M12 Motorway Groundwater Monitoring

Report 12 – October 2024 to March 2025

Transport for NSW

06 May 2025

→ The Power of Commitment



GHD Pty Ltd | ABN 39 008 488 373
133 Castlereagh Street, Level 15
Sydney, New South Wales 2000, Australia
T +61 2 9239 7100 | **F** +61 2 9239 7199 | **E** sydmail@ghd.com | **ghd.com**

Printed date	6/05/2025 10:46:00 AM
Last saved date	06 May 2025
File name	https://projectsportal.ghd.com/sites/pp15_04/m12motorwaywaterqual/ProjectDocs/Deliverables/12554717_REP_M12 Motorway_ Groundwater Monitoring Report 12.docx
Author	Emily Smith and Lia Saunders
Project manager	Henry Luo
Client name	Transport for NSW
Project name	M12 Motorway water quality and level monitoring services (contract number: 20.0000303606.0590)
Document title	M12 Motorway Groundwater Monitoring | Report 12 – October 2024 to March 2025
Document number	M12CDD-GHDA-ALL-EV-RPT-000037
Revision version	Rev 0
Project number	12554717

Document status

Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S4	Rev 0A	E. Smith L. Saunders	N. Rosen	On file	H. Milne	[redacted]	06/05/2025

© GHD 2025
This document is and shall remain the property of GHD. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

Acknowledgement of Country

GHD acknowledges Aboriginal and Torres Strait Islander peoples as the Traditional Custodians of the land, water and sky throughout Australia on which we do business. We recognise their strength, diversity, resilience and deep connections to Country. We pay our respects to Elders of the past, present and future, as they hold the memories, knowledges and spirit of Australia. GHD is committed to learning from Aboriginal and Torres Strait Islander peoples in the work we do.



Executive Summary

Background

The M12 Motorway (the project) is under construction between the M7 Motorway at Cecil Hills, and The Northern Road at Luddenham, covering approximately 16 kilometres (km). This construction will provide direct access between the Western Sydney International Airport (WSIA) at Badgerys Creek and Sydney's motorway network.

The Instrument of Approval granted by NSW Government Department of Planning, Industry and Environment in April 2021 stipulates conditions of approval for the M12 Motorway SSI 9364. Condition C17 of the approval requires the construction monitoring program for surface water quality and groundwater quality and levels (as approved by the Planning Secretary) to be implemented for the duration of construction.

Condition D9 of the approval requires the operational monitoring program for surface water quality and groundwater quality and levels to be implemented for the duration specified in the program.

– The amendment report submissions report states in Revised Environmental Management Measure (REMM) SWH06 that surface water monitoring will be carried out for a minimum of 12 months following the completion of construction.
– GW04 states that groundwater quality monitoring will be carried out for a minimum of six months following construction.

To meet these conditions of approval, GHD Pty Ltd (GHD) was engaged by Transport for New South Wales (TfNSW) to undertake the groundwater monitoring program for the M12 Motorway construction and operation project. This report summarises the construction phase of the groundwater monitoring program conducted between October 2024 and March 2025.

Scope of work

The scope of works undertaken to support the preparation of this report include:

– Monthly sampling of the monitoring wells (BH104R, BH107R, BH112R and BH145R) along the proposed project alignment over the six months. The analytical suite includes physiochemical parameters, nutrients, major anions and cations, metals, and hydrocarbons.
– Collation of groundwater level data from the same wells which includes data from manual gauging and data loggers.
– Collation of groundwater level data from the remaining monitoring wells which includes data from bi-monthly manual gauging and data loggers.

Summary of monitoring data

The groundwater analytical results for the six-month monitoring period (October 2024 to March 2025) indicated the following differences between the baseline and construction monitoring period:

– Field parameters
  - Increases in dissolved oxygen at all groundwater wells (current and construction monitoring periods).
  - Stabilisation of electrical conductivity in all wells (current and construction monitoring periods).
  - Decreases in redox in all wells (current and construction monitoring periods).
  - pH concentrations trending more alkaline at BH104/BH104R, BH107/BH107R and BH112/BH112R.
– Major cations and anions
  - BH104/BH104R has reduced calcium and magnesium concentrations, remaining dominated by sodium chloride (as per baseline monitoring).
  - BH107/BH107R has increased in bicarbonate and carbonate ions towards a sodium bicarbonate type (BH107 was dominated by sodium chloride during baseline monitoring).
  - BH112/BH112R remains dominated by sodium chloride, as per baseline monitoring.

- BH145/BH145R has increased towards calcium and magnesium, remaining dominated by sodium chloride (as per the baseline).

– Nutrients
  - Increases in ammonia concentrations above the baseline at BH104/BH104R and BH112/BH112R, and above the construction monitoring period for BH145R.
  - Increases in nitrate, total oxidised nitrogen (NOx), and total nitrogen above baseline percentiles (although the majority of these reported increases are reducing with each monitoring event).
  - Fluctuating nitrite concentrations above the baseline since the beginning of the construction period at BH104/BH104R and BH112/BH112R.
– Metals
  - Arsenic 80th percentile concentrations in the current and construction period were reported above the baseline in BH104/BH104R and BH112/BH112R.
  - Iron 80th percentile concentrations in the current and construction monitoring periods were reported above the baseline 80th percentile at BH104/BH104R.
  - Any exceedances of adopted criteria were eliminated for this current monitoring period following the application of hardness modified trigger values.
– Total Suspended Solids (TSS) and Total Dissolved Solids (TDS)
  - An increasing trend in TSS concentrations above the baseline at BH104/BH104R and BH112/BH112R. Current period BH112/BH112R concentrations of TSS decreased significantly and is below the baseline 80th percentile.
  - The current and construction 80th percentiles for TDS concentrations in BH112/BH112R are above the baseline 80th percentile. While the current period 80th percentile is above the construction 80th percentile in BH145R.

It is noted that there are differences in field parameters and laboratory analytical results between the original wells BH104, BH107, BH112, and BH145 and their replacements BH104R, BH107R, BH112R, and BH145R.

Summary of gauging data

– In the western area, groundwater levels in:
  - BH104R have been relatively stable since November 2023, with slight increases and decreases over time that are indicative of seasonal fluctuations. BH104R slightly increased over the current period.
  - BH107R slightly increased in the current period with an overall increase of approximately 0.41 m observed since August 2024.
  - BH112R remained relatively stable over the current period but appears to be continuing an overall slightly decreasing trend (with a change in water level of approximately one metre since monitoring of the replacement well began).
– In the central area, water levels in replacement well BH145R remained relatively stable over the current monitoring period yet continues an overall slightly increasing trend. Gauging well BH219 water level increased by approximately 0.28 m throughout April and June 2024 but no further monitoring data was retrieved due to destruction of the well from construction after June 2024.
– In the eastern area, the water level in BH175 increased by approximately 0.59 m during the current monitoring period.
– This increasing trend observed in the majority of wells (excluding BH112R) coincide with a period of increased rainfall, with water levels remaining within the historical range since monitoring began.

Conclusion

The measured groundwater quality parameters and the project analytical suite have provided further data to incorporate into the construction monitoring period percentiles. The reported field parameters and concentration of analytes in the current monitoring period are broadly consistent with those reported in the baseline monitoring period. However, there were noted increases in most field parameters, as well as some nutrients and few metals concentrations. These changes have mostly occurred with the replacements of the monitoring wells and therefore no management actions are required cumulating from this monitoring period. Furthermore, increases in water levels in the majority of groundwater wells appear to occur simultaneously with a period of increased rainfall.

Contents

1. Introduction **4**

1.1 Background 4

1.2 Scope of work 5

1.3 Limitations 5

2. Project description **7**

2.1 Project identification 7

2.2 Historical land use summary 7

2.3 Environmental setting 8

3. Field program **10**

3.1 Workplace health and safety 10

3.2 Sampling dates 10

3.3 Summary of groundwater quality monitoring locations 10

3.4 Groundwater sampling methodology 11

3.4.1 Gauging 11

3.4.2 Purging 11

3.4.3 Sampling 12

3.5 Laboratory analytical schedule 12

3.5.1 Quality assurance / quality control (QA/QC) 14

4. Assessment methodology **15**

4.1 Data quality objectives 15

4.2 Basis for assessment 15

4.2.1 Water quality objectives 15

4.2.2 Relevant guidelines 15

4.2.3 Adopted assessment criteria 15

5. Data assessment **17**

5.1 Field measured groundwater quality parameters 17

5.1.1 Dissolved oxygen (DO) 17

5.1.2 Electrical conductivity (EC) 18

5.1.3 Redox conditions 19

5.1.4 pH 20

5.1.5 Temperature 20

5.2 Field observations 21

5.3 Laboratory analytical results 21

5.3.1 Major cations and anions 21

5.3.2 Nutrients 23

5.3.3 Metals 26
5.3.4 Hardness 31
5.3.5 Benzene, toluene, ethylbenzene, xylene, naphthalene (BTEXN) 32
5.3.6 Total recoverable hydrocarbons (TRH) 32
5.3.7 Polycyclic aromatic hydrocarbons (PAHs) 32
5.3.8 Speciated phenols 32
5.3.9 Total suspended solids (TSS) 32
5.3.10 Total Dissolved Solids (TDS) 33

6. Groundwater level monitoring 35
6.1 Schedule of groundwater well locations 35
6.2 Data collection and analysis methodology 36
6.3 Manual gauging 36
6.4 Results 37

7. Conclusions 39

8. References 40

Table index

Table 1 Project identification summary 7
Table 2 Environmental setting summary 8
Table 3 Groundwater quality monitoring locations 11
Table 4 EIS compliance of analytical schedule 13
Table 5 Summary statistics for dissolved oxygen 17
Table 6 Summary statistics for electrical conductivity 18
Table 7 Summary statistics for redox 19
Table 8 Summary statistics for pH 20
Table 9 Summary statistics for temperature 20
Table 10 Summary of groundwater observations during current monitoring period 21
Table 11 Summary statistics for ammonia 24
Table 12 Summary statistics for nitrate 24
Table 13 Summary statistics for nitrite 25
Table 14 Summary Statistics for total oxidised nitrogen 25
Table 15 Summary statistics for total nitrogen 26
Table 16 Summary statistics for total phosphorus 26
Table 17 Summary statistics for arsenic 27
Table 18 Summary statistics for cadmium 27
Table 19 Summary statistics for chromium 27
Table 20 Summary statistics for copper 28

Table 21	Summary statistics for iron	28
Table 22	Summary statistics for lead	28
Table 23	Summary statistics for manganese	29
Table 24	Summary statistics for mercury	29
Table 25	Summary statistics for nickel	29
Table 26	Summary statistics for zinc	30
Table 27	Exceptions to exceedances of adopted criteria following application of HMTVs	32
Table 28	Maximum and average concentration of total suspended solids in monitoring wells	33
Table 29	Summary statistics for total suspended solids	33
Table 30	Maximum and average concentration of total dissolved solids in monitoring wells	34
Table 31	Summary statistics for total dissolved solids	34
Table 32	Schedule of M12 groundwater level wells monitored by GHD from August 2022 to March 2025	35

Figure index

Figure 1	Piper plot for groundwater changes throughout the baseline monitoring period (July 2019 to July 2022)	22
Figure 2	Piper plot for groundwater changes throughout the construction monitoring period (August 2022 to March 2025)	22
Figure 3	Piper plot for groundwater changes throughout the current monitoring period (April 2024 to March 2025)	23

Appendices

Appendix A	Figure
Appendix B	Tables
Appendix C	Field Parameter Graphs
Appendix D	Boxplot Graphs
Appendix E	Calibration certificates
Appendix F	Quality assurance / Quality control program and assessment
Appendix G	Field sheets
Appendix H	Laboratory reports
Appendix I	Groundwater level plots

1. Introduction

GHD Pty Ltd (GHD) was engaged by Transport for New South Wales (TfNSW) to undertake the groundwater monitoring program for the M12 Motorway construction and operation project.

This biannual report is the twelfth for the monitoring program. This report (Report 12) provides details of the monitoring locations, sampling methodology, and results of the groundwater samples collected between October 2024 to March 2025.

This current monitoring period and six-monthly report sits under contract number 20.0000303606.0590.

1.1 Background

The M12 Motorway construction works area (the project) in Western Sydney covers approximately 16 kilometres (km). The project is under construction between the M7 Motorway at Cecil Hills and The Northern Road at Luddenham. At the completion of the project, the M12 Motorway will provide direct access between the Western Sydney International Airport (WSIA) at Badgerys Creek and Sydney's motorway network.

The project has been determined to be a controlled action under Section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) (EPBC Act) (EPBC 2018/8286) for significant impact to threatened species and communities (Section 18 and Section 18A of the EPBC Act). This requires assessment and approval from the Commonwealth Government. As part of the project approval conditions, Transport for NSW (TfNSW) are required to prepare and implement a groundwater monitoring program for the project. GHD was commissioned to undertake a groundwater monitoring program during pre-construction, construction, and operational stages of the project.

A groundwater quality and hydrology assessment report were previously prepared as part of the M12 Motorway Environmental Impact Statement (JAJV, 2019). A key part of this report included a dewatering assessment, to estimate potential groundwater inflows (seepage) and subsequent potential drawdown which could occur if road cuttings extend below the water table. The JAJV 2019 assessment concluded that the project had minimal potential for direct interaction with groundwater systems. The potential for interactions with groundwater systems was noted to be limited to one road cutting, approximately 1.5 km east of The Northern Road (the 'western cut'), and bridge footings where piles are drilled below the water table.

JAJV (2019) stated that groundwater quality at groundwater monitoring well BH104 was representative of the western cut, with initial sampling of this monitoring well indicating copper and zinc concentrations exceeding (ANZECC & ARMCANZ, 2000) trigger values for 95% protection of freshwater species. Groundwater quality from BH104 did not indicate a risk to human health, nor anticipated impacts from intercepted groundwater from the cut being discharged to surface water. Changes to water table levels in areas where bridge footings extend beneath the water table are qualitatively predicted to be minor and localised.

The Overarching Construction Environmental Management Plans (OCEMP) for the project was approved by the Department of Planning and Industry Environment (DPIE) in December 2021 (TfNSW, 2024).

Between April 2019 and July 2022, GHD monitored four groundwater monitoring wells in the pre-construction phase for the collection of baseline data. The collection of baseline data was completed in July 2022 as the pre-construction phase for the central and west packages, including the four groundwater wells, ended. Construction phase data has been collected from August 2022 onwards.

The groundwater monitoring program conducted to date can be summarised as follows:

– Baseline monitoring period:
    - Report 1: April 2019 to September 2019 (GHD, 2019)
    - Report 2: October 2019 to March 2020 (GHD, 2020)
    - Report 3: April 2020 to September 2020 (GHD, 2021a)
    - Report 4: October 2020 to March 2021 (GHD, 2021b)

- Report 5: April 2021 to September 2021 (GHD, 2022a)
- Report 6: October 2021 to March 2022 (GHD, 2022b)

– Baseline / construction monitoring period:
  - Report 7: April 2022 to September 2022 (GHD, 2022c)
– Construction monitoring period:
  - Report 8: October 2022 to March 2023 (GHD, 2023a)
  - Report 9: April 2023 to September 2023 (GHD, 2023b)
  - Report 10: October 2023 to March 2024 (GHD, 2024a)
  - Report 11: April 2024 to September 2024 (GHD, 2024b)
  - Report 12 (this report): October 2024 to March 2025

1.2 Scope of work

For the duration of the pre-construction, construction, and operational phases, GHD is to undertake a monthly groundwater monitoring event at each of the monitoring locations within the project.

The pre-construction monitoring was to occur for a minimum of 12 months, followed by four years of construction monitoring on a stage-by-stage basis, followed by post-construction (operation) monitoring commencing at the opening of each stage.

The scope for the groundwater monitoring events undertaken within the project includes:

– Monthly sampling of four existing monitoring wells (BH104, BH107, BH112 and BH145) along the proposed project alignment including groundwater levels using an interface probe (IP) to determine presence of light non-aqueous phase liquid (LNAPL) and measure groundwater levels.
– Collection of samples from four existing monitoring wells (BH104, BH107, BH112 and BH145) using a micro-purge pump, employing low-flow sampling methodology to determine water quality and estimate flow direction.
– Bi-monthly (every second month) gauging of twenty-five existing monitoring wells along the project alignment using an IP to measure groundwater levels and downloading of the data loggers (if present).
– Collation and graphing of groundwater level data from all twenty-nine wells which includes data from manual gauging and data loggers.
– Preparation of one monitoring report every six months.

As the construction phase has progressed, samples are now collected from four re-drilled monitoring wells (BH104R, BH107R, BH112R and BH145R), and bi-monthly groundwater gauging is only conducted on the remaining two wells. However, since June 2024 only one of the bi-monthly groundwater gauging wells remain due to construction impacts.

1.3 Limitations

This report has been prepared by GHD for Transport for NSW and may only be used and relied on by Transport for NSW for the purpose agreed between GHD and Transport for NSW as set out in section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than Transport for NSW arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of buildings, services and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

Site conditions (including the presence of hazardous substances and/or site contamination) may change after the date of this Report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.

2. Project description

2.1 Project identification

A summary of available information pertaining to the project is presented in Table 1. A location plan of the project is provided in Figure 1, Appendix A.

Table 1 Project identification summary

Information	Details
Description of the project	The M12 Motorway project alignment is approximately 16 km in length. This will extend between the M7 Motorway at Cecil Hills and The Northern Road at Luddenham.
Local Government Area	Liverpool City Council for the eastern portion, up to Mamre Road Penrith City Council from Mamre Road
Local Land Use Zoning	**Liverpool LEP 2008** RU4 – primary production small lots **Fairfield LEP 2013:** RU4 – primary production small lots RU1 – primary production **Penrith LEP 2010:** RU4 – primary production small lots C2 – environmental conservation RU2 – rural landscape SP2 – classified road **State Environmental Planning Policy (Western Sydney Aerotropolis) 2020:** ENZ – environment and recreation ENT – enterprise SP2 – infrastructure **SEPP (Western Sydney Parklands) 2009:** Western Sydney Parklands
Land Use	The area where the project is occurring is currently used for agricultural, industrial, residential and rural purposes. Potentially contaminating activities within and / or next to the project include the SUEZ Kemps Resource Recovery Park, Brandown Quarry and general agricultural land use.
Surrounding Land Use	A range of land uses including industrial, commercial, residential, agriculture and landfill surround the project. Potentially contaminating activities outside of the project include the Hi-Quality Group Quarry and Sydney Recycling Park (located adjacent to the Hi-Quality Group Quarry). An Ampol service station is located approximately 300 metres northeast of the project at 1163 Mamre Road, Kemps Creek. Regulation under the Contaminated Land Management (CLM) Act is not required.

2.2 Historical land use summary

A historical aerial photography review of the project and surrounding area was completed by JAJV (2019). The review indicated that the project and surrounding area has remained largely rural/agricultural and residential since the 1940s. Increased rural residential density in suburban pockets, and the number of commercial/industrial premises in Kemps Creek have been observed since the 1950s and 1960s until present-day.

2.3 Environmental setting

JAJV (2019) undertook a desktop review of the existing environment for the entire M12 Motorway construction footprint. A summary of this information is presented in Table 2.

Table 2 Environmental setting summary

Aspect	Description
Climate	The long-term average monthly rainfall for the project ranges between 33.1 millimetres (mm) in July to 106.3 mm in March, with an average annual rainfall of 727.6 mm (Badgerys Creek AWS, ID 067108) (BOM, 2025) Long-term maximum mean temperatures range between 17.6°C in July to 30.0°C in January, and minimum mean temperatures between 4.3°C in July to 17.2°C in January (Badgerys Creek AWS, ID 067108) (BOM, 2025). Further details of climate information are included in groundwater level monitoring of Section 6.4 and Appendix I.
Topography and drainage	The ground surface along the project ranges between reduced level (RL) 70 metres (m) Australian Height Datum (AHD) to RL 115 mAHD. The landscape comprises relatively flat terrain with low rising crests. Flat floodplains are present at South Creek and Kemps Creek. Low rolling hills are situated between the floodplain areas, typically comprising gentle rises and undulations with broad rounded crests. Based on the topography within the project, surface runoffs are expected to drain to nearby dams and creeks (i.e. Kemps Creek and South Creek), as well as infiltrating into subsurface soils across unsealed lands in the surrounding area.
Soil and landscapes	The project is primarily underlain by the Blacktown residual soil unit (Geological Survey of NSW, 1991). The South Creek and Kemps Creek areas are underlain by the South Creek fluvial soil landscape. The Blacktown residual soil landscape typically comprises of clayey soils over gently undulating crests. The soil unit can have moderately reactive, highly plastic subsoils and poor drainage. The South Creek fluvial soil comprises floodplains and drainage depressions of very deep layered clays and sands. These fluvial soils are prone to erosion and frequent flooding.
Acid sulfate soils (ASS)	The project is not covered by areas mapped in the Acid Sulfate Soil Risk Maps prepared by Department of Land and Water Conservation.
Geology	Majority of the project is underlain by two geological units, Bringelly Shale (Rwb) and Quaternary aged alluvial deposits (Qal) (Geological Survey of NSW, 1991). Bringelly Shale is the predominant geological unit for the project. Bringelly shale is described as comprising shale, carbonaceous claystone, laminite and rare coal. Bringelly Shale is the upper portion of the Wianamatta Group and the upper sedimentary sequence in the Sydney Basin with a thickness of typically 150 m. Quaternary aged alluvial deposits (Qal) are described as comprising quartz and lithic fluvial sand, silt and clay. These are present near South Creek and Kemps Creek.
Hydrology	The project crosses South Creek in the western portion and Kemps Creek in the eastern portion. Kemps Creek is a tributary of South Creek, joining approximately three kilometres north of Elizabeth Drive, which then flows north to discharge into the Hawkesbury River.
Hydrogeology	The underlying aquifers are dominated by shale, siltstone and other sedimentary basins. They have a low potential for groundwater movement and comprise salinity

Aspect	Description
	levels greater than 16,000 microsiemens per centimetre (µs/cm), being unsuitable for stock use (DPI, 2014). According to the manual groundwater gauging data collected during the baseline and construction monitoring periods (April 2019 to March 2025), groundwater levels within the project range between 34.84 mAHD (BH217, September 2022) and 114.07 mAHD (BH162, October 2022).

3. Field program

3.1 Workplace health and safety

GHD developed a site-specific health safety and environment (HSE) plan for the works as part of the overall commitment to provide a healthy and safe working environment for staff. All work was conducted with appropriate personal protection equipment (PPE).

The HSE plan included a site-specific job safety and environmental analysis detailing the step-by-step procedures of all aspects of the works and associated hazards and control measures to be implemented. The HSE plan was read by all GHD personnel, and feedback and discussion provided prior to the works commencing. A site-specific pre-start safety assessment was conducted each morning before commencing works.

3.2 Sampling dates

Groundwater sampling was conducted at accessible groundwater monitoring wells on the following dates:

– Event 67 – 9 to 10 October 2024
– Event 68 – 6 to 7 November 2024
– Event 69 – 11 to 12 December 2024
– Event 70 – 17 January 2025 and 23 January 2025
– Event 71 – 18 to 19 February 2025
– Event 72 – 11 to 12 March 2025

We note that for event 70 (January 2025) groundwater monitoring was conducted at BH145R only on 17 January 2025 due to rainfall which triggered the site closure of M12 West project site. Subsequently, sampling of the remaining wells (BH104R, BH107R and BH112R) was completed the following week on 23 January 2025.

A summary of the status of groundwater monitoring wells during this monitoring period, and previous monitoring events, is presented in Table B1, Appendix B.

3.3 Summary of groundwater quality monitoring locations

The locations for groundwater quality monitoring wells are summarised below in Table 3 and presented on Figure 1, Appendix A. These monitoring wells are located in the vicinity of the project and were chosen as they represent areas of relatively substantial road cuttings and therefore there is a higher potential for groundwater interception by the project alignment in these areas.

BH104R, BH107R, and BH112R were added to the monitoring program in December 2022 to replace monitoring wells BH104, BH107 and BH112 that were destroyed by the expansion of the construction footprint. BH145R was added to the monitoring program in April 2023 to replace well BH145 which had not been intersecting the groundwater aquifer.

Due to access restrictions of BH112R between December 2022 and May 2023, BH112R was redrilled for a second time in June 2023, and sampled for the first time in August 2023 after well development had occurred. BH144 was temporarily added to the program in November 2022 to provide additional monitoring data before it was destroyed in December 2022.

Table 3 Groundwater quality monitoring locations

Well ID	Latitude	Longitude	Package	Comment
BH104	-33.854952	150.7055015	West	Located on private property, access negotiated with landowner. Destroyed in December 2022.
BH104R	-33.854024	150.7056504	West	Located on TfNSW property. Installed and monitored from December 2022.
BH107	-33.854432	150.7146769	West	Located on private property, access negotiated with landowner. Destroyed in December 2022.
BH107R	-33.854092	150.7146021	West	Located on TfNSW property. Installed and monitored from December 2022.
BH112	-33.855866	150.7195004	West	Located on TfNSW property. Destroyed in December 2022.
BH112R	-33.855998	150.71932242	West	Located on TfNSW property. Originally installed in December 2022 but could not be sampled due to access restrictions. Redrilled and monitored from August 2023.
BH144	-33.879915	150.8229921	Central	Located on TfNSW property.
BH145	-33.880292	150.8253916	Central	Located in Sydney Parklands Reserve, negotiated access. Destroyed in April 2023. No longer monitored due to low water column.
BH145R	-33.855066	150.720140	Central	Located on TfNSW property. Installed and monitored from April 2023.

3.4 Groundwater sampling methodology

All fieldwork was conducted in general accordance with:

– Australian Standard 5667:1998 Water Quality – Sampling, Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples (AS 5667.1:1998);
– Australian Standard 5667:1998 Water Quality – Sampling, Part 11: Guidance on the Sampling of Groundwaters (AS 566.11:1998); and
– GHD standard operating procedure for groundwater well sampling (GHD, 2015).

3.4.1 Gauging

Groundwater gauging and monitoring locations were gauged routinely on a monthly basis where possible. At each location, the well cap was removed, and time was allowed for the groundwater level to stabilise before any measurements were collected. The calibration certificates are provided in Appendix E. Groundwater gauging results are presented in Section 6.3.

A calibrated IP was used to measure the standing water level in metres below top of casing (mbTOC), and to determine whether LNAPL was present in the well. Measurements were taken to the nearest five millimetres. The depth to the bottom of the well was also measured to determine the amount of water in the casing.

Water level meters (WLMs) are also present in most of the groundwater monitoring well locations associated with this project. This data is presented in Section 6. These groundwater wells are gauged and data downloaded every second month.

3.4.2 Purging

A micropurge and bladder-pump unit was used to purge and to draw a sample from the wells.

