BH_009_s	BH_035_s	BH_035
Date Sampled		22/11/2023	22/11/2023	22/11/2023	22/11/2023	22/11/2023
Type of sample		Water	Water	Water	Water	Water
Date Extracted	-	27/11/2023	27/11/2023	28/11/2023	28/11/2023	28/11/2023
Date Analysed	-	28/11/2023	28/11/2023	29/11/2023	29/11/2023	29/11/2023
Dichlorodifluoromethane	µg/L	<10	<10	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<1	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1
Benzene	µg/L	<1	<1	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1

VOCs in water						
Our Reference		338593-1	338593-2	338593-3	338593-4	338593-5
Your Reference	UNITS	BH_046s	BH_018	BH_009_s	BH_035_s	BH_035
Date Sampled		22/11/2023	22/11/2023	22/11/2023	22/11/2023	22/11/2023
Type of sample		Water	Water	Water	Water	Water
Bromoform	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
Styrene	µg/L	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
o-xylene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	105	104	104	105	105
Surrogate Toluene-d8	%	99	99	99	100	99
Surrogate 4-Bromofluorobenzene	%	104	104	104	105	105

VOCs in water		
Our Reference		338593-6
Your Reference	UNITS	DS2
Date Sampled		22/11/2023
Type of sample		Water
Date Extracted	-	28/11/2023
Date Analysed	-	29/11/2023
Dichlorodifluoromethane	µg/L	<10
Chloromethane	µg/L	<10
Vinyl Chloride	µg/L	<10
Bromomethane	µg/L	<10
Chloroethane	µg/L	<10
Trichlorofluoromethane	µg/L	<10
1,1-Dichloroethene	µg/L	<1
Trans-1,2-dichloroethene	µg/L	<1
1,1-dichloroethane	µg/L	<1
Cis-1,2-dichloroethene	µg/L	<1
Bromochloromethane	µg/L	<1
Chloroform	µg/L	<1
2,2-dichloropropane	µg/L	<1
1,2-dichloroethane	µg/L	<1
1,1,1-trichloroethane	µg/L	<1
1,1-dichloropropene	µg/L	<1
Cyclohexane	µg/L	<1
Carbon tetrachloride	µg/L	<1
Benzene	µg/L	<1
Dibromomethane	µg/L	<1
1,2-dichloropropane	µg/L	<1
Trichloroethene	µg/L	<1
Bromodichloromethane	µg/L	<1
trans-1,3-dichloropropene	µg/L	<1
cis-1,3-dichloropropene	µg/L	<1
1,1,2-trichloroethane	µg/L	<1
Toluene	µg/L	<1
1,3-dichloropropane	µg/L	<1
Dibromochloromethane	µg/L	<1
1,2-dibromoethane	µg/L	<1
Tetrachloroethene	µg/L	<1
1,1,1,2-tetrachloroethane	µg/L	<1
Chlorobenzene	µg/L	<1
Ethylbenzene	µg/L	<1

VOCs in water		
Our Reference		338593-6
Your Reference	UNITS	DS2
Date Sampled		22/11/2023
Type of sample		Water
Bromoform	µg/L	<1
m+p-xylene	µg/L	<2
Styrene	µg/L	<1
1,1,2,2-tetrachloroethane	µg/L	<1
o-xylene	µg/L	<1
1,2,3-trichloropropane	µg/L	<1
Isopropylbenzene	µg/L	<1
Bromobenzene	µg/L	<1
n-propyl benzene	µg/L	<1
2-chlorotoluene	µg/L	<1
4-chlorotoluene	µg/L	<1
1,3,5-trimethyl benzene	µg/L	<1
Tert-butyl benzene	µg/L	<1
1,2,4-trimethyl benzene	µg/L	<1
1,3-dichlorobenzene	µg/L	<1
Sec-butyl benzene	µg/L	<1
1,4-dichlorobenzene	µg/L	<1
4-isopropyl toluene	µg/L	<1
1,2-dichlorobenzene	µg/L	<1
n-butyl benzene	µg/L	<1
1,2-dibromo-3-chloropropane	µg/L	<1
1,2,4-trichlorobenzene	µg/L	<1
Hexachlorobutadiene	µg/L	<1
1,2,3-trichlorobenzene	µg/L	<1
Surrogate Dibromofluoromethane	%	104
Surrogate Toluene-d8	%	99
Surrogate 4-Bromofluorobenzene	%	103

vTRH(C6-C10)/BTEXN in Water						
Our Reference		338593-1	338593-2	338593-3	338593-4	338593-5
Your Reference	UNITS	BH_046s	BH_018	BH_009_s	BH_035_s	BH_035
Date Sampled		22/11/2023	22/11/2023	22/11/2023	22/11/2023	22/11/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	27/11/2023	27/11/2023	28/11/2023	28/11/2023	28/11/2023
Date analysed	-	28/11/2023	28/11/2023	29/11/2023	29/11/2023	29/11/2023
TRH C ₆ - C ₉	µg/L	<10	<10	<10	<10	<10
TRH C ₆ - C ₁₀	µg/L	<10	<10	<10	<10	<10
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	<10	<10	<10	<10	<10
Benzene	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
o-xylene	µg/L	<1	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	105	104	104	105	105
Surrogate Toluene-d8	%	99	99	99	100	99
Surrogate 4-Bromofluorobenzene	%	104	104	104	105	105

vTRH(C6-C10)/BTEXN in Water		
Our Reference		338593-6
Your Reference	UNITS	DS2
Date Sampled		22/11/2023
Type of sample		Water
Date extracted	-	28/11/2023
Date analysed	-	29/11/2023
TRH C ₆ - C ₉	µg/L	<10
TRH C ₆ - C ₁₀	µg/L	<10
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	104
Surrogate Toluene-d8	%	99
Surrogate 4-Bromofluorobenzene	%	103

svTRH (C10-C40) in Water						
Our Reference		338593-1	338593-2	338593-3	338593-4	338593-5
Your Reference	UNITS	BH_046s	BH_018	BH_009_s	BH_035_s	BH_035
Date Sampled		22/11/2023	22/11/2023	22/11/2023	22/11/2023	22/11/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023
Date analysed	-	27/11/2023	27/11/2023	27/11/2023	27/11/2023	27/11/2023
TRH C ₁₀ - C ₁₄	µg/L	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	µg/L	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆	µg/L	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	<50	<50	<50	<50	<50
TRH >C ₁₆ - C ₃₄	µg/L	<100	<100	<100	<100	<100
TRH >C ₃₄ - C ₄₀	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	89	90	81	79	76

svTRH (C10-C40) in Water		
Our Reference		338593-6
Your Reference	UNITS	DS2
Date Sampled		22/11/2023
Type of sample		Water
Date extracted	-	24/11/2023
Date analysed	-	27/11/2023
TRH C ₁₀ - C ₁₄	µg/L	<50
TRH C ₁₅ - C ₂₈	µg/L	<100
TRH C ₂₉ - C ₃₆	µg/L	<100
Total +ve TRH (C10-C36)	µg/L	<50
TRH >C ₁₀ - C ₁₆	µg/L	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	<50
TRH >C ₁₆ - C ₃₄	µg/L	<100
TRH >C ₃₄ - C ₄₀	µg/L	<100
Total +ve TRH (>C10-C40)	µg/L	<50
Surrogate o-Terphenyl	%	75

PAHs in Water						
Our Reference		338593-1	338593-2	338593-3	338593-4	338593-5
Your Reference	UNITS	BH_046s	BH_018	BH_009_s	BH_035_s	BH_035
Date Sampled		22/11/2023	22/11/2023	22/11/2023	22/11/2023	22/11/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023
Date analysed	-	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023
Naphthalene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate <i>p</i> -Terphenyl-d14	%	139	117	79	119	112

PAHs in Water		
Our Reference		338593-6
Your Reference	UNITS	DS2
Date Sampled		22/11/2023
Type of sample		Water
Date extracted	-	24/11/2023
Date analysed	-	29/11/2023
Naphthalene	µg/L	<0.1
Acenaphthylene	µg/L	<0.1
Acenaphthene	µg/L	<0.1
Fluorene	µg/L	<0.1
Phenanthrene	µg/L	<0.1
Anthracene	µg/L	<0.1
Fluoranthene	µg/L	<0.1
Pyrene	µg/L	<0.1
Benzo(a)anthracene	µg/L	<0.1
Chrysene	µg/L	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2
Benzo(a)pyrene	µg/L	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5
Total +ve PAH's	µg/L	<0.1
Surrogate <i>p</i> -Terphenyl-d14	%	91

All metals in water-dissolved						
Our Reference	UNITS	338593-1	338593-2	338593-3	338593-4	338593-5
Your Reference		BH_046s	BH_018	BH_009_s	BH_035_s	BH_035
Date Sampled		22/11/2023	22/11/2023	22/11/2023	22/11/2023	22/11/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	28/11/2023	28/11/2023	28/11/2023	28/11/2023	28/11/2023
Date analysed	-	28/11/2023	28/11/2023	28/11/2023	28/11/2023	28/11/2023
Arsenic-Dissolved	µg/L	<1	<1	<1	<1	<1
Boron-Dissolved	µg/L	100	30	100	60	70
Barium-Dissolved	µg/L	29	100	120	32	4,800
Beryllium-Dissolved	µg/L	<0.5	<0.5	<0.5	3	<0.5
Cadmium-Dissolved	µg/L	<0.1	<0.1	0.3	0.3	<0.1
Chromium-Dissolved	µg/L	<1	11	<1	<1	<1
Copper-Dissolved	µg/L	<1	4	4	4	1
Cobalt-Dissolved	µg/L	1	<1	130	98	2
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Manganese-Dissolved	µg/L	890	<5	9,100	6,900	210
Molybdenum-Dissolved	µg/L	1	9	3	<1	<1
Nickel-Dissolved	µg/L	3	<1	61	98	9
Lead-Dissolved	µg/L	<1	<1	<1	<1	<1
Antimony-Dissolved	µg/L	<1	1	<1	<1	<1
Selenium-Dissolved	µg/L	<1	<1	<1	<1	<1
Tin-Dissolved	µg/L	<1	<1	1	<1	<1
Zinc-Dissolved	µg/L	4	4	110	660	5
Iron-Dissolved	µg/L	140	<10	10	5,400	<10

All metals in water-dissolved		
Our Reference		338593-6
Your Reference	UNITS	DS2
Date Sampled		22/11/2023
Type of sample		Water
Date prepared	-	28/11/2023
Date analysed	-	28/11/2023
Arsenic-Dissolved	µg/L	<1
Boron-Dissolved	µg/L	20
Barium-Dissolved	µg/L	110
Beryllium-Dissolved	µg/L	<0.5
Cadmium-Dissolved	µg/L	<0.1
Chromium-Dissolved	µg/L	11
Copper-Dissolved	µg/L	5
Cobalt-Dissolved	µg/L	<1
Mercury-Dissolved	µg/L	<0.05
Manganese-Dissolved	µg/L	<5
Molybdenum-Dissolved	µg/L	9
Nickel-Dissolved	µg/L	<1
Lead-Dissolved	µg/L	<1
Antimony-Dissolved	µg/L	2
Selenium-Dissolved	µg/L	<1
Tin-Dissolved	µg/L	2
Zinc-Dissolved	µg/L	3
Iron-Dissolved	µg/L	<10

All metals in water - total						
Our Reference		338593-1	338593-2	338593-3	338593-4	338593-5
Your Reference	UNITS	BH_046s	BH_018	BH_009_s	BH_035_s	BH_035
Date Sampled		22/11/2023	22/11/2023	22/11/2023	22/11/2023	22/11/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	28/11/2023	28/11/2023	28/11/2023	28/11/2023	28/11/2023
Date analysed	-	28/11/2023	28/11/2023	28/11/2023	28/11/2023	28/11/2023
Arsenic-Total	µg/L	7	<1	11	13	<1
Boron-Total	µg/L	80	<20	100	50	60
Barium-Total	µg/L	83	170	2,600	400	8,600
Beryllium-Total	µg/L	1	<0.5	13	19	<0.5
Cadmium-Total	µg/L	<0.1	<0.1	1.5	0.5	<0.1
Chromium-Total	µg/L	3	15	55	36	6
Copper-Total	µg/L	110	7	320	200	4
Cobalt-Total	µg/L	7	<1	400	130	3
Mercury-Total	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Manganese-Total	µg/L	930	<5	19,000	7,600	220
Molybdenum-Total	µg/L	1	10	3	<1	<1
Nickel-Total	µg/L	12	3	200	140	11
Lead-Total	µg/L	7	<1	95	45	2
Antimony-Total	µg/L	<1	2	<1	<1	<1
Selenium-Total	µg/L	<1	<1	2	<1	<1
Tin-Total	µg/L	<1	1	<1	1	<1
Zinc-Total	µg/L	32	6	910	1,100	20
Iron-Total	µg/L	8,200	100	48,000	75,000	1,700

All metals in water - total		
Our Reference		338593-6
Your Reference	UNITS	DS2
Date Sampled		22/11/2023
Type of sample		Water
Date prepared	-	28/11/2023
Date analysed	-	28/11/2023
Arsenic-Total	µg/L	<1
Boron-Total	µg/L	<20
Barium-Total	µg/L	160
Beryllium-Total	µg/L	<0.5
Cadmium-Total	µg/L	<0.1
Chromium-Total	µg/L	22
Copper-Total	µg/L	16
Cobalt-Total	µg/L	<1
Mercury-Total	µg/L	<0.05
Manganese-Total	µg/L	31
Molybdenum-Total	µg/L	11
Nickel-Total	µg/L	9
Lead-Total	µg/L	1
Antimony-Total	µg/L	2
Selenium-Total	µg/L	<1
Tin-Total	µg/L	7
Zinc-Total	µg/L	25
Iron-Total	µg/L	560

Metals in Waters - Total						
Our Reference		338593-1	338593-2	338593-3	338593-4	338593-5
Your Reference	UNITS	BH_046s	BH_018	BH_009_s	BH_035_s	BH_035
Date Sampled		22/11/2023	22/11/2023	22/11/2023	22/11/2023	22/11/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	28/11/2023	28/11/2023	28/11/2023	28/11/2023	28/11/2023
Date analysed	-	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023
Phosphorus - Total	mg/L	0.09	<0.05	2.1	1.6	<0.05

Metals in Waters - Total		
Our Reference		338593-6
Your Reference	UNITS	DS2
Date Sampled		22/11/2023
Type of sample		Water
Date prepared	-	28/11/2023
Date analysed	-	29/11/2023
Phosphorus - Total	mg/L	<0.05

Miscellaneous Inorganics						
Our Reference		338593-1	338593-2	338593-3	338593-4	338593-5
Your Reference	UNITS	BH_046s	BH_018	BH_009_s	BH_035_s	BH_035
Date Sampled		22/11/2023	22/11/2023	22/11/2023	22/11/2023	22/11/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023
Date analysed	-	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023
Ammonia as N in water	mg/L	0.33	<0.005	0.073	0.15	2.0
Nitrate as N in water	mg/L	0.05	0.32	0.44	0.01	2.8
Total Nitrogen in water	mg/L	0.4	1.4	1.4	1.3	5.1

Miscellaneous Inorganics		
Our Reference		338593-6
Your Reference	UNITS	DS2
Date Sampled		22/11/2023
Type of sample		Water
Date prepared	-	24/11/2023
Date analysed	-	24/11/2023
Ammonia as N in water	mg/L	0.006
Nitrate as N in water	mg/L	0.35
Total Nitrogen in water	mg/L	1.5

Ion Balance						
Our Reference		338593-1	338593-2	338593-3	338593-4	338593-5
Your Reference	UNITS	BH_046s	BH_018	BH_009_s	BH_035_s	BH_035
Date Sampled		22/11/2023	22/11/2023	22/11/2023	22/11/2023	22/11/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023
Date analysed	-	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023
Calcium - Dissolved	mg/L	140	240	150	46	470
Potassium - Dissolved	mg/L	30	6.7	8.4	9.2	43
Sodium - Dissolved	mg/L	1,900	340	180	740	2,700
Magnesium - Dissolved	mg/L	230	<0.5	39	55	340
Hardness	mgCaCO ₃ /L	1,300	590	540	340	2,600
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5	210	<5	<5	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	550	<5	130	50	650
Carbonate Alkalinity as CaCO ₃	mg/L	<5	33	<5	<5	<5
Total Alkalinity as CaCO ₃	mg/L	550	240	130	50	650
Sulphate, SO ₄	mg/L	510	260	580	560	17
Chloride, Cl	mg/L	3,200	480	130	1,100	5,300
Ionic Balance	%	-1.0	6.0	2.0	-6.0	2.0

Ion Balance		
Our Reference		338593-6
Your Reference	UNITS	DS2
Date Sampled		22/11/2023
Type of sample		Water
Date prepared	-	24/11/2023
Date analysed	-	24/11/2023
Calcium - Dissolved	mg/L	230
Potassium - Dissolved	mg/L	7.0
Sodium - Dissolved	mg/L	340
Magnesium - Dissolved	mg/L	<0.5
Hardness	mgCaCO ₃ /L	590
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	230
Bicarbonate Alkalinity as CaCO ₃	mg/L	<5
Carbonate Alkalinity as CaCO ₃	mg/L	38
Total Alkalinity as CaCO ₃	mg/L	260
Sulphate, SO ₄	mg/L	260
Chloride, Cl	mg/L	470
Ionic Balance	%	5.0