The monitoring wells were constructed with a three-metre screened casing from the bottom of the well. The pump was lowered to approximately one metre above the bottom of the well to ensure the pump inlet was within the screened interval.

A calibrated water quality meter was used to measure and record water quality parameters, including pH, electrical conductivity (EC), dissolved oxygen (DO), temperature, oxidation-reduction potential (redox) and standing water level (SWL) at regular intervals (e.g. every 2 to 5 minutes).

Descriptions of visual and olfactory characteristics, such as colour, turbidity, odour, and sheen were recorded along with SWL and field water quality parameters.

Water quality parameters were considered stable once three consecutive readings were obtained within the following ranges:

– ± 0.05 for pH
– ± 3% for EC
– ± 10% for DO
– ± 0.2 °C for temperature
– ± 10 mV for redox.

Exceptions to this methodology occur when water quality parameters do not stabilise over a long period of time e.g., greater than one hour of purging, or due to time constraints in the field. For example, this occurred on multiple occasions throughout the current monitoring period for one or more field parameters. These exceptions are noted on the field sheets provided in Appendix G.

Additionally, due to equipment malfunction in November 2024, January 2025 and March 2025, groundwater monitoring was undertaken through use of a disposable bailer at select locations. These observations are summarised in Table B2, Appendix B.

Calibration certificates for the monitoring equipment used are provided in Appendix E.

3.4.3 Sampling

Groundwater samples were transported on ice and submitted to ALS (primary laboratory) and Eurofins (secondary laboratory), both National Association of Testing Authorities (NATA) Australia accredited laboratories, under Chain of Custody (CoC) procedures (presented in Appendix H). A maximum of four primary samples were collected during each sampling event. The NEPM (NEPC, 2013) states that split samples should be collected at a rate of one per 20 primary samples. As such, one intra-laboratory duplicate and one inter-laboratory duplicate sample were collected per event as part of the current groundwater monitoring period between October 2024 and March 2025.

3.5 Laboratory analytical schedule

All samples were analysed by ALS Environmental (primary) and Eurofins (secondary), NATA accredited laboratories. The analytical schedule for groundwater is presented in Table B5, Appendix B, and summarised below.

Groundwater samples were submitted for laboratory analysis including:

– Dissolved heavy metals (arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, and zinc).
– Total recoverable hydrocarbons (TRH).
– Benzene, toluene, ethylbenzene, xylene and naphthalene (BTEXN).
– Nutrients (including ammonia, nitrate, nitrite, total nitrogen, total phosphorus and reactive phosphorus).
– Total dissolved solids (TDS).
– Total suspended solids (TSS).
– Major anions and cations with alkalinity (chloride, sulphate, sodium, potassium, magnesium, calcium, carbonate and bicarbonate).

– Total hardness as $CaCO_3$.

Groundwater samples are submitted for laboratory analysis annually include:

– Polyaromatic hydrocarbons (PAH) (only in March 2025).
– Phenols (only in March 2025).

The laboratory analytical schedule is consistent with the groundwater monitoring indicator requirements as stated in the EIS (JAJV, 2019). The OCEMP (TfNSW, 2024) includes PAH and phenols which are not usually analysed in the program due to consistent non-detections in the baseline period. These analytes are sampled once a year to confirm that they remain non detect (undertaken March 2025), to meet the requirements of the OCEMP as per the recommendations in Report 9. The additional analysis of total hardness was to allow the adjustment of threshold criteria for metals based on hardness data.

Table 4 depicts the differing analytical suites employed over the course of the monitoring program.

Table 4 EIS compliance of analytical schedule

Sampling event	Compliant with required EIS monitoring indicators?	Additional analyte analysis?
Report 1 (GHD, 2019) Event 1 to Event 6 (April to September 2019)	Mostly yes – Did not sample for iron (dissolved), manganese (dissolved), TDS or TSS	Additionally sampled for PAH, phenols, OCP, OPP, fungicides
Report 2 (GHD, 2020) Event 7 to Event 12 (October 2019 to March 2020)		
Report 3 (GHD, 2021a) Event 13 – April 2020 Event 14 – May 2020		
Report 3 (GHD, 2021a) Event 15 – June 2020	No samples collected	
Report 3 (GHD, 2021a) Event 16 – July 2020 Event 17 – August 2020 Event 18 – September 2020	Yes	No
Report 4 (GHD, 2021b) Events 19 to 24 (October 2020 to March 2021)	Yes (however no samples collected at BH107 and BH112 in November 2020 due to access restrictions)	Hardness as $CaCO_3$
Report 5 (GHD, 2022a) Events 25 to 30 (April to September 2021)	Yes	Hardness as $CaCO_3$
Report 6 (GHD, 2022b) Events 31 to 36 (October 2021 to March 2022)	Yes	Hardness as $CaCO_3$, PAH and phenols during January, February and March 2022 events
Report 7 (GHD, 2022c) Events 37 – 42 (April 2022 to September 2022)	Mostly Yes – unable to sample in April due to weather conditions.	Hardness as $CaCO_3$
Report 8 (GHD, 2023a) Events 43 – 48 (October 2022 to March 2023)	Yes (however no samples collected at BH112R between December 2022 and March 2023, and BH107R in January 2023, due to access restrictions)	Hardness as $CaCO_3$
Report 9	Yes (no samples collected at BH112R between March and July	Hardness as $CaCO_3$

Sampling event	Compliant with required EIS monitoring indicators?	Additional analyte analysis?
Events 49 – 54 (April 2023 to September 2023)	2023, and BH107R in June 2023, due to access restrictions)	
Report 10 Events 55 – 60 (October 2023 to March 2024)	Yes	Hardness as $CaCO_3$ in all events. PAH and phenols in January 2024
Report 11 Events 61 – 66 (April 2024 to September 2024)	Yes	Hardness as $CaCO_3$
Report 12 Events 67 – 72 (October 2024 to March 2025)	Yes	Hardness as $CaCO_3$ in all events. PAH and phenols in March 2025

3.5.1 Quality assurance / quality control (QA/QC)

A review of the field and laboratory QA/QC performance from the investigation is presented in Appendix F. It is considered the analytical dataset collected during this monitoring period can be relied on for interpretation and assessment of background groundwater conditions in the vicinity of the project.

4. Assessment methodology

4.1 Data quality objectives

Data Quality Objectives (DQO) have been established for this groundwater report and are detailed in Appendix F. DQOs have been established to ensure the investigation is undertaken in a way that supports the collection and reporting of reliable data on which to base the investigation.

Data quality indicators (DQIs) have also been established to assess the usability of the data to allow decisions to be made with confidence. These are presented in Appendix F.

4.2 Basis for assessment

4.2.1 Water quality objectives

The key water quality objective of the M12 Motorway project was to determine baseline groundwater conditions within the project boundary prior to construction, supporting the development of a groundwater monitoring program and management plan during construction and operation of the project. This included forming site-specific water quality guidelines applicable for subsequent assessment. The plans and programs will likely be used to form conditions of approval under Part 5.1 of the *Environmental Planning and Assessment Act 1979.*

In order to achieve this, the framework in The Australian and New Zealand Environment Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand (ANZECC & ARMCANZ, 2000) water quality guidelines are adopted to guide the conservation of ambient water quality. These guidelines provide recommended trigger values that have been applied to understand the current health of the waterways and key indicators of concern. These guidelines should be regarded as highly conservative in relation to the current condition of the sampling locations.

4.2.2 Relevant guidelines

The framework for the contamination assessment made herein, was developed in accordance with guidelines “made or approved”, by the NSW EPA under Section 105 of the *Contaminated Land Management Act, 1997*. These guidelines include, but are not limited to the following:

– Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC & ARMCANZ, 2000).
– Consultants Reporting on Contaminated Land: Contaminated Land Guidelines, NSW EPA (NSW EPA, 2020).
– National Environmental Protection (Assessment of Site Contamination) Amendment Measure NEPM, National Environment Protection Council, NEPC (NEPC, 2013).
– NHMRC & NRMMC (2018) Australian Drinking Water Guidelines 6, 2011 (version 3.7 updated in January 2022) (NHMRC & NRMMC, 2011).
– NSW EPA, Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997 (NSW EPA, 2015).

4.2.3 Adopted assessment criteria

To assess and understand baseline groundwater quality conditions, assessment criteria have been adopted from ANZECC & ARMCANZ, 2000 (updated in 2018), NEPM (NEPC, 2013) and NHMRC & NRMMC (2011, v3.7 updated in 2022).

GHD conducted a search of existing registered groundwater bore records in the vicinity of the project area using the Bureau of Meteorology’s Australian Groundwater Explorer (BOM, 2025); accessed 23 April 2025, and identified four non-monitoring groundwater wells within 1000 m of the project area. These groundwater wells were identified

as being used for commercial/industrial use, exploration, water supply, stock and/or domestic purposes. The health screening level (HSL) for commercial/industrial were applied (HSL D) to represent the proposed land use. As three wells used for water extraction purposes were identified within 1000 m of the project area, the Australian Drinking Water Guidelines (ADWG) (NHMRC & NRMMC, 2011) have been selected as the screening criteria protective of human health.

Health screening levels (HSL) for petroleum hydrocarbons

The NEPM (NEPC, 2013) provides guidance relating to the assessment of vapour risks from petroleum hydrocarbons. HSLs for petroleum hydrocarbons for commercial/industrial land use (HSL D) have been adopted for the groundwater assessment to characterise the risk posed to future commercial users of the project area by potential hydrocarbon vapour intrusion.

Groundwater Investigation Levels (GIL) for human health

As previously stated, ADWG v3.7, updated in January 2022 (NHMRC & NRMMC, 2011) health criteria have been adopted as a conservative approach to characterise the risk posed to users of the project area and potential off-site drinking water users by contaminants of potential concern (CoPC) via direct contact with groundwater. Drinking water criteria were considered due to the presence of four groundwater wells located within a 1000 m radius of the project area used for non-monitoring purposes.

Ecological assessment criteria

Ecological assessment criteria for the groundwater assessment have been considered due to the close proximity of numerous fresh water bodies throughout the project area, of which there is potential for groundwater to migrate. As such, the following guidelines were adopted for the protection of local freshwater systems.

– ANZG (2018) Freshwater – 95% level of species protection (slightly to moderately disturbed systems)
– ANZECC (2000) – Lowland Rivers (NSW Coastal Rivers)
– ANZECC (2000) – Stock Watering

These criteria were selected as it is possible for plants and/or freshwater bodies to come into contact with groundwater. Assessment criteria for slightly to moderately disturbed systems were considered to be appropriate, as the project area is neither undisturbed systems of high ecological value, nor highly disturbed systems with no to low ecological value.

5. Data assessment

5.1 Field measured groundwater quality parameters

Groundwater quality parameters measured in the field during the baseline monitoring period are summarised in Table B6, Appendix B, the construction monitoring period to date in Table B7, Appendix B, and the current monitoring period in Table B8, Appendix B. The field purging sheets are included in Appendix G.

Summary statistics of field parameters for all baseline monitoring events (April 2019 – July 2022), all construction monitoring events (August 2022 to March 2025), and the current monitoring events (October 2024 to March 2025) were calculated for sampling wells BH104/BH104R, BH107/BH107R, BH112/BH112R, and BH145R. A comparison of results between BH145 and BH145R is not included as BH145 was not installed correctly. This is based on less than one metre of groundwater recorded in BH145 with water in the well suspected to be from surface runoff infiltration.

These summary statistics included the 80th percentile concentrations of the field parameters, which can be used to define site-specific conditions during the pre-construction phase of the works. These summary statistics are presented in Sections 5.1.1 to 5.1.5 below. As of Report 10, calculation and comparison of the 20th percentiles are no longer included, with exception of those for DO, EC, redox and pH as the low 20th percentile values pose a risk. This is due to consideration that for the majority of analytes and/or parameters, the 80th percentile is the main calculation of value for comparison due to a higher concentration of the analytes being the risk driver between each phase of works and the overall purposes of the M12 water monitoring program.

It is noted that the construction period summary statistics for BH112R do not include monitoring rounds between December 2022 to July 2023 where the well was inaccessible or was not yet available for groundwater sampling as the redrilled monitoring well had not been developed.

Graphs presenting the field parameters at each location since the beginning of the monitoring program are presented in Figures 1 to 5, Appendix C. It is noted that missing data points observed in Figures 1 to 5, Appendix C, are the result of field parameters unable to be collected due to access restrictions and/or insufficient water in well locations (see Table B1, Appendix B). The box plots are provided in Appendix D.

It is noted that there are differences in field parameters and laboratory analytical results between the old wells BH104, BH107, BH112, and BH145 with their replacements BH104R, BH107R, BH112R, and BH145R.

5.1.1 Dissolved oxygen (DO)

The 20th and 80th percentile DO concentrations calculated for the current and construction monitoring periods compared to the baseline monitoring period are presented in Table 5 below. Variations in DO concentrations across sampling locations and sampling events are presented in Figure 1, Appendix C. Boxplot comparisons between baseline and construction DO concentrations are presented in Figure 3, Appendix D.

Table 5 Summary statistics for dissolved oxygen

Dissolved Oxygen (mg/L)									
Phase:	**Current Monitoring Period**			**Construction Monitoring Period**			**Baseline Monitoring Period**		
Site ID	N	20th %ile	80th %ile	N	20th %ile	80th %ile	N	20th %ile	80th %ile
BH104 / BH104R	6	**0.050**	**2.430**	32	**0.056**	**2.190**	34	0.372	2.058
BH107 / BH107R	6	1.270	**5.310**	30	**0.662**	**5.030**	31	0.670	3.530
BH112 / BH112R	6	**0.370**	**4.900**	24	**0.284**	**4.648**	29	0.558	2.926
BH145R	6	0.370	**2.690**	24	0.088	2.126	--	--	--

Notes: 1. **BOLD** for BH104/BH104R, BH107/BH107R and BH112/BH112R: sits outside the baseline data (i.e. either below the 20th baseline percentile or above the 80th baseline percentile).

2. **BOLD** for BH145R: sits outside the construction data (i.e. either below the 20th construction percentile or above the 80th construction percentile).

The comparison of calculated percentiles for DO monitoring data in each well for the current and construction monitoring periods are summarised as follows:

– Current period:
  - BH104/BH104R: the 20th percentile is below the 20th baseline percentile and the 80th percentile is above the 80th baseline percentile.
  - BH107/BH107R: the 80th percentile is above the 80th baseline percentile.
  - BH112/BH112R: the 20th percentile is below the 20th baseline percentile and the 80th percentile is above the 80th baseline percentile.
  - BH145R: the current period 80th percentile is above the 80th construction percentile.
– Construction period:
  - BH104/BH104R, BH107/BH107R and BH112/BH112R: all 20th percentiles are below the baseline 20th percentiles and all 80th percentiles are above the baseline 80th percentiles.

The above DO data indicates that all construction period 20th and 80th percentiles sit outside the baseline data for BH104/BH104R, BH107/BH107R and BH112/BH112R. Construction period measurements above the baseline in BH104/BH104R and BH107/BH107R may be attributed to increased DO results recorded since May 2023, and in BH112/BH112R, since August 2023.

5.1.2 Electrical conductivity (EC)

The 20th and 80th percentile EC concentrations calculated for the current and construction monitoring periods compared to the baseline monitoring period are presented in Table 6 below. Variations in EC concentrations across sampling locations and sampling events are presented in Figure 2, Appendix C. Boxplot comparisons between baseline and construction EC concentrations are presented in Figure 2, Appendix D.

Table 6 Summary statistics for electrical conductivity

Electrical Conductivity (µs/cm)									
Phase:	**Current Monitoring Period**			**Construction Monitoring Period**			**Baseline Monitoring Period**		
Site ID	N	20th %ile	80th %ile	N	20th %ile	80th %ile	N	20th %ile	80th %ile
BH104 / BH104R	6	**7078**	**7327**	32	**6907**	**8558**	34	10441	16920
BH107 / BH107R	6	**2999**	**3107**	30	**3000**	**3474**	31	4654	9375
BH112 / BH112R	6	**14126**	**14629**	24	**13251**	**14840**	29	6479	12589
BH145R	6	16372	16788	24	13744	16813	--	--	--

Notes: 1. **BOLD** for BH104/BH104R, BH107/BH107R and BH112/BH112R: sits outside the baseline data (i.e. either below the 20th baseline percentile or above the 80th baseline percentile).

2. **BOLD** for BH145R: sits outside the construction data (i.e. either below the 20th construction percentile or above the 80th construction percentile).

The comparison of calculated percentiles for EC monitoring data in each well for the current and construction monitoring periods are summarised as follows:

– Current period:
  - BH104/BH104R and BH107/BH107R the 20th and 80th percentiles sit below the baseline 20th percentile.
  - BH112R the 20th and 80th percentiles sit above the baseline 80th percentile.
– Construction period:

- BH104/BH104R and BH107/BH107R: like the current period, the 20th and 80th percentiles sit below the baseline 20th percentile.
- BH112/BH112R: the 20th and 80th percentiles are also above the 80th baseline percentile.

The above comparison for EC monitoring data indicates that all current period and construction period 20th and 80th percentiles sit outside the baseline data for BH104/BH104R, BH107/BH107R and BH112/BH112R.

EC measurements in BH112/BH112R increased by an order of magnitude after the replacement well BH112R was monitored for the first time in August 2023, where these concentrations have since stabilised at this level. Conversely in BH104/BH104R and BH107/BH107R, EC measurements have decreased since the monitoring of replacement wells BH104R and BH107R began in December 2022. Since December 2022, BH104R has displayed a slight increasing trend but appears to be steadily decreasing as of February 2024, while BH107R appears to be stabilising at its replacement level. EC measurements at replacement well BH145R were within the historical range of BH145 when it was first monitored in April 2023, however, has since displayed an overall increasing trend.

5.1.3 Redox conditions

The calculated redox measurements at the 80th percentile for the current and construction monitoring periods compared to the baseline monitoring period are presented in Table 7 below. Variations in redox concentrations across sampling locations and sampling events are presented in Figure 3, Appendix C.

Table 7 Summary statistics for redox

Redox (mV)									
Phase:	**Current Monitoring Period**			**Construction Monitoring Period**			**Baseline Monitoring Period**		
Site ID	N	20th %ile	80th %ile	N	20th %ile	80th %ile	N	20th %ile	80th %ile
BH104 / BH104R	6	**-26.30**	146.90	32	**94.20**	222.68	34	98.82	272.08
BH107 / BH107R	6	**91.40**	277.30	30	240.74	**302.18**	31	151.30	291.40
BH112 / BH112R	6	**116.90**	293.90	24	**206.10**	**311.56**	29	225.88	301.18
BH145R	6	**-11.10**	**148.00**	24	59.48	145.00	--	--	--

Notes: 1. **BOLD** for BH104/BH104R, BH107/BH107R, BH112/BH112R: sits above the baseline data for the 80th baseline percentile.

2. **BOLD** for BH145R: sits above the construction data for the 80th construction percentile.

3. Redox is corrected for standard hydrogen electrode (SHE) by adding 205 mV to YSI redox potential reading

The comparison of calculated percentiles for redox monitoring data in each well for the current and construction monitoring periods are summarised as follows:

– Current period:
  - BH104/BH104R, BH107/BH107R, BH112/BH112R the 20th percentile are above the baseline 20th percentiles
  - BH145R: the 20th percentile is below the construction 20th percentile and 80th percentile is above the construction period.
– Construction period:
  - BH104/BH104R the 20th percentile is below the baseline 20th percentile
  - BH107/BH107R the 80th percentile is above the baseline 80th percentile.
  - BH112/BH112R the 20th percentile is below the baseline 20th percentile and 80th percentile is above the baseline period.

It should be noted all redox measurements throughout the construction monitoring period and baseline period do not appear to show a trend.

5.1.4 pH

The 20th and 80th percentile pH values calculated for the current and construction monitoring periods compared to the baseline monitoring period are presented in Table 8 below. Variations in pH concentrations across sampling locations and sampling events are presented in Figure 4, Appendix C. Boxplot comparisons between baseline and construction pH concentrations are presented in Figure 1, Appendix D.

Table 8 Summary statistics for pH

pH									
Phase:	**Current Monitoring Period**			**Construction Monitoring Period**			**Baseline Monitoring Period**		
Site ID	N	20th %ile	80th %ile	N	20th %ile	80th %ile	N	20th %ile	80th %ile
BH104 / BH104R	6	**6.79**	**6.93**	32	6.68	**6.89**	34	6.20	6.70
BH107 / BH107R	6	**7.05**	**7.27**	30	**6.97**	**7.32**	31	6.57	6.91
BH112 / BH112R	6	6.66	**6.82**	24	6.55	**6.88**	29	6.45	6.71
BH145R	6	**6.50**	6.67	24	6.51	6.76	--	--	--

Notes: 1. **BOLD** for BH104/BH104R, BH107/BH107R and BH112/BH112R: sits outside the baseline data (i.e. either below the 20th baseline percentile or above the 80th baseline percentile).

2. **BOLD** for BH145R: sits outside the construction data (i.e. either below the 20th construction percentile or above the 80th construction percentile).

The comparison of calculated percentiles for pH monitoring data in each well for the current and construction monitoring periods are summarised as follows:

– Current period:
  - BH104/BH104R and BH107/BH107R the 20th and 80th percentiles are above the baseline 80th percentiles
  - BH145R: the 20th percentile is below the construction 20th percentile.
  - BH112R: the 80th percentile is above the baseline 80th percentile.
– Construction period:
  - BH104/BH104R and BH112/BH112R: the 80th percentile is above the baseline 80th percentiles
  - BH107/BH107R the 20th and 80th percentiles are above the baseline 80th percentile.

The exceedances of the baseline 80th percentile in BH104/BH104R, BH107/BH107R and BH112/BH112R may be attributed to the increasing pH concentrations across these wells which have occurred as part of a trend that began around February 2022, during the baseline monitoring period.

5.1.5 Temperature

The 80th percentile groundwater temperature values calculated for the current and construction monitoring periods compared to the baseline monitoring period are presented in Table 9 below. Variations in temperatures recorded across sampling locations and sampling events are presented in Figure 5, Appendix C.

Table 9 Summary statistics for temperature

Temperature (°C)						
Phase:	**Current Monitoring Period**		**Construction Monitoring Period**		**Baseline Monitoring Period**	
Location ID	N	80th %ile	N	80th %ile	N	80th %ile
BH104 / BH104R	6	19.9	32	19.9	34	20.1
BH107 / BH107R	6	20.1	30	20.1	31	20.2
BH112 / BH112R	6	**20.4**	24	**21.1**	29	20.2

Temperature (°C)						
BH145R	6	**19.9**	24	19.8	--	--

Notes: 1. **BOLD** for BH104/BH104R, BH107/BH107R, BH112/BH112R: sits above the baseline data for the 80th baseline percentile.

2. **BOLD** for BH145R: sits above the construction data for the 80th construction percentile.

Groundwater temperature data indicates that the current and construction period 80th percentiles are above the baseline 80th percentile for BH112/BH112R, while the current period 80th percentile is above the construction period 80th percentile for BH145R. In general, these exceedances are minor and may be attributed to warm weather conditions over the course of the current monitoring period (October 2024 to March 2025).

5.2 Field observations

During groundwater purging, observations of visual and olfactory characteristics of the groundwater, such as colour, turbidity, odour, and sheen, were recorded alongside SWL and water quality measurements (as presented in Table B8, Appendix B). LNAPL was not detected in any of the sampled wells during the baseline and construction monitoring periods.

As discussed in Section 6, the measured SWL at monitoring well locations were relatively consistent across the monitoring period at BH107R, BH112R and BH145R with a slight increase occurring at BH104R. As discussed in Section 5.1 and tabulated in Table B8, Appendix B, fluctuations in pH, temperature, oxidation/reduction potential, dissolved oxygen and electrical conductivity measurements were recorded across the monitoring period.

The observations for each well sampled during the current monitoring period are summarised in Table 10 below. Observations from all sampling events are provides in Tables B5 to B7, Appendix B.

Table 10 Summary of groundwater observations during current monitoring period

Well ID	Observations during current monitoring period (October 2024 to March 2025)
BH104R	Generally clear or with a pale yellow-grey to yellow-green tinge and slightly cloudy, no sheen and no odour except a sulphuric odour noted in November and December 2024.
BH107R	Generally clear, no odour or sheen.
BH112R	Clear to cloudy appearance (November 2024 and January 2025), no odour or sheen.
BH145R	Clear or yellow to white-grey tinge and slightly cloudy appearance, no odour or sulphuric odour (November and December 2024 and February 2025), no sheen.

5.3 Laboratory analytical results

The laboratory analytical results of groundwater samples for the current monitoring period are tabulated in Table B5, Appendix B. All baseline results are tabulated in Table B3, Appendix B, and all construction results are tabulated in Table B4, Appendix B. Laboratory reports are provided in Appendix H. The analytical results of the current monitoring period were compared against relevant assessment criteria (as discussed in 4.2.3). A summary of CoPC exceedances and statistical summaries where exceedances of adopted assessment criteria occurred is presented below.

5.3.1 Major cations and anions

The major ions for each groundwater monitoring well are characterised graphically using a Piper diagram which can be used to identify whether the water quality at each location has changed over time. Piper diagrams for the baseline monitoring period are presented in Figure 1, the construction monitoring period to date in Figure 2, and the current monitoring period in Figure 3.

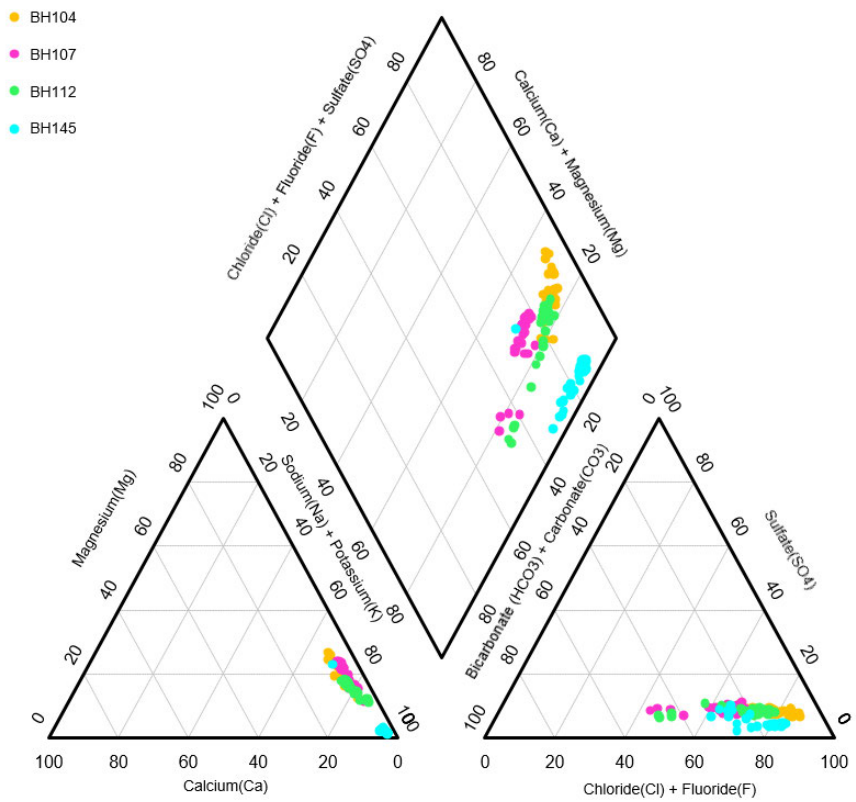


Figure 1 *Piper plot for groundwater changes throughout the baseline monitoring period (July 2019 to July 2022)*

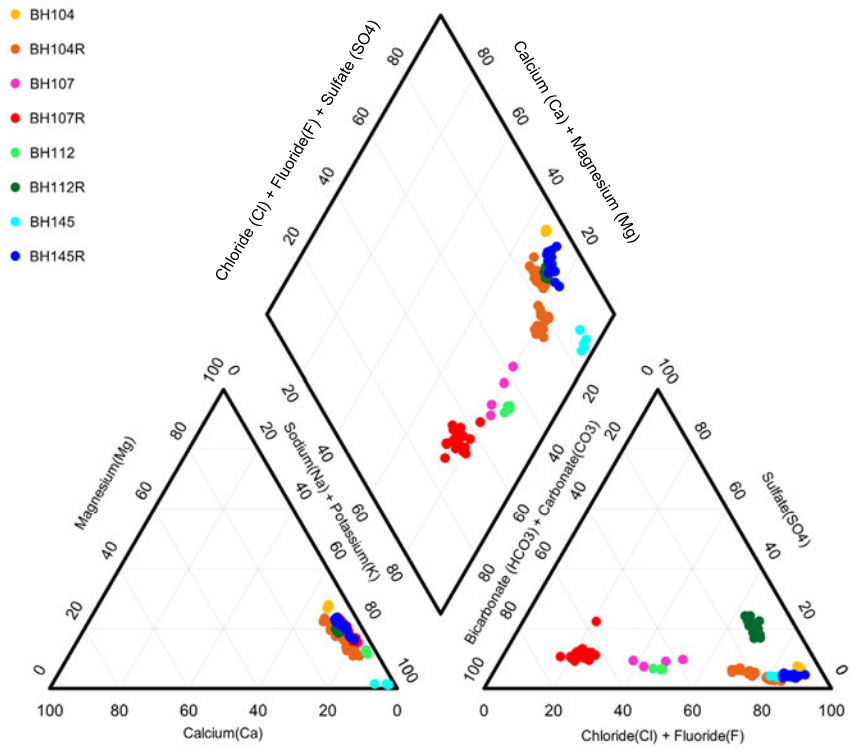


Figure 2 *Piper plot for groundwater changes throughout the construction monitoring period (August 2022 to March 2025)*

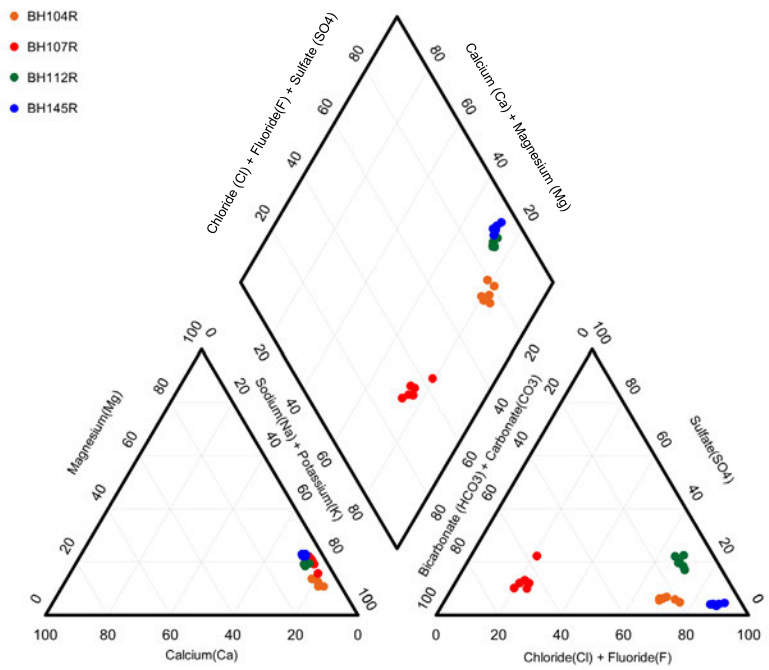


Figure 3 Piper plot for groundwater changes throughout the current monitoring period (April 2024 to March 2025)

In the baseline period, all monitoring wells recorded groundwater dominated by sodium chloride, resembling marine water composition. This may be due to the underlying shale and fluvial clay deposits (former marine origins). BH145 recorded a higher sodium chloride concentration when compared to the western wells BH104, BH107 and BH112. The western wells recorded higher calcium and magnesium concentrations when compared to eastern well BH145.

In the construction period, it can be observed from Figure 2 that major cations and anions in replacement wells are different from their original wells. In the current period, Figure 3 presents that BH104R, BH112R and BH145R recorded groundwater dominated by sodium chloride, and BH107R recorded groundwater dominated by sodium bicarbonate. In BH107R the dominant compound change between the baseline period and current period is attributable to the lower concentrations of chloride in the replacement well compared to the original well. In BH145R, decreased sodium and potassium and increased chloride and fluoride concentrations compared to the original well indicate a difference in groundwater chemistry.

BH107R is more indicative of freshwater than the other monitoring wells and has a varied physiochemical profile compared to the other groundwater wells, this may be due to the monitoring well installation. The installation was based on the original install for BH107; however, the lithology is slightly different and the filter pack for the screen is within the unconsolidated residual soils, allowing fresh water infiltration from the surface into the well. All other monitoring wells have the screen and filter packs wholly within the consolidated bedrock.

5.3.2 Nutrients

All groundwater samples reported concentrations above the LOR for at least one nutrient compound in the current monitoring period.

Comparisons between summary statistics for nutrient concentrations in monitoring wells for sampling events throughout the baseline monitoring period (April 2019 to July 2022), the construction monitoring period (August 2022 to March 2025), and the current monitoring period (October 2024 to March 2025) are provided in Table 11 to Table 16.

Boxplots comparisons between the baseline monitoring period and the construction monitoring period for ammonia, nitrate, total oxidised nitrogen (as N), total nitrogen, and total phosphorus are provided in Figures 6 to 10, Appendix D.

Table 11 Summary statistics for ammonia

Ammonia (mg/L)						
Adopted criterion	ANZG 2018 – 95% Freshwater: 0.090 mg/L					
Phase:	**Current Monitoring Period**		**Construction Monitoring Period**		**Baseline Monitoring Period**	
Location ID	N	80th %ile	N	80th %ile	N	80th %ile
BH104 / BH104R	6	**1.800**	32	**1.744**	35	0.328
BH107 / BH107R	6	0.050	30	**0.120**	32	0.070
BH112 / BH112R	6	**2.240**	24	**2.504**	32	1.978
BH145R	6	**2.250**	24	2.234	--	--

Notes: 1. **BOLD** for BH104/BH104R, BH107/BH107R, BH112/BH112R: sits above the baseline data for the 80th baseline percentile.

2. **BOLD** for BH145R: sits above the construction data for the 80th construction percentile.

Construction and current period 80th percentiles for ammonia were above the baseline 80th percentile in BH104/BH104R and BH112/BH112R. In BH107/BH107R, only the construction 80th percentile is above the baseline 80th percentile. In BH145R, the current period 80th percentile is above the construction 80th percentile.

This increase in concentrations above the baseline can be attributed to the drilling of the replacement wells. It is noted that the current period 80th percentile concentration in BH107R is similar to the baseline 80th percentile indicating that the concentration has slowly reduced over time.

Table 12 Summary statistics for nitrate

Nitrate (mg/L)						
Adopted criterion	ANZG 2018 – 95% Freshwater: 2.40 mg/L					
	ADWG 2011 – Health: 11.29 mg/L					
Phase:	**Current Monitoring Period**		**Construction Monitoring Period**		**Baseline Monitoring Period**	
Location ID	N	80th %ile	N	80th %ile	N	80th %ile
BH104 / BH104R	6	**0.140**	32	0.060	35	0.122
BH107 / BH107R	6	**2.680**	30	**2.822**	32	2.484
BH112 / BH112R	6	0.420	24	0.904	32	1.922
BH145R	6	**0.040**	24	0.028	--	--

Notes: 1. **BOLD** for BH104/BH104R, BH107/BH107R, BH112/BH112R: sits above the baseline data for the 80th baseline percentile.

2. **BOLD** for BH145R: sits above the construction data for the 80th construction percentile.

Construction and current period 80th percentiles for nitrate are above the baseline 80th percentile in BH107/BH107R. The current period 80th percentile for nitrate is above the construction period 80th percentile in BH145R and above the baseline 80th percentile in BH104/BH104R. The increase in concentrations above the baseline at BH107/BH107R for the construction period is attributed to significant increases in BH107 between May 2022 and November 2022. These started at the end of the baseline period and therefore not attributed to the construction of the project. The concentrations of nitrate in the replacement well (BH107R) were significantly lower and are reflected in the statistics for the current period.

Table 13 Summary statistics for nitrite

Nitrite (mg/L)						
Adopted criterion	ADWG 2011 – Health: 11.29 mg/L					
	ANZECC 2000 – Stock Watering: 9.1 mg/L					
Phase:	**Current Monitoring Period**		**Construction Monitoring Period**		**Baseline Monitoring Period**	
Location ID	N	80th %ile	N	80th %ile	N	80th %ile
BH104 / BH104R	6	**0.020**	32	**0.020**	35	0.010
BH107 / BH107R	6	0.010	30	0.010	32	0.020
BH112 / BH112R	6	**0.260**	24	**0.280**	32	0.018
BH145R	6	0.010	24	0.010	--	--

Notes: 1. **BOLD** for BH104/BH104R, BH107/BH107R, BH112/BH112R: sits above the baseline data for the 80th baseline percentile.

2. **BOLD** for BH145R: sits above the construction data for the 80th construction percentile.

In BH104/BH104R and BH112/BH112R, current and construction period 80th percentiles are above the baseline 80th percentile. Nitrite concentrations in BH104/BH104R have been fluctuating at levels above the baseline since the beginning of the construction period. Since monitoring of the redrilled well BH112R, nitrite concentrations have been steadily decreasing from 2 mg/L (August 2023) to 0.26 mg/L (March 2025). In addition, previous nitrite concentrations were reported as low as 0.01 mg/L (September 2024), suggesting that nitrite concentrations may eventually decrease to baseline concentrations.

Table 14 Summary Statistics for total oxidised nitrogen

Nitrogen (Total Oxidised) (as N) (mg/L)						
Adopted criterion	ANZECC 2000 – Lowland Rivers: 0.04 mg/L					
Phase:	**Current Monitoring Period**		**Construction Monitoring Period**		**Baseline Monitoring Period**	
Location ID	N	80th %ile	N	80th %ile	N	80th %ile
BH104 / BH104R	6	**0.140**	32	0.084	35	0.122
BH107 / BH107R	6	**2.680**	30	**2.822**	32	2.534
BH112 / BH112R	6	0.500	24	1.316	32	1.922
BH145R	6	**0.040**	24	0.028	--	--

Notes: 1. **BOLD** for BH104/BH104R, BH107/BH107R, BH112/BH112R: sits above the baseline data for the 80th baseline percentile.

2. **BOLD** for BH145R: sits above the construction data for the 80th construction percentile.

Current and construction period 80th percentiles for total oxidised nitrogen are above the baseline 80th percentile in BH107/BH107R. Current period 80th percentile concentrations are above the baseline 80th percentile for BH104/BH104R and construction period 80th percentile in BH145R.

The increase in concentrations above the baseline at BH107/BH107R is attributed to significant increases in BH107 between May 2022 and November 2022, with concentrations in the replacement well (BH107R) significantly lower. For the current monitoring period, the concentration of total oxidised nitrogen is decreasing in BH107R as the 80th percentile is below the construction 80th percentile.

Table 15 Summary statistics for total nitrogen

Total Nitrogen (mg/L)						
Adopted criterion	ANZECC 2000 – Lowland Rivers: 0.35 mg/L					
Phase:	**Current Monitoring Period**		**Construction Monitoring Period**		**Baseline Monitoring Period**	
Location ID	N	80th %ile	N	80th %ile	N	80th %ile
BH104 / BH104R	6	**2.100**	32	**2.280**	35	1.260
BH107 / BH107R	6	**3.200**	30	**3.600**	32	3.080
BH112 / BH112R	6	**4.000**	24	**4.140**	32	3.840
BH145R	6	2.300	24	2.380	--	--

Notes: 1. **BOLD** for BH104/BH104R, BH107/BH107R, BH112/BH112R: sits above the baseline data for the 80th baseline percentile.

2. **BOLD** for BH145R: sits above the construction data for the 80th construction percentile.

Construction and current period 80th percentiles for total nitrogen are above the baseline 80th percentiles in BH104/BH104R, BH107/BH107R and BH112/BH112R. The increase in construction period concentrations above the baseline at BH104/BH104R and BH107/BH107R is attributed to significant increases in BH104 and BH107 between May 2022 and November 2022, and the concentrations in replacement wells significantly lower. Although the replacement wells BH104R and BH107R have recorded lower concentrations of total nitrogen, the current period concentrations remain above the baseline 80th percentile. Meanwhile, the increase in current and construction 80th percentiles for BH112/BH112R is attributed to the increase in total nitrogen concentrations since monitoring of the redrilled well BH112R. Total nitrogen concentrations in BH104R, BH107R and BH112R indicate a steadily decreasing trend as the current 80th percentiles are less than the construction 80th percentiles.

Table 16 Summary statistics for total phosphorus

Total Phosphorus (mg/L)						
Adopted criterion	ANZECC 2000 – Lowland Rivers: 0.025 mg/L					
Phase:	**Current Monitoring Period**		**Construction Monitoring Period**		**Baseline Monitoring Period**	
Location ID	N	80th %ile	N	80th %ile	N	80th %ile
BH104 / BH104R	6	**0.130**	32	**0.176**	35	0.108
BH107 / BH107R	6	0.070	30	0.106	32	0.222
BH112 / BH112R	6	**0.530**	24	0.378	32	0.432
BH145R	6	0.080	24	0.098	--	--

Notes: 1. **BOLD** for BH104/BH104R, BH107/BH107R, BH112/BH112R: sits above the baseline data for the 80th baseline percentile.

2. **BOLD** for BH145R: sits above the construction data for the 80th construction percentile.

Current and construction period 80th percentiles for total phosphorus are above the baseline 80th percentile in BH104/BH104R. The current period 80th percentile is above the construction and baseline 80th percentile for BH112/BH112R. The increase in current and construction period concentrations above the baseline at BH104/BH104R is attributed to increases recorded since monitoring began in the replacement well. Overall, total phosphorus has reduced at most wells during the current monitoring period, except for BH112/BH112R which recorded an increase from 0.06 mg/L in October 2024 to 1.14 mg/L in March 2025 and still within the historical range.

5.3.3 Metals

Comparisons between summary statistics for metal concentrations in monitoring wells for sampling events throughout the baseline monitoring period (April 2019 to July 2022), the construction monitoring period (August

2022 to March 2025), and current monitoring period (October 2024 to March 2025) are provided in Table 17 to Table 26. Boxplot comparisons between the baseline monitoring period and the construction monitoring period for copper and manganese are provided in Figures 11 and 12, Appendix D.

Table 17 Summary statistics for arsenic

Arsenic (mg/L)						
Adopted criterion	ADWG 2011 – Health: 0.01 mg/L					
	ANZG 2018 – 95% Freshwater: 0.013 mg/L					
Phase:	**Current Monitoring Period**		**Construction Monitoring Period**		**Baseline Monitoring Period**	
Location ID	N	80th %ile	N	80th %ile	N	80th %ile
BH104 / BH104R	6	**0.003**	32	**0.003**	35	0.001
BH107 / BH107R	6	0.001	30	0.001	32	0.001
BH112 / BH112R	6	**0.002**	24	**0.006**	32	0.001
BH145R	6	0.003	24	0.006	--	--

Notes: 1. **BOLD** for BH104/BH104R, BH107/BH107R, BH112/BH112R: sits above the baseline data for the 80th baseline percentile.

2. **BOLD** for BH145R: sits above the construction data for the 80th construction percentile.

Table 18 Summary statistics for cadmium

Cadmium (mg/L)						
Adopted criterion	ADWG 2011 – Health: 0.002 mg/L					
	ANZG 2018 – 95% Freshwater: 0.0002 mg/L					
Phase:	**Current Monitoring Period**		**Construction Monitoring Period**		**Baseline Monitoring Period**	
Location ID	N	80th %ile	N	80th %ile	N	80th %ile
BH104 / BH104R	6	0.0001	32	0.0001	35	0.0001
BH107 / BH107R	6	0.0001	30	0.0001	32	0.0001
BH112 / BH112R	6	0.0001	24	0.0001	32	0.0001
BH145R	6	0.0001	24	0.0001	--	--

Notes: 1. **BOLD** for BH104/BH104R, BH107/BH107R, BH112/BH112R: sits above the baseline data for the 80th baseline percentile.

2. **BOLD** for BH145R: sits above the construction data for the 80th construction percentile.

Table 19 Summary statistics for chromium

Chromium (mg/L)						
Adopted criterion	ANZG 2018 – 95% Freshwater: 0.001 mg/L					
Phase:	**Current Monitoring Period**		**Construction Monitoring Period**		**Baseline Monitoring Period**	
Location ID	N	80th %ile	N	80th %ile	N	80th %ile
BH104 / BH104R	6	0.001	32	0.001	35	0.001
BH107 / BH107R	6	0.001	30	0.001	32	0.001
BH112 / BH112R	6	0.001	24	0.001	32	0.001
BH145R	6	0.001	24	0.001	--	--

Notes: 1. **BOLD** for BH104/BH104R, BH107/BH107R, BH112/BH112R: sits above the baseline data for the 80th baseline percentile.

2. **BOLD** for BH145R: sits above the construction data for the 80th construction percentile.

Table 20 Summary statistics for copper

Copper (mg/L)						
Adopted criterion	ANZG 2018 – 95% Freshwater: 0.0014 mg/L					
	ADWG 2011 – Health: 2 mg/L					
Phase:	**Current Monitoring Period**		**Construction Monitoring Period**		**Baseline Monitoring Period**	
Location ID	N	80th %ile	N	80th %ile	N	80th %ile
BH104 / BH104R	6	0.001	32	0.002	35	0.028
BH107 / BH107R	6	0.002	30	0.005	32	0.032
BH112 / BH112R	6	0.004	24	0.006	32	0.033
BH145R	6	0.001	24	0.001	--	--

Notes: 1. **BOLD** for BH104/BH104R, BH107/BH107R, BH112/BH112R: sits above the baseline data for the 80th baseline percentile.

2. **BOLD** for BH145R: sits above the construction data for the 80th construction percentile.

Table 21 Summary statistics for iron

Iron (mg/L)						
Adopted criterion	None					
Phase:	**Current Monitoring Period**		**Construction Monitoring Period**		**Baseline Monitoring Period**	
Location ID	N	80th %ile	N	80th %ile	N	80th %ile
BH104 / BH104R	6	**1.280**	32	**1.380**	24	1.054
BH107 / BH107R	6	0.050	30	0.050	23	0.162
BH112 / BH112R	6	0.050	24	0.050	23	0.182
BH145R	6	3.080	23	3.882	--	--

Notes: 1. **BOLD** for BH104/BH104R, BH107/BH107R, BH112/BH112R: sits above the baseline data for the 80th baseline percentile.

2. **BOLD** for BH145R: sits above the construction data for the 80th construction percentile.

Table 22 Summary statistics for lead

Lead (mg/L)						
Adopted criterion	ANZG 2018 – 95% Freshwater: 0.0034 mg/L					
	ADWG 2011 – Health: 0.01 mg/L					
Phase:	**Current Monitoring Period**		**Construction Monitoring Period**		**Baseline Monitoring Period**	
Location ID	N	80th %ile	N	80th %ile	N	80th %ile
BH104 / BH104R	6	0.001	32	0.001	35	0.001
BH107 / BH107R	6	0.001	30	0.001	32	0.001
BH112 / BH112R	6	0.001	24	0.001	32	0.001
BH145R	6	0.001	24	0.001	--	--

Notes: 1. **BOLD** for BH104/BH104R, BH107/BH107R, BH112/BH112R: sits above the baseline data for the 80th baseline percentile.

2. **BOLD** for BH145R: sits above the construction data for the 80th construction percentile.

Table 23 Summary statistics for manganese

Manganese (mg/L)						
Adopted criterion	ANZG 2018 – 95% Freshwater: 1.9 mg/L					
	ADWG 2011 – Health: 0.5 mg/L					
Phase:	**Current Monitoring Period**		**Construction Monitoring Period**		**Baseline Monitoring Period**	
Location ID	N	80th %ile	N	80th %ile	N	80th %ile
BH104 / BH104R	6	0.082	32	0.197	24	0.699
BH107 / BH107R	6	0.004	30	0.048	23	0.502
BH112 / BH112R	6	0.084	24	0.111	23	0.266
BH145R	6	0.109	23	0.322	--	--

Notes: 1. **BOLD** for BH104/BH104R, BH107/BH107R, BH112/BH112R: sits above the baseline data for the 80th baseline percentile.

2. **BOLD** for BH145R: sits above the construction data for the 80th construction percentile.

Table 24 Summary statistics for mercury

Mercury (mg/L)						
Adopted criterion	ANZG 2018 – 95% Freshwater: 0.0006 mg/L					
	ADWG 2011 – Health: 0.001 mg/L					
Phase:	**Current Monitoring Period**		**Construction Monitoring Period**		**Baseline Monitoring Period**	
Location ID	N	80th %ile	N	80th %ile	N	80th %ile
BH104 / BH104R	6	0.0001	32	0.0001	35	0.0001
BH107 / BH107R	6	0.0001	30	0.0001	32	0.0001
BH112 / BH112R	6	0.0001	24	0.0001	32	0.0001
BH145R	6	0.0001	24	0.0001	--	--

Notes: 1. **BOLD** for BH104/BH104R, BH107/BH107R, BH112/BH112R: sits above the baseline data for the 80th baseline percentile.

2. **BOLD** for BH145R: sits above the construction data for the 80th construction percentile.

Table 25 Summary statistics for nickel

Nickel (mg/L)						
Adopted criterion	ANZG 2018 – 95% Freshwater: 0.011 mg/L					
	ADWG 2011 – Health: 0.02 mg/L					
Phase:	**Current Monitoring Period**		**Construction Monitoring Period**		**Baseline Monitoring Period**	
Location ID	N	80th %ile	N	80th %ile	N	80th %ile
BH104 / BH104R	6	0.0010	32	0.0072	35	0.1054
BH107 / BH107R	6	0.0010	30	0.0022	32	0.0696
BH112 / BH112R	6	0.0060	24	0.0118	32	0.1162

Nickel (mg/L)						
Adopted criterion	ANZG 2018 – 95% Freshwater: 0.011 mg/L					
	ADWG 2011 – Health: 0.02 mg/L					
BH145R	6	0.0020	24	0.0106	--	--

Notes: 1. **BOLD** for BH104/BH104R, BH107/BH107R, BH112/BH112R: sits above the baseline data for the 80th baseline percentile.

2. **BOLD** for BH145R: sits above the construction data for the 80th construction percentile.

Table 26 Summary statistics for zinc

Zinc (mg/L)						
Adopted criterion	ANZG 2018 – 95% Freshwater: 0.008 mg/L					
Phase:	**Current Monitoring Period**		**Construction Monitoring Period**		**Baseline Monitoring Period**	
Location ID	N	80th %ile	N	80th %ile	N	80th %ile
BH104 / BH104R	6	0.0060	32	0.0104	35	0.0962
BH107 / BH107R	6	0.0100	30	0.0122	32	0.0848
BH112 / BH112R	6	0.0170	24	0.0190	32	0.1276
BH145R	6	**0.0170**	24	0.0094	--	--

Notes: 1. **BOLD** for BH104/BH104R, BH107/BH107R, BH112/BH112R: sits above the baseline data for the 80th baseline percentile.

2. **BOLD** for BH145R: sits above the construction data for the 80th construction percentile.

Current and construction period 80th percentiles for the majority of metals were below the baseline 80th percentile, with the exception of the following:

– Arsenic: current and construction period 80th percentile concentrations were reported above the baseline in BH104/BH104R and BH112/BH112R. This may be attributable to increased concentrations coinciding with the monitoring of the replacement wells, which have been decreasing at BH112/BH112R and stable at BH104/BH104R.
– Iron: current and construction 80th percentile concentrations were reported above the baseline in BH104/BH104R, which may be attributed to iron concentrations recorded above the maximum baseline concentration since the installation of the replacement well. However, the current 80th percentile is now below the construction 80th percentile, indicating a decreasing trend.
– The current period 80th percentile for zinc at BH145R was above the construction 80th percentile and is attributed to the slight increasing trend evident since May 2024.

The majority of groundwater samples collected during the current monitoring period reported heavy metal concentrations below the LOR and/or adopted assessment criteria. The reported concentrations and/ or exceedances are discussed below.

– **Arsenic (filtered):** All groundwater samples reported arsenic concentrations below the adopted criteria.
– **Cadmium (filtered):** Most groundwater samples reported cadmium concentrations below the laboratory LOR (0.0001 mg/L), except for one sample at BH104R which reported 0.0001 mg/L. All results were below the adopted criteria.
– **Chromium (filtered)**: All groundwater samples reported chromium concentrations below the LOR (0.001 mg/L) and the adopted criteria.
– **Copper (filtered)**: Exceedances of the adopted ANZG ecological criterion (0.0014 mg/L) for copper were reported in the following groundwater samples:
    - BH107R in majority of events (maximum 0.003 mg/L), with the exception of primary samples in October and November 2024. It is noted that the duplicate sample in October 2024 (GWDUP2) exceeded the ANZG ecological criterion while the parent sample was below the LOR.

- BH112R in November and December 2024 (maximum 0.005 mg/L).
- BH145R in January 2025 (0.004 mg/L), GWDUP1 intra-laboratory duplicate sample (0.004 mg/L) and GWDUP2 interlaboratory duplicate sample (0.005 mg/L).

All other concentrations remained below or equal to the LOR. All reported concentrations remained below human health and stock watering criteria.