PFAS in Waters Extended						
Our Reference		338593-1	338593-2	338593-3	338593-4	338593-5
Your Reference	UNITS	BH_046s	BH_018	BH_009_s	BH_035_s	BH_035
Date Sampled		22/11/2023	22/11/2023	22/11/2023	22/11/2023	22/11/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023
Date analysed	-	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023
Perfluorobutanesulfonic acid	µg/L	<0.01	<0.01	0.01	<0.01	<0.01
Perfluoropentanesulfonic acid	µg/L	<0.01	<0.01	0.01	<0.01	<0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01	0.01	0.04	0.02	<0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01	<0.01	0.01	<0.01	<0.01
Perfluorodecanesulfonic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid	µg/L	<0.01	<0.01	0.01	<0.01	<0.01
Perfluoroheptanoic acid	µg/L	<0.01	<0.01	0.01	<0.01	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01	<0.01	0.03	<0.01	<0.01
Perfluorononanoic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
4:2 FTS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
6:2 FTS	µg/L	<0.01	0.01	<0.01	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
10:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctanesulfonamide	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Surrogate ¹³ C ₈ PFOS	%	108	99	100	100	104
Surrogate ¹³ C ₂ PFOA	%	101	98	103	97	99
Extracted ISTD ¹³ C ₃ PFBS	%	91	89	88	85	86
Extracted ISTD ¹⁸ O ₂ PFHxS	%	91	96	95	90	93
Extracted ISTD ¹³ C ₄ PFOS	%	96	104	99	100	95
Extracted ISTD ¹³ C ₄ PFBA	%	95	106	106	61	109

PFAS in Waters Extended						
Our Reference		338593-1	338593-2	338593-3	338593-4	338593-5
Your Reference	UNITS	BH_046s	BH_018	BH_009_s	BH_035_s	BH_035
Date Sampled		22/11/2023	22/11/2023	22/11/2023	22/11/2023	22/11/2023
Type of sample		Water	Water	Water	Water	Water
Extracted ISTD ¹³ C ₃ PFPeA	%	103	107	104	106	104
Extracted ISTD ¹³ C ₂ PFHxA	%	90	90	91	93	87
Extracted ISTD ¹³ C ₄ PFHpA	%	93	98	98	93	94
Extracted ISTD ¹³ C ₄ PFOA	%	113	113	105	111	105
Extracted ISTD ¹³ C ₅ PFNA	%	105	103	102	99	100
Extracted ISTD ¹³ C ₂ PFDA	%	117	109	110	109	108
Extracted ISTD ¹³ C ₂ PFUnDA	%	121	116	117	113	105
Extracted ISTD ¹³ C ₂ PFDoDA	%	132	114	112	110	111
Extracted ISTD ¹³ C ₂ PFTeDA	%	98	86	83	85	88
Extracted ISTD ¹³ C ₂ 4:2FTS	%	84	91	97	96	86
Extracted ISTD ¹³ C ₂ 6:2FTS	%	134	113	114	118	102
Extracted ISTD ¹³ C ₂ 8:2FTS	%	144	146	131	121	130
Extracted ISTD ¹³ C ₈ FOSA	%	101	105	100	97	99
Extracted ISTD d ₃ N MeFOSA	%	102	99	97	103	99
Extracted ISTD d ₅ N EtFOSA	%	94	90	92	92	92
Extracted ISTD d ₇ N MeFOSE	%	96	102	96	94	93
Extracted ISTD d ₉ N EtFOSE	%	95	104	95	93	95
Extracted ISTD d ₃ N MeFOSAA	%	116	118	111	108	107
Extracted ISTD d ₅ N EtFOSAA	%	107	110	112	111	104
Total Positive PFHxS & PFOS	µg/L	<0.01	0.01	0.05	0.02	<0.01
Total Positive PFOA & PFOS	µg/L	<0.01	<0.01	0.04	<0.01	<0.01
Total Positive PFAS	µg/L	<0.01	0.03	0.13	0.02	<0.01

PFAS in Waters Extended		
Our Reference		338593-6
Your Reference	UNITS	DS2
Date Sampled		22/11/2023
Type of sample		Water
Date prepared	-	24/11/2023
Date analysed	-	24/11/2023
Perfluorobutanesulfonic acid	µg/L	<0.01
Perfluoropentanesulfonic acid	µg/L	<0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01
Perfluorodecanesulfonic acid	µg/L	<0.02
Perfluorobutanoic acid	µg/L	<0.02
Perfluoropentanoic acid	µg/L	<0.02
Perfluorohexanoic acid	µg/L	0.02
Perfluoroheptanoic acid	µg/L	<0.01
Perfluorooctanoic acid PFOA	µg/L	0.01
Perfluorononanoic acid	µg/L	<0.01
Perfluorodecanoic acid	µg/L	<0.02
Perfluoroundecanoic acid	µg/L	<0.02
Perfluorododecanoic acid	µg/L	<0.05
Perfluorotridecanoic acid	µg/L	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5
4:2 FTS	µg/L	<0.01
6:2 FTS	µg/L	<0.01
8:2 FTS	µg/L	<0.02
10:2 FTS	µg/L	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05
N-Ethyl perfluorooctanesulfonamide	µg/L	<0.1
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.05
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02
Surrogate ¹³ C ₈ PFOS	%	101
Surrogate ¹³ C ₂ PFOA	%	101
Extracted ISTD ¹³ C ₃ PFBS	%	88
Extracted ISTD ¹⁸ O ₂ PFHxS	%	95
Extracted ISTD ¹³ C ₄ PFOS	%	103
Extracted ISTD ¹³ C ₄ PFBA	%	108

PFAS in Waters Extended		
Our Reference		338593-6
Your Reference	UNITS	DS2
Date Sampled		22/11/2023
Type of sample		Water
Extracted ISTD ¹³ C ₃ PFPeA	%	107
Extracted ISTD ¹³ C ₂ PFHxA	%	93
Extracted ISTD ¹³ C ₄ PFHpA	%	99
Extracted ISTD ¹³ C ₄ PFOA	%	111
Extracted ISTD ¹³ C ₅ PFNA	%	108
Extracted ISTD ¹³ C ₂ PFDA	%	112
Extracted ISTD ¹³ C ₂ PFUnDA	%	115
Extracted ISTD ¹³ C ₂ PFDoDA	%	120
Extracted ISTD ¹³ C ₂ PFTeDA	%	92
Extracted ISTD ¹³ C ₂ 4:2FTS	%	92
Extracted ISTD ¹³ C ₂ 6:2FTS	%	116
Extracted ISTD ¹³ C ₂ 8:2FTS	%	132
Extracted ISTD ¹³ C ₈ FOSA	%	105
Extracted ISTD d ₃ N MeFOSA	%	105
Extracted ISTD d ₅ N EtFOSA	%	92
Extracted ISTD d ₇ N MeFOSE	%	96
Extracted ISTD d ₉ N EtFOSE	%	97
Extracted ISTD d ₃ N MeFOSAA	%	112
Extracted ISTD d ₅ N EtFOSAA	%	116
Total Positive PFHxS & PFOS	µg/L	0.01
Total Positive PFOA & PFOS	µg/L	0.01
Total Positive PFAS	µg/L	0.04

Dissolved Gases in Water

Our Reference		338593-1	338593-2	338593-3	338593-4	338593-5
Your Reference	UNITS	BH_046s	BH_018	BH_009_s	BH_035_s	BH_035
Date Sampled		22/11/2023	22/11/2023	22/11/2023	22/11/2023	22/11/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023
Date analysed	-	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023
Methane	µg/L	<5	<5	23	<5	480

Dissolved Gases in Water

Our Reference		338593-6
Your Reference	UNITS	DS2
Date Sampled		22/11/2023
Type of sample		Water
Date prepared	-	29/11/2023
Date analysed	-	29/11/2023
Methane	µg/L	<5

Method ID	Methodology Summary
AT-006	Dissolved gases determined by GC-FID based on draft method USEPA SOP RSK175
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% ie total anions = total cations +/-15%.
Inorg-055	Nitrate - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-055/062/127	Total Nitrogen - Calculation sum of TKN and oxidised Nitrogen. Alternatively analysed by combustion and chemiluminescence.
Inorg-057	Ammonia - determined colourimetrically, based on APHA latest edition 4500-NH3 F. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a KCl extraction.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
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.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

Method ID	Methodology Summary
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

Client Reference: CTP Groundwater Monitoring - 22-11-23

QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date Extracted	-			28/11/2023	[NT]	[NT]	[NT]	[NT]	28/11/2023	[NT]
Date Analysed	-			29/11/2023	[NT]	[NT]	[NT]	[NT]	29/11/2023	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Dibromomethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Bromoform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	110	[NT]
Styrene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	104	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate Toluene-d8	%		Org-023	99	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	102	[NT]	[NT]	[NT]	[NT]	100	[NT]

Client Reference: CTP Groundwater Monitoring - 22-11-23

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			28/11/2023	[NT]	[NT]	[NT]	[NT]	28/11/2023	[NT]
Date analysed	-			29/11/2023	[NT]	[NT]	[NT]	[NT]	29/11/2023	[NT]
TRH C ₆ - C ₉	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH C ₆ - C ₁₀	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	108	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	110	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	104	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate Toluene-d8	%		Org-023	99	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	102	[NT]	[NT]	[NT]	[NT]	100	[NT]

Client Reference: CTP Groundwater Monitoring - 22-11-23

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			27/11/2023	[NT]	[NT]	[NT]	[NT]	27/11/2023	[NT]
Date analysed	-			27/11/2023	[NT]	[NT]	[NT]	[NT]	27/11/2023	[NT]
TRH C ₁₀ - C ₁₄	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH C ₁₅ - C ₂₈	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	102	[NT]
TRH C ₂₉ - C ₃₆	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	86	[NT]
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	102	[NT]
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	86	[NT]
Surrogate o-Terphenyl	%		Org-020	83	[NT]	[NT]	[NT]	[NT]	88	[NT]

Client Reference: CTP Groundwater Monitoring - 22-11-23

QUALITY CONTROL: PAHs in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			24/11/2023	[NT]	[NT]	[NT]	[NT]	24/11/2023	[NT]
Date analysed	-			29/11/2023	[NT]	[NT]	[NT]	[NT]	29/11/2023	[NT]
Naphthalene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	127	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	117	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	111	[NT]	[NT]	[NT]	[NT]	101	[NT]

Client Reference: CTP Groundwater Monitoring - 22-11-23

QUALITY CONTROL: All metals in water-dissolved					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	338593-2
Date prepared	-			28/11/2023	1	28/11/2023	28/11/2023		28/11/2023	28/11/2023
Date analysed	-			28/11/2023	1	28/11/2023	28/11/2023		28/11/2023	28/11/2023
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	91	[NT]
Boron-Dissolved	µg/L	20	Metals-022	<20	1	100	100	0	104	[NT]
Barium-Dissolved	µg/L	1	Metals-022	<1	1	29	28	4	102	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	1	<0.5	<0.5	0	97	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	<0.1	<0.1	0	97	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	94	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	95	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	<1	1	1	1	0	104	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	112	110
Manganese-Dissolved	µg/L	5	Metals-022	<5	1	890	900	1	100	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	1	1	<1	0	102	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	3	3	0	98	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	100	[NT]
Antimony-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	103	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	89	[NT]
Tin-Dissolved	µg/L	1	Metals-022	<1	1	<1	1	0	107	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	4	3	29	101	[NT]
Iron-Dissolved	µg/L	10	Metals-022	<10	1	140	140	0	101	[NT]

Client Reference: CTP Groundwater Monitoring - 22-11-23

QUALITY CONTROL: All metals in water - total					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	338593-2
Date prepared	-			28/11/2023	1	28/11/2023	28/11/2023		28/11/2023	28/11/2023
Date analysed	-			28/11/2023	1	28/11/2023	28/11/2023		28/11/2023	28/11/2023
Arsenic-Total	µg/L	1	Metals-022	<1	1	7	8	13	91	94
Boron-Total	µg/L	20	Metals-022	<20	1	80	90	12	107	98
Barium-Total	µg/L	1	Metals-022	<1	1	83	83	0	98	#
Beryllium-Total	µg/L	0.5	Metals-022	<0.5	1	1	1	0	100	104
Cadmium-Total	µg/L	0.1	Metals-022	<0.1	1	<0.1	<0.1	0	98	99
Chromium-Total	µg/L	1	Metals-022	<1	1	3	4	29	94	93
Copper-Total	µg/L	1	Metals-022	<1	1	110	110	0	95	94
Cobalt-Total	µg/L	1	Metals-022	<1	1	7	7	0	96	98
Mercury-Total	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	112	111
Manganese-Total	µg/L	5	Metals-022	<5	1	930	980	5	99	103
Molybdenum-Total	µg/L	1	Metals-022	<1	1	1	2	67	104	107
Nickel-Total	µg/L	1	Metals-022	<1	1	12	12	0	99	98
Lead-Total	µg/L	1	Metals-022	<1	1	7	7	0	101	89
Antimony-Total	µg/L	1	Metals-022	<1	1	<1	<1	0	112	103
Selenium-Total	µg/L	1	Metals-022	<1	1	<1	<1	0	91	89
Tin-Total	µg/L	1	Metals-022	<1	1	<1	<1	0	108	113
Zinc-Total	µg/L	1	Metals-022	<1	1	32	34	6	101	98
Iron-Total	µg/L	10	Metals-022	<10	1	8200	8500	4	108	75

Client Reference: CTP Groundwater Monitoring - 22-11-23

QUALITY CONTROL: Metals in Waters - Total					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	338593-2
Date prepared	-			28/11/2023	1	28/11/2023	28/11/2023		28/11/2023	28/11/2023
Date analysed	-			29/11/2023	1	29/11/2023	29/11/2023		29/11/2023	29/11/2023
Phosphorus - Total	mg/L	0.05	Metals-020	<0.05	1	0.09	0.09	0	107	105

Client Reference: CTP Groundwater Monitoring - 22-11-23

QUALITY CONTROL: Miscellaneous Inorganics					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			24/11/2023	1	24/11/2023	24/11/2023		24/11/2023	[NT]
Date analysed	-			24/11/2023	1	24/11/2023	24/11/2023		24/11/2023	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	1	0.33	0.32	3	102	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	1	0.05	0.050	0	98	[NT]
Total Nitrogen in water	mg/L	0.1	Inorg-055/062/127	<0.1	1	0.4	0.4	0	112	[NT]

Client Reference: CTP Groundwater Monitoring - 22-11-23

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date prepared	-			24/11/2023	1	24/11/2023	24/11/2023		24/11/2023	[NT]
Date analysed	-			24/11/2023	1	24/11/2023	24/11/2023		24/11/2023	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	140	140	0	105	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	30	30	0	95	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	1900	2000	5	99	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	230	240	4	105	[NT]
Hardness	mgCaCO ₃ /L	3	Metals-020	[NT]	1	1300	1300	0	[NT]	[NT]
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	5	Inorg-006	<5	1	<5	<5	0	[NT]	[NT]
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	1	550	550	0	[NT]	[NT]
Carbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	1	<5	<5	0	[NT]	[NT]
Total Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	1	550	550	0	107	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	<1	1	510	560	9	117	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	1	3200	3200	0	113	[NT]
Ionic Balance	%		Inorg-040	[NT]	1	-1.0	0	-200	[NT]	[NT]

Client Reference: CTP Groundwater Monitoring - 22-11-23

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	338593-2
Date prepared	-			24/11/2023	1	24/11/2023	24/11/2023		24/11/2023	24/11/2023
Date analysed	-			24/11/2023	1	24/11/2023	24/11/2023		24/11/2023	24/11/2023
Perfluorobutanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	108	109
Perfluoropentanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	113	106
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	107	105
Perfluoroheptanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	114	110
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	105	99
Perfluorodecanesulfonic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	83	79
Perfluorobutanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	102	98
Perfluoropentanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	103	102
Perfluorohexanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	106	107
Perfluoroheptanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	108	103
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	103	101
Perfluorononanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	115	117
Perfluorodecanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	103	101
Perfluoroundecanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	102	97
Perfluorododecanoic acid	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	105	101
Perfluorotridecanoic acid	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	97	95
Perfluorotetradecanoic acid	µg/L	0.5	Org-029	<0.5	1	<0.5	<0.5	0	114	110
4:2 FTS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	106	108
6:2 FTS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	96	90
8:2 FTS	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	112	96
10:2 FTS	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	113	102
Perfluorooctane sulfonamide	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	112	107
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	109	106
N-Ethyl perfluorooctanesulfonamide	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	110	108
N-Me perfluorooctanesulfonamidethanol	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	103	99
N-Et perfluorooctanesulfonamidethanol	µg/L	0.5	Org-029	<0.5	1	<0.5	<0.5	0	109	104
MePerfluorooctanesulfonamidacetic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	108	104
EtPerfluorooctanesulfonamidacetic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	99	109
Surrogate ¹³ C ₈ PFOS	%		Org-029	103	1	108	102	6	103	97
Surrogate ¹³ C ₂ PFOA	%		Org-029	98	1	101	99	2	100	100

Client Reference: CTP Groundwater Monitoring - 22-11-23

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	338593-2
Extracted ISTD ¹³ C ₃ PFBS	%		Org-029	88	1	91	91	0	85	88
Extracted ISTD ¹⁸ O ₂ PFHxS	%		Org-029	91	1	91	94	3	90	96
Extracted ISTD ¹³ C ₄ PFOS	%		Org-029	95	1	96	101	5	95	103
Extracted ISTD ¹³ C ₄ PFBA	%		Org-029	107	1	95	98	3	105	106
Extracted ISTD ¹³ C ₃ PFPeA	%		Org-029	101	1	103	104	1	98	105
Extracted ISTD ¹³ C ₂ PFHxA	%		Org-029	87	1	90	91	1	88	91
Extracted ISTD ¹³ C ₄ PFHpA	%		Org-029	93	1	93	96	3	90	96
Extracted ISTD ¹³ C ₄ PFOA	%		Org-029	103	1	113	114	1	101	107
Extracted ISTD ¹³ C ₅ PFNA	%		Org-029	100	1	105	108	3	96	100
Extracted ISTD ¹³ C ₂ PFDA	%		Org-029	103	1	117	116	1	103	111
Extracted ISTD ¹³ C ₂ PFUnDA	%		Org-029	105	1	121	128	6	107	118
Extracted ISTD ¹³ C ₂ PFDoDA	%		Org-029	107	1	132	136	3	104	112
Extracted ISTD ¹³ C ₂ PFTeDA	%		Org-029	79	1	98	92	6	82	88
Extracted ISTD ¹³ C ₂ 4:2FTS	%		Org-029	86	1	84	79	6	88	90
Extracted ISTD ¹³ C ₂ 6:2FTS	%		Org-029	112	1	134	125	7	106	116
Extracted ISTD ¹³ C ₂ 8:2FTS	%		Org-029	112	1	144	158	9	109	127
Extracted ISTD ¹³ C ₈ FOSA	%		Org-029	96	1	101	103	2	95	98
Extracted ISTD d ₃ N MeFOSA	%		Org-029	101	1	102	106	4	99	100
Extracted ISTD d ₅ N EtFOSA	%		Org-029	92	1	94	96	2	92	93
Extracted ISTD d ₇ N MeFOSE	%		Org-029	90	1	96	97	1	96	97

Client Reference: CTP Groundwater Monitoring - 22-11-23

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	338593-2
Extracted ISTD d ₉ N EtFOSE	%		Org-029	94	1	95	101	6	96	101
Extracted ISTD d ₃ N MeFOSAA	%		Org-029	105	1	116	117	1	109	110
Extracted ISTD d ₅ N EtFOSAA	%		Org-029	105	1	107	108	1	105	105

Client Reference: CTP Groundwater Monitoring - 22-11-23

QUALITY CONTROL: Dissolved Gases in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			29/11/2023	1	29/11/2023	29/11/2023		29/11/2023	[NT]
Date analysed	-			29/11/2023	1	29/11/2023	29/11/2023		29/11/2023	[NT]
Methane	µg/L	5	AT-006	<5	1	<5	<5	0	98	[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

For PFAS Extracted Internal Standards denoted with # or outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).