– **Iron (filtered)**: The majority of groundwater samples for the current monitoring period in BH104R and BH145R reported iron concentrations above the LOR, while BH107R and BH112R were below the LOR. The maximum concentration reported was in BH145R in October 2024 (3.14 mg/L). There are no adopted assessment criteria for iron.
– **Lead (filtered)**: All groundwater samples reported lead concentrations below the LOR (0.001 mg/L).
– **Manganese (filtered)**: The majority of groundwater samples reported manganese concentrations above the LOR except for BH107R which reported two samples below the LOR in October and November 2024. The maximum concentration reported was in BH145R in November 2024 (0.116 mg/L). There were no exceedances of the human health or ecological criterion.
– **Mercury (filtered)**: All groundwater samples reported mercury concentrations below the LOR (0.0001 mg/L) and all adopted assessment criteria.
– **Nickel (filtered)**: All groundwater samples in BH112R and the majority of groundwater samples in BH145R reported nickel concentrations at or above the LOR (0.001 mg/L). The following locations reported concentrations above the ANZG ecological (0.011 mg/L) and/ or adopted human health (0.02 mg/L) assessment criteria:
  - BH112R in December 2024 (0.030 mg/L).
  - BH145R (0.019 mg/L) and GWDUP1 (0.017 mg/L) in December 2024

  All reported concentrations were below the stock watering criteria.
– **Zinc (filtered)**: The majority of groundwater samples in BH104R were below the LOR (0.005 mg/L) or did not report any concentrations above the ANZG ecological criterion (0.008 mg/L). In BH107R, BH112R and BH145R the following samples reported concentrations above the ANZG ecological criterion.
  - BH107R in December, February and March 2025 (maximum 0.010 mg/L).
  - BH112R and BH145R in all events except February 2025 (maximum 0.019 mg/L for both wells)

5.3.4 Hardness

(ANZECC & ARMCANZ, 2000) stated that the toxicity of certain heavy metals in freshwater reduces with increasing hardness. As such, hardness-modified trigger values (HMTV) were derived for selected metals exceeding ecological criteria (cadmium, chromium, lead, nickel and zinc) during the baseline and current monitoring period using guidance by ANZECC & ARMCANZ (2000). This provides a more accurate assessment of risk to ecological receptors. It is noted that HMTV algorithms are not able to be applied to iron and manganese.

Exceedances of adopted criteria were eliminated following the application of HMTVs for cadmium, chromium, lead, nickel and zinc, with the exceptions summarised in Table 27. No exceedances were detected during the current monitoring period (October 2024 to March 2025). Exceedances still exist as copper HMTV are not able to be derived by this method.

Table 27 Exceptions to exceedances of adopted criteria following application of HMTVs

Metal	Well ID	Events
Chromium	BH145	January 2021
Nickel	BH104R/BH104R	March 2022
	BH107/BH107R	March 2022
	BH112/BH112R	May 2021 March 2022
	BH145	September 2020 November 2020 December 2020 March 2021
Zinc	BH107/BH107R	December 2021 January 2022 March 2023
	BH112/BH112R	December 2021
	BH145	All monitoring events between September 2020 and February 2023, with the exception of October 2021

This indicates that the toxicity of metals within all groundwater monitoring wells is being reduced due to the presence of hard water during the current monitoring round. It is noted that continual exceedances of the zinc HMTV at BH145 were eliminated once BH145R was installed and monitored from April 2023.

Hardness-modified trigger values and associated heavy metal concentrations for all monitoring events are presented in Table B9, Appendix B.

5.3.5 Benzene, toluene, ethylbenzene, xylene, naphthalene (BTEXN)

All groundwater samples collected in the current monitoring period reported concentrations of BTEXN below the laboratory LOR and adopted criteria.

5.3.6 Total recoverable hydrocarbons (TRH)

All groundwater samples collected in the current monitoring period reported concentrations of TRH below the laboratory LOR and adopted criteria.

5.3.7 Polycyclic aromatic hydrocarbons (PAHs)

Groundwater samples were analysed for PAHs in the March 2025 event only. All samples reported concentrations below the laboratory LOR and adopted criteria. However, it is noted that the laboratory LOR was higher than the adopted assessment criteria for anthracene, benzo(a)pyrene and sum of PAHs, and therefore any exceedances of the assessment criteria may not have been reported.

5.3.8 Speciated phenols

Groundwater samples were analysed for phenols in the March 2025 event only. All samples reported concentrations below the laboratory LOR and adopted criteria.

5.3.9 Total suspended solids (TSS)

The majority of groundwater samples reported TSS concentrations above the laboratory LOR of 5 mg/L and the adopted lowland rivers criterion of 6 mg/L (ANZECC, 2000). This parameter has been analysed from July 2020

onwards. Table 28 presents the maximum and average concentrations of TSS over the baseline monitoring period (July 2020 to July 2022), compared to the construction monitoring period (August 2022 to March 2025), and current monitoring period (October 2024 to March 2025) for each monitoring well.

Table 28 Maximum and average concentration of total suspended solids in monitoring wells

Total Suspended Solids (mg/L)						
Phase:	**Current Monitoring Period**		**Construction Monitoring Period**		**Baseline Monitoring Period**	
Location ID	Maximum	Average	Maximum	Average	Maximum	Average
BH104 / BH104R	130	67	405	108	219	48
BH107 / BH107R	145	63	1890	179	1910	271
BH112 / BH112R	993	225	2710	451	8780	937
BH145R	234	72	464	88	--	--

Current period average TSS concentration was above the baseline average in BH104/BH104R only. The remaining groundwater wells reported average TSS values lower than the baseline and construction period values, with groundwater well BH112R reporting higher maximum and average concentrations than the other monitoring wells for the current period. The maximum concentration of TSS in the current monitoring period was 993 mg/L, reported in BH112R in March 2025.

Comparisons between summary statistics for TSS concentrations in monitoring wells for sampling events throughout the baseline monitoring period, the construction monitoring period, and the current monitoring period (October 2024 to March 2025) are provided in Table 29.

Table 29 Summary statistics for total suspended solids

Total Suspended Solids (mg/L)						
Adopted criterion	ANZECC 2000 – Lowland Rivers (NSW coastal rivers): 6 mg/L					
Phase:	**Current Monitoring Period**		**Construction Monitoring Period**		**Baseline Monitoring Period**	
Location ID	N	80th %ile	N	80th %ile	N	80th %ile
BH104 / BH104R	5	**92**	31	**142**	24	61
BH107 / BH107R	6	127	30	216	23	275
BH112 / BH112R	6	241	24	**737**	23	726
BH145R	6	78	24	104	--	--

Notes: 1. **BOLD** for BH104/BH104R, BH107/BH107R, BH112/BH112R: sits above the baseline data for the 80th baseline percentile.

2. **BOLD** for BH145R: sits above the construction data for the 80th construction percentile.

Construction period 80th percentiles for BH104/BH104R and BH112/BH112R exceed the baseline period 80th percentiles for TSS, with the current period 80th percentile at BH104/BH104R also above the baseline.

Construction period exceedances above the baseline at BH104/BH104R are attributed to increased concentrations in replacement well BH104R compared to BH104. TSS concentrations in BH104/BH104R since reinstatement have fluctuated between 100 mg/L and 405 mg/L. Exceedances above the baseline at BH112/BH112R can be attributed to increased concentrations between June 2022 and January 2023, with concentrations in the replacement well significantly lower.

5.3.10 Total Dissolved Solids (TDS)

All samples in the current monitoring period reported TDS concentrations above the laboratory LOR (10 mg/L). Ecological and human health criteria are generally not applied to total dissolved solids as it is an aesthetic issue; however, the ADWG (NHMRC & NRMMC, 2011) states that concentrations exceeding 1200 mg/L are regarded as unacceptable drinking water. All samples exceeded this limit. Table 30 presents the maximum and average

concentrations of TDS over the baseline monitoring period (July 2020 to July 2022), compared to the construction monitoring period (August 2022 to March 2025), and current monitoring period (October 2024 to March 2025) for each monitoring well.

Table 30 Maximum and average concentration of total dissolved solids in monitoring wells

Total Dissolved Solids (mg/L)						
Phase:	**Current Monitoring Period**		**Construction Monitoring Period**		**Baseline Monitoring Period**	
Location ID	Maximum	Average	Maximum	Average	Maximum	Average
BH104 / BH104R	4680	4576	16500	6277	15400	8374
BH107 / BH107R	2510	2167	3200	2336	6360	4753
BH112 / BH112R	11200	10392	11400	8913	8470	6093
BH145R	13800	12067	14500	10401	--	--

Current period maximum and average TDS concentrations in groundwater were below the baseline maximum and averages in BH104/BH104R and BH107/BH107R. While groundwater concentrations at BH112/BH112R and BH145R reported maximum concentrations an order of magnitude higher than BH104R and BH107R. The highest concentration in the current monitoring period was reported in BH145R in February 2025 (13,800 mg/L).

Comparisons between summary statistics for TDS concentrations in monitoring wells for sampling events throughout the baseline monitoring period, the construction monitoring period, and the current monitoring period (October 2024 to March 2025) are provided in Table 31.

Table 31 Summary statistics for total dissolved solids

Total Dissolved Solids (mg/L)						
Adopted criterion	ANZECC 2000 – Stock Watering: 5000 mg/L					
Phase:	**Current Monitoring Period**		**Construction Monitoring Period**		**Baseline Monitoring Period**	
Location ID	N	80th %ile	N	80th %ile	N	80th %ile
BH104 / BH104R	5	4648	31	5430	24	9778
BH107 / BH107R	6	2260	30	2518	23	6210
BH112 / BH112R	6	**10600**	24	**10600**	23	8290
BH145R	6	**13000**	24	12100	--	--

Notes: 1. **BOLD** for BH104/BH104R, BH107/BH107R, BH112/BH112R: sits above the baseline data for the 80th baseline percentile.

2. **BOLD** for BH145R: sits above the construction data for the 80th construction percentile.

Current and construction period 80th percentiles for TDS concentrations are above the baseline 80th percentile in BH112/BH112R, while the current period 80th percentile is above the construction 80th percentile for BH145R.

Exceedances above the baseline in the current and construction periods for BH112/BH112R are attributed to increased TDS concentrations since the monitoring of replacement well BH112R in August 2023. The increases in the current 80th percentile compared to the construction 80th percentile in BH145R is attributed to an increasing trend in TDS concentration recorded since August 2024.

6. Groundwater level monitoring

6.1 Schedule of groundwater well locations

As defined in C71, addendum 2 of the GHD proposal (GHD, 2021c), GHD would monitor groundwater levels from the four groundwater sampling locations (BH104, BH107, BH112, BH145) on a monthly basis and twenty-five existing groundwater monitoring wells on a bimonthly basis (every second month) during the construction monitoring phase. Newly installed replacement sampling wells BH104R, BH107R, BH112R, and BH145R are monitored monthly during the construction phase, depending on accessibility, as the original four wells have been decommissioned. Groundwater level monitoring is conducted manually using a dip-meter and using water level meters (WLM) installed in the wells. Some wells could not be monitored for groundwater level due to inaccessible wells, destroyed wells, or damaged WLMs.

The schedule of wells required to be sampled is listed in Table 32 below, and notes if the scheduled wells were successfully monitored. Remaining groundwater wells have water level meters (WLM) mounted to the underside of the well caps unless noted in the Table. This ensures data processing is as accurate as possible.

Table B1, Appendix B identifies the wells successfully gauged and wells that were not monitored due to inaccessibly or decommissioning, including the month they were last gauged.

Table 32 Schedule of M12 groundwater level wells monitored by GHD from August 2022 to March 2025

Installed by	Well ID	Package	RL (m, AHD)	Manual gauging data	WLM data	Well Status
JAJV	BH102	West	92.19	No	No	Destroyed
JAJV	BH104	West	101.11	No	No	Destroyed
JBS&G	BH104R	West	100.269	Yes	Yes	Monitoring Well
JAJV	BH105	West	92.7	No	No	Destroyed
JAJV	BH107	West	94.63	No	No	Destroyed
JBS&G	BH107R	West	95.566	Partial	Yes	Monitoring Well
JAJV	BH112	West	93.78	No	No	Destroyed
ADE	BH112R	West	93.663	Partial	Partial	Monitoring Well
JAJV	BH117	West	65.05	No	No	Destroyed
JAJV	BH119	West	54.0	No	No	Destroyed
JAJV	BH129	Central	49.12	No	No	Destroyed
JAJV	BH134	Central	57.94	No	No	Destroyed
JAJV	BH135	Central	60.55	No	No	Destroyed
JAJV	BH139	Central	101.1	No	No	Destroyed
JAJV	BH144	Central	113.5	No	No	Destroyed
JAJV	BH145	Central	116.3	No	No	Destroyed
MMGEO	BH145R	Central	113.153	Yes	Yes	Monitoring Well
JAJV	BH150	Central	109.5	No	No	Destroyed
JAJV	BH155	East	121.6	Yes	No[1]	Destroyed
JAJV	BH162	East	118.62	Yes	Yes	Destroyed after Oct 2023

Installed by	Well ID	Package	RL (m, AHD)	Manual gauging data	WLM data	Well Status
JAJV	BH170	East	92.41	No	No	Unable to locate
JAJV	BH175	East	80.34	Yes	Partial	Gauging Well
JAJV	BH202	West	49.53	No	No	Destroyed
JAJV	BH204	West	50.24	No	No	Destroyed
JAJV	BH207	West	40.03	No	No	Destroyed
JAJV	BH209	West	39.36	No	No	Destroyed
JAJV	BH211	Central	37.72	No	No	Destroyed
JAJV	BH215	Central	37.77	No	No	Destroyed
JAJV	BH217	Central	40.49	No	No	Destroyed
JAJV	BH219	Central	44.46	Yes	Yes	Destroyed after June 2024
JAJV	BH221	Central	45.24	No	No	Destroyed
JAJV	BH223	Central	46.26	No	No	Destroyed
JAJV	BH227	Central	Unknown	No	No	Destroyed

[1] BH155 did not have a logger as it was dry

6.2 Data collection and analysis methodology

The methodology to collect the groundwater level data is indicatively as follows:

1. Remove gatic cover and well cap. The WLM is removed from the groundwater well during this process.
2. A manual reading of the standing water level is collected using a calibrated IP. This is done to ensure reliability of the data collected with the WLM. Measurements are taken to the nearest millimetre.
3. The data from the WLM is then downloaded to the commercially available relevant computer software package “HOBOware Pro”, “Levelogger” or “Win-Situ”. The data is collected as absolute pressure (kPa).
4. WLM is replaced into the groundwater well and gatic cover secured.
5. Data is then processed against the atmospheric pressure data and converted to 1 meter of water column (mH_2O). It is then plotted against groundwater well RL and plotted.

6.3 Manual gauging

Manual gauging results reported during the current monitoring period (October 2024 to March 2025) are presented in Table B10, Appendix B.

Depth to groundwater for the current monitoring period (October 2024 to March 2025) ranged between 81.570 m AHD (BH112R, February 2025) and 102.198 m AHD (BH145R, February 2025) in the four groundwater quality monitoring wells.

Groundwater elevation to Australian Height Datum (AHD) is lowest at BH112R and highest at BH104R for the group of monitoring wells BH104/BH104R, BH107/BH107R and BH112/BH112R. These wells are located on a linear alignment and therefore triangulation for groundwater flow is unable to be determined. However, based on the local topography the groundwater flow is likely to flow in a north-east direction. BH145R is located east of the other wells and there are no other wells nearby to determine groundwater flow. However, based on the local topography groundwater is likely to flow towards the south in this area.

The approximate groundwater elevation of the gauging wells with results from the current monitoring round are plotted in Appendix I.

Groundwater levels obtained by manual reading across the monitoring and gauging wells throughout the current monitoring period are summarised as follows:

– BH104R: increased by approximately 0.41 m.
– BH107R and BH145R: increased by approximately 0.21 m.
– BH112R: remained relatively stable.
– BH175 increased by approximately 0.59 m.

6.4 Results

Manual gauging data is presented in Table B10, Appendix B, and groundwater level plots are presented in Appendix I.

The groundwater level monitoring results are presented on RL vs time plots. A secondary axis shows daily rainfall data downloaded from the Bureau of Meteorology website for the Badgerys Creek AWS Station (ID 067108) which is located approximately 4 km southeast of the western project area (BH104/BH104R, BH107/BH107R and BH112/BH112R) and approximately 9 km west of the eastern project area (BH145/BH145R). It is noted that for the current monitoring period four wells have WLM data within the current monitoring period (October 2024 to March 2025). Whilst BH219 was identified as destroyed sometime after June 2024, this was not confirmed until October 2024 and therefore the WLM data has been included in Appendix I as the final graph for this well. The remaining wells, as outlined in Table 32, have either been destroyed or were inaccessible, as noted in Table B1, Appendix B.

In the western area, only the groundwater quality monitoring wells remain out of all gauging wells. The groundwater levels in these wells are summarised as follows:

– BH104R steadily decreased from December 2022 to July 2023, and between July 2023 and August 2023, the water level dropped approximately 1.2 m. Since November 2023, the water level has remained relatively stable with slight increases and decreases over time, which may be indicative of seasonal fluctuations as individual months of 2024 are comparable to 2025.
– BH107R steadily decreased from December 2022 to November 2023 where the water level dropped approximately 0.93 m. Between November 2023 and August 2024, the water level remained relatively stable. Since August 2024, there has been a slight increase in water level, by approximately 0.41 m between August 2024 and March 2025.
– BH112R steadily decreased between August 2023 and December 2023 by approximately 0.60 m and has remained relatively stable since December 2023.

Groundwater levels in the central wells are summarised as follows:

– BH145R water level remained relatively stable since monitoring began in March 2023, although a slight increasing trend is apparent over time. It is noted that anomalous data appears between February and March 2025 events, which records unusually higher water levels. Field notes recorded in February 2025 indicate extreme weather temperatures, possibly affecting the WLM sensors when stationed aboveground during sampling. Incorrect replacement of the WLM in the groundwater well may also attribute to the anomalous data recorded. Further inspection of this WLM and its data will be conducted to ensure the instrument is not faulty.
– BH145, which was decommissioned in April 2023, only had a small amount of water column within the well when monitored during previous monitoring rounds and had slow to no recharge once the water was removed. Therefore, the groundwater levels in BH145 are not indicative of the surrounding area.
– Gauging well BH219 increased by 0.28 m throughout April to June 2024, likely due to increases in rainfall across the project area during this period. However, no further gauging or monitoring data was collected after June 2024 as the well was destroyed during construction work at an adjacent project. All other gauging wells in the central area have been destroyed.

In the eastern area, water levels in BH175 slightly decreased between October and December 2024, before fluctuating and increasing over approximately 0.5 m between December 2024 and February 2025. The overall increase in the current monitoring period disrupted a decreasing trend between September and December 2024. Although recent water levels are still within range of historical water levels recorded since May 2019 to present, the fluctuations over a two-month period appear dissimilar to historical records. However, field staff did not note

any ponded water, dams or increased construction activity near BH175 over this period. All other gauging wells in the eastern area have been destroyed or were unable to be located.

7. Conclusions

The measured groundwater quality parameters and the project analytical suite have provided further data to incorporate into the construction monitoring period percentile values. The reported field parameters and concentration of analytes in the current monitoring period are broadly consistent with those reported in the baseline monitoring period, despite noted increases in most field parameters, some nutrients and few metals concentrations. Groundwater chemistry data showed BH107R continued to be dominated by sodium bicarbonate in the current monitoring period, while BH104R, BH112R and BH145R remained dominated by sodium chloride. As the changes in field parameters and groundwater chemistry have occurred with the replacement of monitoring wells, and any exceedances of adopted assessment criteria were eliminated (following application of hardness modified trigger values), no management actions are required cumulating from this monitoring period.

8. References

ANZECC & ARMCANZ. (2000). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Canberra: Australian and New Zealand Environment and Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ.

ANZECC. (2000). *Criteria for lowland rivers (NSW coastal rivers).*

ANZG. (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Available at www.waterquality.gov.au/anz-guidelines.* Canberra ACT, Australia: Australian and New Zealand Governments and Australian state and territory governments,.

BOM. (2025). Australian Groundwater Explorer. Bureau of Meterology. Retrieved from Australian Groundwater Explorer: http://www.bom.gov.au/water/groundwater/explorer/

BOM. (2025). *Climate Data Online Long-term Rainfall and Temperature - Station ID 067108.* Bureau of Meteorology.

CPB Georgiou JV. (2023). Appendix C Construction Soil and Water Monitoring Program M12 Motorway West April 2023 Rev 01. *Construction Environmental Management Plan Appendix B8 Construction Soil and Water Management Sub-plan M12 Motorway West April 2023 Rev 01*.

DPI. (2014, April). Water for livestock: interpreting water quality tests. Department of Primary Industries.

Geological Survey of NSW. (1991). *Penrith 1:100,000 Geological Series Sheet 9030.*

GHD. (2015). *Standard Operating Procedure (SOP) for groundwater well sampling.*

GHD. (2019). *M12 Motorway Groundwater Monitoring Six Monthly Report 1 - April to September 2019.*

GHD. (2020). *M12 Motorway Groundwater Monitoring Report 2 – April 2019 to March 2020.*

GHD. (2021a). *M12 Motorway Groundwater Monitoring Six Monthly Report 3 - April to September 2020.*

GHD. (2021a). *M12 Motorway Groundwater Monitoring Six Monthly Report 3 - April to September 2020.*

GHD. (2021b). *M12 Motorway Groundwater Monitoring Six Monthly Report 4 - October 2020 to March 2021.*

GHD. (2021c). *Development - Western Parkland City M12 Motorway Project. Water quality and level monitoring services. Contract number 20.0000303606.0590.*

GHD. (2022a). *M12 Motorway Groundwater Monitoring Report 5 – April 2021 to September 2021.*

GHD. (2022b). *M12 Motorway Groundwater Monitoring, Report 6 - October 2021 to March 2022. Transport for NSW.*

GHD. (2022c). *M12 Motorway Groundwater Monitoring Six Monthly Report 7 - April to September 2022.*

GHD. (2023a). *M12 Motorway Groundwater Monitoring Six Monthly Report 8 - October 2022 to March 2023.* Sydney: GHD Pty Ltd.

GHD. (2023b). *M12 Motorway Groundwater Monitoring Six Monthly Report 9 - April 2023 to September 2023.* Sydney: GHD Pty Ltd.

GHD. (2024a). *M12 Motorway Groundwater Monitoring Six Monthly Report 10 - October 2023 to March 2024.*

GHD. (2024b). *M12 Motorway Groundwater Monitoring Six Monthly Report 11 - April 2024 to September 2024.* Sydney: GHD Pty Ltd.

JAJV. (2018a). *M12 Motorway Concept Design and Environmental Impact Statement: Surface Water and Hydrology Assessment Report. Report prepared for Roads and Maritime Services by Jacobs Arcadis Joint Venture.* Sydney, NSW.

JAJV. (2018b). *M12 Motorway Concept Design and Environmental Impact Statement: Contamination Factual Report. Report prepared for Roads and Maritime Services by Jacobs Arcadis Joint Venture.* Sydney, NSW.

JAJV. (2018c). *M12 Motorway Concept Design and Environmental Impact Statement: Groundwater Assessment. Report prepared for Roads and Maritime Services by Jacobs Arcadis Joint Venture.* Sydney, NSW.

JAJV. (2019). *M12 Motorway Concept Design and Environmental Impact Statement - Groundwater quality and hydrology assessment report. Report prepared for Roads and Maritime Services by Jacobs Arcadis Join Venture.*

JAJV. (2019). *M12 Motorway Environmental Impact Statement. Report prepared for Roads and Maritime Services by Jacobs Arcadis Join Venture.* Sydney NSW.

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure (ASC NEPM).* National Environmental Protection Council (NEPC).

NEPC. (2013). *National Environmental Protection (Assessment of Site Contamination) Measure.* National Environment Protection Council.

NHMRC & NRMMC. (2011). *Australian Drinking Water Guidelines 6 (version 3.5 updated in August 2018) - Health and Recreation criteria.*

NSW EPA. (2015). *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997.*

NSW EPA. (2020). *Consultants Reporting on Contaminated Land Guidelines: Contaminated Land Guidelines.* Parramatta: NSW Environment Protection Authority (EPA).

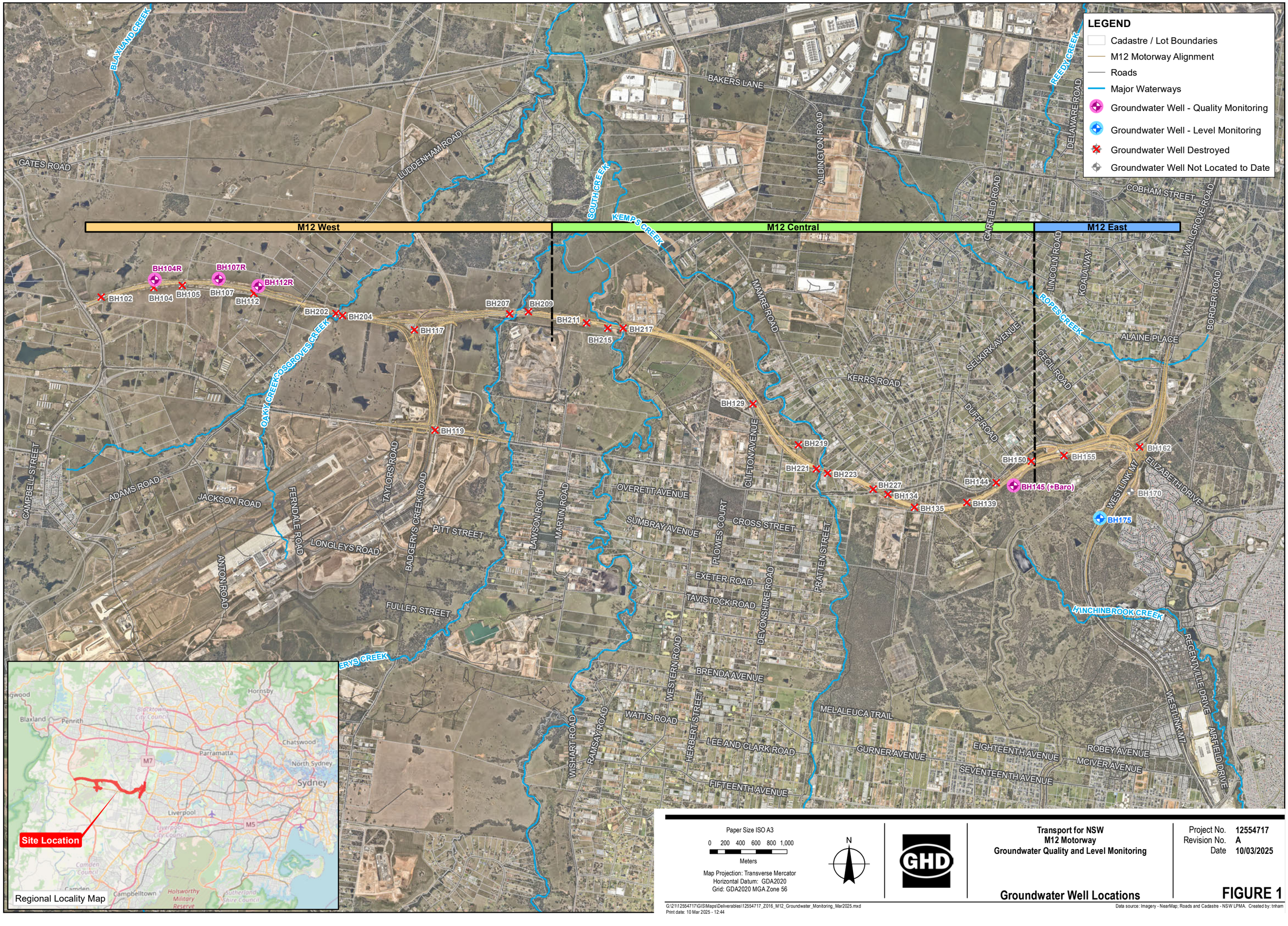
Seymour Whyte. (2023). Appendix B Construction Soil and Water Monitoring Program M12 Motorway – Central August 2023, Rev E. *Construction Environmental Management Plan Appendix B4 Construction Soil and Water Management Sub-plan M12 Motorway – Central July 2023, Rev E*.

TfNSW. (2024). *Overarching Construction Environmental Management Plan, Appendix B4.* Sydney: NSW Government. Retrieved from https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSI-9364-PA-46%2120211220T053303.892%20GMT

Appendices

Appendix A

Figure



Paper Size ISO A3

0 200 400 600 800 1,000

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

GHD

Transport for NSW
M12 Motorway
Groundwater Quality and Level Monitoring

Project No. **12554717**
Revision No. **A**
Date **10/03/2025**

Groundwater Well Locations

FIGURE 1

G:\21\12554717\GIS\Maps\Deliverables\12554717_Z016_M12_Groundwater_Monitoring_Mar2025.mxd
Print date: 10 Mar 2025 - 12:44

Data source: Imagery - NearMap; Roads and Cadastre - NSW LPMA. Created by: tnham

Appendix B

Tables

Package		Well ID	Event 1 April 2019	Event 2 May 2019	Event 3 June 2019	Event 4 July 2019	Event 5 August 2019	Event 6 September 2019	Event 7 October 2019	Event 8 November 2019	Event 9 December 2019	Event 10 January 2020	Event 11 February 2020	Event 12 March 2020	Event 13 April 2020	Event 14 May 2020	Event 15 June 2020	Event 16 July 2020	Event 17 August 2020
	West	BH102																	
		BH104			No access												No access		
		BH104R																	
		BH105																	
		BH107	No access	No access	No access	Bailer						No access	Parameters[1]	No access			No access		
		BH107R																	
		BH112	No access	No access	No access	Bailer						No access	Parameters[1]	No access		Bailer	No access		
		BH112R																	
		BH117																	
		BH119																	
		BH202																	
		BH204																	
		BH207																	
		BH209																	
	Central	BH129																	
		BH134																	
		BH135																	
		BH139																	
		BH144																	
		BH145	No access	No access		Bailer	Bailer	Bailer	Bailer	No access	Bailer	No access	No access	No access	No access		No access		Bailer
		BH145R																	
		BH150																	
		BH211																	
		BH215																	
		BH217																	
		BH219																	
		BH221																	
		BH223																	
		BH227																	
	East	BH155																	
		BH162																	
		BH170																	
		BH175																	

Well sampled
Not sampled
Not required
Not located - Attempts to locate well for sampling or sample was made
No access - due to property restrictions and/or wet weather
[1] Insufficient water to collect groundwater sample
[2] No field parameters collected due to insufficient water

Package		Well ID	Event 18 September 2020	Event 19 October 2020	Event 20 November 2020	Event 21 December 2020	Event 22 January 2021	Event 23 February 2021	Event 24 March 2021	Event 25 April 2021	Event 26 May 2021	Event 27 June 2021	Event 28 July 2021	Event 29 August 2021	Event 30 September 2021	Event 31 October 2021	Event 32 November 2021	Event 33 December 2021	Event 34 January 2022
	West	BH102																	
		BH104																	
		BH104R																	
		BH105																	
		BH107			No access														
		BH107R																	
		BH112			No access														
		BH112R																	
		BH117																	
		BH119																	
		BH202																	
		BH204																	
		BH207																	
		BH209																	
	Central	BH129																	
		BH134																	
		BH135																	
		BH139																	
		BH144																	
		BH145					Bailer[2]	Bailer[2]			[1,2]	Bailer[2]	Bailer[2]	No access	Bailer[2]	Bailer[2]	Bailer[2]	Bailer[2]	Bailer[2]
		BH145R																	
		BH150																	
		BH211																	
		BH215																	
		BH217																	
		BH219																	
		BH221																	
		BH223																	
		BH227																	
	East	BH155																	
		BH162																	
		BH170																	
		BH175																	

Well sampled
Not sampled
Not required
Not located - Attempts to locate well for sampling or sample was made
No access - due to property restrictions and/or wet weather
[1] Insufficient water to collect groundwater sample
[2] No field parameters collected due to insufficient water

Package		Well ID	Event 35 February 2022	Event 36 March 2022	Event 37 April 2022	Event 38 May 2022	Event 39 June 2022	Event 40 July 2022	Event 41 August 2022	Event 42 September 2022	Event 43 October 2022	Event 44 November 2022	Event 45 December 2022	Event 46 January 2023	Event 47 February 2023	Event 48 March 2023	Event 49 April 2023	Event 50 May 2023
	West	BH102															Destroyed	
		BH104				Bailer							Destroyed					
		BH104R																
		BH105											Destroyed					
		BH107				Bailer	Bailer	Bailer	Bailer	Bailer			Destroyed					
		BH107R												No access				
		BH112				Bailer	Bailer	Bailer	Bailer	Bailer			Destroyed					
		BH112R											No access	No access	No access	No access	No access	No access
		BH117							No access		No access		Destroyed					
		BH119							No access		No access		Destroyed					
		BH202											Destroyed					
		BH204							No access		No access		Destroyed					
		BH207							No access		Not located		Destroyed					
		BH209											Destroyed					
	Central	BH129											Destroyed					
		BH134														Destroyed		
		BH135							Not located				Destroyed					
		BH139							Not located		Not located		Destroyed					
		BH144											Destroyed					
		BH145	Bailer[2]	Bailer[2]		Bailer	Bailer[2]	Bailer	Bailer[2]	Bailer[2]	Bailer	Bailer	Bailer[2]	Bailer[2]	Bailer[2]	Bailer[2]	Not required	
		BH145R																
		BH150							No access				Destroyed					
		BH211											Destroyed					
		BH215							Not located		Not located		Destroyed					
		BH217							No access				Destroyed					
		BH219							No access		Not located							
		BH221							No access		Destroyed							
		BH223							No access		Destroyed							
		BH227							No access		Destroyed							
	East	BH155																
		BH162							No access									
		BH170							No access		Not located		Not located		Not located		Not located	
		BH175							No access									

Well sampled
Not sampled
Not required

Not located - Attempts to locate well for sampling or sample was made
No access - due to property restrictions and/or wet weather
[1] Insufficient water to collect groundwater sample
[2] No field parameters collected due to insufficient water

Package		Well ID	Event 51 June 2023	Event 52 July 2023	Event 53 August 2023	Event 54 September 2023	Event 55 October 2023	Event 56 November 2023	Event 57 December 2023	Event 58 January 2024	Event 59 February 2024	Event 60 March 2024	Event 61 April 2024	Event 62 May 2024	Event 63 June 2024	Event 64 July 2024	Event 65 August 2024	Event 66 September 2024
	West	BH102																
		BH104																
		BH104R																
		BH105																
		BH107																
		BH107R	No access															
		BH112																
		BH112R			Bailer													
		BH117																
		BH119																
		BH202																
		BH204																
		BH207																
		BH209																
	Central	BH129																
		BH134																
		BH135																
		BH139																
		BH144																
		BH145																
		BH145R			Bailer											Bailer[2]		
		BH150																
		BH211																
		BH215																
		BH217																
		BH219															Not located	Destroyed
		BH221																
		BH223																
		BH227																
	East	BH155							Destroyed									
		BH162							Destroyed									
		BH170	Not located		Not located		Not located		Not located		Not located		Not located		Not located		Not located	
		BH175																

Well sampled
Not sampled
Not required

Not located - Attempts to locate well for sampling or sample was made
No access - due to property restrictions and/or wet weather
[1] Insufficient water to collect groundwater sample
[2] No field parameters collected due to insufficient water

Package		Well ID	Event 67 October 2024	Event 68 November 2024	Event 69 December 2024	Event 70 January 2025	Event 71 February 2025	Event 72 March 2025
West		BH102						
		BH104						
		BH104R				Bailer		
		BH105						
		BH107						
		BH107R		Bailer		Bailer		Bailer
		BH112						
		BH112R		Bailer		Bailer		Bailer
		BH117						
		BH119						
		BH202						
		BH204						
		BH207						
		BH209						
Central		BH129						
		BH134						
		BH135						
		BH139						
		BH144						
		BH145						
		BH145R		Bailer				
		BH150						
		BH211						
		BH215						
		BH217						
		BH219						
		BH221						
		BH223						
		BH227						
East		BH155						
		BH162						
		BH170	Not located		Not located		Not located	
		BH175						

Well sampled
Not sampled
Not required

Not located - Attempts to locate well for sampling or sample was made
No access - due to property restrictions and/or wet weather
[1] Insufficient water to collect groundwater sample
[2] No field parameters collected due to insufficient water

Sampling Event	Well IDs	Observations and Deviations
Event 68 - November 2024	BH104R BH107R BH112R BH145R	Micropurge equipment failure whilst purging BH104R. Replacement equipment could not be obtained during event. Purge and sampling method changed to disposable bailer at all locations.
Event 70 - January 2025	BH104R BH107R BH112R	These locations were purged and sampled with a disposable bailer instead of the micropurge. This was due to time constraints with the surface water program, as wet weather sampling had been conducted in the week prior and all routine monitoring had to be conducted on this date.
Event 72 - March 2025	BH107R BH112R	The battery which powers the micropurge equipment failed and no longer worked, so these locations were purged and sampled with a disposable bailer.

						Inorganics			Acidity & Alkalinity					Major Ions												Minor Ions		Nutrients								
						Electrical conductivity (lab)	Total Dissolved Solids	Total Suspended Solids	Alkalinity (Carbonate as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Hardness as CaCO3 (Filtered)	Calcium	Calcium (Filtered)	Magnesium	Magnesium (Filtered)	Potassium	Potassium (Filtered)	Sodium	Sodium (Filtered)	Chloride	Sulfate	Sulfate (Filtered)	Cations Total	Anions Total	Ionic Balance	Bicarbonate ion (HCO3-)	Carbonate ion	Ammonia as N	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)	Kjeldahl Nitrogen Total	Reactive Phosphorus as P	Phosphate total (P)	Phosphorus (Total)
						µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL						10	10	5	1	1	1	1	1	0.5	1	0.5	1	0.5	1	0.5	1	1	2	1	0.01	0.01	0.01	1	1	0.01	0.01	0.01	0.01	0.1	0.1	0.01	0.01	0.01
ADWG 2011 Health (v3.7 updated 2022)																							500[#1]	500[#1]						11.29[#2]	0.91[#3]							
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)						**200**		**6**																					**0.01165[#4]**			**0.04**	**0.35**		**0.008**		**0.025**
ANZECC 2000 - Stock Watering							*5000[#5]*							*1000*	*1000*								*1000*	*1000*						*90[#6]*	*9.1[#7]*							
ANZG (2018) - FW - 95% (updated 26 July 2021)																												0.9[#9]	2.4[#10]								
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																					
2-4m																																					
4-8m																																					
>8m																																					
Package	**Location Code**	**Sample Date**	**Field ID**	**Sample Type**	**Lab Report Number**																																
M12 - West	BH104	16-Jul-19	BH104	Normal	ES1922192	-	-	-	<1	-	<1	914	-	-	240	-	517	-	27	-	3,120	5,600	-	842	191	194	0.74	914	-	**0.09**	0.09	<0.01	**0.09**	**0.6**	0.5	<0.01	-	**0.22**
		20-Aug-19	BH104	Normal	ES1926460	-	-	-	<1	-	<1	932	-	-	240	-	565	-	28	-	3,360	5,870	-	882	205	202	0.68	932	-	**0.05**	0.07	0.04	**0.11**	<0.2[#1]	<0.2[#1]	<0.01	-	<0.02[#1]
		24-Sep-19	BH104	Normal	ES1930997	-	-	-	<1	-	<1	973	-	-	205	-	542	-	28	-	3,240	6,070	-	810	196	208	2.73	973	-	**0.02**	0.04	0.01	**0.05**	**0.4**	0.3	<0.01	-	**0.05**
		22-Oct-19	BH104	Normal	ES1934707	-	-	-	<1	-	<1	1,030	-	-	245	-	581	-	27	-	3,360	6,010	-	678	207	204	0.64	1,030	-	**0.1**	0.03	<0.01	0.03	<0.2[#1]	<0.2[#1]	<0.01	-	0.02
		07-Nov-19	BH104	Normal	ES1936840	-	-	-	<1	-	<1	1,180	-	-	280	-	584	-	29	-	3,380	6,160	-	706	210	212	0.53	1,180	-	**0.28**	0.02	<0.01	0.02	**0.6**	0.6	<0.01	-	**0.16**
		12-Dec-19	BH104	Normal	ES1941279	-	-	-	<1	-	<1	1,030	-	-	287	-	624	-	30	-	3,560	6,700	-	892	221	228	1.52	1,030	-	**0.15**	0.09	0.02	**0.11**	<0.2[#1]	<0.2[#1]	<0.01	-	**0.03**
		16-Jan-20	BH104	Normal	ES2001376	-	-	-	<1	-	<1	1,080	-	-	248	-	562	-	35	-	3,430	6,520	-	747	209	221	2.87	1,080	-	**0.11**	0.1	<0.01	**0.1**	<0.5[#1]	<0.5[#1]	<0.01	-	**0.27**
		18-Feb-20	BH104	Normal	ES2005577	-	-	-	<1	-	<1	603	-	-	87	-	167	-	14	-	1,190	1,920	-	326	70.2	73	1.95	603	-	**0.24**	1.17	<0.05[#1]	**1.17**	**2.4**	1.2	<0.02[#1]	-	**0.07**
		12-Mar-20	SD01	Interlab_D	707829	-	-	-	<10	-	<20	810	-	96	-	190	-	17	-	1,600	-	3,400	420	-	-	-	-	810	-	**0.11**	1.6	0.03	**1.6**	**2.6**	1	<0.01	0.06	-
		12-Mar-20	BD01	Field_D	ES2008731	-	-	-	<1	-	<1	704	-	-	103	-	182	-	16	-	1,580	2,670	-	395	89.2	97.6	4.47	704	-	**0.03**	1.09	0.04	**1.13**	**1.9**	0.8	<0.01	-	**0.04**
			BH104	Normal	ES2008731	-	-	-	<1	-	<1	727	-	-	103	-	182	-	16	-	1,580	2,700	-	393	89.2	98.9	5.11	727	-	<0.01	1.09	0.04	**1.13**	**2.1**	1	<0.01	-	**0.05**
		23-Apr-20	BH104	Normal	ES2013858	-	-	-	-	-	<1	1,090	-	-	159	-	321	-	22	-	2,320	3,980	-	586	136	146	3.69	1,090	<1	**0.02**	0.12	<0.01	**0.12**	**0.4**	0.3	<0.01	-	<0.02[#1]
		19-May-20	BH104	Normal	ES2017191	-	-	-	-	-	<1	1,010	-	-	178	-	381	-	23	-	2,710	4,620	-	675	159	164	1.81	1,010	<1	<0.1[#1]	0.13	<0.01	**0.13**	<0.2[#1]	<0.2[#1]	<0.01	-	<0.02[#1]
		30-Jul-20	BH104	Normal	ES2026408	-	*6,030*	**52**	-	-	<1	821	-	-	114	-	231	-	16	-	1,740	3,040	-	436	101	111	4.92	821	<1	**0.25**	0.02	<0.01	0.02	**0.8**	0.8	-	-	**0.08**
		11-Aug-20	BH104	Normal	ES2027951	-	3,250	**14**	-	-	<1	690	-	-	67	-	112	-	11	-	1,050	1,270	-	275	58.5	55.3	2.79	690	<1	<0.01	0.03	<0.01	0.03	**0.5**	0.5	-	-	0.02
		10-Sep-20	BD01	Field_D	ES2032115	-	*7,430*	<5	-	-	<1	1,030	-	-	141	-	286	-	20	-	2,160	3,650	-	511	125	134	3.52	1,030	<1	**0.08**	0.07	<0.01	**0.07**	**0.4**	0.3	-	-	**0.03**
			BH104	Normal	ES2032115	-	*7,380*	**6**	-	-	<1	1,000	1,550	-	141	-	292	-	20	-	2,270	3,650	-	477	130	133	0.97	1,000	<1	**0.09**	0.05	<0.01	**0.05**	**0.4**	0.3	-	-	0.02
		09-Oct-20	BD01	Field_D	ES2035519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			BH104	Normal	ES2035519	-	*8,930*	**20**	-	-	<1	1,200	1,610	-	175	-	285	-	20	-	2,150	4,190	-	612	126	155	10.2	1,200	<1	**0.09**	0.09	<0.01	**0.09**	<0.2[#1]	<0.2[#1]	-	-	**0.04**
		13-Nov-20	BH104	Normal	ES2040330	-	*9,380*	**19**	-	-	<1	1,160	2,020	-	212	-	363	-	24	-	2,570	4,240	-	586	153	155	0.69	1,160	<1	<0.1[#1]	0.12	<0.01	**0.12**	0.3	0.2	-	-	0.02
		08-Dec-20	BH104	Normal	ES2043799	-	*10,200*	**68**	-	-	<1	1,340	2,090	-	206	-	382	-	23	-	2,720	4,580	-	630	161	169	2.57	1,340	<1	**0.6**	0.01	<0.01	0.01	**1.5**	1.5	-	-	**0.08**
			M12GW_DUP	Field_D	ES2043799	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		14-Jan-21	BH104	Normal	ES2101242	-	*9,510*	**24**	-	-	<1	1,430	1,900	-	232	-	322	-	21	-	2,260	4,640	-	603	137	172	11.4	1,430	<1	**0.32**	<0.01	<0.01	<0.01	**1**	1	-	-	**0.06**
			M12GWDUP	Field_D	ES2101242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11-Feb-21	BH104	Normal	ES2104999	-	*9,630*	**48**	-	-	<1	1,130	2,110	-	194	-	394	-	25	-	2,790	4,400	-	601	164	159	1.51	1,130	<1	**0.59**	0.05	<0.01	**0.05**	**1.2**	1.2	-	-	**0.14**
			M12GWDUP	Field_D	ES2104999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Mar-21	BH104	Normal	ES2108508	-	*10,100*	**32**	-	-	<1	1,290	2,190	-	226	-	394	-	26	-	2,760	4,950	-	686	164	180	4.44	1,290	<1	**0.31**	0.04	<0.01	**0.04**	**0.4**	0.4	-	-	**0.04**
			M12GWDUP	Field_D	ES2108508	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Apr-21	BH104	Normal	ES2112804	-	4,350	**22**	<1	768	<1	768	833	-	96	-	144	-	14	-	1,260	1,740	-	322	71.8	71.1	0.47	-	-	**0.19**	0.06	<0.01	**0.06**	**0.7**	0.6	-	-	**0.04**
			M12GWDUP	Field_D	ES2112804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		04-May-21	BH104	Normal	ES2116634	-	*7,190*	**21**	<1	987	<1	987	1,490	-	151	-	271	-	20	-	2,040	3,280	-	526	119	123	1.7	-	-	**0.06**	0.08	<0.01	**0.08**	**0.7**	0.6	-	-	**0.06**
			M12GWDUP	Field_D	ES2116634	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Jun-21	BH104	Normal	ES2121745	-	*8,490*	**42**	<1	957	<1	957	1,860	-	176	-	344	-	24	-	2,540	4,010	-	552	148	144	1.53	-	-	**0.26**	0.04	<0.01	**0.04**	**0.5**	0.5	-	-	**0.04**
			M12GWDUP	Field_D	ES2121745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Jul-21	BH104	Normal	ES2125048	-	*8,860*	**57**	<1	1,040	<1	1,040	1,860	-	201	-	330	-	23	-	2,520	3,940	-	548	147	143	1.4	-	-	**0.36**	0.01	<0.01	0.01	**0.6**	0.6	-	-	**0.06**
			M12GWDUP	Field_D	ES2125048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Aug-21	BH104	Normal	ES2129596	-	*8,770*	**21**	<1	1,200	<1	1,200	1,910	-	206	-	340	-	23	-	2,570	4,200	-	632	151	156	1.62	-	-	**0.13**	0.04	<0.01	**0.04**	<0.2[#1]	<0.2[#1]	-	-	<0.02[#1]
			M12GWDUP	Field_D	ES2129596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		01-Sep-21	BH104	Normal	ES2131753	-	*8,660*	**36**	<1	1,170	<1	1,170	1,590	-	165	-	286	-	22	-	2,260	3,830	-	519	131	142	4.24	-	-	**0.21**	0.01	<0.01	0.01	0.3	0.3	-	-	**0.03**
			M12GWDUP	Field_D	ES2131753	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15-Oct-21	BH104	Normal	ES2137338	-	*8,650*	**138**	<1	1,130	<1	1,130	1,860	-	199	-	330	-	23	-	2,620	4,120	-	595	152	151	0.15	-	-	**0.38**	0.02	<0.01	0.02	**0.7**	0.7	-	-	**0.14**
		15-Oct-21	GWDUP1	Field_D	ES2137338	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Nov-21	BH104	Normal	ES2140334	-	*8,530*	**78**	<1	1,090	<1	1,090	1,680	-	169	-	306	-	23	-	2,380	3,970	-	616	138	146	3.12	-	-	**0.17**	0.37	0.01	**0.38**	**0.8**	0.4	-	-	**0.04**
			GWDUP1	Field_D	ES2140334	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-21	BH104	Normal	ES2144782	-	*6,720*	**50**	<1	626	<1	626	1,400	-	153	-	248	-	21	-	2,000	3,380	-	464	116	118	0.83	-	-	**0.25**	0.06	<0.01	**0.06**	**0.9**	0.8	-	-	**0.08**
			GWDUP1	Field_D	ES2144782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Jan-22	BH104	Normal	ES2201179	-	*7,860*	**99**	<1	1,000	<1	1,000	1,470	-	151	-	266	-	19	-	2,190	4,130	-	566	125	148	8.44	-	-	**0.39**	0.06	<0.01	**0.06**	**1**	0.9	<0.01	-	**0.1**
			GWDUP1	Field_D	ES2201179	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Feb-22	GWDUP2	Interlab_D	863166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Feb-22	BH104	Normal	ES2204606	-	4,380	**45**	<1	860	<1	860	637	-	72	-	111	-	12	-	1,190	1,750	-	313	64.8	73.1	6	-	-	**0.56**	0.01	<0.01	0.01	**1.2**	1.2	<0.01	-	**0.14**
		18-Mar-22	BH104	Normal	ES2209694	-	4,710	**219**	<1	916	<1	916	645	-	72	-	113	-	15	-	1,350	2,120	-	315	72	84.7	8.08	-	-	**0.52**	<0.01	<0.01	<0.01	**1.8**	1.8	<0.01	-	**0.14**
		25-May-22	BH104	Normal	ES2218210	-	*10,000*	**30**	<1	778	<1	778	2,540	-	237	-	473	-	28	-	2,420	4,960	-	709	157	170	4.12	-	-	**0.02**	1.94	<0.01	**1.94**	**2.8**	0.9	<0.01	-	**0.07**
		27-Jun-22	GWDUP2	Interlab_D	901087	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		27-Jun-22	BH104	Normal	ES2222571	-	*14,000*	**10**	<1	880	<1	880	3,730	-	288	-	732	-	30	-	3,580	7,220	-	913	231	240	1.94	-	-	<0.1[#1]	4.13	<0.01	**4.13**	**4.1**	<0.5[#1]	<0.01	-	**0.1**
		20-Jul-22	GWDUP2	Interlab_D	907459	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20-Jul-22	BH104	Normal	ES2225656	-	*15,400*	<5	<1	894	<1	894	3,540	-	287	-	685	-	28	-	3,200	6,970	-	767	211	230	4.5	-	-	**0.09**	5.19	0.04	**5.23**	**6.2**	1	<0.01	-	**0.03**