Dissolved Metals: no filtered, preserved sample was received, therefore the unpreserved sample was filtered through 0.45µm filter at the lab.

Note: there is a possibility some elements may be underestimated.

All metals 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.

CERTIFICATE OF ANALYSIS 339966

Client Details

Client	CTP AFJV
Attention	
Address	7 Figtree Dr, SYDNEY OLYMPIC PARK, NSW, 2127

Sample Details

Your Reference	<u>CTP Groundwater Monitoring</u>
Number of Samples	4 Water
Date samples received	12/12/2023
Date completed instructions received	12/12/2023

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	19/12/2023
Date of Issue	19/12/2023
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 *	

Client Reference: CTP Groundwater Monitoring

VOCs in water					
Our Reference		339966-1	339966-2	339966-3	339966-4
Your Reference	UNITS	S02d	S06	SMW_BH126	SMW_BH019
Date Sampled		11/12/2023	11/12/2023	11/12/2023	11/12/2023
Type of sample		Water	Water	Water	Water
Date Extracted	-	12/12/2023	12/12/2023	12/12/2023	12/12/2023
Date Analysed	-	13/12/2023	13/12/2023	13/12/2023	13/12/2023
Dichlorodifluoromethane	µg/L	<10	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	3	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1	<1
Cyclohexane	µg/L	<1	<1	13	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1
Benzene	µg/L	<1	<1	69	<1
Dibromomethane	µg/L	<1	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	51	<1
Ethylbenzene	µg/L	<1	<1	1	<1

Client Reference: CTP Groundwater Monitoring

VOCs in water					
Our Reference		339966-1	339966-2	339966-3	339966-4
Your Reference	UNITS	S02d	S06	SMW_BH126	SMW_BH019
Date Sampled		11/12/2023	11/12/2023	11/12/2023	11/12/2023
Type of sample		Water	Water	Water	Water
Bromoform	µg/L	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	2	<2
Styrene	µg/L	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1	<1
o-xylene	µg/L	<1	<1	1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	5	<1
Bromobenzene	µg/L	<1	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	4	<1
2-chlorotoluene	µg/L	<1	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	1	<1
Tert-butyl benzene	µg/L	<1	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	3	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	5	4
1,2-dichlorobenzene	µg/L	<1	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	94	95	101	95
Surrogate Toluene-d8	%	98	98	103	99
Surrogate 4-Bromofluorobenzene	%	126	121	117	127

Client Reference: CTP Groundwater Monitoring

vTRH(C6-C10)/BTEXN in Water					
Our Reference		339966-1	339966-2	339966-3	339966-4
Your Reference	UNITS	S02d	S06	SMW_BH126	SMW_BH019
Date Sampled		11/12/2023	11/12/2023	11/12/2023	11/12/2023
Type of sample		Water	Water	Water	Water
Date extracted	-	12/12/2023	12/12/2023	12/12/2023	12/12/2023
Date analysed	-	13/12/2023	13/12/2023	13/12/2023	13/12/2023
TRH C ₆ - C ₉	µg/L	<10	<10	180	<10
TRH C ₆ - C ₁₀	µg/L	<10	<10	200	<10
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	<10	<10	130	<10
Benzene	µg/L	<1	<1	69	<1
Toluene	µg/L	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	1	<1
m+p-xylene	µg/L	<2	<2	2	<2
o-xylene	µg/L	<1	<1	1	<1
Naphthalene	µg/L	<1	<1	15	<1
Surrogate Dibromofluoromethane	%	94	95	101	95
Surrogate Toluene-d8	%	98	98	103	99
Surrogate 4-Bromofluorobenzene	%	126	121	117	127

Client Reference: CTP Groundwater Monitoring

svTRH (C10-C40) in Water					
Our Reference		339966-1	339966-2	339966-3	339966-4
Your Reference	UNITS	S02d	S06	SMW_BH126	SMW_BH019
Date Sampled		11/12/2023	11/12/2023	11/12/2023	11/12/2023
Type of sample		Water	Water	Water	Water
Date extracted	-	14/12/2023	14/12/2023	14/12/2023	14/12/2023
Date analysed	-	15/12/2023	15/12/2023	15/12/2023	15/12/2023
TRH C ₁₀ - C ₁₄	µg/L	69	260	550	75
TRH C ₁₅ - C ₂₈	µg/L	580	1,400	1,300	130
TRH C ₂₉ - C ₃₆	µg/L	450	<100	110	<100
Total +ve TRH (C10-C36)	µg/L	1,100	1,700	1,900	200
TRH >C ₁₀ - C ₁₆	µg/L	91	630	740	84
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	91	630	720	84
TRH >C ₁₆ - C ₃₄	µg/L	830	1,000	1,100	160
TRH >C ₃₄ - C ₄₀	µg/L	280	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	1,200	1,700	1,800	240
Surrogate o-Terphenyl	%	81	118	109	79

Client Reference: CTP Groundwater Monitoring

PAHs in Water					
Our Reference		339966-1	339966-2	339966-3	339966-4
Your Reference	UNITS	S02d	S06	SMW_BH126	SMW_BH019
Date Sampled		11/12/2023	11/12/2023	11/12/2023	11/12/2023
Type of sample		Water	Water	Water	Water
Date extracted	-	14/12/2023	14/12/2023	14/12/2023	14/12/2023
Date analysed	-	15/12/2023	15/12/2023	15/12/2023	15/12/2023
Naphthalene	µg/L	<0.1	<0.1	13	<0.1
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	0.3	0.1	0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	0.5	0.2	<0.1	<0.1
Pyrene	µg/L	0.6	0.2	<0.1	<0.1
Benzo(a)anthracene	µg/L	0.3	0.2	<0.1	<0.1
Chrysene	µg/L	0.3	0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	0.5	0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	0.3	0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	0.2	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	0.3	0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	3.3	1.3	13	<0.1
Surrogate p-Terphenyl-d14	%	74	93	82	76

Client Reference: CTP Groundwater Monitoring

All metals in water-dissolved					
Our Reference		339966-1	339966-2	339966-3	339966-4
Your Reference	UNITS	S02d	S06	SMW_BH126	SMW_BH019
Date Sampled		11/12/2023	11/12/2023	11/12/2023	11/12/2023
Type of sample		Water	Water	Water	Water
Date prepared	-	13/12/2023	13/12/2023	13/12/2023	13/12/2023
Date analysed	-	13/12/2023	13/12/2023	13/12/2023	13/12/2023
Arsenic-Dissolved	µg/L	3	2	4	1
Boron-Dissolved	µg/L	890	860	1,800	50
Barium-Dissolved	µg/L	74	110	1,100	21,000
Beryllium-Dissolved	µg/L	<0.5	<0.5	<0.5	<0.5
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	24	<1
Copper-Dissolved	µg/L	<1	<1	<1	<1
Cobalt-Dissolved	µg/L	<1	<1	11	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05
Manganese-Dissolved	µg/L	130	95	26	360
Molybdenum-Dissolved	µg/L	41	19	2	1
Nickel-Dissolved	µg/L	3	2	28	2
Lead-Dissolved	µg/L	<1	<1	<1	<1
Antimony-Dissolved	µg/L	2	<1	<1	<1
Selenium-Dissolved	µg/L	<1	<1	<1	<1
Tin-Dissolved	µg/L	<1	<1	<1	<1
Zinc-Dissolved	µg/L	<1	2	25	18
Iron-Dissolved	µg/L	20	1,200	410	980

Client Reference: CTP Groundwater Monitoring

All metals in water - total					
Our Reference		339966-1	339966-2	339966-3	339966-4
Your Reference	UNITS	S02d	S06	SMW_BH126	SMW_BH019
Date Sampled		11/12/2023	11/12/2023	11/12/2023	11/12/2023
Type of sample		Water	Water	Water	Water
Date prepared	-	13/12/2023	13/12/2023	13/12/2023	13/12/2023
Date analysed	-	13/12/2023	13/12/2023	13/12/2023	13/12/2023
Arsenic-Total	µg/L	50	47	9	9
Boron-Total	µg/L	1,000	1,200	2,300	60
Barium-Total	µg/L	1,500	1,100	1,400	20,000
Beryllium-Total	µg/L	4	6	0.9	0.9
Cadmium-Total	µg/L	2.3	1.8	0.5	0.2
Chromium-Total	µg/L	190	200	99	14
Copper-Total	µg/L	560	320	35	36
Cobalt-Total	µg/L	79	48	60	5
Mercury-Total	µg/L	<0.05	<0.05	<0.05	<0.05
Manganese-Total	µg/L	3,300	2,200	230	460
Molybdenum-Total	µg/L	66	25	1	4
Nickel-Total	µg/L	130	96	46	14
Lead-Total	µg/L	400	380	96	12
Antimony-Total	µg/L	9	4	1	<1
Selenium-Total	µg/L	2	3	<1	<1
Tin-Total	µg/L	28	19	4	1
Zinc-Total	µg/L	3,300	1,400	490	160
Iron-Total	µg/L	150,000	180,000	32,000	12,000

Client Reference: CTP Groundwater Monitoring

Metals in Waters - Total					
Our Reference		339966-1	339966-2	339966-3	339966-4
Your Reference	UNITS	S02d	S06	SMW_BH126	SMW_BH019
Date Sampled		11/12/2023	11/12/2023	11/12/2023	11/12/2023
Type of sample		Water	Water	Water	Water
Date prepared	-	13/12/2023	13/12/2023	13/12/2023	13/12/2023
Date analysed	-	13/12/2023	13/12/2023	13/12/2023	13/12/2023
Phosphorus - Total	mg/L	3.2	3.4	0.61	1.9

Client Reference: CTP Groundwater Monitoring

Miscellaneous Inorganics					
Our Reference		339966-1	339966-2	339966-3	339966-4
Your Reference	UNITS	S02d	S06	SMW_BH126	SMW_BH019
Date Sampled		11/12/2023	11/12/2023	11/12/2023	11/12/2023
Type of sample		Water	Water	Water	Water
Date prepared	-	12/12/2023	12/12/2023	12/12/2023	12/12/2023
Date analysed	-	12/12/2023	12/12/2023	12/12/2023	12/12/2023
Ammonia as N in water	mg/L	0.70	1.4	290	4.1
Nitrate as N in water	mg/L	<0.005	<0.005	<0.005	<0.005
Total Nitrogen in water	mg/L	1.6	3.5	340	4.2

Client Reference: CTP Groundwater Monitoring

Ion Balance					
Our Reference		339966-1	339966-2	339966-3	339966-4
Your Reference	UNITS	S02d	S06	SMW_BH126	SMW_BH019
Date Sampled		11/12/2023	11/12/2023	11/12/2023	11/12/2023
Type of sample		Water	Water	Water	Water
Date prepared	-	12/12/2023	12/12/2023	12/12/2023	12/12/2023
Date analysed	-	12/12/2023	12/12/2023	12/12/2023	12/12/2023
Calcium - Dissolved	mg/L	92	43	43	260
Potassium - Dissolved	mg/L	41	32	380	38
Sodium - Dissolved	mg/L	560	130	2,100	1,800
Magnesium - Dissolved	mg/L	26	29	80	240
Hardness	mgCaCO ₃ /L	340	230	430	1,600
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5	<5	<5	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	490	480	2,000	560
Carbonate Alkalinity as CaCO ₃	mg/L	<5	<5	<5	<5
Total Alkalinity as CaCO ₃	mg/L	490	480	2,000	560
Sulphate, SO ₄	mg/L	200	24	2	150
Chloride, Cl	mg/L	1,000	98	3,300	3,500
Ionic Balance	%	-13	-7.0	-9.0	-1.0

Client Reference: CTP Groundwater Monitoring

PFAS in Waters Extended					
Our Reference		339966-1	339966-2	339966-3	339966-4
Your Reference	UNITS	S02d	S06	SMW_BH126	SMW_BH019
Date Sampled		11/12/2023	11/12/2023	11/12/2023	11/12/2023
Type of sample		Water	Water	Water	Water
Date prepared	-	12/12/2023	12/12/2023	12/12/2023	12/12/2023
Date analysed	-	12/12/2023	12/12/2023	12/12/2023	12/12/2023
Perfluorobutanesulfonic acid	µg/L	<0.01	0.10	3.8	<0.01
Perfluoropentanesulfonic acid	µg/L	<0.01	0.11	0.11	<0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01	0.81	0.22	<0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01	0.04	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01	1.0	0.15	0.01
Perfluorodecanesulfonic acid	µg/L	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid	µg/L	<0.02	0.03	1.5	<0.02
Perfluoropentanoic acid	µg/L	<0.02	0.03	<0.1	<0.02
Perfluorohexanoic acid	µg/L	0.01	0.15	0.60	0.01
Perfluoroheptanoic acid	µg/L	<0.01	0.03	0.19	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01	0.03	0.46	<0.01
Perfluorononanoic acid	µg/L	<0.01	<0.01	0.05	<0.01
Perfluorodecanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid	µg/L	<0.02	<0.02	<0.2	<0.02
Perfluorododecanoic acid	µg/L	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid	µg/L	<0.1	<0.1	<0.1	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5	<0.5	<0.5	<0.5
4:2 FTS	µg/L	<0.01	<0.01	<0.01	<0.01
6:2 FTS	µg/L	<0.01	<0.01	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02
10:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1	<0.1	<0.1	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctanesulfonamide	µg/L	<0.1	<0.1	<0.1	<0.1
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.05	<0.05	<0.05	<0.05
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.5	<0.5	<0.5	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	0.2	<0.02
Surrogate ¹³ C ₈ PFOS	%	92	90	69	82
Surrogate ¹³ C ₂ PFOA	%	87	90	76	80
Extracted ISTD ¹³ C ₃ PFBS	%	98	99	90	92
Extracted ISTD ¹⁸ O ₂ PFHxS	%	99	103	87	98
Extracted ISTD ¹³ C ₄ PFOS	%	109	110	116	112
Extracted ISTD ¹³ C ₄ PFBA	%	68	87	#	63