						Inorganics			Acidity & Alkalinity					Major Ions												Minor Ions		Nutrients								
						Electrical conductivity (lab)	Total Dissolved Solids	Total Suspended Solids	Alkalinity (Carbonate as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Hardness as CaCO3 (Filtered)	Calcium	Calcium (Filtered)	Magnesium	Magnesium (Filtered)	Potassium	Potassium (Filtered)	Sodium	Sodium (Filtered)	Chloride	Sulfate	Sulfate (Filtered)	Cations Total	Anions Total	Ionic Balance	Bicarbonate ion (HCO3-)	Carbonate ion	Ammonia as N	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)	Kjeldahl Nitrogen Total	Reactive Phosphorus as P	Phosphate total (P)	Phosphorus (Total)
						µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL						10	10	5	1	1	1	1	1	0.5	1	0.5	1	0.5	1	0.5	1	1	2	1	0.01	0.01	0.01	1	1	0.01	0.01	0.01	0.01	0.1	0.1	0.01	0.01	0.01
ADWG 2011 Health (v3.7 updated 2022)																							500[#1]	500[#1]						11.29[#2]	0.91[#3]							
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)						**200**		**6**																					**0.01165**[#4]			**0.04**	**0.35**		**0.008**		**0.025**
ANZECC 2000 - Stock Watering							*5000*[#5]							*1000*	*1000*								*1000*	*1000*						*90*[#6]	*9.1*[#7]							
ANZG (2018) - FW - 95% (updated 26 July 2021)																													0.9[#9]	2.4[#10]							
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																					
2-4m																																					
4-8m																																					
>8m																																					
Package	**Location Code**	**Sample Date**	**Field ID**	**Sample Type**	**Lab Report Number**																																
M12 - West	BH107	18-Jul-19	BH107	Normal	ES1922601	-	-	-	<1	-	<1	1,520	-	-	148	-	240	-	36	-	2,200	2,400	-	460	124	108	6.96	1,520	-	**0.07**	0.07	<0.01	**0.07**	**0.7**	0.6	<0.01	-	**0.23**
		20-Aug-19	BH107	Normal	ES1926460	-	-	-	<1	-	<1	1,350	-	-	115	-	322	-	34	-	1,820	1,980	-	437	112	91.9	9.96	1,350	-	0.01	0.05	<0.01	**0.05**	**0.6**	0.5	<0.01	-	**0.25**
		24-Sep-19	BH107	Normal	ES1930997	-	-	-	<1	-	<1	1,490	-	-	102	-	312	-	34	-	1,800	2,780	-	500	110	119	3.79	1,490	-	**0.05**	0.07	<0.01	**0.07**	**1.9**	1.8	<0.01	-	**0.19**
		22-Oct-19	BH107	Normal	ES1934707	-	-	-	<1	-	<1	1,610	-	-	114	-	325	-	34	-	1,900	2,690	-	411	116	117	0.28	1,610	-	**0.02**	<0.01	0.04	**0.04**	<0.1	<0.1	<0.01	-	<0.01
		07-Nov-19	BH107	Normal	ES1936840	-	-	-	<1	-	<1	1,480	-	-	128	-	316	-	34	-	1,850	2,790	-	513	114	119	2.24	1,480	-	**0.04**	0.04	<0.01	**0.04**	0.2	0.2	<0.01	-	**0.09**
		12-Dec-19	BH107	Normal	ES1941279	-	-	-	<1	-	<1	1,430	-	-	125	-	333	-	37	-	1,900	2,800	-	498	117	118	0.29	1,430	-	**0.11**	0.1	<0.01	**0.1**	<0.2[#1]	<0.2[#1]	<0.01	-	<0.02[#1]
		20-Feb-20	BH107	Normal	ES2005947	-	-	-	<1	-	<1	1,440	-	-	110	-	309	-	33	-	1,820	2,610	-	470	111	112	0.56	1,440	-	**0.1**	0.18	<0.01	**0.18**	**0.5**	0.3	<0.01	-	<0.02[#1]
		23-Apr-20	BH107	Normal	ES2013858	-	-	-	-	-	<1	1,710	-	-	134	-	319	-	34	-	1,810	2,680	-	450	112	119	2.84	1,710	<1	**0.05**	0.1	<0.01	**0.1**	<0.2[#1]	<0.2[#1]	<0.01	-	<0.02[#1]
		21-May-20	BH107	Normal	ES2017665	-	-	-	-	-	<1	1,620	-	-	123	-	338	-	34	-	1,950	2,980	-	496	120	127	2.88	1,620	<1	**0.04**	0.05	<0.01	**0.05**	<0.1	<0.1	<0.01	-	**0.03**
		30-Jul-20	BH107	Normal	ES2026408	-	*5,300*	**100**	-	-	<1	1,520	-	-	89	-	257	-	29	-	1,500	2,320	-	387	91.6	104	6.29	1,520	<1	**0.06**	0.15	<0.01	**0.15**	**0.4**	0.2	-	-	**0.08**
		11-Aug-20	BH107	Normal	ES2027951	-	*5,860*	**46**	-	-	<1	1,440	-	-	114	-	301	-	31	-	1,730	2,470	-	504	106	109	1.13	1,440	<1	**0.04**	0.06	<0.01	**0.06**	<0.2[#1]	<0.2[#1]	-	-	<0.02[#1]
		10-Sep-20	BH107	Normal	ES2032115	-	*6,180*	**40**	-	-	<1	1,420	1,650	-	118	-	329	-	34	-	1,870	2,760	-	418	115	115	0.11	1,420	<1	**0.07**	0.05	<0.01	**0.05**	<0.2[#1]	<0.2[#1]	-	-	0.02
		09-Oct-20	BH107	Normal	ES2035519	-	*6,340*	**56**	-	-	<1	1,600	1,530	-	131	-	293	-	30	-	1,670	2,850	-	473	104	122	8.02	1,600	<1	**0.04**	0.11	<0.01	**0.11**	<0.2[#1]	<0.2[#1]	-	-	**0.05**
		08-Dec-20	BH107	Normal	ES2043799	-	*6,230*	**36**	-	-	<1	1,750	1,600	-	121	-	316	-	33	-	1,760	2,650	-	460	109	119	4.31	1,750	<1	**0.06**	0.04	<0.01	**0.04**	0.2	0.2	-	-	<0.02[#1]
		14-Jan-21	BH107	Normal	ES2101242	-	*5,730*	**72**	-	-	<1	1,590	1,500	-	113	-	295	-	32	-	1,640	2,740	-	454	102	118	7.45	1,590	<1	**0.06**	0.08	<0.01	**0.08**	**0.4**	0.3	-	-	**0.07**
		11-Feb-21	BH107	Normal	ES2104999	-	*6,360*	**16**	-	-	<1	1,610	1,650	-	117	-	329	-	33	-	1,880	2,720	-	472	116	119	1.36	1,610	<1	**0.06**	0.13	<0.01	**0.13**	0.2	0.1	-	-	0.02
		10-Mar-21	BH107	Normal	ES2108508	-	*6,240*	**12**	-	-	<1	1,580	1,570	-	121	-	307	-	34	-	1,740	2,800	-	476	108	120	5.52	1,580	<1	**0.06**	0.12	<0.01	**0.12**	<0.2[#1]	<0.2[#1]	-	-	<0.02[#1]
		07-Apr-21	BH107	Normal	ES2112804	-	4,210	**18**	<1	1,170	<1	1,170	997	-	76	-	196	-	24	-	1,260	1,530	-	326	75.3	73.3	1.36	-	-	**0.03**	0.55	0.02	**0.57**	**0.7**	0.1	-	-	<0.01
		03-May-21	BH107	Normal	ES2116634	-	3,800	**252**	<1	1,240	<1	1,240	926	-	64	-	186	-	26	-	1,160	1,360	-	307	69.6	69.5	0.07	-	-	<0.01	2.86	<0.01	**2.86**	**3.5**	0.6	-	-	**0.1**
		08-Jun-21	BH107	Normal	ES2121745	-	*5,030*	**166**	<1	1,500	<1	1,500	1,280	-	88	-	258	-	32	-	1,590	1,740	-	366	95.6	86.7	4.9	-	-	**0.06**	2.34	0.01	**2.35**	**2.8**	0.5	-	-	**0.13**
		07-Jul-21	BH107	Normal	ES2125048	-	*5,250*	**38**	<1	1,520	<1	1,520	1,230	-	97	-	239	-	29	-	1,490	1,980	-	375	90.1	94	2.15	-	-	**0.02**	2.91	0.02	**2.93**	**3.2**	0.3	-	-	**0.04**
		13-Aug-21	BH107	Normal	ES2129596	-	*5,440*	**27**	<1	1,700	<1	1,700	1,400	-	115	-	271	-	30	-	1,670	2,190	-	411	101	104	1.38	-	-	**0.03**	2.73	0.01	**2.74**	**3**	0.3	-	-	**0.03**
		01-Sep-21	BH107	Normal	ES2131753	-	*6,230*	**1,910**	<1	1,620	<1	1,620	1,260	-	96	-	247	-	31	-	1,520	2,450	-	397	92	110	8.78	-	-	**0.21**	0.14	<0.01	**0.14**	**1.1**	1	-	-	**0.42**
		15-Oct-21	GWDUP2	Interlab_D	833147	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15-Oct-21	BH107	Normal	ES2137338	-	*5,670*	**1,420**	<1	1,630	<1	1,630	1,290	-	96	-	256	-	30	-	1,600	2,380	-	416	96.2	108	5.94	-	-	**0.21**	0.31	<0.01	**0.31**	**2.3**	2	-	-	**1**
		08-Nov-21	BH107	Normal	ES2140334	-	4,940	**42**	<1	1,640	<1	1,640	1,180	-	87	-	234	-	35	-	1,440	1,860	-	388	87.1	93.3	3.43	-	-	**0.02**	2.52	0.06	**2.58**	**3.1**	0.5	-	-	0.02
		08-Dec-21	GWDUP2	Interlab_D	849475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-21	BH107	Normal	ES2144782	-	*5,200*	**22**	<1	955	<1	955	1,230	-	92	-	243	-	29	-	1,500	1,810	-	411	90.6	78.7	7.02	-	-	**0.03**	2.23	0.06	**2.29**	**2.9**	0.6	-	-	0.02
		13-Jan-22	BH107	Normal	ES2201179	-	2,040	**642**	<1	609	<1	609	376	-	30	-	73	-	12	-	572	820	-	138	32.7	38.2	7.73	-	-	**0.05**	0.87	0.02	**0.89**	**2.9**	2	<0.01	-	**0.45**
		10-Feb-22	BH107	Normal	ES2204606	-	3,990	**34**	<1	1,140	<1	1,140	806	-	59	-	160	-	22	-	1,160	1,410	-	307	67.1	68.9	1.33	-	-	<0.01	0.93	0.02	**0.95**	**1.2**	0.3	<0.01	-	**0.03**
		18-Mar-22	BH107	Normal	ES2209694	-	1,050	**290**	<1	409	<1	409	131	-	13	-	24	-	10	-	319	320	-	61	16.8	18.5	4.86	-	-	**0.13**	1.71	0.02	**1.73**	**3.3**	1.6	<0.01	-	**0.24**
			GWDUP1	Field_D	ES2209694	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		25-May-22	BH107	Normal	ES2218210	-	3,040	**715**	<1	1,360	<1	1,360	543	-	41	-	107	-	25	-	926	781	-	221	51.8	53.8	1.93	-	-	<0.01	11.2	<0.01	**11.2**	**13.8**	2.6	**0.01**	-	**0.08**
		27-Jun-22	BH107	Normal	ES2222571	-	2,930	**104**	<1	1,350	<1	1,350	569	-	45	-	111	-	22	-	1,110	902	-	228	60.2	57.2	2.61	-	-	0.01	11.5	<0.01	**11.5**	**14**	2.5	<0.01	-	**0.32**
		20-Jul-22	BH107	Normal	ES2225656	-	2,260	**172**	<1	1,090	<1	1,090	366	-	28	-	72	-	18	-	709	569	-	155	38.6	41	3.05	-	-	**0.22**	8.95	<0.01	**8.95**	**11.2**	2.2	<0.01	-	**0.08**
	BH112	18-Jul-19	BH112	Normal	ES1922601	-	-	-	<1	-	<1	1,200	-	-	159	-	253	-	37	-	2,310	3,440	-	553	130	132	0.89	1,200	-	**1.45**	0.32	0.1	**0.42**	**5.2**	4.8	<0.01	-	**1.92**
		20-Aug-19	BH112	Normal	ES1926460	-	-	-	<1	-	<1	1,150	-	-	169	-	280	-	41	-	2,390	3,360	-	457	136	127	3.49	1,150	-	**1.43**	0.06	<0.01	**0.06**	**4.6**	4.5	<0.01	-	**1.5**
		25-Sep-19	BH112	Normal	ES1931244	-	-	-	<1	-	<1	1,240	-	-	179	-	294	-	40	-	2,420	3,720	-	548	139	141	0.61	1,240	-	**2.08**	0.06	0.06	**0.12**	**2.4**	2.3	<0.01	-	**0.19**
		22-Oct-19	BH112	Normal	ES1934707	-	-	-	<1	-	<1	1,620	-	-	174	-	324	-	42	-	2,570	3,580	-	488	148	144	1.61	1,620	-	**2.12**	0.07	<0.01	**0.07**	**2.8**	2.7	<0.01	-	**0.4**
		07-Nov-19	BH112	Normal	ES1936840	-	-	-	<1	-	<1	1,520	-	-	192	-	327	-	43	-	2,560	3,650	-	599	149	146	1.07	1,520	-	**2.16**	0.08	<0.01	**0.08**	**3**	2.9	<0.01	-	**0.44**
		12-Dec-19	BH112	Normal	ES1941279	-	-	-	<1	-	<1	1,330	-	-	204	-	338	-	44	-	2,660	4,100	-	647	155	156	0.28	1,330	-	**2.03**	0.1	<0.01	**0.1**	**2.3**	2.2	<0.01	-	<0.02[#1]
		20-Feb-20	BH112	Normal	ES2005947	-	-	-	<1	-	<1	1,390	-	-	169	-	319	-	40	-	2,460	3,640	-	610	143	143	0.15	1,390	-	**2.17**	0.06	<0.01	**0.06**	**2.6**	2.5	**0.24**	-	**0.33**
		21-Apr-20	BH112	Normal	ES2013464	-	-	-	-	-	<1	1,510	-	-	177	-	321	-	40	-	2,540	3,720	-	623	147	148	0.45	1,510	<1	**2.07**	0.13	<0.01	**0.13**	**2.7**	2.6	<0.01	-	<0.05[#1]
		21-May-20	BH112	Normal	ES2017665	-	-	-	-	-	<1	1,520	-	-	186	-	338	-	41	-	2,640	4,080	-	631	153	158	1.8	1,520	<1	**1.73**	0.45	0.01	**0.46**	**2.5**	2	<0.01	-	**0.44**
		30-Jul-20	BH112	Normal	ES2026408	-	*8,470*	**581**	-	-	<1	1,540	-	-	188	-	318	-	39	-	2,470	4,120	-	615	144	160	5.2	1,540	<1	**1.93**	1.65	0.03	**1.68**	**4.3**	2.6	-	-	**0.18**
		13-Aug-20	BH112	Normal	ES2028325	-	*8,120*	**238**	-	-	<1	1,450	-	-	173	-	317	-	40	-	2,490	3,780	-	663	144	149	1.82	1,450	<1	**1.99**	0.27	0.04	**0.31**	**2.3**	2	-	-	**0.14**
		10-Sep-20	BH112	Normal	ES2032115	-	*8,150*	**259**	-	-	<1	1,560	1,740	-	166	-	322	-	40	-	2,500	3,780	-	533	144	149	1.48	1,560	<1	**1.74**	0.48	<0.01	**0.48**	**3.2**	2.7	-	-	**0.09**
		09-Oct-20	BH112	Normal	ES2035519	-	*8,310*	**293**	-	-	<1	1,360	1,640	-	190	-	284	-	36	-	2,220	3,920	-	621	130	151	7.24	1,360	<1	**1.31**	0.94	<0.01	**0.94**	**3**	2.1	-	-	**0.13**
		08-Dec-20	BH112	Normal	ES2043799	-	*8,370*	**101**	-	-	<1	1,630	1,700	-	176	-	306	-	39	-	2,440	3,790	-	592	141	152	3.66	1,630	<1	**1.82**	0.43	<0.01	**0.43**	**2.3**	1.9	-	-	<0.02[#1]
		14-Jan-21	BH112	Normal	ES2101242	-	*8,030*	**429**	-	-	<1	1,450	1,720	-	158	-	321	-	38	-	2,620	4,240	-	595	149	161	3.78	1,450	<1	**1.83**	0.2	<0.01	**0.2**	**2.3**	2.1	-	-	**0.21**
		11-Feb-21	BH112	Normal	ES2104999	-	*8,260*	**413**	-	-	<1	1,310	1,700	-	161	-	316	-	39	-	2,470	3,720	-	594	142	143	0.35	1,310	<1	**1.58**	0.59	0.01	**0.6**	**2.4**	1.8	-	-	**0.17**
		10-Mar-21	BH112	Normal	ES2108508	-	*8,390*	**288**	-	-	<1	1,370	1,710	-	183	-	304	-	40	-	2,460	4,010	-	628	142	154	3.85	1,370	<1	**1.7**	0.37	0.01	**0.38**	**2.1**	1.7	-	-	**0.13**
		07-Apr-21	BH112	Normal	ES2112804	-	2,970	**90**	<1	921	<1	921	402	-	44	-	71	-	19	-	919	974	-	248	48.5	51	2.55	-	-	**0.31**	1.59	0.07	**1.66**	**2.3**	0.6	-	-	**0.03**
		04-May-21	BH112	Normal	ES2116634	-	*5,080*	**823**	<1	1,310	<1	1,310	792	-	78	-	145	-	28	-	1,510	2,020	-	413	82.2	91.8	5.48	-	-	**0.69**	2.02	0.05	**2.07**	**3.6**	1.5	-	-	**0.32**
		08-Jun-21	BH112	Normal	ES2121745	-	4,790	**512**	<1	1,170	<1	1,170	804	-	78	-	148	-	30	-	1,580	1,580	-	339	85.6	75	6.58	-	-	**0.76**	2.78	0.02	**2.8**	**4.2**	1.4	-	-	**0.15**
		07-Jul-21	BH112	Normal	ES2125048	-	*5,390*	**1,470**	<1	1,140	<1	1,140	825	-	93	-	144	-	27	-	1,560	2,060	-	374	85	88.7	2.09	-	-	**1.23**	1.53	<0.01	**1.53**	**4.1**	2.6	-	-	**0.7**
		13-Aug-21	BH112	Normal	ES2129596	-	*5,540*	**128**	<1	1,420	<1	1,420	972	-	109	-	170	-	29	-	1,790	2,610	-	424	98	111	6.12	-	-	**1.19**	1.95	<0.01	**1.95**	**3.4**	1.5	-	-	**0.06**
		01-Sep-21	BH112	Normal	ES2131753	-	*6,200*	**158**	<1	1,290	<1	1,290	957	-	103	-	170	-	32	-	1,700	2,500	-	410	93.9	105	5.5	-	-	**0.94**	1.81	<0.01	**1.81**	**3**	1.2	-	-	**0.04**
		15-Oct-21	BH112	Normal	ES2137338	-	*8,340*	**52**	<1	1,090	<1	1,090	1,690	-	177	-	304	-	22	-	2,350	4,040	-	584	137	148	3.96	-	-	**0.03**	0.13	<0.01	**0.13**	<0.5[#1]	<0.5[#1]	-	-	<0.05[#1]

						Inorganics			Acidity & Alkalinity					Major Ions												Minor Ions		Nutrients								
						Electrical conductivity (lab)	Total Dissolved Solids	Total Suspended Solids	Alkalinity (Carbonate as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Hardness as CaCO3 (Filtered)	Calcium	Calcium (Filtered)	Magnesium	Magnesium (Filtered)	Potassium	Potassium (Filtered)	Sodium	Sodium (Filtered)	Chloride	Sulfate	Sulfate (Filtered)	Cations Total	Anions Total	Ionic Balance	Bicarbonate ion (HCO3-)	Carbonate ion	Ammonia as N	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)	Kjeldahl Nitrogen Total	Reactive Phosphorus as P	Phosphate total (P)	Phosphorus (Total)
						µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL						10	10	5	1	1	1	1	1	0.5	1	0.5	1	0.5	1	0.5	1	1	2	1	0.01	0.01	0.01	1	1	0.01	0.01	0.01	0.01	0.1	0.1	0.01	0.01	0.01
ADWG 2011 Health (v3.7 updated 2022)																							500[#1]	500[#1]						11.29[#2]	0.91[#3]							
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)						**200**		**6**																					**0.01165[#4]**				**0.04**	**0.35**		**0.008**		**0.025**
ANZECC 2000 - Stock Watering							*5000[#5]*							*1000*	*1000*								*1000*	*1000*						*90[#6]*	*9.1[#7]*							
ANZG (2018) - FW - 95% (updated 26 July 2021)																												0.9[#9]	2.4[#10]								
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																					
2-4m																																					
4-8m																																					
>8m																																					
Package	**Location Code**	**Sample Date**	**Field ID**	**Sample Type**	**Lab Report Number**																																
M12 - West	BH112	08-Nov-21	BH112	Normal	ES2140334	-	*6,300*	**329**	<1	1,260	<1	1,260	1,180	-	124	-	211	-	41	-	2,000	2,800	-	486	112	114	1.19	-	-	**0.76**	2.15	<0.01	**2.15**	**3.4**	1.2	-	-	**0.11**
		08-Dec-21	BH112	Normal	ES2144782	-	*6,380*	**273**	<1	1,040	<1	1,040	1,210	-	129	-	216	-	34	-	2,030	3,230	-	502	113	122	3.8	-	-	**1.03**	1.97	0.01	**1.98**	**3.6**	1.6	-	-	**0.15**
		13-Jan-22	GWDUP2	Interlab_D	856978	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Jan-22	BH112	Normal	ES2201179	-	*6,700*	**134**	<1	1,260	<1	1,260	1,180	-	118	-	214	-	33	-	1,950	3,320	-	522	109	130	8.6	-	-	**1.01**	2.07	<0.01	**2.07**	**3.9**	1.8	<0.01	-	**0.24**
		10-Feb-22	BH112	Normal	ES2204606	-	*7,220*	**81**	<1	1,270	<1	1,270	1,340	-	131	-	245	-	36	-	2,110	3,400	-	552	119	133	5.3	-	-	**0.55**	4.4	<0.01	**4.4**	**5.3**	0.9	<0.01	-	**0.05**
			GWPDUP1	Field_D	ES2204606	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18-Mar-22	GWDUP2	Interlab_D	874238	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18-Mar-22	BH112	Normal	ES2209694	-	2,890	**3,790**	<1	1,220	<1	1,220	364	-	32	-	69	-	19	-	891	815	-	182	46.5	51.2	4.75	-	-	**0.1**	0.2	<0.01	**0.2**	**2.6**	2.4	<0.01	-	**1.35**
		25-May-22	BH112	Normal	ES2218210	-	2,310	**8,780**	<1	947	<1	947	286	-	22	-	56	-	14	-	712	631	-	120	37	39.2	2.86	-	-	**0.1**	0.23	<0.01	**0.23**	**3.6**	3.4	<0.01	-	**2.3**
		27-Jun-22	BH112	Normal	ES2222571	-	1,920	**154**	<1	1,010	<1	1,010	264	-	20	-	52	-	12	-	741	588	-	123	37.8	39.3	1.96	-	-	**0.04**	0.33	<0.01	**0.33**	**0.5**	0.2	<0.01	-	**0.26**
		20-Jul-22	BH112	Normal	ES2225656	-	2,000	**2,180**	<1	933	<1	933	251	-	18	-	50	-	10	-	651	550	-	100	33.6	36.2	3.8	-	-	**0.03**	0.51	<0.01	**0.51**	**0.8**	0.3	<0.01	-	**0.13**
M12 - Central	BH145	13-Jun-19	BH145	Normal	ES1918214	-	-	-	<1	-	<1	841	-	-	46	-	23	-	8	-	1,840	2,520	-	183	84.4	91.7	4.13	841	-	**2.86**	13.4	4.49	**17.9**	**24.2**	6.3	<0.01	-	**0.31**
		17-Jul-19	BH145	Normal	ES1922407	-	-	-	<1	-	<1	854	-	-	44	-	20	-	9	-	1,840	2,370	-	153	84.1	87.1	1.75	854	-	**2.84**	8.24	4.86	**13.1**	**17.1**	4	<0.01	-	**0.41**
		21-Aug-19	BH145	Normal	ES1926628	-	-	-	<1	-	<1	785	-	-	62	-	24	-	10	-	1,980	2,370	-	168	91.4	86	3.05	785	-	**3**	17.1	5.66	**22.8**	**29.2**	6.4	**0.01**	-	**0.19**
		26-Sep-19	BH145	Normal	ES1931491	-	-	-	<1	-	<1	865	-	-	67	-	30	-	11	-	2,180	2,800	-	215	101	101	0.09	865	-	**3.34**	43.7	6.28	**50**	**54**	4	<0.01	-	**0.18**
		23-Oct-19	BH145	Normal	ES1934911	-	-	-	<1	-	<1	849	-	-	77	-	34	-	11	-	2,260	3,000	-	212	105	106	0.37	849	-	**3.55**	35.3	*10.5*	**45.8**	**55.1**	9.3	<0.01	-	**2.35**
		12-Dec-19	BH145	Normal	ES1941279	-	-	-	<1	-	<1	908	-	-	85	-	39	-	13	-	2,500	3,320	-	212	116	116	0.14	908	-	**2.69**	47.3	6.68	**54**	**68**	14	<0.01	-	**4.65**
		21-May-20	BH145	Normal	ES2017665	-	-	-	-	-	<1	670	-	-	22	-	11	-	6	-	1,240	1,460	-	105	56.1	56.8	0.59	670	<1	**0.72**	28.3	8	**36.3**	**38**	1.7	<0.01	-	**0.1**
		30-Jul-20	BD01	Field_D	ES2026408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			BH145	Normal	ES2026408	-	2,770	**815**	-	-	<1	494	-	-	21	-	16	-	4	-	822	1,030	-	149	38.2	42	4.74	494	<1	**1.81**	16.8	1.79	**18.6**	**24.8**	6.2	-	-	**0.31**
		13-Aug-20	BH145	Normal	ES2028325	-	3,220	**470**	-	-	<1	782	-	-	29	-	16	-	6	-	1,160	1,220	-	216	53.4	54.5	1.08	782	<1	**2.83**	19.3	0.28	**19.6**	**25.2**	5.6	-	-	**0.32**
		26-Aug-20	BH145	Normal	740880	**6,500**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,200	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Sep-20	BH145	Normal	ES2032115	-	4,630	**2,210**	-	-	<1	1,230	223	-	53	-	22	-	9	-	1,720	1,950	-	171	79.5	83.1	2.24	1,230	<1	**3.06**	3.82	0.49	**4.31**	**9.6**	5.3	-	-	**1.16**
		08-Oct-20	BH145	Normal	ES2035519	-	*7,420*	**22,200**	-	-	<1	1,250	264	-	66	-	24	-	11	-	1,770	2,490	-	163	82.5	98.6	8.87	1,250	<1	**2.88**	6.44	3.76	**10.2**	**31**	20.8	-	-	**10.8**
		11-Nov-20	BH145	Normal	ES2040330	-	1,610	**428**	-	-	<1	385	65	-	13	-	8	-	3	-	530	604	-	124	24.4	27.3	5.56	385	<1	**1.11**	8.71	0.06	**8.77**	**11.5**	2.7	-	-	**0.14**
		12-Nov-20	BD01	Field_D	ES2040667	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Dec-20	BH145	Normal	ES2043799	-	2,300	**632**	-	-	<1	645	65	-	16	-	6	-	4	-	849	837	-	163	38.3	39.9	2	645	<1	**0.22**	0.23	0.25	**0.48**	**2.5**	2	-	-	**0.13**
		12-Jan-21	BH145	Normal	ES2101242	-	2,720	**1,010**	-	-	<1	850	88	-	22	-	8	-	5	-	949	941	-	139	43.2	46.4	3.64	850	<1	**1.49**	11.6	0.06	**11.7**	**15.7**	4	-	-	**0.69**
		09-Feb-21	BH145	Normal	ES2104999	-	2,620	**274**	-	-	<1	721	80	-	19	-	8	-	5	-	1,020	1,020	-	136	46.1	46	0.1	721	<1	**1.24**	25.5	0.32	**25.8**	**32.6**	6.8	-	-	**0.22**
		10-Mar-21	BH145	Normal	ES2108508	-	3,500	**2,330**	-	-	<1	761	119	-	28	-	12	-	8	-	1,260	1,460	-	160	57.4	59.7	1.98	761	<1	**2.84**	22	0.51	**22.5**	**28.7**	6.2	-	-	**0.88**
		07-Apr-21	BH145	Normal	ES2112804	-	2,220	**1,100**	<1	518	<1	518	65	-	16	-	6	-	4	-	795	745	-	132	36	34.1	2.66	-	-	**0.73**	21	0.45	**21.5**	**24.4**	2.9	-	-	**0.43**
		08-Jun-21	BH145	Normal	ES2121745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1.82**	60.1	5.97	**66.1**	**81.5**	15.4	-	-	**3.64**
		07-Jul-21	BH145	Normal	ES2125048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		01-Sep-21	BH145	Normal	ES2131753	-	4,980	**3,470**	<1	605	<1	605	211	-	50	-	21	-	8	-	1,670	1,790	-	140	77.1	65.5	8.12	-	-	**1.34**	*133*	*9.19*	**142**	**156**	14	-	-	**1.24**
		15-Oct-21	BH145	Normal	ES2137338	-	342	**18**	<1	96	<1	96	86	-	8	-	16	-	4	-	90	150	-	6	5.73	6.27	4.51	-	-	<0.01	0.26	<0.01	**0.26**	0.3	<0.1	-	-	**0.1**
		08-Nov-21	GWDUP2	Interlab_D	839397	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Nov-21	BH145	Normal	ES2140334	-	*5,170*	**1,400**	<1	655	<1	655	234	-	54	-	24	-	11	-	1,760	2,090	-	137	81.5	74.9	4.23	-	-	**1.2**	*127*	8.18	**135**	**155**	19.8	-	-	**0.65**
		08-Dec-21	BH145	Normal	ES2144782	-	*5,590*	**12,000**	<1	504	<1	504	228	-	55	-	22	-	10	-	1,770	1,980	-	153	81.8	69.1	8.41	-	-	**1.59**	*130*	4.93	**135**	**158**	22.7	-	-	**4.22**
		13-Jan-22	BH145	Normal	ES2201179	-	4,560	**3,780**	<1	455	<1	455	154	-	37	-	15	-	7	-	1,390	1,800	-	128	63.7	62.5	0.94	-	-	**1.12**	*118*	1.92	**120**	**125**	5	<0.01	-	**0.68**
		10-Feb-22	BH145	Normal	ES2204606	-	4,330	**1,220**	<1	497	<1	497	131	-	31	-	13	-	6	-	1,350	1,610	-	126	61.5	58	2.95	-	-	**0.71**	*91.7*	3.13	**94.8**	**103**	7.8	<0.01	-	**0.72**
		18-Mar-22	BH145	Normal	ES2209694	-	4,030	**997**	<1	410	<1	410	149	-	35	-	15	-	7	-	1,350	1,700	-	125	61.9	58.7	2.6	-	-	**0.54**	*94.2*	1.74	**95.9**	**106**	10.6	<0.01	-	**0.34**
		25-May-22	GWDUP2	Interlab_D	892529	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		25-May-22	BH145	Normal	ES2218210	-	3,590	**912**	<1	431	<1	431	106	-	26	-	10	-	6	-	1,210	1,500	-	117	54.9	53.4	1.43	-	-	**1.01**	75	3.38	**78.4**	**91.4**	13	<0.01	-	**0.08**
			GWDUP1	Field_D	ES2218210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		27-Jun-22	BH145	Normal	ES2222571	-	3,760	**4,260**	<1	412	<1	412	113	-	27	-	11	-	6	-	1,380	1,520	-	119	62.4	53.6	7.62	-	-	**1.03**	53.4	2.52	**55.9**	**66.2**	10.3	<0.01	-	**0.85**
			GWDUP1	Field_D	ES2222571	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20-Jul-22	BH145	Normal	ES2225656	-	1,950	**814**	<1	277	<1	277	48	-	11	-	5	-	3	-	585	744	-	54	26.5	27.6	2.15	-	-	**0.31**	28.4	0.54	**28.9**	**30.6**	1.7	<0.01	-	**0.12**
			GWDUP1	Field_D	ES2225656	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	Inorganics			Acidity & Alkalinity					Major Ions															Minor Ions		Nutrients								
	Electrical conductivity (lab)	Total Dissolved Solids	Total Suspended Solids	Alkalinity (Carbonate as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Hardness as CaCO3 (Filtered)	Calcium	Calcium (Filtered)	Magnesium	Magnesium (Filtered)	Potassium	Potassium (Filtered)	Sodium	Sodium (Filtered)	Chloride	Sulfate	Sulfate (Filtered)	Cations Total	Anions Total	Ionic Balance	Bicarbonate ion (HCO3-)	Carbonate ion	Ammonia as N	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)	Kjeldahl Nitrogen Total	Reactive Phosphorus as P	Phosphate total (P)	Phosphorus (Total)
	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL	10	10	5	1	1	1	1	1	0.5	1	0.5	1	0.5	1	0.5	1	1	2	1	0.01	0.01	0.01	1	1	0.01	0.01	0.01	0.01	0.1	0.1	0.01	0.01	0.01
ADWG 2011 Health (v3.7 updated 2022)																		500[#1]	500[#1]							11.29[#2]	0.91[#3]						
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)	**200**		**6**																						**0.01165[#4]**				**0.04**	**0.35**		**0.008**		**0.025**
ANZECC 2000 - Stock Watering		*5000[#5]*							*1000*	*1000*								*1000*	*1000*							*90[#6]*	*9.1[#7]*							
ANZG (2018) - FW - 95% (updated 26 July 2021)																									0.9[#9]	2.4[#10]							
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																	
2-4m																																	
4-8m																																	
>8m																																	