Client Reference: CTP Groundwater Monitoring

PFAS in Waters Extended					
Our Reference		339966-1	339966-2	339966-3	339966-4
Your Reference	UNITS	S02d	S06	SMW_BH126	SMW_BH019
Date Sampled		11/12/2023	11/12/2023	11/12/2023	11/12/2023
Type of sample		Water	Water	Water	Water
Extracted ISTD ¹³ C ₃ PFPeA	%	92	107	48	107
Extracted ISTD ¹³ C ₂ PFHxA	%	100	98	53	97
Extracted ISTD ¹³ C ₄ PFHpA	%	102	100	88	102
Extracted ISTD ¹³ C ₄ PFOA	%	110	109	87	107
Extracted ISTD ¹³ C ₅ PFNA	%	88	96	80	88
Extracted ISTD ¹³ C ₂ PFDA	%	92	95	75	89
Extracted ISTD ¹³ C ₂ PFUnDA	%	79	90	#	68
Extracted ISTD ¹³ C ₂ PFDoDA	%	113	111	94	94
Extracted ISTD ¹³ C ₂ PFTeDA	%	93	97	70	82
Extracted ISTD ¹³ C ₂ 4:2FTS	%	94	118	150	106
Extracted ISTD ¹³ C ₂ 6:2FTS	%	143	130	171	118
Extracted ISTD ¹³ C ₂ 8:2FTS	%	121	121	104	97
Extracted ISTD ¹³ C ₈ FOSA	%	119	129	112	128
Extracted ISTD d ₃ N MeFOSA	%	92	100	71	86
Extracted ISTD d ₅ N EtFOSA	%	101	108	90	97
Extracted ISTD d ₇ N MeFOSE	%	158	174	184	173
Extracted ISTD d ₉ N EtFOSE	%	197	#	#	#
Extracted ISTD d ₃ N MeFOSAA	%	119	124	68	112
Extracted ISTD d ₅ N EtFOSAA	%	117	127	82	101
Total Positive PFHxS & PFOS	µg/L	<0.01	1.8	0.37	0.01
Total Positive PFOA & PFOS	µg/L	<0.01	1.1	0.61	0.01
Total Positive PFAS	µg/L	0.01	2.4	7.2	0.02

Client Reference: CTP Groundwater Monitoring

Dissolved Gases in Water					
Our Reference		339966-1	339966-2	339966-3	339966-4
Your Reference	UNITS	S02d	S06	SMW_BH126	SMW_BH019
Date Sampled		11/12/2023	11/12/2023	11/12/2023	11/12/2023
Type of sample		Water	Water	Water	Water
Date prepared	-	18/12/2023	18/12/2023	18/12/2023	18/12/2023
Date analysed	-	18/12/2023	18/12/2023	18/12/2023	18/12/2023
Methane	µg/L	400	7,100	7,500	1,600

Client Reference: CTP Groundwater Monitoring

Method ID	Methodology Summary
AT-006	Dissolved gases determined by GC-FID based on draft method USEPA SOP RSK175
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% ie total anions = total cations +/-15%.
Inorg-055	Nitrate - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-055/062/127	Total Nitrogen - Calculation sum of TKN and oxidised Nitrogen. Alternatively analysed by combustion and chemiluminescence.
Inorg-057	Ammonia - determined colourimetrically, based on APHA latest edition 4500-NH3 F. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a KCl extraction.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
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.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

Client Reference: CTP Groundwater Monitoring

Method ID	Methodology Summary
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date Extracted	-			12/12/2023	[NT]	[NT]	[NT]	[NT]	12/12/2023	[NT]
Date Analysed	-			13/12/2023	[NT]	[NT]	[NT]	[NT]	13/12/2023	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	80	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	84	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Dibromomethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	87	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Bromoform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	119	[NT]
Styrene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	116	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	94	[NT]	[NT]	[NT]	[NT]	92	[NT]
Surrogate Toluene-d8	%		Org-023	100	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	126	[NT]	[NT]	[NT]	[NT]	116	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			12/12/2023	[NT]	[NT]	[NT]	[NT]	12/12/2023	[NT]
Date analysed	-			13/12/2023	[NT]	[NT]	[NT]	[NT]	13/12/2023	[NT]
TRH C ₆ - C ₉	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	109	[NT]
TRH C ₆ - C ₁₀	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	109	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	119	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	94	[NT]	[NT]	[NT]	[NT]	92	[NT]
Surrogate Toluene-d8	%		Org-023	100	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	126	[NT]	[NT]	[NT]	[NT]	116	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W5	[NT]
Date extracted	-			14/12/2023	[NT]	[NT]	[NT]	[NT]	14/12/2023	[NT]
Date analysed	-			15/12/2023	[NT]	[NT]	[NT]	[NT]	15/12/2023	[NT]
TRH C ₁₀ - C ₁₄	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	92	[NT]
TRH C ₁₅ - C ₂₈	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	93	[NT]
TRH C ₂₉ - C ₃₆	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	92	[NT]
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	93	[NT]
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
Surrogate o-Terphenyl	%		Org-020	90	[NT]	[NT]	[NT]	[NT]	113	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PAHs in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			14/12/2023	[NT]	[NT]	[NT]	[NT]	14/12/2023	[NT]
Date analysed	-			15/12/2023	[NT]	[NT]	[NT]	[NT]	15/12/2023	[NT]
Naphthalene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	85	[NT]	[NT]	[NT]	[NT]	96	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: All metals in water-dissolved					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date prepared	-			13/12/2023	3	13/12/2023	13/12/2023		13/12/2023	[NT]
Date analysed	-			13/12/2023	3	13/12/2023	13/12/2023		13/12/2023	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	3	4	4	0	100	[NT]
Boron-Dissolved	µg/L	20	Metals-022	<20	3	1800	1700	6	108	[NT]
Barium-Dissolved	µg/L	1	Metals-022	<1	3	1100	1200	9	99	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	3	<0.5	<0.5	0	109	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	3	<0.1	<0.1	0	102	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	3	24	25	4	103	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	3	<1	<1	0	98	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	<1	3	11	11	0	96	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	3	<0.05	[NT]		87	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	<5	3	26	26	0	103	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	3	2	2	0	101	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	3	28	28	0	102	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	3	<1	<1	0	106	[NT]
Antimony-Dissolved	µg/L	1	Metals-022	<1	3	<1	<1	0	116	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	<1	3	<1	<1	0	94	[NT]
Tin-Dissolved	µg/L	1	Metals-022	<1	3	<1	<1	0	105	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	3	25	25	0	103	[NT]
Iron-Dissolved	µg/L	10	Metals-022	<10	3	410	390	5	105	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: All metals in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	339966-3
Date prepared	-			13/12/2023	1	13/12/2023	13/12/2023		13/12/2023	13/12/2023
Date analysed	-			13/12/2023	1	13/12/2023	13/12/2023		13/12/2023	13/12/2023
Arsenic-Total	µg/L	1	Metals-022	<1	1	50	52	4	108	93
Boron-Total	µg/L	20	Metals-022	<20	1	1000	1000	0	105	#
Barium-Total	µg/L	1	Metals-022	<1	1	1500	1500	0	99	#
Beryllium-Total	µg/L	0.5	Metals-022	<0.5	1	4	4	0	107	118
Cadmium-Total	µg/L	0.1	Metals-022	<0.1	1	2.3	2.6	12	106	108
Chromium-Total	µg/L	1	Metals-022	<1	1	190	210	10	108	112
Copper-Total	µg/L	1	Metals-022	<1	1	560	620	10	101	99
Cobalt-Total	µg/L	1	Metals-022	<1	1	79	87	10	101	102
Mercury-Total	µg/L	0.05	Metals-021	<0.05	1	<0.05	[NT]		91	[NT]
Manganese-Total	µg/L	5	Metals-022	<5	1	3300	3200	3	107	#
Molybdenum-Total	µg/L	1	Metals-022	<1	1	66	72	9	106	85
Nickel-Total	µg/L	1	Metals-022	<1	1	130	150	14	106	104
Lead-Total	µg/L	1	Metals-022	<1	1	400	410	2	106	110
Antimony-Total	µg/L	1	Metals-022	<1	1	9	9	0	116	74
Selenium-Total	µg/L	1	Metals-022	<1	1	2	2	0	96	71
Tin-Total	µg/L	1	Metals-022	<1	1	28	31	10	111	85
Zinc-Total	µg/L	1	Metals-022	<1	1	3300	3200	3	106	#
Iron-Total	µg/L	10	Metals-022	<10	1	150000	140000	7	109	#

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Metals in Waters - Total					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	339966-2
Date prepared	-			13/12/2023	1	13/12/2023	13/12/2023		13/12/2023	13/12/2023
Date analysed	-			13/12/2023	1	13/12/2023	13/12/2023		13/12/2023	13/12/2023
Phosphorus - Total	mg/L	0.05	Metals-020	<0.05	1	3.2	3.4	6	103	113

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			12/12/2023	1	12/12/2023	12/12/2023		12/12/2023	[NT]
Date analysed	-			12/12/2023	1	12/12/2023	12/12/2023		12/12/2023	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	1	0.70	[NT]		103	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	1	<0.005	[NT]		92	[NT]
Total Nitrogen in water	mg/L	0.1	Inorg-055/062/127	<0.1	1	1.6	1.6	0	87	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			12/12/2023	2	12/12/2023	12/12/2023		12/12/2023	[NT]
Date analysed	-			12/12/2023	2	12/12/2023	12/12/2023		12/12/2023	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	2	43	[NT]		103	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	2	32	[NT]		91	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	2	130	[NT]		102	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	2	29	[NT]		103	[NT]
Hardness	mgCaCO ₃ /L	3	Metals-020	[NT]	2	230	[NT]		[NT]	[NT]
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	5	Inorg-006	<5	2	<5	[NT]		[NT]	[NT]
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	2	480	[NT]		[NT]	[NT]
Carbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	2	<5	[NT]		[NT]	[NT]
Total Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	2	480	[NT]		98	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	<1	2	24	27	12	119	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	2	98	110	12	111	[NT]
Ionic Balance	%		Inorg-040	[NT]	2	-7.0	[NT]		[NT]	[NT]

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	3	12/12/2023	12/12/2023		[NT]	[NT]
Date analysed	-			[NT]	3	12/12/2023	12/12/2023		[NT]	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	[NT]	3	43	40	7	[NT]	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	[NT]	3	380	390	3	[NT]	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	[NT]	3	2100	2200	5	[NT]	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	[NT]	3	80	76	5	[NT]	[NT]
Hardness	mgCaCO ₃ /L	3	Metals-020	[NT]	3	430	410	5	[NT]	[NT]
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	5	Inorg-006	[NT]	3	<5	[NT]		[NT]	[NT]
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	3	2000	[NT]		[NT]	[NT]
Carbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	3	<5	[NT]		[NT]	[NT]
Total Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	3	2000	[NT]		[NT]	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	[NT]	3	2	[NT]		[NT]	[NT]
Chloride, Cl	mg/L	1	Inorg-081	[NT]	3	3300	[NT]		[NT]	[NT]
Ionic Balance	%		Inorg-040	[NT]	3	-9.0	[NT]		[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	4	12/12/2023	12/12/2023		[NT]	[NT]
Date analysed	-			[NT]	4	12/12/2023	12/12/2023		[NT]	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	[NT]	4	260	[NT]		[NT]	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	[NT]	4	38	[NT]		[NT]	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	[NT]	4	1800	[NT]		[NT]	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	[NT]	4	240	[NT]		[NT]	[NT]
Hardness	mgCaCO ₃ /L	3	Metals-020	[NT]	4	1600	[NT]		[NT]	[NT]
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	5	Inorg-006	[NT]	4	<5	<5	0	[NT]	[NT]
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	4	560	600	7	[NT]	[NT]
Carbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	4	<5	<5	0	[NT]	[NT]
Total Alkalinity as CaCO ₃	mg/L	5	Inorg-006	[NT]	4	560	600	7	[NT]	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	[NT]	4	150	[NT]		[NT]	[NT]
Chloride, Cl	mg/L	1	Inorg-081	[NT]	4	3500	[NT]		[NT]	[NT]
Ionic Balance	%		Inorg-040	[NT]	4	-1.0	[NT]		[NT]	[NT]

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	339966-2
Date prepared	-			12/12/2023	1	12/12/2023	12/12/2023		12/12/2023	12/12/2023
Date analysed	-			12/12/2023	1	12/12/2023	12/12/2023		12/12/2023	12/12/2023
Perfluorobutanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	110	106
Perfluoropentanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	100	95
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	114	109
Perfluoroheptanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	118	118
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	1	<0.01	0.01	0	105	107
Perfluorodecanesulfonic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	108	112
Perfluorobutanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	112	109
Perfluoropentanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	107	105
Perfluorohexanoic acid	µg/L	0.01	Org-029	<0.01	1	0.01	<0.01	0	111	103
Perfluoroheptanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	110	113
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	91	92
Perfluorononanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	121	123
Perfluorodecanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	106	104
Perfluoroundecanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	105	100
Perfluorododecanoic acid	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	92	85
Perfluorotridecanoic acid	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	81	78
Perfluorotetradecanoic acid	µg/L	0.5	Org-029	<0.5	1	<0.5	<0.5	0	104	94
4:2 FTS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	108	104
6:2 FTS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	96	91
8:2 FTS	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	108	112
10:2 FTS	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	125	130
Perfluorooctane sulfonamide	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	121	122
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	111	111
N-Ethyl perfluorooctanesulfon amide	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	94	92
N-Me perfluorooctanesulfonamid oethanol	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	92	89
N-Et perfluorooctanesulfonamid oethanol	µg/L	0.5	Org-029	<0.5	1	<0.5	<0.5	0	72	72
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	88	86
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	116	119
Surrogate ¹³ C ₈ PFOS	%		Org-029	92	1	92	87	6	97	94
Surrogate ¹³ C ₂ PFOA	%		Org-029	93	1	87	87	0	89	88

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	339966-2
Extracted ISTD ¹³ C ₃ PFBS	%		Org-029	92	1	98	98	0	94	100
Extracted ISTD ¹⁸ O ₂ PFHxS	%		Org-029	102	1	99	102	3	100	103
Extracted ISTD ¹³ C ₄ PFOS	%		Org-029	108	1	109	111	2	105	106
Extracted ISTD ¹³ C ₄ PFBA	%		Org-029	102	1	68	70	3	100	86
Extracted ISTD ¹³ C ₃ PFPeA	%		Org-029	110	1	92	98	6	106	107
Extracted ISTD ¹³ C ₂ PFHxA	%		Org-029	102	1	100	97	3	101	104
Extracted ISTD ¹³ C ₄ PFHpA	%		Org-029	96	1	102	96	6	99	97
Extracted ISTD ¹³ C ₄ PFOA	%		Org-029	104	1	110	105	5	104	108
Extracted ISTD ¹³ C ₅ PFNA	%		Org-029	94	1	88	89	1	91	90
Extracted ISTD ¹³ C ₂ PFDA	%		Org-029	97	1	92	90	2	93	92
Extracted ISTD ¹³ C ₂ PFUnDA	%		Org-029	78	1	79	75	5	88	83
Extracted ISTD ¹³ C ₂ PFDoDA	%		Org-029	109	1	113	104	8	105	108
Extracted ISTD ¹³ C ₂ PFTeDA	%		Org-029	83	1	93	90	3	86	95
Extracted ISTD ¹³ C ₂ 4:2FTS	%		Org-029	108	1	94	81	15	103	118
Extracted ISTD ¹³ C ₂ 6:2FTS	%		Org-029	119	1	143	97	38	113	128
Extracted ISTD ¹³ C ₂ 8:2FTS	%		Org-029	114	1	121	92	27	119	117
Extracted ISTD ¹³ C ₈ FOSA	%		Org-029	123	1	119	116	3	118	120
Extracted ISTD d ₃ N MeFOSA	%		Org-029	79	1	92	89	3	98	99
Extracted ISTD d ₅ N EtFOSA	%		Org-029	86	1	101	101	0	102	104
Extracted ISTD d ₇ N MeFOSE	%		Org-029	121	1	158	164	4	165	168

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: PFAS in Waters Extended						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	339966-2
Extracted ISTD d ₉ N EtFOSE	%		Org-029	152	1	197	#		189	190
Extracted ISTD d ₃ N MeFOSAA	%		Org-029	114	1	119	95	22	117	119
Extracted ISTD d ₅ N EtFOSAA	%		Org-029	115	1	117	95	21	127	120

Client Reference: CTP Groundwater Monitoring

QUALITY CONTROL: Dissolved Gases in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			18/12/2023	1	18/12/2023	18/12/2023		18/12/2023	[NT]
Date analysed	-			18/12/2023	1	18/12/2023	18/12/2023		18/12/2023	[NT]
Methane	µg/L	5	AT-006	<5	1	400	390	3	95	[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

For PFAS Extracted Internal Standards denoted with # or outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).

PFAS_W_EXT1: PQLs have been raised for PFPeA in sample 339966-3 due to matrix interference.

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

- # 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.

CERTIFICATE OF ANALYSIS 340203

Client Details

Client	CTP AFJV
Attention	
Address	7 Figtree Dr, SYDNEY OLYMPIC PARK, NSW, 2127

Sample Details

Your Reference	<u>CTP Groundwater Monitoring - 12.12.23</u>
Number of Samples	7 Water
Date samples received	13/12/2023
Date completed instructions received	14/12/2023

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	21/12/2023
Date of Issue	22/12/2023
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VOCs in water						
Our Reference	UNITS	340203-1	340203-2	340203-3	340203-4	340203-5
Your Reference		BH120	MW01s	BH715B	MW01d	BH36
Date Sampled		12/12/2023	12/12/2023	12/12/2023	12/12/2023	12/12/2023
Type of sample		Water	Water	Water	Water	Water
Date Extracted	-	15/12/2023	15/12/2023	15/12/2023	15/12/2023	15/12/2023
Date Analysed	-	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023
Dichlorodifluoromethane	µg/L	<10	<10	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<1	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1
Benzene	µg/L	<1	<1	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1

VOCs in water						
Our Reference		340203-1	340203-2	340203-3	340203-4	340203-5
Your Reference	UNITS	BH120	MW01s	BH715B	MW01d	BH36
Date Sampled		12/12/2023	12/12/2023	12/12/2023	12/12/2023	12/12/2023
Type of sample		Water	Water	Water	Water	Water
Bromoform	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
Styrene	µg/L	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
o-xylene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	103	103	103	103	102
Surrogate Toluene-d8	%	100	100	100	100	100
Surrogate 4-Bromofluorobenzene	%	102	100	100	104	102

VOCs in water			
Our Reference		340203-6	340203-7
Your Reference	UNITS	MW03s	MW03d
Date Sampled		12/12/2023	12/12/2023
Type of sample		Water	Water
Date Extracted	-	15/12/2023	15/12/2023
Date Analysed	-	18/12/2023	18/12/2023
Dichlorodifluoromethane	µg/L	<10	<10
Chloromethane	µg/L	<10	<10
Vinyl Chloride	µg/L	<10	<10
Bromomethane	µg/L	<10	<10
Chloroethane	µg/L	<10	<10
Trichlorofluoromethane	µg/L	<10	<10
1,1-Dichloroethene	µg/L	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1
1,1-dichloroethane	µg/L	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1
Bromochloromethane	µg/L	<1	<1
Chloroform	µg/L	<1	<1
2,2-dichloropropane	µg/L	<1	<1
1,2-dichloroethane	µg/L	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1
1,1-dichloropropene	µg/L	<1	<1
Cyclohexane	µg/L	<1	<1
Carbon tetrachloride	µg/L	<1	<1
Benzene	µg/L	<1	<1
Dibromomethane	µg/L	<1	<1
1,2-dichloropropane	µg/L	<1	<1
Trichloroethene	µg/L	<1	<1
Bromodichloromethane	µg/L	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1
Toluene	µg/L	<1	<1
1,3-dichloropropane	µg/L	<1	<1
Dibromochloromethane	µg/L	<1	<1
1,2-dibromoethane	µg/L	<1	<1
Tetrachloroethene	µg/L	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1
Chlorobenzene	µg/L	<1	<1
Ethylbenzene	µg/L	<1	<1

VOCs in water			
Our Reference		340203-6	340203-7
Your Reference	UNITS	MW03s	MW03d
Date Sampled		12/12/2023	12/12/2023
Type of sample		Water	Water
Bromoform	µg/L	<1	<1
m+p-xylene	µg/L	<2	<2
Styrene	µg/L	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1
o-xylene	µg/L	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1
Isopropylbenzene	µg/L	<1	<1
Bromobenzene	µg/L	<1	<1
n-propyl benzene	µg/L	<1	<1
2-chlorotoluene	µg/L	<1	<1
4-chlorotoluene	µg/L	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1
Tert-butyl benzene	µg/L	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1
Sec-butyl benzene	µg/L	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1
4-isopropyl toluene	µg/L	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1
n-butyl benzene	µg/L	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1
Hexachlorobutadiene	µg/L	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1
Surrogate Dibromofluoromethane	%	103	102
Surrogate Toluene-d8	%	100	100
Surrogate 4-Bromofluorobenzene	%	103	102

vTRH(C6-C10)/BTEXN in Water						
Our Reference		340203-1	340203-2	340203-3	340203-4	340203-5
Your Reference	UNITS	BH120	MW01s	BH715B	MW01d	BH36
Date Sampled		12/12/2023	12/12/2023	12/12/2023	12/12/2023	12/12/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	15/12/2023	15/12/2023	15/12/2023	15/12/2023	15/12/2023
Date analysed	-	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023
TRH C ₆ - C ₉	µg/L	<10	<10	<10	<10	<10
TRH C ₆ - C ₁₀	µg/L	<10	<10	<10	<10	<10
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	<10	<10	<10	<10	<10
Benzene	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
o-xylene	µg/L	<1	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	103	103	103	103	102
Surrogate Toluene-d8	%	100	100	100	100	100
Surrogate 4-Bromofluorobenzene	%	102	100	100	104	102

vTRH(C6-C10)/BTEXN in Water			
Our Reference		340203-6	340203-7
Your Reference	UNITS	MW03s	MW03d
Date Sampled		12/12/2023	12/12/2023
Type of sample		Water	Water
Date extracted	-	15/12/2023	15/12/2023
Date analysed	-	18/12/2023	18/12/2023
TRH C ₆ - C ₉	µg/L	<10	<10
TRH C ₆ - C ₁₀	µg/L	<10	<10
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	<10	<10
Benzene	µg/L	<1	<1
Toluene	µg/L	<1	<1
Ethylbenzene	µg/L	<1	<1
m+p-xylene	µg/L	<2	<2
o-xylene	µg/L	<1	<1
Naphthalene	µg/L	<1	<1
Surrogate Dibromofluoromethane	%	103	102
Surrogate Toluene-d8	%	100	100
Surrogate 4-Bromofluorobenzene	%	103	102

svTRH (C10-C40) in Water						
Our Reference		340203-1	340203-2	340203-3	340203-4	340203-5
Your Reference	UNITS	BH120	MW01s	BH715B	MW01d	BH36
Date Sampled		12/12/2023	12/12/2023	12/12/2023	12/12/2023	12/12/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	20/12/2023	20/12/2023	20/12/2023	20/12/2023	20/12/2023
Date analysed	-	21/12/2023	21/12/2023	21/12/2023	21/12/2023	21/12/2023
TRH C ₁₀ - C ₁₄	µg/L	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	µg/L	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆	µg/L	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	<50	<50	<50	<50	<50
TRH >C ₁₆ - C ₃₄	µg/L	<100	<100	<100	<100	<100
TRH >C ₃₄ - C ₄₀	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	92	79	75	71	72

svTRH (C10-C40) in Water			
Our Reference		340203-6	340203-7
Your Reference	UNITS	MW03s	MW03d
Date Sampled		12/12/2023	12/12/2023
Type of sample		Water	Water
Date extracted	-	20/12/2023	20/12/2023
Date analysed	-	21/12/2023	21/12/2023
TRH C ₁₀ - C ₁₄	µg/L	<50	<50
TRH C ₁₅ - C ₂₈	µg/L	<100	<100
TRH C ₂₉ - C ₃₆	µg/L	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50
TRH >C ₁₀ - C ₁₆	µg/L	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	<50	<50
TRH >C ₁₆ - C ₃₄	µg/L	<100	<100
TRH >C ₃₄ - C ₄₀	µg/L	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50
Surrogate o-Terphenyl	%	76	95

PAHs in Water						
Our Reference		340203-1	340203-2	340203-3	340203-4	340203-5
Your Reference	UNITS	BH120	MW01s	BH715B	MW01d	BH36
Date Sampled		12/12/2023	12/12/2023	12/12/2023	12/12/2023	12/12/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	20/12/2023	20/12/2023	20/12/2023	20/12/2023	20/12/2023
Date analysed	-	21/12/2023	21/12/2023	21/12/2023	21/12/2023	21/12/2023
Naphthalene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate <i>p</i> -Terphenyl-d14	%	88	87	86	88	75

PAHs in Water			
Our Reference		340203-6	340203-7
Your Reference	UNITS	MW03s	MW03d
Date Sampled		12/12/2023	12/12/2023
Type of sample		Water	Water
Date extracted	-	20/12/2023	20/12/2023
Date analysed	-	21/12/2023	21/12/2023
Naphthalene	µg/L	<0.1	<0.1
Acenaphthylene	µg/L	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1
Surrogate <i>p</i> -Terphenyl-d14	%	83	91

All metals in water-dissolved						
Our Reference	UNITS	340203-1	340203-2	340203-3	340203-4	340203-5
Your Reference		BH120	MW01s	BH715B	MW01d	BH36
Date Sampled		12/12/2023	12/12/2023	12/12/2023	12/12/2023	12/12/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	19/12/2023	19/12/2023	19/12/2023	19/12/2023	19/12/2023
Date analysed	-	19/12/2023	19/12/2023	19/12/2023	19/12/2023	19/12/2023
Arsenic-Dissolved	µg/L	<1	2	1	1	2
Boron-Dissolved	µg/L	40	<20	70	<20	100
Barium-Dissolved	µg/L	50	24	94	67	13
Beryllium-Dissolved	µg/L	<0.5	<0.5	<0.5	<0.5	1
Cadmium-Dissolved	µg/L	<0.1	0.1	<0.1	<0.1	0.1
Chromium-Dissolved	µg/L	<1	<1	<1	<1	<1
Copper-Dissolved	µg/L	10	2	1	<1	5
Cobalt-Dissolved	µg/L	27	8	15	<1	32
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Manganese-Dissolved	µg/L	420	2,600	1,300	260	1,600
Molybdenum-Dissolved	µg/L	1	<1	8	4	<1
Nickel-Dissolved	µg/L	20	14	14	1	23
Lead-Dissolved	µg/L	<1	<1	<1	<1	<1
Antimony-Dissolved	µg/L	<1	<1	<1	<1	<1
Selenium-Dissolved	µg/L	<1	<1	<1	<1	<1
Tin-Dissolved	µg/L	<1	<1	<1	<1	<1
Zinc-Dissolved	µg/L	18	30	31	5	100
Iron-Dissolved	µg/L	<10	<10	<10	<10	10

All metals in water-dissolved			
Our Reference		340203-6	340203-7
Your Reference	UNITS	MW03s	MW03d
Date Sampled		12/12/2023	12/12/2023
Type of sample		Water	Water
Date prepared	-	19/12/2023	19/12/2023
Date analysed	-	19/12/2023	19/12/2023
Arsenic-Dissolved	µg/L	<1	<1
Boron-Dissolved	µg/L	<20	<20
Barium-Dissolved	µg/L	21	46
Beryllium-Dissolved	µg/L	<0.5	1
Cadmium-Dissolved	µg/L	<0.1	0.2
Chromium-Dissolved	µg/L	<1	<1
Copper-Dissolved	µg/L	<1	<1
Cobalt-Dissolved	µg/L	<1	67
Mercury-Dissolved	µg/L	<0.05	<0.05
Manganese-Dissolved	µg/L	570	4,600
Molybdenum-Dissolved	µg/L	<1	<1
Nickel-Dissolved	µg/L	9	43
Lead-Dissolved	µg/L	<1	<1
Antimony-Dissolved	µg/L	<1	<1
Selenium-Dissolved	µg/L	<1	<1
Tin-Dissolved	µg/L	<1	<1
Zinc-Dissolved	µg/L	13	170
Iron-Dissolved	µg/L	<10	20

All metals in water - total						
Our Reference	UNITS	340203-1	340203-2	340203-3	340203-4	340203-5
Your Reference		BH120	MW01s	BH715B	MW01d	BH36
Date Sampled		12/12/2023	12/12/2023	12/12/2023	12/12/2023	12/12/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	20/12/2023	20/12/2023	20/12/2023	20/12/2023	20/12/2023
Date analysed	-	21/12/2023	21/12/2023	21/12/2023	21/12/2023	21/12/2023
Arsenic-Total	µg/L	1	2	2	<1	25
Boron-Total	µg/L	80	<20	60	30	50
Barium-Total	µg/L	91	24	120	65	570
Beryllium-Total	µg/L	<0.5	<0.5	<0.5	<0.5	15
Cadmium-Total	µg/L	0.2	0.2	0.1	<0.1	0.8
Chromium-Total	µg/L	16	3	19	3	91
Copper-Total	µg/L	37	1	6	<1	360
Cobalt-Total	µg/L	33	10	16	<1	150
Mercury-Total	µg/L	<0.05	<0.1	<0.05	<0.05	<0.05
Manganese-Total	µg/L	540	2,600	1,100	330	5,000
Molybdenum-Total	µg/L	3	1	11	4	5
Nickel-Total	µg/L	40	18	29	4	210
Lead-Total	µg/L	5	<1	2	<1	160
Antimony-Total	µg/L	<1	<1	<1	<1	<1
Selenium-Total	µg/L	1	<1	<1	<1	2
Tin-Total	µg/L	1	1	2	1	4
Zinc-Total	µg/L	39	98	110	8	980
Iron-Total	µg/L	1,800	720	2,700	570	190,000

All metals in water - total			
Our Reference		340203-6	340203-7
Your Reference	UNITS	MW03s	MW03d
Date Sampled		12/12/2023	12/12/2023
Type of sample		Water	Water
Date prepared	-	20/12/2023	20/12/2023
Date analysed	-	21/12/2023	21/12/2023
Arsenic-Total	µg/L	5	<1
Boron-Total	µg/L	20	20
Barium-Total	µg/L	36	51
Beryllium-Total	µg/L	<0.5	2
Cadmium-Total	µg/L	<0.1	0.2
Chromium-Total	µg/L	2	3
Copper-Total	µg/L	<1	<1
Cobalt-Total	µg/L	12	87
Mercury-Total	µg/L	<0.05	<0.05
Manganese-Total	µg/L	1,600	4,700
Molybdenum-Total	µg/L	1	<1
Nickel-Total	µg/L	12	51
Lead-Total	µg/L	1	<1
Antimony-Total	µg/L	<1	<1
Selenium-Total	µg/L	<1	<1
Tin-Total	µg/L	<1	<1
Zinc-Total	µg/L	25	210
Iron-Total	µg/L	2,000	1,400

Metals in Waters - Total						
Our Reference		340203-1	340203-2	340203-3	340203-4	340203-5
Your Reference	UNITS	BH120	MW01s	BH715B	MW01d	BH36
Date Sampled		12/12/2023	12/12/2023	12/12/2023	12/12/2023	12/12/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	15/12/2023	15/12/2023	15/12/2023	15/12/2023	15/12/2023
Date analysed	-	15/12/2023	15/12/2023	15/12/2023	15/12/2023	15/12/2023
Phosphorus - Total	mg/L	0.08	<0.05	0.2	<0.05	8.5

Metals in Waters - Total			
Our Reference		340203-6	340203-7
Your Reference	UNITS	MW03s	MW03d
Date Sampled		12/12/2023	12/12/2023
Type of sample		Water	Water
Date prepared	-	15/12/2023	15/12/2023
Date analysed	-	15/12/2023	15/12/2023
Phosphorus - Total	mg/L	0.07	<0.05

Miscellaneous Inorganics

Our Reference		340203-1	340203-2	340203-3	340203-4	340203-5
Your Reference	UNITS	BH120	MW01s	BH715B	MW01d	BH36
Date Sampled		12/12/2023	12/12/2023	12/12/2023	12/12/2023	12/12/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	14/12/2023	14/12/2023	14/12/2023	14/12/2023	14/12/2023
Date analysed	-	14/12/2023	14/12/2023	14/12/2023	14/12/2023	14/12/2023
Ammonia as N in water	mg/L	0.87	4.7	1.0	0.65	0.031
Nitrate as N in water	mg/L	0.48	0.93	0.01	0.092	1.1
Total Nitrogen in water	mg/L	1.4	6.0	1	0.9	0.5

Miscellaneous Inorganics

Our Reference		340203-6	340203-7
Your Reference	UNITS	MW03s	MW03d
Date Sampled		12/12/2023	12/12/2023
Type of sample		Water	Water
Date prepared	-	14/12/2023	14/12/2023
Date analysed	-	14/12/2023	14/12/2023
Ammonia as N in water	mg/L	0.015	0.008
Nitrate as N in water	mg/L	0.069	0.081
Total Nitrogen in water	mg/L	0.2	0.2

Ion Balance						
Our Reference		340203-1	340203-2	340203-3	340203-4	340203-5
Your Reference	UNITS	BH120	MW01s	BH715B	MW01d	BH36
Date Sampled		12/12/2023	12/12/2023	12/12/2023	12/12/2023	12/12/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	14/12/2023	14/12/2023	14/12/2023	14/12/2023	14/12/2023
Date analysed	-	14/12/2023	14/12/2023	14/12/2023	14/12/2023	14/12/2023
Calcium - Dissolved	mg/L	210	110	180	110	3
Potassium - Dissolved	mg/L	54	68	64	44	8.1
Sodium - Dissolved	mg/L	3,500	1,700	3,300	2,100	400
Magnesium - Dissolved	mg/L	490	120	280	160	9.5
Hardness	mgCaCO ₃ /L	2,600	770	1,600	930	48
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5	<5	<5	<5	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	640	590	440	530	110
Carbonate Alkalinity as CaCO ₃	mg/L	<5	<5	<5	<5	<5
Total Alkalinity as CaCO ₃	mg/L	640	590	440	530	110
Sulphate, SO ₄	mg/L	550	710	610	750	420
Chloride, Cl	mg/L	6,200	2,300	4,900	3,000	310
Ionic Balance	%	2.0	-1.0	5.0	1.0	-3.0

Ion Balance			
Our Reference		340203-6	340203-7
Your Reference	UNITS	MW03s	MW03d
Date Sampled		12/12/2023	12/12/2023
Type of sample		Water	Water
Date prepared	-	14/12/2023	14/12/2023
Date analysed	-	14/12/2023	14/12/2023
Calcium - Dissolved	mg/L	81	64
Potassium - Dissolved	mg/L	16	15
Sodium - Dissolved	mg/L	960	910
Magnesium - Dissolved	mg/L	110	100
Hardness	mgCaCO ₃ /L	640	570
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	350	500
Carbonate Alkalinity as CaCO ₃	mg/L	<5	<5
Total Alkalinity as CaCO ₃	mg/L	350	500
Sulphate, SO ₄	mg/L	370	250
Chloride, Cl	mg/L	1,500	1,400
Ionic Balance	%	-2.0	-3.0