Statistical Summary

Number of Results	1	91	91	87	56	129	129	82	1	128	1	128	1	128	1	128	130	2	128	128	128	128	73	42	130	130	130	130	130	130	62	1	129
Number of Detects	1	91	89	0	56	0	129	82	1	128	1	128	1	128	1	128	130	2	128	128	128	128	73	0	121	127	56	128	114	112	3	1	113
Minimum Concentration	6500	342	<5	<1	96	<1	96	48	96	8	190	5	17	3	1600	90	150	200	6	5.73	6.27	0.07	385	<1	<0.01	<0.01	<0.01	<0.01	<0.1	<0.1	<0.01	0.06	<0.01
Minimum Detect	6500	342	6	ND	96	ND	96	48	96	8	190	5	17	3	1600	90	150	200	6	5.73	6.27	0.07	385	ND	0.01	0.01	0.01	0.01	0.2	0.1	0.01	0.06	0.02
Maximum Concentration	6500	15400	22200	<10	1700	<20	1750	3730	96	288	190	732	17	44	1600	3580	7220	420	913	231	240	11.4	1750	<1	3.55	133	10.5	142	158	22.7	0.24	0.06	10.8
Maximum Detect	6500	15400	22200	ND	1700	ND	1750	3730	96	288	190	732	17	44	1600	3580	7220	420	913	231	240	11.4	1750	ND	3.55	133	10.5	142	158	22.7	0.24	0.06	10.8
Average Concentration		5815	981	0.55	989	0.57	1099	1082		118		228		24		1877	2850		417	107	111	3.3	1183	0.5	0.75	10	0.75	11	14	2.6	0.009		0.42
Geometric Average		5063	165	0.51	893	0.51	1019	694		91		137		20		1697	2393		345	94	98	2.2	1127	0.5	0.24	0.58	0.024	0.62	2.2	1	0.0055		0.11
Median Concentration	6500	5590	138	0.5	1025	0.5	1130	1180	96	114	190	254.5	17	24.5	1600	1830	2710	310	443.5	108.5	113	2.76	1230	0.5	0.25	0.35	0.005	0.4	2.4	1.2	0.005	0.06	0.1
Standard Deviation		2759	2831	0.48	377	0.84	368	794		71		163		12		728	1503		210	47	49	2.6	341	0	0.92	27	2	28	31	4.1	0.03		1.2
Geometric Standard Deviation		1.8	6.8	1.3	1.7	1.3	1.5	3.1		2.3		3.6		2		1.7	1.9	1.7	2.1	1.8	1.8	3.1	1.4		6.1	14	11	14	7.1	4.3	1.7		4.8
Number of Guideline Exceedances	1	55	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49	0	0	0	0	0	122	37	18	119	110	0	62	0	107
Number of Guideline Exceedances(Detects Only)	1	55	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49	0	0	0	0	0	119	37	18	119	108	0	3	0	105
% of Results at or above the Detect Limit	100	100	98	0	100	0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0	93	98	43	98	88	86	5	100	88
% of Results below the Detect Limit	0	0	2	100	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	7	2	57	2	12	14	95	0	12
% of Detects at or above Guidelines	100	60	98	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	0	0	0	0	0	92	28	14	92	83	0	5	0	81
% of Results Below Guidelines or Non-Detect	0	40	2	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	62	100	100	100	100	100	8	72	86	8	17	100	95	100	19

A Non-Detect multiplier of 0.5 has been applied.

Env Stds Comments
#1:Not specifically guideline value: >500mg/L can have purgative effects
#2:Guideline value calculated by dividing Nitrate (as Nitrate) value (50 mg/L) by 4.427
#3:Guideline value calculated by dividing Nitrite (as Nitrite) value (0.3 mg/L) by molecular weight (3.2967033).
#4:Calculated from ammonia NH4
#5:Loss of production expected at 5000 mg/L for beef cattle, 4000 mg/L dairy cattle, 10000 mg/L sheep, 6000 mg/L horses and pigs, 3000 mg/L poultry
#6:400 mg/L divided by molecular weight, stock may tolerate higher nitrate concentrations if nitrate in feed are not high, water containing >1500 mg/L (as NO3) is likely to be toxic.
#7:30 mg/L divided by molecular weight
#8:>0.5 mg/L hazardous to sheep, >1 mg/L for cattle, >5 mg/L pigs and poulty
#9:Measured as NH3-N at pH 8
#10:Values taken from "Updating nitrate toxicity effects on freshwater aquatic species, 2013"
#11:In absence of total As guideline, As (V) guideline has been adopted.
#12:In absence of total Cr guideline, Cr (VI) guideline has been adopted.
#13:Not limiting: Derived water HSL exceeds water solubility limit
#14:To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

Data Comments
#1 Reported Analyte LOR is higher than Requested Analyte LOR

						Metals										BTEXN								TRH - NEPM 2013							TRH - NEPM 1999					PAHs - standard 16					
						Arsenic (Filtered)	Cadmium (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Iron (Filtered)	Lead (Filtered)	Manganese (Filtered)	Mercury (Filtered)	Nickel (Filtered)	Zinc (Filtered)	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	BTEX (Sum of Total) - Lab Calc	Naphthalene (BTEXN suite)	F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 (Sum of Total)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo[b+j]fluoranthene
						mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						0.001	0.0001	0.001	0.001	0.05	0.001	0.001	0.0001	0.001	0.005	1	2	2	2	2	2	1	5	20	20	100	100	100	100	100	20	50	100	50	50	1	1	1	1	0.5	1
ADWG 2011 Health (v3.7 updated 2022)						0.01	0.002		2		0.01	0.5	0.001	0.02		1	800	300			600																			0.01	
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																																									
ANZECC 2000 - Stock Watering						*0.5*	*0.01*	*1*	*1* [#8]		*0.1*		*0.002*	*1*	*20*																											
ANZG (2018) - FW - 95% (updated 26 July 2021)						0.013 [#11]	0.0002	0.001 [#12]	0.0014		0.0034	1.9	0.0006	0.011	0.008	950	180	80	350				16															0.4		0.2	
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																									
2-4m																5000	NL [#13]	NL [#13]			NL [#13]		NL [#13]	6000 [#14]		NL [#13]															
4-8m																5000	NL [#13]	NL [#13]			NL [#13]		NL [#13]	6000 [#14]		NL [#13]															
>8m																5000	NL [#13]	NL [#13]			NL [#13]		NL [#13]	7000 [#14]		NL [#13]															
Package	**Location Code**	**Sample Date**	**Field ID**	**Sample Type**	**Lab Report Number**																																					
M12 - West	BH104	16-Jul-19	BH104	Normal	ES1922192	<0.001	0.0002	<0.001	0.018	-	0.001	-	<0.0001	0.06	0.109	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		20-Aug-19	BH104	Normal	ES1926460	<0.001	<0.0001	<0.001	0.015	-	0.001	-	<0.0001	0.074	0.033	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		24-Sep-19	BH104	Normal	ES1930997	<0.001	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	0.117	0.021	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		22-Oct-19	BH104	Normal	ES1934707	<0.001	<0.0001	<0.001	0.009	-	<0.001	-	<0.0001	0.062	0.051	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		07-Nov-19	BH104	Normal	ES1936840	<0.001	<0.0001	<0.001	0.004	-	<0.001	-	<0.0001	0.078	0.057	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		12-Dec-19	BH104	Normal	ES1941279	<0.001	<0.0001	0.001	0.016	-	0.001	-	<0.0001	0.107	0.163	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		16-Jan-20	BH104	Normal	ES2001376	0.002	<0.0001	0.001	0.081	-	0.005	-	<0.0001	0.109	0.172	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		18-Feb-20	BH104	Normal	ES2005577	0.001	<0.0001	<0.001	0.039	-	0.001	-	<0.0001	0.06	0.114	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		12-Mar-20	SD01	Interlab_D	707829	<0.001	<0.0002	<0.001	0.02	-	<0.001	-	<0.0001	0.053	0.1	<1	<1	<1	<1	<2	<3	-	<10	<20	<20	<50	<50	<100	<100	<100	<20	<50	<100	<100	<100	<1	<1	<1	<1	<1	<1
		12-Mar-20	BD01	Field_D	ES2008731	<0.001	<0.0001	<0.001	0.012	-	<0.001	-	<0.0001	0.042	0.067	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
			BH104	Normal	ES2008731	<0.001	<0.0001	<0.001	0.012	-	<0.001	-	<0.0001	0.046	0.077	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		23-Apr-20	BH104	Normal	ES2013858	<0.001	<0.0001	<0.001	0.046	-	0.001	-	<0.0001	0.091	0.17	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		19-May-20	BH104	Normal	ES2017191	<0.001	<0.0001	<0.001	0.026	-	<0.001	-	<0.0001	0.027	0.042	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		30-Jul-20	BH104	Normal	ES2026408	<0.001	<0.0001	<0.001	0.015	0.19	<0.001	0.247	<0.0001	0.066	0.041	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		11-Aug-20	BH104	Normal	ES2027951	<0.001	0.0001	<0.001	0.105	0.15	0.002	0.266	<0.0001	0.076	0.368	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		10-Sep-20	BD01	Field_D	ES2032115	<0.001	<0.0001	<0.001	0.003	0.72	<0.001	0.339	<0.0001	0.023	0.077	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
			BH104	Normal	ES2032115	<0.001	<0.0001	<0.001	0.002	0.24	<0.001	0.347	<0.0001	0.022	0.061	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		09-Oct-20	BD01	Field_D	ES2035519	<0.001	0.0001	<0.001	0.074	-	0.002	-	<0.0001	0.087	0.125	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			BH104	Normal	ES2035519	<0.001	<0.0001	<0.001	0.001	0.37	<0.001	0.584	<0.0001	0.031	0.025	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		13-Nov-20	BH104	Normal	ES2040330	<0.001	<0.0001	<0.001	<0.001	1.51	<0.001	0.609	<0.0001	0.137	0.025	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		08-Dec-20	BH104	Normal	ES2043799	<0.001	<0.0001	0.002	<0.001	2.83	<0.001	0.93	<0.0001	0.105	0.093	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
			M12GW_DUP	Field_D	ES2043799	<0.001	<0.0001	0.002	<0.001	-	<0.001	-	<0.0001	0.103	0.089	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		14-Jan-21	BH104	Normal	ES2101242	<0.001	<0.0001	<0.001	<0.001	3.12	<0.001	1.33	<0.0001	0.175	0.019	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2101242	<0.001	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	0.181	0.023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11-Feb-21	BH104	Normal	ES2104999	<0.001	<0.0001	<0.001	<0.001	<0.05	<0.001	0.896	<0.0001	0.081	<0.005	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	130	<100	130	<20	<50	<100	80	80	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2104999	0.002	<0.0001	0.002	<0.001	-	<0.001	-	<0.0001	0.206	<0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Mar-21	BH104	Normal	ES2108508	0.001	<0.0001	<0.001	0.002	2.15	<0.001	1.02	<0.0001	0.057	0.025	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2108508	0.001	<0.0001	<0.001	0.067	-	0.002	-	<0.0001	0.064	0.105	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Apr-21	BH104	Normal	ES2112804	<0.001	<0.0001	<0.001	0.002	0.41	<0.001	0.39	<0.0001	0.04	0.008	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2112804	<0.001	<0.0001	0.001	0.003	-	<0.001	-	<0.0001	0.039	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		04-May-21	BH104	Normal	ES2116634	<0.001	<0.0001	<0.001	0.002	0.16	<0.001	0.274	<0.0001	0.108	0.03	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2116634	<0.001	<0.0001	<0.001	0.002	-	<0.001	-	<0.0001	0.113	0.039	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Jun-21	BH104	Normal	ES2121745	<0.001	<0.0001	<0.001	0.002	0.77	<0.001	0.313	<0.0001	0.081	0.062	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2121745	<0.001	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	0.074	0.067	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Jul-21	BH104	Normal	ES2125048	<0.001	<0.0001	<0.001	<0.001	1.09	<0.001	0.323	<0.0001	0.011	0.007	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2125048	<0.001	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	0.012	0.007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Aug-21	BH104	Normal	ES2129596	0.001	<0.0001	<0.001	<0.001	0.69	<0.001	0.308	<0.0001	0.057	0.092	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2129596	<0.001	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	0.054	0.086	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		01-Sep-21	BH104	Normal	ES2131753	<0.001	<0.0001	<0.001	<0.001	0.34	<0.001	0.305	<0.0001	0.033	0.007	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2131753	<0.001	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	0.039	0.006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15-Oct-21	BH104	Normal	ES2137338	<0.001	<0.0001	0.002	0.002	0.82	<0.001	0.542	<0.0001	0.043	0.039	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		15-Oct-21	GWDUP1	Field_D	ES2137338	<0.001	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	0.037	0.078	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Nov-21	BH104	Normal	ES2140334	<0.001	<0.0001	<0.001	0.002	0.24	<0.001	0.299	<0.0001	0.035	0.019	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
			GWDUP1	Field_D	ES2140334	<0.001	<0.0001	<0.001	0.001	-	<0.001	-	<0.0001	0.033	0.018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-21	BH104	Normal	ES2144782	0.001	<0.0001	<0.001	0.004	0.35	<0.001	0.834	<0.0001	0.023	0.149	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
			GWDUP1	Field_D	ES2144782	<0.001	<0.0001	<0.001	0.003	-	<0.001	-	<0.0001	0.024	0.154	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Jan-22	BH104	Normal	ES2201179	0.002	<0.0001	<0.001	0.009	<0.05	<0.001	0.53	<0.0001	0.035	0.011	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
			GWDUP1	Field_D	ES2201179	0.002	<0.0001	<0.001	0.004	-	<0.001	-	<0.0001	0.05	0.098	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Feb-22	GWDUP2	Interlab_D	863166	<0.001	<0.0002	<0.001	<0.001	-	<0.001	-	<0.0001	0.051	<0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Feb-22	BH104	Normal	ES2204606	<0.001	<0.0001	<0.001	<0.001	0.99	<0.001	0.421	<0.0001	0.06	<0.005	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		18-Mar-22	BH104	Normal	ES2209694	0.001	<0.0001	<0.001	0.008	1.03	<0.001	0.391	<0.0001	0.192	0.008	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		25-May-22	BH104	Normal	ES2218210	<0.001	<0.0001	<0.001	0.034	<0.05	<0.001	0.096	<0.0001	0.003	0.008	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		27-Jun-22	GWDUP2	Interlab_D	901087	<0.001	0.0002	<0.001	0.17	-	<0.001	-	<0.0001	0.024	0.011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		27-Jun-22	BH104	Normal	ES2222571	<0.001	<0.0001	<0.001	0.071	<0.05	<0.001	0.2	<0.0001	0.024	0.008	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		20-Jul-22	GWDUP2	Interlab_D	907459	<0.001	<0.0002	<0.001	0.079	-	<0.001	-	<0.0001	0.009	0.008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20-Jul-22	BH104	Normal	ES2225656	0.002	0.0003	0.002	0.089	<0.05	<0.001	0.337	<0.0001	0.011	0.011	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-

							Metals										BTEXN								TRH - NEPM 2013							TRH - NEPM 1999					PAHs - standard 16					
							Arsenic (Filtered)	Cadmium (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Iron (Filtered)	Lead (Filtered)	Manganese (Filtered)	Mercury (Filtered)	Nickel (Filtered)	Zinc (Filtered)	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	BTEX (Sum of Total) - Lab Calc	Naphthalene (BTEXN suite)	F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 (Sum of Total)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo[b+j]fluoranthene
							mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL							0.001	0.0001	0.001	0.001	0.05	0.001	0.001	0.0001	0.001	0.005	1	2	2	2	2	2	1	5	20	20	100	100	100	100	100	20	50	100	50	50	1	1	1	1	0.5	1
ADWG 2011 Health (v3.7 updated 2022)							0.01	0.002		2		0.01	0.5	0.001	0.02		1	800	300			600																			0.01	
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																																										
ANZECC 2000 - Stock Watering							*0.5*	*0.01*	*1*	*1* [#8]		*0.1*		*0.002*	*1*	*20*																												
ANZG (2018) - FW - 95% (updated 26 July 2021)							0.013 [#11]	0.0002	0.001 [#12]	0.0014		0.0034	1.9	0.0006	0.011	0.008	950	180	80	350				16															0.4		0.2	
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																										
2-4m																	5000	NL [#13]	NL [#13]			NL [#13]		NL [#13]	6000 [#14]		NL [#13]																
4-8m																	5000	NL [#13]	NL [#13]			NL [#13]		NL [#13]	6000 [#14]		NL [#13]																
>8m																	5000	NL [#13]	NL [#13]			NL [#13]		NL [#13]	7000 [#14]		NL [#13]																
Package	**Location Code**	**Sample Date**	**Field ID**	**Sample Type**	**Lab Report Number**																																						
M12 - West	BH107	18-Jul-19	BH107	Normal	ES1922601	<0.001	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	0.018	0.012	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		20-Aug-19	BH107	Normal	ES1926460	<0.001	<0.0001	<0.001	0.005	-	<0.001	-	<0.0001	0.033	0.026	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		24-Sep-19	BH107	Normal	ES1930997	<0.001	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	0.067	0.016	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		22-Oct-19	BH107	Normal	ES1934707	<0.001	<0.0001	<0.001	0.009	-	<0.001	-	<0.0001	0.057	0.029	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		07-Nov-19	BH107	Normal	ES1936840	<0.001	<0.0001	0.006	0.014	-	<0.001	-	<0.0001	0.055	0.089	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		12-Dec-19	BH107	Normal	ES1941279	<0.001	<0.0001	<0.001	0.036	-	0.002	-	<0.0001	0.046	0.049	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		20-Feb-20	BH107	Normal	ES2005947	<0.001	<0.0001	<0.001	0.013	-	<0.001	-	<0.0001	0.07	0.036	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		23-Apr-20	BH107	Normal	ES2013858	<0.001	<0.0001	<0.001	0.016	-	<0.001	-	<0.0001	0.084	0.077	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		21-May-20	BH107	Normal	ES2017665	<0.001	<0.0001	<0.001	0.003	-	<0.001	-	<0.0001	0.037	0.028	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		30-Jul-20	BH107	Normal	ES2026408	<0.001	0.0003	<0.001	0.079	0.14	0.004	0.471	<0.0001	0.045	0.17	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		11-Aug-20	BH107	Normal	ES2027951	<0.001	0.0001	<0.001	0.11	0.1	0.001	0.543	<0.0001	0.04	0.182	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		10-Sep-20	BH107	Normal	ES2032115	<0.001	<0.0001	<0.001	0.084	0.23	0.002	0.645	<0.0001	0.023	0.085	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		09-Oct-20	BH107	Normal	ES2035519	<0.001	0.0001	<0.001	0.074	0.09	0.003	0.59	<0.0001	0.055	0.122	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		08-Dec-20	BH107	Normal	ES2043799	<0.001	<0.0001	<0.001	<0.001	0.15	<0.001	0.459	<0.0001	0.109	0.034	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		14-Jan-21	BH107	Normal	ES2101242	<0.001	<0.0001	<0.001	0.001	0.17	<0.001	0.43	<0.0001	0.068	0.017	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		11-Feb-21	BH107	Normal	ES2104999	<0.001	0.0006	<0.001	0.089	0.13	0.003	0.621	<0.0001	0.09	0.168	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		10-Mar-21	BH107	Normal	ES2108508	<0.001	0.0002	<0.001	0.119	0.15	0.002	0.522	<0.0001	0.056	0.084	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		07-Apr-21	BH107	Normal	ES2112804	<0.001	<0.0001	<0.001	0.008	<0.05	<0.001	0.389	<0.0001	0.041	0.017	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		03-May-21	BH107	Normal	ES2116634	<0.001	<0.0001	<0.001	0.016	0.06	<0.001	0.052	<0.0001	0.011	0.046	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		08-Jun-21	BH107	Normal	ES2121745	<0.001	<0.0001	<0.001	0.002	0.14	<0.001	0.443	<0.0001	0.096	0.028	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		07-Jul-21	BH107	Normal	ES2125048	<0.001	<0.0001	<0.001	0.002	<0.05	<0.001	0.34	<0.0001	0.004	0.008	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		13-Aug-21	BH107	Normal	ES2129596	<0.001	<0.0001	<0.001	<0.001	0.06	<0.001	0.408	<0.0001	0.021	0.012	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		01-Sep-21	BH107	Normal	ES2131753	<0.001	<0.0001	<0.001	0.002	0.24	<0.001	0.344	<0.0001	0.05	0.009	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		15-Oct-21	GWDUP2	Interlab_D	833147	<0.001	<0.0002	<0.001	0.002	-	<0.001	-	<0.0001	0.051	0.072	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15-Oct-21	BH107	Normal	ES2137338	<0.001	<0.0001	<0.001	<0.001	0.31	<0.001	0.29	<0.0001	0.05	0.057	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		08-Nov-21	BH107	Normal	ES2140334	<0.001	<0.0001	<0.001	0.002	<0.05	<0.001	0.201	<0.0001	0.024	<0.005	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		08-Dec-21	GWDUP2	Interlab_D	849475	<0.001	<0.0002	<0.001	0.003	-	<0.001	-	<0.0001	0.008	0.68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-21	BH107	Normal	ES2144782	<0.001	<0.0001	<0.001	<0.001	0.09	<0.001	0.308	<0.0001	0.009	0.679	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		13-Jan-22	BH107	Normal	ES2201179	<0.001	<0.0001	<0.001	0.009	<0.05	<0.001	0.264	<0.0001	0.07	0.078	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		10-Feb-22	BH107	Normal	ES2204606	<0.001	<0.0001	<0.001	<0.001	0.05	<0.001	0.353	<0.0001	0.073	0.005	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		18-Mar-22	BH107	Normal	ES2209694	<0.001	<0.0001	<0.001	0.006	0.13	<0.001	0.236	<0.0001	0.061	0.022	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
			GWDUP1	Field_D	ES2209694	<0.001	<0.0001	<0.001	0.006	-	<0.001	-	<0.0001	0.069	0.021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		25-May-22	BH107	Normal	ES2218210	<0.001	<0.0001	<0.001	0.018	<0.05	<0.001	0.002	<0.0001	0.001	0.006	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		27-Jun-22	BH107	Normal	ES2222571	<0.001	<0.0001	<0.001	0.003	0.62	<0.001	0.446	<0.0001	0.002	0.006	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		20-Jul-22	BH107	Normal	ES2225656	<0.001	<0.0001	<0.001	0.008	<0.05	<0.001	0.001	<0.0001	<0.001	0.006	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
	BH112	18-Jul-19	BH112	Normal	ES1922601	<0.001	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	0.004	<0.005	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		20-Aug-19	BH112	Normal	ES1926460	<0.001	<0.0001	<0.001	0.032	-	0.002	-	<0.0001	0.051	0.07	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		25-Sep-19	BH112	Normal	ES1931244	<0.001	<0.0001	<0.001	0.001	-	<0.001	-	<0.0001	0.804	0.038	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		22-Oct-19	BH112	Normal	ES1934707	0.001	<0.0001	<0.001	0.015	-	0.001	-	<0.0001	0.19	0.051	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		07-Nov-19	BH112	Normal	ES1936840	<0.001	<0.0001	<0.001	0.014	-	<0.001	-	<0.0001	0.095	0.076	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		12-Dec-19	BH112	Normal	ES1941279	<0.001	<0.0001	<0.001	0.027	-	0.002	-	<0.0001	0.087	0.13	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		20-Feb-20	BH112	Normal	ES2005947	<0.001	<0.0001	<0.001	0.011	-	<0.001	-	<0.0001	0.179	0.078	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		21-Apr-20	BH112	Normal	ES2013464	<0.001	<0.0001	<0.001	0.05	-	0.001	-	<0.0001	0.09	0.274	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		21-May-20	BH112	Normal	ES2017665	<0.001	<0.0001	<0.001	0.002	-	<0.001	-	<0.0001	0.025	0.012	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		30-Jul-20	BH112	Normal	ES2026408	<0.001	0.0007	<0.001	0.138	0.24	0.007	0.267	<0.0001	0.06	0.441	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		13-Aug-20	BH112	Normal	ES2028325	<0.001	<0.0001	<0.001	0.033	0.06	<0.001	0.276	<0.0001	0.068	0.204	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		10-Sep-20	BH112	Normal	ES2032115	<0.001	<0.0001	<0.001	0.08	0.15	0.001	0.284	<0.0001	0.08	0.104	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		09-Oct-20	BH112	Normal	ES2035519	<0.001	0.0002	<0.001	0.11	0.07	0.003	0.281	<0.0001	0.062	0.146	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		08-Dec-20	BH112	Normal	ES2043799	<0.001	<0.0001	<0.001	0.004	0.09	<0.001	0.264	<0.0001	0.101	0.149	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		14-Jan-21	BH112	Normal	ES2101242	<0.001	<0.0001	<0.001	0.007	0.06	<0.001	0.223	<0.0001	0.12	0.035	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		11-Feb-21	BH112	Normal	ES2104999	<0.001	<0.0001	<0.001	0.001	<0.05	<0.001	0.222	<0.0001	0.048	0.011	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		10-Mar-21	BH112	Normal	ES2108508	<0.001	<0.0001	<0.001	0.186	0.12	0.002	0.225	<0.0001	0.04	0.086	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		07-Apr-21	BH112	Normal	ES2112804	<0.001	<0.0001	<0.001	0.011	<0.05	<0.001	0.139	<0.0001	0.036	0.009	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		04-May-21	BH112	Normal	ES2116634	<0.001	<0.0001	<0.001	0.004	0.19	<0.001	0.206	<0.0001	0.182	0.058	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		08-Jun-21	BH112	Normal	ES2121745	<0.001	<0.0001	<0.001	0.001	0.37	<0.001	0.174	<0.0001	0.056	0.034	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		07-Jul-21	BH112	Normal	ES2125048	<0.001	<0.0001	<0.001	0.002	0.27	<0.001	0.172	<0.0001	0.01	0.007	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		13-Aug-21	BH112	Normal	ES2129596	<0.001	<0.0001	<0.001	0.002	0.17	<0.001	0.162	<0.0001	0.043	0.029	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		01-Sep-21	BH112	Normal	ES2131753	<0.001	<0.0001	<0.001	0.002	0.1	<0.001	0.142	<0.0001	0.038	0.01	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		15-Oct-21	BH112	Normal	ES2137338	<0.001	<0.0001	0.003	0.086	1.24	0.004	0.792	<0.0001	0.071	0.118	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-