PFAS in Waters Extended						
Our Reference		340203-1	340203-2	340203-3	340203-4	340203-5
Your Reference	UNITS	BH120	MW01s	BH715B	MW01d	BH36
Date Sampled		12/12/2023	12/12/2023	12/12/2023	12/12/2023	12/12/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	14/12/2023	14/12/2023	14/12/2023	14/12/2023	14/12/2023
Date analysed	-	14/12/2023	14/12/2023	14/12/2023	14/12/2023	14/12/2023
Perfluorobutanesulfonic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoropentanesulfonic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecanesulfonic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptanoic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
4:2 FTS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
6:2 FTS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
10:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctanesulfonamide	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Surrogate ¹³ C ₈ PFOS	%	93	98	103	99	99
Surrogate ¹³ C ₂ PFOA	%	104	102	101	106	97
Extracted ISTD ¹³ C ₃ PFBS	%	98	105	103	103	105
Extracted ISTD ¹⁸ O ₂ PFHxS	%	111	107	104	111	108
Extracted ISTD ¹³ C ₄ PFOS	%	124	121	114	118	117
Extracted ISTD ¹³ C ₄ PFBA	%	109	102	107	103	76

PFAS in Waters Extended						
Our Reference		340203-1	340203-2	340203-3	340203-4	340203-5
Your Reference	UNITS	BH120	MW01s	BH715B	MW01d	BH36
Date Sampled		12/12/2023	12/12/2023	12/12/2023	12/12/2023	12/12/2023
Type of sample		Water	Water	Water	Water	Water
Extracted ISTD ¹³ C ₃ PFPeA	%	117	124	120	123	126
Extracted ISTD ¹³ C ₂ PFHxA	%	104	102	106	104	105
Extracted ISTD ¹³ C ₄ PFHpA	%	105	103	105	105	106
Extracted ISTD ¹³ C ₄ PFOA	%	124	126	124	122	128
Extracted ISTD ¹³ C ₅ PFNA	%	115	118	114	117	116
Extracted ISTD ¹³ C ₂ PFDA	%	148	146	134	135	138
Extracted ISTD ¹³ C ₂ PFUnDA	%	157	158	137	150	147
Extracted ISTD ¹³ C ₂ PFDoDA	%	179	175	158	166	175
Extracted ISTD ¹³ C ₂ PFTeDA	%	150	135	138	140	139
Extracted ISTD ¹³ C ₂ 4:2FTS	%	84	94	86	93	93
Extracted ISTD ¹³ C ₂ 6:2FTS	%	140	140	133	141	133
Extracted ISTD ¹³ C ₂ 8:2FTS	%	179	#	167	163	177
Extracted ISTD ¹³ C ₈ FOSA	%	117	118	116	118	116
Extracted ISTD d ₃ N MeFOSA	%	119	118	113	115	116
Extracted ISTD d ₅ N EtFOSA	%	110	108	106	105	106
Extracted ISTD d ₇ N MeFOSE	%	113	115	109	108	113
Extracted ISTD d ₉ N EtFOSE	%	129	130	117	120	122
Extracted ISTD d ₃ N MeFOSAA	%	126	135	123	127	132
Extracted ISTD d ₅ N EtFOSAA	%	131	133	120	127	132
Total Positive PFHxS & PFOS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Total Positive PFOA & PFOS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Total Positive PFAS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01

PFAS in Waters Extended			
Our Reference		340203-6	340203-7
Your Reference	UNITS	MW03s	MW03d
Date Sampled		12/12/2023	12/12/2023
Type of sample		Water	Water
Date prepared	-	14/12/2023	14/12/2023
Date analysed	-	14/12/2023	14/12/2023
Perfluorobutanesulfonic acid	µg/L	0.03	0.02
Perfluoropentanesulfonic acid	µg/L	0.02	0.02
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.02	<0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01	<0.01
Perfluorodecanesulfonic acid	µg/L	<0.02	<0.02
Perfluorobutanoic acid	µg/L	0.04	<0.02
Perfluoropentanoic acid	µg/L	<0.02	<0.02
Perfluorohexanoic acid	µg/L	<0.01	<0.01
Perfluoroheptanoic acid	µg/L	<0.01	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01	<0.01
Perfluorononanoic acid	µg/L	<0.01	<0.01
Perfluorodecanoic acid	µg/L	<0.02	<0.02
Perfluoroundecanoic acid	µg/L	<0.02	<0.02
Perfluorododecanoic acid	µg/L	<0.05	<0.05
Perfluorotridecanoic acid	µg/L	<0.1	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5	<0.5
4:2 FTS	µg/L	<0.01	<0.01
6:2 FTS	µg/L	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02
10:2 FTS	µg/L	<0.02	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05	<0.05
N-Ethyl perfluorooctanesulfonamide	µg/L	<0.1	<0.1
N-Me perfluorooctanesulfonamidethanol	µg/L	<0.05	<0.05
N-Et perfluorooctanesulfonamidethanol	µg/L	<0.5	<0.5
MePerfluorooctanesulfonamidacetic acid	µg/L	<0.02	<0.02
EtPerfluorooctanesulfonamidacetic acid	µg/L	<0.02	<0.02
Surrogate ¹³ C ₈ PFOS	%	96	101
Surrogate ¹³ C ₂ PFOA	%	103	106
Extracted ISTD ¹³ C ₃ PFBS	%	104	106
Extracted ISTD ¹⁸ O ₂ PFHxS	%	107	107
Extracted ISTD ¹³ C ₄ PFOS	%	121	117
Extracted ISTD ¹³ C ₄ PFBA	%	105	107

PFAS in Waters Extended			
Our Reference		340203-6	340203-7
Your Reference	UNITS	MW03s	MW03d
Date Sampled		12/12/2023	12/12/2023
Type of sample		Water	Water
Extracted ISTD ¹³ C ₃ PFPeA	%	125	123
Extracted ISTD ¹³ C ₂ PFHxA	%	111	108
Extracted ISTD ¹³ C ₄ PFHpA	%	109	107
Extracted ISTD ¹³ C ₄ PFOA	%	127	125
Extracted ISTD ¹³ C ₅ PFNA	%	120	117
Extracted ISTD ¹³ C ₂ PFDA	%	146	136
Extracted ISTD ¹³ C ₂ PFUnDA	%	158	148
Extracted ISTD ¹³ C ₂ PFDoDA	%	171	173
Extracted ISTD ¹³ C ₂ PFTeDA	%	139	151
Extracted ISTD ¹³ C ₂ 4:2FTS	%	99	99
Extracted ISTD ¹³ C ₂ 6:2FTS	%	142	135
Extracted ISTD ¹³ C ₂ 8:2FTS	%	180	186
Extracted ISTD ¹³ C ₈ FOSA	%	119	119
Extracted ISTD d ₃ N MeFOSA	%	117	119
Extracted ISTD d ₅ N EtFOSA	%	107	109
Extracted ISTD d ₇ N MeFOSE	%	113	110
Extracted ISTD d ₉ N EtFOSE	%	117	116
Extracted ISTD d ₃ N MeFOSAA	%	134	132
Extracted ISTD d ₅ N EtFOSAA	%	132	129
Total Positive PFHxS & PFOS	µg/L	0.02	<0.01
Total Positive PFOA & PFOS	µg/L	<0.01	<0.01
Total Positive PFAS	µg/L	0.10	0.04

Dissolved Gases in Water

Our Reference		340203-1	340203-2	340203-3	340203-4	340203-5
Your Reference	UNITS	BH120	MW01s	BH715B	MW01d	BH36
Date Sampled		12/12/2023	12/12/2023	12/12/2023	12/12/2023	12/12/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	19/12/2023	19/12/2023	19/12/2023	19/12/2023	19/12/2023
Date analysed	-	19/12/2023	19/12/2023	19/12/2023	19/12/2023	19/12/2023
Methane	µg/L	<5	9	500	<5	<5

Dissolved Gases in Water

Our Reference		340203-6	340203-7
Your Reference	UNITS	MW03s	MW03d
Date Sampled		12/12/2023	12/12/2023
Type of sample		Water	Water
Date prepared	-	19/12/2023	19/12/2023
Date analysed	-	19/12/2023	19/12/2023
Methane	µg/L	<5	<5

Method ID	Methodology Summary
AT-006	Dissolved gases determined by GC-FID based on draft method USEPA SOP RSK175
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% ie total anions = total cations +/-15%.
Inorg-055	Nitrate - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-055/062/127	Total Nitrogen - Calculation sum of TKN and oxidised Nitrogen. Alternatively analysed by combustion and chemiluminescence.
Inorg-057	Ammonia - determined colourimetrically, based on APHA latest edition 4500-NH3 F. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a KCl extraction.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
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.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

Method ID	Methodology Summary
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

Client Reference: CTP Groundwater Monitoring - 12.12.23

QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W5	[NT]
Date Extracted	-			15/12/2023	1	15/12/2023	18/12/2023		15/12/2023	[NT]
Date Analysed	-			18/12/2023	1	18/12/2023	19/12/2023		18/12/2023	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	100	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	1	<1	<1	0	104	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	102	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	103	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	103	[NT]
Dibromomethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	102	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	100	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	104	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	97	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	106	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	108	[NT]
Bromoform	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	110	[NT]
Styrene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]

Client Reference: CTP Groundwater Monitoring - 12.12.23

QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W5	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	107	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	103	1	103	104	1	101	[NT]
Surrogate Toluene-d8	%		Org-023	101	1	100	100	0	101	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	101	1	102	101	1	97	[NT]

Client Reference: CTP Groundwater Monitoring - 12.12.23

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W5	[NT]
Date extracted	-			15/12/2023	1	15/12/2023	18/12/2023		15/12/2023	[NT]
Date analysed	-			18/12/2023	1	18/12/2023	19/12/2023		18/12/2023	[NT]
TRH C ₆ - C ₉	µg/L	10	Org-023	<10	1	<10	<10	0	106	[NT]
TRH C ₆ - C ₁₀	µg/L	10	Org-023	<10	1	<10	<10	0	106	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	103	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	104	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	108	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	110	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	107	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	103	1	103	104	1	101	[NT]
Surrogate Toluene-d8	%		Org-023	101	1	100	100	0	101	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	101	1	102	101	1	97	[NT]

Client Reference: CTP Groundwater Monitoring - 12.12.23

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	340203-2
Date extracted	-			20/12/2023	1	20/12/2023	20/12/2023		20/12/2023	20/12/2023
Date analysed	-			21/12/2023	1	21/12/2023	21/12/2023		21/12/2023	21/12/2023
TRH C ₁₀ - C ₁₄	µg/L	50	Org-020	<50	1	<50	<50	0	97	97
TRH C ₁₅ - C ₂₈	µg/L	100	Org-020	<100	1	<100	<100	0	102	103
TRH C ₂₉ - C ₃₆	µg/L	100	Org-020	<100	1	<100	<100	0	100	98
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-020	<50	1	<50	<50	0	97	97
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-020	<100	1	<100	<100	0	102	103
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-020	<100	1	<100	<100	0	100	98
Surrogate o-Terphenyl	%		Org-020	62	1	92	61	41	78	84

Client Reference: CTP Groundwater Monitoring - 12.12.23

QUALITY CONTROL: PAHs in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	340203-2
Date extracted	-			20/12/2023	1	20/12/2023	20/12/2023		20/12/2023	20/12/2023
Date analysed	-			21/12/2023	1	21/12/2023	21/12/2023		21/12/2023	21/12/2023
Naphthalene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	104	110
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	98
Fluorene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	97	97
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	99	97
Anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	97	96
Pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	98	94
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	99	96
Benzo(b,j,k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	102	99
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	81	1	88	69	24	96	93

Client Reference: CTP Groundwater Monitoring - 12.12.23

QUALITY CONTROL: All metals in water-dissolved					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	340203-2
Date prepared	-			19/12/2023	1	19/12/2023	19/12/2023		19/12/2023	19/12/2023
Date analysed	-			19/12/2023	1	19/12/2023	19/12/2023		19/12/2023	19/12/2023
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	95	102
Boron-Dissolved	µg/L	20	Metals-022	<20	1	40	40	0	105	103
Barium-Dissolved	µg/L	1	Metals-022	<1	1	50	53	6	103	89
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	1	<0.5	<0.5	0	94	92
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	<0.1	<0.1	0	96	111
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	89	99
Copper-Dissolved	µg/L	1	Metals-022	<1	1	10	10	0	92	94
Cobalt-Dissolved	µg/L	1	Metals-022	<1	1	27	27	0	92	102
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	97	83
Manganese-Dissolved	µg/L	5	Metals-022	<5	1	420	430	2	85	#
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	1	1	1	0	93	117
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	20	21	5	87	105
Lead-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	98	82
Antimony-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	109	104
Selenium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	99	103
Tin-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	102	125
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	18	18	0	95	119
Iron-Dissolved	µg/L	10	Metals-022	<10	1	<10	<10	0	90	109

Client Reference: CTP Groundwater Monitoring - 12.12.23

QUALITY CONTROL: All metals in water - total					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	340203-2
Date prepared	-			20/12/2023	1	20/12/2023	20/12/2023		20/12/2023	20/12/2023
Date analysed	-			21/12/2023	1	21/12/2023	21/12/2023		21/12/2023	21/12/2023
Arsenic-Total	µg/L	1	Metals-022	<1	1	1	1	0	88	[NT]
Boron-Total	µg/L	20	Metals-022	<20	1	80	80	0	92	[NT]
Barium-Total	µg/L	1	Metals-022	<1	1	91	94	3	86	[NT]
Beryllium-Total	µg/L	0.5	Metals-022	<0.5	1	<0.5	<0.5	0	86	[NT]
Cadmium-Total	µg/L	0.1	Metals-022	<0.1	1	0.2	0.2	0	88	[NT]
Chromium-Total	µg/L	1	Metals-022	<1	1	16	15	6	83	[NT]
Copper-Total	µg/L	1	Metals-022	<1	1	37	34	8	80	[NT]
Cobalt-Total	µg/L	1	Metals-022	<1	1	33	31	6	94	[NT]
Mercury-Total	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	96	#
Manganese-Total	µg/L	5	Metals-022	<5	1	540	490	10	87	[NT]
Molybdenum-Total	µg/L	1	Metals-022	<1	1	3	3	0	85	[NT]
Nickel-Total	µg/L	1	Metals-022	<1	1	40	36	11	82	[NT]
Lead-Total	µg/L	1	Metals-022	<1	1	5	5	0	89	[NT]
Antimony-Total	µg/L	1	Metals-022	<1	1	<1	<1	0	106	[NT]
Selenium-Total	µg/L	1	Metals-022	<1	1	1	<1	0	88	[NT]
Tin-Total	µg/L	1	Metals-022	<1	1	1	1	0	97	[NT]
Zinc-Total	µg/L	1	Metals-022	<1	1	39	31	23	91	[NT]
Iron-Total	µg/L	10	Metals-022	<10	1	1800	1800	0	81	[NT]

Client Reference: CTP Groundwater Monitoring - 12.12.23

QUALITY CONTROL: Metals in Waters - Total					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			15/12/2023	1	15/12/2023	15/12/2023		15/12/2023	[NT]
Date analysed	-			15/12/2023	1	15/12/2023	15/12/2023		15/12/2023	[NT]
Phosphorus - Total	mg/L	0.05	Metals-020	<0.05	1	0.08	0.08	0	91	[NT]

Client Reference: CTP Groundwater Monitoring - 12.12.23

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	340203-2
Date prepared	-			14/12/2023	1	14/12/2023	14/12/2023		14/12/2023	14/12/2023
Date analysed	-			14/12/2023	1	14/12/2023	14/12/2023		14/12/2023	14/12/2023
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	1	0.87	0.82	6	99	#
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	1	0.48	0.48	0	96	106
Total Nitrogen in water	mg/L	0.1	Inorg-055/062/127	<0.1	1	1.4	1.5	7	101	[NT]

Client Reference: CTP Groundwater Monitoring - 12.12.23

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	340203-2
Date prepared	-			14/12/2023	1	14/12/2023	14/12/2023		14/12/2023	14/12/2023
Date analysed	-			14/12/2023	1	14/12/2023	14/12/2023		14/12/2023	14/12/2023
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	210	210	0	108	#
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	54	59	9	92	#
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	3500	3900	11	98	#
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	490	500	2	107	#
Hardness	mgCaCO ₃ /L	3	Metals-020	[NT]	1	2600	2600	0	[NT]	[NT]
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	5	Inorg-006	<5	1	<5	<5	0	[NT]	[NT]
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	1	640	640	0	[NT]	[NT]
Carbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	1	<5	<5	0	[NT]	[NT]
Total Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	1	640	640	0	105	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	<1	1	550	550	0	108	#
Chloride, Cl	mg/L	1	Inorg-081	<1	1	6200	6300	2	103	#
Ionic Balance	%		Inorg-040	[NT]	1	2.0	5.0	86	[NT]	[NT]

Client Reference: CTP Groundwater Monitoring - 12.12.23

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	340203-2
Date prepared	-			14/12/2023	1	14/12/2023	14/12/2023		14/12/2023	14/12/2023
Date analysed	-			14/12/2023	1	14/12/2023	14/12/2023		14/12/2023	14/12/2023
Perfluorobutanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	106	108
Perfluoropentanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	105	102
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	109	106
Perfluoroheptanesulfonic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	116	112
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	96	100
Perfluorodecanesulfonic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	91	95
Perfluorobutanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	110	108
Perfluoropentanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	100	100
Perfluorohexanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	108	104
Perfluoroheptanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	103	103
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	97	99
Perfluorononanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	121	126
Perfluorodecanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	98	98
Perfluoroundecanoic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	95	103
Perfluorododecanoic acid	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	91	94
Perfluorotridecanoic acid	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	94	97
Perfluorotetradecanoic acid	µg/L	0.5	Org-029	<0.5	1	<0.5	<0.5	0	108	112
4:2 FTS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	99	92
6:2 FTS	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	94	102
8:2 FTS	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	86	92
10:2 FTS	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	102	118
Perfluorooctane sulfonamide	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	106	109
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	106	108
N-Ethyl perfluorooctanesulfonamide	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	106	105
N-Me perfluorooctanesulfonamidethanol	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	78	85
N-Et perfluorooctanesulfonamidethanol	µg/L	0.5	Org-029	<0.5	1	<0.5	<0.5	0	90	97
MePerfluorooctanesulfonamidacetic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	110	110
EtPerfluorooctanesulfonamidacetic acid	µg/L	0.02	Org-029	<0.02	1	<0.02	<0.02	0	111	119
Surrogate ¹³ C ₈ PFOS	%		Org-029	97	1	93	98	5	94	93
Surrogate ¹³ C ₂ PFOA	%		Org-029	98	1	104	102	2	105	98

Client Reference: CTP Groundwater Monitoring - 12.12.23

QUALITY CONTROL: PFAS in Waters Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	340203-2
Extracted ISTD ¹³ C ₃ PFBS	%		Org-029	104	1	98	105	7	103	105
Extracted ISTD ¹⁸ O ₂ PFHxS	%		Org-029	109	1	111	106	5	106	110
Extracted ISTD ¹³ C ₄ PFOS	%		Org-029	117	1	124	123	1	124	120
Extracted ISTD ¹³ C ₄ PFBA	%		Org-029	118	1	109	110	1	117	99
Extracted ISTD ¹³ C ₃ PFPeA	%		Org-029	118	1	117	121	3	118	121
Extracted ISTD ¹³ C ₂ PFHxA	%		Org-029	108	1	104	103	1	105	107
Extracted ISTD ¹³ C ₄ PFHpA	%		Org-029	107	1	105	104	1	105	104
Extracted ISTD ¹³ C ₄ PFOA	%		Org-029	124	1	124	125	1	122	124
Extracted ISTD ¹³ C ₅ PFNA	%		Org-029	114	1	115	114	1	115	115
Extracted ISTD ¹³ C ₂ PFDA	%		Org-029	134	1	148	137	8	140	138
Extracted ISTD ¹³ C ₂ PFUnDA	%		Org-029	147	1	157	155	1	152	143
Extracted ISTD ¹³ C ₂ PFDoDA	%		Org-029	169	1	179	181	1	173	166
Extracted ISTD ¹³ C ₂ PFTeDA	%		Org-029	136	1	150	135	11	143	137
Extracted ISTD ¹³ C ₂ 4:2FTS	%		Org-029	105	1	84	91	8	105	106
Extracted ISTD ¹³ C ₂ 6:2FTS	%		Org-029	141	1	140	145	4	139	131
Extracted ISTD ¹³ C ₂ 8:2FTS	%		Org-029	170	1	179	191	6	195	184
Extracted ISTD ¹³ C ₈ FOSA	%		Org-029	121	1	117	119	2	119	116
Extracted ISTD d ₃ N MeFOSA	%		Org-029	115	1	119	113	5	116	115
Extracted ISTD d ₅ N EtFOSA	%		Org-029	107	1	110	108	2	110	109
Extracted ISTD d ₇ N MeFOSE	%		Org-029	111	1	113	112	1	117	112

Client Reference: CTP Groundwater Monitoring - 12.12.23

QUALITY CONTROL: PFAS in Waters Extended						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	340203-2
Extracted ISTD d ₉ N EtFOSE	%		Org-029	128	1	129	125	3	127	117
Extracted ISTD d ₃ N MeFOSAA	%		Org-029	127	1	126	123	2	124	124
Extracted ISTD d ₅ N EtFOSAA	%		Org-029	120	1	131	125	5	125	118

Client Reference: CTP Groundwater Monitoring - 12.12.23

QUALITY CONTROL: Dissolved Gases in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			19/12/2023	1	19/12/2023	19/12/2023		19/12/2023	[NT]
Date analysed	-			19/12/2023	1	19/12/2023	19/12/2023		19/12/2023	[NT]
Methane	µg/L	5	AT-006	<5	1	<5	<5	0	92	[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

For PFAS Extracted Internal Standards denoted with # or outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).

MISC_INORG:# Percent recovery is not applicable due to the high concentration of the analyte/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Ion Balance: # Percent recovery is not applicable due to the high concentration of the analyte/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Dissolved Metals: no filtered, preserved sample was received, therefore the unpreserved sample was filtered through 0.45µm filter at the lab.

Note: there is a possibility some elements may be underestimated.

All metals 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.

All metals in water - total:

- # Low spike recovery was obtained for this sample. The sample was re-digested and re-spiked and the low recovery was confirmed. This is due to matrix interferences.

However, an acceptable recovery was obtained for the LCS.

- The PQL for 340203-2 has been raised for Hg due to the low spike recovery/recoveries. This may reflect other samples where similar in matrix and similar analytical interferences occur.

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 Dissolved metals and results have been confirmed.

APPENDIX E – WTP SAMPLING AND DISCHARGE REGISTER

The Bays WTP Sampling and Discharge Summary

Sample Date	Site / WTP	Source Water	Lab ID			pH	Turbidity	Oil and Grease	Hydrocarbons TRH (C6-C9)	Aluminium	Arsenic	Cadmium	Chromium (VI) Compounds	Cobalt	Copper	Iron	Lead	Manganese	Nickel	Zinc	Ammonia	Nitrate + nitrite (oxidised nitrogen)	Nitrogen (total)	Perfluorooctane sulphonate (PFOS)	Phosphorus (total)
					Sampling	Lab	TSS (Lab)	Visual	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab
					UoM	pH units	mg/L	Y/N	ug/L	ug/l	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
				Notes	EPL Criteria	6.5-8.5	15	N	100	55	None	0.7	4.4	1	1.3	300	4.4	80	7	8	910	200	300	0.00023	30
10/07/2023	TBY C-WTP	Untreated	327583	Month 1		12	51,000	N	100	380	1	0.1	1	1	1	30	1	5	1	1	450	780	1600	0.0096	2500
10/07/2023	TBY C-WTP	Treated	327583	Month 1		9.2	37	N	130	20	1	0.1	81	1	1	10	1	5	1	1	330	400	800	0.0008	10
26/07/2023	TBY C-WTP	Untreated	327583	Resample		12.1	53000	N	49	30	1	0.1	170	1	3	30	3	5	1	5	1000	400	2900	0.0032	450
26/07/2023	TBY C-WTP	Treated	327583	Resample		8.9	5	N	61	20	1	0.1	2	1	1	10	1	5	1	3	760	60	1600	0.0003	10
21/08/2023	TBY C-WTP	Untreated	331040	Month 2		11.4	1600	N	14	20	1	0.1	15	1	1	20	1	5	1	6	340	590	1000	0.0094	80
21/08/2023	TBY C-WTP	Treated	331040	Month 2		8.4	26	N	44	50	1	0.1	1	1	2	10	1	5	1	4	310	300	700	0.0007	10
11/09/2023	TBY C-WTP	Untreated	332722	Month 3		11.9	5300	N	10	90	1	0.1	86	1	4	10	1	16	1	1	340	800	1900	0.016	500
11/09/2023	TBY C-WTP	Treated	332722	Month 3		8.3	5	N	10	40	1	0.1	1	1	4	10	1	22	1	2	780	300	1000	0.0007	10
23/10/2023	TBY C-WTP	Untreated	335988	Month 4		12.1	570	N	24	3600	4	0.1	40	1	4	160	1	5	1	2	940	710	2100	0.0077	40
23/10/2023	TBY C-WTP	Treated	335988	Month 4		7.7	16	N	91	50	1	0.1	5	1	1	10	1	5	3	19	350	300	700	0.001	10
15/11/2023	TBY C-WTP	Untreated	337841	Month 5		12.2	3100	N	<10	1600	<1	0.1	190	<1	2	30	<1	5	1	1	380	610	2100	0.0043	100
15/11/2023	TBY C-WTP	Treated	337841	Month 5		7.4	6	N	<10	20	1	0.1	120	<1	2	80	<1	14	1	4	680	630	2100	0.0029	40
13/12/2023	TBY C-WTP	Untreated	340131	Month 6		12.1	NT	N	5700	9300	13	<0.1	69	<1	10	440	<1	<5	2	<1	300	710	3300	0.0081	360
13/12/2023	TBY C-WTP	Treated	340131	Month 6		7.5	5	N	<5	160	5	<0.1	1	<1	2	1100	<1	9	<1	4	1000	30	2100	0.0003	430

Burwood WTP Sampling and Discharge Summary

Sample Date	Sampled by	Site / WTP	Source Water	Lab ID	Sample Point	Notes	pH	Turbidity	Oil and Grease	Hydrocarbons TRH (C6-C9)	Aluminium	Arsenic	Cadmium	Chromium (VI) Compounds	Cobalt	Copper	Iron	Lead	Manganese	Nickel	Zinc	Ammonia	Nitrate + nitrite (oxidised nitrogen)	Nitrogen (total)	Perfluorooctane sulphonate (PFOS)	Phosphorus (total)					
							Lab	TSS (Lab)	Visual	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	
							UoM	pH units	mg/L	Y/N	ug/L	ug/l	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
							WPIA Criteria	6.5-8.5	50		100		90				1	1.3	300		1900	70	8	900	200	700	0.13	1000			
							EPL Criteria	6.5-8.5	15	N	100	55	None	0.7	4.4	1	1.3	300	4.4	80	7	8	910	200	300	0.00023	30				
8/08/2023	Kelvin Nmereole	BWD	Untreated	329957	Untreated	Fortnight 3	7.5	150	N	92	10	10	0.1	6	2	3	10	1	260	6	110	250	72	700	0.0004	40					
8/08/2023	Kelvin Nmereole	BWD	Treated	329957	Treated	Fortnight 3	4.1	4.1	N	59	930	5	0.1	1	1	3	780	1	2100	1	180	83	20	600	0.0002	500					

Five Dock WTP Sampling and Discharge Summary

Sample Date	Site / WTP	Source Water	Lab ID	Sampling UoM	pH	Turbidity	Oil and Grease	Hydrocarbons TRH (C6-C9)	Aluminium	Arsenic	Cadmium	Chromium (VI) Compounds	Cobalt	Copper	Iron	Lead	Manganese	Nickel	Zinc	Ammonia	Nitrate + nitrite (oxidised nitrogen)	Nitrogen (total)	Perfluorooctane sulphonate (PFOS)	Phosphorus (total)			
					Lab	TSS (Lab)	Visual	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	
					pH units	mg/L	Y/N	ug/L	ug/l	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
					Notes	EPL Criteria	6.5-8.5	15	N	100	55	None	0.7	4.4	1	1.3	300	4.4	80	7	8	910	200	300	0.00023	30	
7/07/2023	FDK	Untreated	327433	Fortnight 2	9.8	27000	N	10	10	3	0.1	41	1	1	20	1	5	1	3	320	160	1100	0.0003	6400			
7/07/2023	FDK	Treated	327433	Fortnight 2	7.5	14	N	10	60	1	0.1	11	1	1	1800	1	14	1	40	400	20	1600	0.0002	10			
28/07/2023	FDK	Untreated	329201	Fortnight 3	9.4	1400	N	10	50	4	0.1	7	1	1	10	1	5	1	11	230	240	800	0.00008	130			
28/07/2023	FDK	Treated	329201	Fortnight 3	7.4	5	N	10	10	3	0.1	60	1	1	10	1	5	1	2	210	96	600	0.00002	10			
17/08/2023	FDK	Untreated	330769	Fortnight 4	7.8	150	N	10	10	3	0.1	1	10	1	10	1	230	14	20	130	160	500	0.0006	800			
17/08/2023	FDK	Treated	330769	Fortnight 4	7.6	5	N	34	10	3	0.1	52	1	1	10	1	5	1	1	150	88	200	0.0002	10			
30/08/2023	FDK	Untreated	331781	Fortnight 5	11.2	540	N	14	20	4	0.1	50	1	1	20	1	5	1	2	270	170	1100	0.0009	130			
30/08/2023	FDK	Treated	331781	Fortnight 5	7.9	1	N	21	10	1	0.1	15	1	1	100	1	5	1	4	210	30	300	0.0002	10			
14/09/2023	FDK	Untreated	333011	Fortnight 6	9	150000	N	10	30	2	0.1	4	1	3	10	1	6	1	1	150	260	1500	0.0002	8000			
14/09/2023	FDK	Treated	333011	Fortnight 6	7.6	5	N	27	10	1	0.1	3	1	2	20	1	5	1	1	78	110	900	0.0002	10			
				Fortnightly sampling period complete. Commence sampling in accordance with EPL Clause M2.2.																							
30/10/2023	FDK	Untreated	336589	Month 1	7.9	1100	N	26	10	1	0.1	1	9	1	10	1	500	13	2	8100	270	10000	0.0065	10			
30/10/2023	FDK	Treated	336589	Month 1	7.7	5	N	54	10	1	0.1	1	1	1	10	1	5	1	1	810	30	1600	0.0002	10			
9/11/2023	FDK	Untreated	337411	Month 2	7.5	38	N	10	10	2	0.1	1	12	1	20	1	490	14	110	1300	3600	5100	0.019	50			
9/11/2023	FDK	Treated	337411	Month 2	7.5	5	N	83	10	1	0.1	4	1	1	10	1	5	1	1	190	100	300	0.0002	40			
15/12/2023	FDK	Untreated	340341	Month 3	8	0.4	N	50	190	2	0.1	3	18	4	80	1	700	23	130	220	400	600	0.0036	160			
15/12/2023	FDK	Treated	340341	Month 3	8	10	N	10	20	1	0.1	2	1	4	20	1	5	1	110	150	300	1200	0.0003	160			

Sydney Olympic Park WTP Sampling and Discharge Summary

Sample Date	Site / WTP	Source Water	Lab ID	Sampling UoM	pH	Turbidity	Oil and Grease	Hydrocarbons TRH (C6-C9)	Aluminium	Arsenic	Cadmium	Chromium (VI) Compounds	Cobalt	Copper	Iron	Lead	Manganese	Nickel	Zinc	Ammonia	Nitrate + nitrite (oxidised nitrogen)	Nitrogen (total)	Perfluorooctane sulphonate (PFOS)	Phosphorus (total)			
					Lab	TSS (Lab)	Visual	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	Lab	
					pH units	mg/L	Y/N	ug/L	ug/l	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
					Notes	EPL Criteria	6.5-8.5	15	N	100	55	None	0.7	4.4	1	1.3	300	4.4	80	7	8	910	200	300	0.00023	30	
4/07/2023	SOP-WTP	Untreated	327108	Fortnight 1	8.7	790	N	10	260	3	0.2	0.003	1	2	10	1	10	5	3	0.29	1.7	5.9	0.0093	630			
4/07/2023	SOP-WTP	Treated	327108	Fortnight 1	7.9	0.7	N	10	10	2	0.1	0.001	1	1	10	1	26	1	2	0.012	0.006	0.2	0.0002	10			
19/07/2023	SOP-WTP	Untreated	328472	Fortnight 2	7.8		N	10	50	2	0.1	0.001	1	1	10	1	27	1	1	0.12	0.61	1.1	0.0087	3000			
19/07/2023	SOP-WTP	Treated	328472	Fortnight 2	7.5	3.3	N	10	40	2	0.1	0.001	1	1	10	1	5	1	2	0.012	0.005	0.1	0.0002	10			
3/08/2023	SOP-WTP	Untreated	329648	Fortnight 3	8.7	850	N	10	30	2	0.1	0.001	1	5	10	1	12	1	1	0.32	0.2	0.8	0.0031	990			
3/08/2023	SOP-WTP	Treated	329648	Fortnight 3	7.8	1.8	N	10	10	3	0.1	0.001	1	1	10	1	5	1	2	0.009	0.005	0.1	0.0002	20			
18/08/2023	SOP-WTP	Untreated	330947	Fortnight 4	8.1		N	10	70	2	0.2	0.003	1	1	10	1	22	1	4	0.4	0.876	2.4	0.023	1000			
18/08/2023	SOP-WTP	Treated	330947	Fortnight 4	7.1	1.5	N	10	10	19	0.1	0.001	1	1	10	1	200	4	9	2.7	0.07	3.3	0.0002	10			
29/08/2023	SOP-WTP	Untreated	331894	Fortnight 5	11.8		N	10	1000	1	0.2	0.046	1	1	70	1	5	1	1	1.1	2.2	6.7	0.0075	22000			
29/08/2023	SOP-WTP	Treated	331894	Fortnight 5	7.6	2	N	10	10	2	0.5	0.001	1	1	10	1	180	4	6	2.1	1.2	3.5	0.0002	20			
15/09/2023	SOP-WTP	Untreated	333260	Fortnight 6	11.3		N	10	2100	3	0.1	0.011	1	4	50	1	5	3	1	1	2.3	8.2	0.012	53000			
15/09/2023	SOP-WTP	Treated	333260	Fortnight 6	7.4	1.2	N	10	10	1	0.1	0.001	1	4	10	1	66	2	5	0.87	0.3	1.7	0.0002	10			
29/09/2023	SOP-WTP	Untreated	334376	Fortnight 7	9.4		N	10	170	9	0.1	0.002	1	2	10	1	5	2	1	0.43	0.3	1.2	0.099	7600			
29/09/2023	SOP-WTP	Treated	334376	Fortnight 7	7.5	0.1	N	10	10	1	0.1	0.001	1	1	10	1	39	1	2	0.67	0.3	0.9	0.0002	10			
				Fortnightly sampling period complete. Commence sampling in accordance with EPL Clause M2.2.																							
26/10/2023	SOP-WTP	Untreated	336351	Month 1	11.7		N	10	70	1	0.1	0.089	2	13	110	1	5	1	3	0.35	1.3	7.4	0.001	0.01			
26/10/2023	SOP-WTP	Treated	336351	Month 1	7.7	0.2	N	10	40	2	0.1	0.008	1	1	10	1	130	3	4	0.53	1.4	2.1	0.0002	0.01			
16/11/2023	SOP-WTP	Untreated	338062	Month 2	11.7		N	10	660	1	0.1	0.08	3	17	80	1	5	1	1	0.81	4.2	16	0.0005	0.06			
16/11/2023	SOP-WTP	Treated	338062	Month 2	8	0.4	N	10	40	1	0.1	0.011	1	1	10	1	7	1	3	0.028	0.61	0.7	0.0002	0.03			
12/12/2023	SOP-WTP	Untreated	340418	Month 3	7.6		N	10	10	20	0.1	0.001	1	2	10	1	8	4	6	1.1	0.2	2.1	0.0002	0.82			
12/12/2023	SOP-WTP	Treated	340418	Month 3	7.9	0.1	N	10	40	2	0.1	0.01	1	1	10	1	30	2	2	0.005	2.4	2.6	0.0002	0.19			

NOTES:	
100	Denotes exceedance of EPL concentration limits for discharge of treated water (L2.4).
100	Denotes untreated water quality exceeding the EPL concentration limits.

Sydney Olympic Park		
Discharge Date	Actual Discharge Amount	Cumulative (kL)
	(Daily report)	
	L	
1/07/2023	0	0
2/07/2023	0	0
3/07/2023	0	0
4/07/2023	7000	7
5/07/2023	6900	13.9
6/07/2023	600	14.5
7/07/2023	1600	16.1
19/07/2023	13900	30
24/07/2023	2000	32
25/07/2023	13600	45.6
26/07/2023	2100	47.7
3/08/2023	7700	55.4
4/08/2023	35100	90.5
8/08/2023	8300	98.8
9/08/2023	8100	106.9
10/08/2023	2700	109.6
13/08/2023	4000	113.6
14/08/2023	4900	118.5
15/08/2023	73300	191.8
18/08/2023	36300	228.1
21/08/2023	10900	239
22/08/2023	26300	265.3
23/08/2023	38500	303.8
24/08/2023	7000	310.8
25/08/2023	10800	321.6
26/08/2023	9900	331.5
28/08/2023	8200	339.7
29/08/2023	25300	365
31/08/2023	21000	386
1/09/2023	17900	403.9
8/09/2023	6500	410.4
11/09/2023	21000	431.4
13/09/2023	9400	440.8
15/09/2023	16400	457.2
21/09/2023	10700	467.9
22/09/2023	7300	475.2
23/09/2023	7100	482.3
24/09/2023	8900	491.2
27/09/2023	9900	501.1
28/09/2023	52500	553.6
29/09/2023	7200	560.8
4/10/2023	29600	590.4
5/10/2023	84100	674.5
6/10/2023	5500	680
7/10/2023	16600	696.6
8/10/2023	1500	698.1
9/10/2023	19000	717.1
10/10/2023	700	717.8
11/10/2023	25700	743.5
12/10/2023	16700	760.2
13/10/2023	21200	781.4
16/10/2023	900	782.3
17/10/2023	14800	797.1
26/10/2023	24700	821.8
27/10/2023	16500	838.3
30/10/2023	11900	850.2
1/11/2023	10400	860.6
2/11/2023	18300	878.9
3/11/2023	18200	897.1
5/11/2023	128600	1025.7

Five Dock		
Discharge Date	Daily discharge volume	Cumulative (kL)
	(Daily report)	
	L	
1/07/2023	19300	19.3
2/07/2023	7500	26.8
3/07/2023	9200	36
5/07/2023	20400	56.4
6/07/2023	14300	70.7
7/07/2023	11000	81.7
8/07/2023	6700	88.4
9/07/2023	10500	98.9
10/07/2023	16300	115.2
11/07/2023	24400	139.6
12/07/2023	36200	175.8
13/07/2023	25600	201.4
14/07/2023	22700	224.1
15/07/2023	7900	232
16/07/2023	7200	239.2
17/07/2023	6700	245.9
18/07/2023	5300	251.2
19/07/2023	4300	255.5
20/07/2023	11900	267.4
21/07/2023	8500	275.9
22/07/2023	11600	287.5
23/07/2023	8900	296.4
24/07/2023	34100	330.5
25/07/2023	5800	336.3
26/07/2023	18500	354.8
27/07/2023	16300	371.1
28/07/2023	7400	378.5
29/07/2023	2700	381.2
30/07/2023	0	381.2
31/07/2023	32000	413.2
1/08/2023	59300	472.5
2/08/2023	39400	511.9
3/08/2023	44300	556.2
4/08/2023	56600	612.8
5/08/2023	7600	620.4
6/08/2023	21100	641.5
7/08/2023	45900	687.4
8/08/2023	70000	757.4
9/08/2023	92700	850.1
10/08/2023	49900	900
11/08/2023	40600	940.6
12/08/2023	28900	969.5
13/08/2023	2500	972
14/08/2023	35700	1007.7
15/08/2023	68600	1076.3
16/08/2023	19400	1095.7
17/08/2023	44900	1140.6
18/08/2023	31800	1172.4
19/08/2023	0	1172.4
20/08/2023	8000	1180.4
21/08/2023	65000	1245.4
22/08/2023	43600	1289
23/08/2023	40200	1329.2
24/08/2023	36800	1366
25/08/2023	35000	1401
26/08/2023	10900	1411.9
27/08/2023	0	1411.9
28/08/2023	32800	1444.7
29/08/2023	4600	1449.3
30/08/2023	13200	1462.5

The Bays		
Discharge Date	TBY Daily discharge volume	Cumulative (kL)
	(Daily report)	
	L	
1/07/2023	201100	201.1
2/07/2023	2222400	2423.5
3/07/2023	245300	2668.8
4/07/2023	397300	3066.1
5/07/2023	167900	3234
6/07/2023	5100	3239.1
7/07/2023	100	3239.2
8/07/2023	0	3239.2
9/07/2023	79800	3319
10/07/2023	115300	3434.3
11/07/2023	0	3434.3
12/07/2023	2700	3437
13/07/2023	0	3437
14/07/2023	0	3437
15/07/2023	12000	3449
16/07/2023	0	3449
17/07/2023	20100	3469.1
18/07/2023	97200	3566.3
19/07/2023	51500	3617.8
20/07/2023	89200	3707
21/07/2023	26400	3733.4
22/07/2023	134000	3867.4
23/07/2023	174800	4042.2
24/07/2023	131100	4173.3
25/07/2023	136800	4310.1
26/07/2023	135000	4445.1
27/07/2023	70500	4515.6
28/07/2023	0	4515.6
29/07/2023	1600	4517.2
30/07/2023	0	4517.2
31/07/2023	72700	4589.9
1/08/2023	76200	4666.1
2/08/2023	70300	4736.4
3/08/2023	42600	4779
4/08/2023	0	4779
5/08/2023	0	4779
6/08/2023	0	4779
7/08/2023	2800	4781.8
8/08/2023	122200	4904
9/08/2023	165700	5069.7
10/08/2023	56200	5125.9
11/08/2023	72800	5198.7
12/08/2023	112300	5311
13/08/2023	107900	5418.9
14/08/2023	39600	5458.5
15/08/2023	0	5458.5
16/08/2023	15900	5474.4
17/08/2023	0	5474.4
18/08/2023	28300	5502.7
19/08/2023	2100	5504.8
20/08/2023	4300	5509.1
21/08/2023	22200	5531.3
22/08/2023	12000	5543.3
23/08/2023	58800	5602.1
24/08/2023	92600	5694.7
25/08/2023	281900	5976.6
26/08/2023	202200	6178.8
27/08/2023	134100	6312.9
28/08/2023	33900	6346.8
29/08/2023	87500	6434.3

6/11/2023	127200	1152.9
7/11/2023	86400	1239.3
8/11/2023	5180	1244.48
9/11/2023	10800	1255.28
10/11/2023	31000	1286.28
12/11/2023	7700	1293.98
13/11/2023	7500	1301.48
14/11/2023	10700	1312.18
15/11/2023	56300	1368.48
16/11/2023	10400	1378.88
17/11/2023	46300	1425.18
20/11/2023	11600	1436.78
23/11/2023	80900	1517.68
24/11/2023	69000	1586.68
25/11/2023	38600	1625.28
27/11/2023	21600	1646.88
28/11/2023	28300	1675.18
29/11/2023	101400	1776.58
30/11/2023	43900	1820.48
1/12/2023	9000	1829.48
2/12/2023	21400	1850.88
3/12/2023	28500	1879.38
5/12/2023	75900	1955.28
6/12/2023	11600	1966.88
7/12/2023	29700	1996.58
8/12/2023	7700	2004.28
10/12/2023	8200	2012.48
11/12/2023	11500	2023.98
12/12/2023	4500	2028.48
13/12/2023	47700	2076.18
14/12/2023	4900	2081.08
15/12/2023	10200	2091.28
16/12/2023	2600	2093.88
18/12/2023	1000	2094.88
19/12/2023	3400	2098.28
20/12/2023	174300	2272.58

31/08/2023	36500	1499
1/09/2023	23600	1522.6
2/09/2023	6300	1528.9
3/09/2023	0	1528.9
4/09/2023	38100	1567
5/09/2023	26700	1593.7
6/09/2023	67200	1660.9
7/09/2023	47100	1708
8/09/2023	89300	1797.3
9/09/2023	39600	1836.9
10/09/2023	7000	1843.9
13/09/2023	23200	1866.2
14/09/2023	19200	1885.4
15/09/2023	45900	1931.3
16/09/2023	20600	1951.9
17/09/2023	13900	1965.8
18/09/2023	57100	2022.9
19/09/2023	59800	2082.7
20/09/2023	87600	2170.3
21/09/2023	19800	2190.1
22/09/2023	23900	2214
23/09/2023	23200	2237.2
24/09/2023	20600	2257.8
25/09/2023	39000	2296.8
26/09/2023	30600	2327.4
28/09/2023	29200	2356.6
29/09/2023	46200	2402.8
30/09/2023	55700	2458.5
1/10/2023	23600	2482.1
2/10/2023	19700	2501.8
3/10/2023	18800	2520.6
4/10/2023	43700	2564.3
5/10/2023	66400	2630.7
6/10/2023	29100	2659.8
7/10/2023	18200	2678
8/10/2023	8400	2686.4
9/10/2023	67500	2753.9
10/10/2023	37500	2791.4
11/10/2023	39900	2831.3
12/10/2023	52300	2883.6
13/10/2023	0	2883.6
14/10/2023	66600	2950.2
15/10/2023	5200	2955.4
16/10/2023	74600	3030
17/10/2023	58100	3088.1
18/10/2023	48900	3137
19/10/2023	51100	3188.1
20/10/2023	42100	3230.2
21/10/2023	23500	3253.7
22/10/2023	6300	3260
23/10/2023	95300	3355.3
24/10/2023	48000	3403.3
25/10/2023	44300	3447.6
26/10/2023	43700	3491.3
27/10/2023	49600	3540.9
28/10/2023	21500	3562.4
29/10/2023	6300	3568.7
30/10/2023	110800	3679.5
31/10/2023	46500	3726
1/11/2023	37900	3763.9
2/11/2023	31800	3795.7
3/11/2023	25600	3821.3
4/11/2023	37900	3859.2
6/11/2023	131900	3991.1
7/11/2023	68400	4059.5
8/11/2023	35100	4094.6
9/11/2023	29700	4124.3

30/08/2023	48300	6482.6
31/08/2023	19000	6501.6
1/09/2023	11600	6513.2
2/09/2023	0	6513.2
3/09/2023	0	6513.2
4/09/2023	16600	6529.8
5/09/2023	9600	6539.4
6/09/2023	69200	6608.6
7/09/2023	79300	6687.9
8/09/2023	77200	6765.1
9/09/2023	0	6765.1
10/09/2023	0	6765.1
11/09/2023	225300	6990.4
12/09/2023	587400	7577.8
13/09/2023	404200	7982
14/09/2023	2400	7984.4
15/09/2023	164700	8149.1
16/09/2023	7000	8156.1
17/09/2023	0	8156.1
18/09/2023	16300	8172.4
19/09/2023	0	8172.4
20/09/2023	0	8172.4
21/09/2023	0	8172.4
22/09/2023	109700	8282.1
23/09/2023	32600	8314.7
24/09/2023	0	8314.7
25/09/2023	131300	8446
26/09/2023	174300	8620.3
27/09/2023	1200	8621.5
28/09/2023	295700	8917.2
29/09/2023	195600	9112.8
30/09/2023	125300	9238.1
1/10/2023	24700	9262.8
2/10/2023	79400	9342.2
3/10/2023	100	9342.3
4/10/2023	60700	9403
5/10/2023	266800	9669.8
6/10/2023	136600	9806.4
7/10/2023	252600	10059
8/10/2023	246300	10305.3
9/10/2023	233900	10539.2
10/10/2023	667900	11207.1
11/10/2023	915100	12122.2
12/10/2023	925900	13048.1
13/10/2023	873600	13921.7
14/10/2023	311400	14233.1
15/10/2023	0	14233.1
16/10/2023	658700	14891.8
17/10/2023	1113600	16005.4
18/10/2023	889300	16894.7
19/10/2023	991300	17886
20/10/2023	666300	18552.3
21/10/2023	180700	18733
22/10/2023	373000	19106
23/10/2023	544100	19650.1
24/10/2023	701800	20351.9
25/10/2023	895500	21247.4
26/10/2023	1057900	22305.3
27/10/2023	1165800	23471.1
28/10/2023	387100	23858.2
29/10/2023	487300	24345.5
30/10/2023	855700	25201.2
31/10/2023	1057900	26259.1
1/11/2023	999300	27258.4
2/11/2023	1062500	28320.9
3/11/2023	946400	29267.3
4/11/2023	668900	29936.2

10/11/2023	50000	4174.3
11/11/2023	48600	4222.9
12/11/2023	61300	4284.2
13/11/2023	52200	4336.4
14/11/2023	75500	4411.9
15/11/2023	64900	4476.8
16/11/2023	31000	4507.8
17/11/2023	58500	4566.3
18/11/2023	32100	4598.4
19/11/2023	27500	4625.9
20/11/2023	74400	4700.3
21/11/2023	72200	4772.5
22/11/2023	95100	4867.6
23/11/2023	99900	4967.5
24/11/2023	125800	5093.3
25/11/2023	69300	5162.6
26/11/2023	14400	5177
27/11/2023	186000	5363
28/11/2023	109700	5472.7
29/11/2023	185100	5657.8
30/11/2023	82600	5740.4
1/12/2023	110500	5850.9
2/12/2023	81500	5932.4
3/12/2023	69100	6001.5
4/12/2023	109500	6111
5/12/2023	95800	6206.8
6/12/2023	114400	6321.2
7/12/2023	96200	6417.4
8/12/2023	107200	6524.6
9/12/2023	108000	6632.6
10/12/2023	82700	6715.3
11/12/2023	116900	6832.2
12/12/2023	94200	6926.4
13/12/2023	124100	7050.5
15/12/2023	72900	7123.4
16/12/2023	42500	7165.9
18/12/2023	56200	7222.1
19/12/2023	28000	7250.1
20/12/2023	18500	7268.6

5/11/2023	552600	30488.8
6/11/2023	766500	31255.3
7/11/2023	1123000	32378.3
8/11/2023	1139000	33517.3
9/11/2023	1325700	34843
10/11/2023	1250300	36093.3
11/11/2023	1178100	37271.4
12/11/2023	675200	37946.6
13/11/2023	866500	38813.1
14/11/2023	1123100	39936.2
15/11/2023	1122200	41058.4
16/11/2023	1330800	42389.2
17/11/2023	1391900	43781.1
18/11/2023	945800	44726.9
19/11/2023	860800	45587.7
20/11/2023	1120800	46708.5
21/11/2023	1302100	48010.6
22/11/2023	1123900	49134.5
23/11/2023	1109400	50243.9
24/11/2023	1153200	51397.1
25/11/2023	642700	52039.8
26/11/2023	681500	52721.3
27/11/2023	949800	53671.1
28/11/2023	957600	54628.7
29/11/2023	1077700	55706.4
30/11/2023	533400	56239.8
1/12/2023	334100	56573.9
2/12/2023	437000	57010.9
3/12/2023	366000	57376.9
4/12/2023	350900	57727.8
5/12/2023	576700	58304.5
6/12/2023	636100	58940.6
7/12/2023	644100	59584.7
8/12/2023	564600	60149.3
9/12/2023	312400	60461.7
10/12/2023	326900	60788.6
11/12/2023	344100	61132.7
12/12/2023	381400	61514.1
13/12/2023	398000	61912.1
14/12/2023	350500	62262.6
15/12/2023	281500	62544.1
16/12/2023	219000	62763.1
17/12/2023	359300	63122.4
18/12/2023	289400	63411.8
19/12/2023	484000	63895.8
20/12/2023	793200	64689
21/12/2023	462600	65151.6
22/12/2023	367800	65519.4
23/12/2023	262600	65782
24/12/2023	98500	65880.5
25/12/2023	417900	66298.4
26/12/2023	332800	66631.2
27/12/2023	398100	67029.3
28/12/2023	278400	67307.7
29/12/2023	180500	67488.2
30/12/2023	342300	67830.5
31/12/2023	347000	68177.5