						Metals										BTEXN								TRH - NEPM 2013							TRH - NEPM 1999					PAHs - standard 16					
						Arsenic (Filtered)	Cadmium (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Iron (Filtered)	Lead (Filtered)	Manganese (Filtered)	Mercury (Filtered)	Nickel (Filtered)	Zinc (Filtered)	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	BTEX (Sum of Total) - Lab Calc	Naphthalene (BTEXN suite)	F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 (Sum of Total)	Acenaphthene	Acenaphthylene	Anthracene	Benz[a]anthracene	Benzo(a)pyrene	Benzo[b+j]fluoranthene
						mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						0.001	0.0001	0.001	0.001	0.05	0.001	0.001	0.0001	0.001	0.005	1	2	2	2	2	2	1	5	20	20	100	100	100	100	100	20	50	100	50	50	1	1	1	1	0.5	1
ADWG 2011 Health (v3.7 updated 2022)						0.01	0.002		2		0.01	0.5	0.001	0.02		1	800	300			600																			0.01	
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																																										
ANZECC 2000 - Stock Watering						*0.5*	*0.01*	*1*	*1* [#8]		*0.1*		*0.002*	*1*	*20*																											
ANZG (2018) - FW - 95% (updated 26 July 2021)						0.013 [#11]	0.0002	0.001 [#12]	0.0014		0.0034	1.9	0.0006	0.011	0.008	950	180	80	350				16															0.4		0.2	
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																										
2-4m																5000	NL [#13]	NL [#13]			NL [#13]		NL [#13]	6000 [#14]		NL [#13]																
4-8m																5000	NL [#13]	NL [#13]			NL [#13]		NL [#13]	6000 [#14]		NL [#13]																
>8m																5000	NL [#13]	NL [#13]			NL [#13]		NL [#13]	7000 [#14]		NL [#13]																
Package	**Location Code**	**Sample Date**	**Field ID**	**Sample Type**	**Lab Report Number**																																						
M12 - West	BH112	08-Nov-21	BH112	Normal	ES2140334	<0.001	<0.0001	<0.001	0.003	<0.05	<0.001	0.19	<0.0001	0.033	0.007	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		08-Dec-21	BH112	Normal	ES2144782	<0.001	<0.0001	<0.001	0.002	0.12	<0.001	0.164	<0.0001	0.05	0.655	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		13-Jan-22	GWDUP2	Interlab_D	856978	0.001	<0.0002	<0.001	<0.001	-	<0.001	-	<0.0001	0.11	0.033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Jan-22	BH112	Normal	ES2201179	<0.001	<0.0001	<0.001	<0.001	<0.05	<0.001	0.247	<0.0001	0.065	0.014	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		10-Feb-22	BH112	Normal	ES2204606	<0.001	<0.0001	<0.001	0.001	<0.05	<0.001	0.164	<0.0001	0.141	0.013	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
			GWPDUP1	Field_D	ES2204606	<0.001	<0.0001	<0.001	0.002	-	<0.001	-	<0.0001	0.152	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18-Mar-22	GWDUP2	Interlab_D	874238	<0.001	<0.0002	<0.001	0.001	-	<0.001	-	<0.0001	0.12	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18-Mar-22	BH112	Normal	ES2209694	<0.001	<0.0001	<0.001	<0.001	0.06	<0.001	0.02	<0.0001	0.13	<0.005	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		25-May-22	BH112	Normal	ES2218210	<0.001	<0.0001	<0.001	0.003	<0.05	<0.001	0.002	<0.0001	0.007	0.022	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		27-Jun-22	BH112	Normal	ES2222571	<0.001	<0.0001	<0.001	<0.001	<0.05	<0.001	0.001	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		20-Jul-22	BH112	Normal	ES2225656	<0.001	<0.0001	<0.001	0.004	<0.05	<0.001	0.001	<0.0001	<0.001	0.005	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
M12 - Central	BH145	13-Jun-19	BH145	Normal	ES1918214	<0.001	<0.0001	<0.001	0.091	-	<0.001	-	<0.0001	0.213	0.064	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		17-Jul-19	BH145	Normal	ES1922407	<0.001	<0.0001	<0.001	0.047	-	<0.001	-	<0.0001	0.034	0.006	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		21-Aug-19	BH145	Normal	ES1926628	<0.001	<0.0001	<0.001	0.038	-	<0.001	-	<0.0001	0.019	0.007	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		26-Sep-19	BH145	Normal	ES1931491	<0.001	<0.0001	<0.001	0.008	-	<0.001	-	<0.0001	0.008	<0.005	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		23-Oct-19	BH145	Normal	ES1934911	<0.001	0.0002	<0.001	0.086	-	0.002	-	<0.0001	0.072	0.15	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		12-Dec-19	BH145	Normal	ES1941279	<0.001	0.0001	<0.001	0.059	-	<0.001	-	<0.0001	0.026	0.015	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		21-May-20	BH145	Normal	ES2017665	<0.001	<0.0001	<0.001	0.009	-	<0.001	-	<0.0001	0.033	0.106	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		30-Jul-20	BD01	Field_D	ES2026408	<0.001	<0.0001	<0.001	0.017	-	<0.001	-	<0.0001	0.047	*27.2*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			BH145	Normal	ES2026408	<0.001	0.0001	<0.001	0.034	<0.05	<0.001	0.566	<0.0001	0.056	*30.6*	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		13-Aug-20	BH145	Normal	ES2028325	<0.001	0.0002	<0.001	0.082	22.2	<0.001	1.51	<0.0001	0.121	*41.6*	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		26-Aug-20	BH145	Normal	740880	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Sep-20	BH145	Normal	ES2032115	<0.001	0.0001	<0.001	0.153	35.3	0.002	1.64	<0.0001	0.129	2.62	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		08-Oct-20	BH145	Normal	ES2035519	<0.001	<0.0001	<0.001	0.008	<0.05	<0.001	1.5	<0.0001	0.02	0.643	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		11-Nov-20	BH145	Normal	ES2040330	<0.001	<0.0001	<0.001	0.004	32.3	<0.001	1.48	<0.0001	0.043	10.7	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		12-Nov-20	BD01	Field_D	ES2040667	<0.001	<0.0001	<0.001	0.004	-	<0.001	-	<0.0001	0.046	11.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Dec-20	BH145	Normal	ES2043799	<0.001	<0.0001	<0.001	<0.001	31.7	<0.001	1	<0.0001	0.082	1.33	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		12-Jan-21	BH145	Normal	ES2101242	<0.001	<0.0001	0.004	0.042	19	0.014	0.935	<0.0001	0.011	1.03	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		09-Feb-21	BH145	Normal	ES2104999	<0.001	<0.0001	<0.001	0.017	5.16	<0.001	0.83	<0.0001	0.008	1.62	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		10-Mar-21	BH145	Normal	ES2108508	<0.001	<0.0001	<0.001	0.062	2.1	<0.001	0.78	<0.0001	0.068	0.297	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		07-Apr-21	BH145	Normal	ES2112804	<0.001	<0.0001	<0.001	0.007	1.91	<0.001	0.809	<0.0001	0.013	1.38	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		08-Jun-21	BH145	Normal	ES2121745	-	-	-	-	-	-	-	-	-	-	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		07-Jul-21	BH145	Normal	ES2125048	-	-	-	-	-	-	-	-	-	-	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	300	300	140	<100	440	<20	150	350	<50	500	-	-	-	-	-	-
		01-Sep-21	BH145	Normal	ES2131753	<0.001	0.0004	<0.001	0.004	<0.05	<0.001	2.84	<0.0001	0.046	0.694	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		15-Oct-21	BH145	Normal	ES2137338	<0.001	<0.0001	<0.001	<0.001	0.75	<0.001	0.004	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		08-Nov-21	GWDUP2	Interlab_D	839397	0.001	0.0006	<0.001	0.025	-	<0.001	-	<0.0001	0.028	0.49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Nov-21	BH145	Normal	ES2140334	<0.001	0.0002	<0.001	0.015	<0.05	<0.001	3.28	<0.0001	0.028	0.556	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		08-Dec-21	BH145	Normal	ES2144782	0.035	0.0005	<0.001	<0.001	<0.05	<0.001	0.483	<0.0001	0.014	0.568	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
		13-Jan-22	BH145	Normal	ES2201179	<0.001	<0.0001	<0.001	<0.001	<0.05	<0.001	2.29	<0.0001	0.008	0.824	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	160	<100	160	<20	<50	130	90	220	<1	<1	<1	<1	<0.5	<1
		10-Feb-22	BH145	Normal	ES2204606	<0.001	0.0001	<0.001	0.002	0.06	<0.001	1.89	<0.0001	0.006	0.498	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		18-Mar-22	BH145	Normal	ES2209694	<0.001	0.0001	<0.001	0.005	<0.05	<0.001	1.89	<0.0001	0.006	0.567	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
		25-May-22	GWDUP2	Interlab_D	892529	<0.001	<0.0002	<0.001	0.002	-	<0.001	-	<0.0001	0.004	0.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		25-May-22	BH145	Normal	ES2218210	<0.001	<0.0001	<0.001	0.006	<0.05	<0.001	1.18	<0.0001	0.004	0.21	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
			GWDUP1	Field_D	ES2218210	<0.001	<0.0001	<0.001	0.004	-	<0.001	-	<0.0001	0.003	0.206	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		27-Jun-22	BH145	Normal	ES2222571	<0.001	<0.0001	<0.001	0.002	<0.05	<0.001	0.935	<0.0001	0.002	0.142	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
			GWDUP1	Field_D	ES2222571	<0.001	<0.0001	<0.001	0.004	-	<0.001	-	<0.0001	0.002	0.151	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20-Jul-22	BH145	Normal	ES2225656	<0.001	<0.0001	<0.001	0.002	0.06	<0.001	0.633	<0.0001	0.003	0.138	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-
			GWDUP1	Field_D	ES2225656	<0.001	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	0.002	0.119	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	Metals										BTEXN								TRH - NEPM 2013							TRH - NEPM 1999					PAHs - standard 16					
	Arsenic (Filtered)	Cadmium (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Iron (Filtered)	Lead (Filtered)	Manganese (Filtered)	Mercury (Filtered)	Nickel (Filtered)	Zinc (Filtered)	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	BTEX (Sum of Total) - Lab Calc	Naphthalene (BTEXN suite)	F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 (Sum of Total)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo[b+j]fluoranthene
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.001	0.0001	0.001	0.001	0.05	0.001	0.001	0.0001	0.001	0.005	1	2	2	2	2	2	1	5	20	20	100	100	100	100	100	20	50	100	50	50	1	1	1	1	0.5	1
ADWG 2011 Health (v3.7 updated 2022)	0.01	0.002		2		0.01	0.5	0.001	0.02		1	800	300			600																			0.01	
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																																				
ANZECC 2000 - Stock Watering	*0.5*	*0.01*	*1*	*1*[#8]		*0.1*		*0.002*	*1*	*20*																										
ANZG (2018) - FW - 95% (updated 26 July 2021)	0.013[#11]	0.0002	0.001[#12]	0.0014		0.0034	1.9	0.0006	0.011	0.008	950	180	80	350				16																0.4		0.2	
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																				
2-4m											5000	NL[#13]	NL[#13]			NL[#13]		NL[#13]	6000[#14]		NL[#13]															
4-8m											5000	NL[#13]	NL[#13]			NL[#13]		NL[#13]	6000[#14]		NL[#13]															
>8m											5000	NL[#13]	NL[#13]			NL[#13]		NL[#13]	7000[#14]		NL[#13]															

Statistical Summary

Number of Results	160	160	160	160	91	160	91	160	160	160	131	131	131	131	131	131	130	131	131	131	131	131	131	131	131	131	131	131	131	50	50	50	50	50	50
Number of Detects	15	23	11	125	63	28	91	0	156	150	0	0	0	0	0	0	0	0	0	0	1	1	3	0	3	0	1	2	2	3	0	0	0	0	0	0
Minimum Concentration	<0.001	<0.0001	<0.001	<0.001	<0.05	<0.001	0.001	<0.0001	<0.001	<0.005	<1	<1	<1	<1	<2	<2	<1	<5	<20	<20	<50	<50	<100	<100	<100	<20	<50	<100	<50	<50	<1	<1	<1	<1	<0.5	<1
Minimum Detect	0.001	0.0001	0.001	0.001	0.05	0.001	0.001	ND	0.001	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	300	300	130	ND	130	ND	150	130	80	80	ND	ND	ND	ND	ND	ND
Maximum Concentration	0.035	0.0007	0.006	0.186	35.3	0.014	3.28	<0.0001	0.804	41.6	<1	<2	<2	<2	<2	<3	<1	<10	<20	<20	300	300	160	<100	440	<20	150	350	<100	500	<1	<1	<1	<1	<1	<1
Maximum Detect	0.035	0.0007	0.006	0.186	35.3	0.014	3.28	ND	0.804	41.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	300	300	160	ND	440	ND	150	350	90	500	ND	ND	ND	ND	ND	ND
Average Concentration	0.00079	0.000081	0.00063	0.022	1.9	0.00088	0.57	0.00005	0.061	0.91	0.5	1	1	1	1	1	0.5	2.5	10	10	52	52	52	50	54	10	26	53	26	31	0.5	0.5	0.5	0.5	0.26	0.5
Geometric Average	0.00056	0.0063	0.00055	0.0052	0.17	0.00064	0.29	0.0052	0.035	0.054	0.5	0.99	0.99	0.99	1	1	0.5	2.5	10	10	50	50	51	50	52	10	25	51	26	26	0.5	0.5	0.5	0.5	0.25	0.5
Median Concentration	0.0005	0.00005	0.0005	0.004	0.13	0.0005	0.347	0.00005	0.049	0.054	0.5	1	1	1	1	1	0.5	2.5	10	10	50	50	50	50	50	10	25	50	25	25	0.5	0.5	0.5	0.5	0.25	0.5
Standard Deviation	0.0027	0.000098	0.0006	0.036	6.6	0.0014	0.59	0	0.075	4.7	0	0.04	0.04	0.044	0	0.04	0	0.22	0	0	22	22	14	0	36	0	11	27	7.7	45	0	0	0	0	0.035	0
Geometric Standard Deviation	1.5	1.7	1.5	6.1	6.7	1.8	5.1		3.7	6.8		1.1	1.1	1.1		1		1.1			1.2	1.2	1.2		1.3		1.2	1.2	1.2	1.4					1.1	
Number of Guideline Exceedances	1	14	11	117	0	5	33	0	134	136	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0	50	0
Number of Guideline Exceedances(Detects Only)	1	14	11	117	0	5	33	0	134	136	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Results at or above the Detect Limit	9	14	7	78	69	18	100	0	98	94	0	0	0	0	0	0	0	0	0	0	1	1	2	0	2	0	1	2	2	2	0	0	0	0	0	0
% of Results below the Detect Limit	91	86	93	22	31	83	0	100	3	6	100	100	100	100	100	100	100	100	100	100	99	99	98	100	98	100	99	98	98	98	100	100	100	100	100	100
% of Detects at or above Guidelines	1	9	7	73	0	3	36	0	84	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Results Below Guidelines or Non-Detect	99	91	93	27	100	97	64	100	16	15	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

A Non-Detect multiplier of 0.5 has been applied.

Env Stds Comments
#1:Not specifically guideline value: >500mg/L can have purgative effects
#2:Guideline value calculated by dividing Nitrate (as Nitrate) value (50 mg/L) by 4.427
#3:Guideline value calculated by dividing Nitrite (as Nitrite) value (0.3 mg/L) by molecular weight (3.2967033).
#4:Calculated from ammonia NH4
#5:Loss of production expected at 5000 mg/L for beef cattle, 4000 mg/L dairy cattle, 10000 mg/L sheep, 6000 mg/L horses and pigs, 3000 mg/L poultry
#6:400 mg/L divided by molecular weight, stock may tolerate higher nitrate concentrations if nitrate in feed are not high, water containing >1500 mg/L (as NO3) is likely to be toxic.
#7:30 mg/L divided by molecular weight
#8:>0.5 mg/L hazardous to sheep, >1 mg/L for cattle, >5 mg/L pigs and poulty
#9:Measured as NH3-N at pH 8
#10:Values taken from "Updating nitrate toxicity effects on freshwater aquatic species, 2013"
#11:In absence of total As guideline, As (V) guideline has been adopted.
#12:In absence of total Cr guideline, Cr (VI) guideline has been adopted.
#13:Not limiting: Derived water HSL exceeds water solubility limit
#14:To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

Data Comments
#1 Reported Analyte LOR is higher than Requested Analyte LOR

						PAHs - standard 16												Phenols - Halogenated									Phenols - Non-Halogenated										OC Pesticides								
						Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene-PAH	Phenanthrene	Pyrene	Sum of standard 16 PAHs	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	2-Chlorophenol	2,4-Dichlorophenol	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,6-Dichlorophenol	4-Chloro-3-methylphenol	Pentachlorophenol	tetrachlorophenols	Phenols (halogenated)	Phenol	2-Nitrophenol	2-Methylphenol (o-Cresol)	3,4-Methylphenol (m,p-cresol)	2,4-Dimethylphenol	2,4-Dinitrophenol	4,6-Dinitro-2-methylphenol	4,6-Dinitro-o-cyclohexyl phenol	4-Nitrophenol	Phenols (Total Non Halogenated)	Organochlorine pesticides EPAVic	Other organochlorine pesticides EPAVic	4,4'-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						1	1	1	1	1	1	1	1	1	1	0.5	0.5	0.5	1	1	1	1	1	1	2	30	10	1	1	1	2	1	30	30	100	30	100	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
ADWG 2011 Health (v3.7 updated 2022)																0.01	0.01		300	200		20			10																	0.3		2
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																																												
ANZECC 2000 - Stock Watering																																												
ANZG (2018) - FW - 95% (updated 26 July 2021)										1.4			16	2					490	160		20			10			320					45											0.08
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																												
2-4m													NL[#13]																																
4-8m													NL[#13]																																
>8m													NL[#13]																																
Package	**Location Code**	**Sample Date**	**Field ID**	**Sample Type**	**Lab Report Number**																																								
M12 - West	BH104	16-Jul-19	BH104	Normal	ES1922192	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		20-Aug-19	BH104	Normal	ES1926460	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		24-Sep-19	BH104	Normal	ES1930997	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		22-Oct-19	BH104	Normal	ES1934707	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		07-Nov-19	BH104	Normal	ES1936840	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		12-Dec-19	BH104	Normal	ES1941279	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		16-Jan-20	BH104	Normal	ES2001376	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		18-Feb-20	BH104	Normal	ES2005577	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		12-Mar-20	SD01	Interlab_D	707829	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	-	<3	<3	<10	<10	<3	<10	<10	<30	<10	<3	<10	<6	<3	<30	<30	<100	<30	<100	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
		12-Mar-20	BD01	Field_D	ES2008731	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
			BH104	Normal	ES2008731	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		23-Apr-20	BH104	Normal	ES2013858	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		19-May-20	BH104	Normal	ES2017191	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		30-Jul-20	BH104	Normal	ES2026408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11-Aug-20	BH104	Normal	ES2027951	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Sep-20	BD01	Field_D	ES2032115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			BH104	Normal	ES2032115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Oct-20	BD01	Field_D	ES2035519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			BH104	Normal	ES2035519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Nov-20	BH104	Normal	ES2040330	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-20	BH104	Normal	ES2043799	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GW_DUP	Field_D	ES2043799	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		14-Jan-21	BH104	Normal	ES2101242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2101242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11-Feb-21	BH104	Normal	ES2104999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2104999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Mar-21	BH104	Normal	ES2108508	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2108508	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Apr-21	BH104	Normal	ES2112804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2112804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		04-May-21	BH104	Normal	ES2116634	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2116634	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Jun-21	BH104	Normal	ES2121745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2121745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Jul-21	BH104	Normal	ES2125048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2125048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Aug-21	BH104	Normal	ES2129596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2129596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		01-Sep-21	BH104	Normal	ES2131753	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2131753	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15-Oct-21	BH104	Normal	ES2137338	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15-Oct-21	GWDUP1	Field_D	ES2137338	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Nov-21	BH104	Normal	ES2140334	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2140334	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-21	BH104	Normal	ES2144782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2144782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Jan-22	BH104	Normal	ES2201179	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2201179	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Feb-22	GWDUP2	Interlab_D	863166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Feb-22	BH104	Normal	ES2204606	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18-Mar-22	BH104	Normal	ES2209694	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		25-May-22	BH104	Normal	ES2218210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		27-Jun-22	GWDUP2	Interlab_D	901087	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		27-Jun-22	BH104	Normal	ES2222571	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20-Jul-22	GWDUP2	Interlab_D	907459	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20-Jul-22	BH104	Normal	ES2225656	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

						PAHs - standard 16												Phenols - Halogenated									Phenols - Non-Halogenated										OC Pesticides								
						Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene-PAH	Phenanthrene	Pyrene	Sum of standard 16 PAHs	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	2-Chlorophenol	2,4-Dichlorophenol	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,6-Dichlorophenol	4-Chloro-3-methylphenol	Pentachlorophenol	tetrachlorophenols	Phenols (halogenated)	Phenol	2-Nitrophenol	2-Methylphenol (o-Cresol)	3,4-Methylphenol (m,p-cresol)	2,4-Dimethylphenol	2,4-Dinitrophenol	4,6-Dinitro-2-methylphenol	4,6-Dinitro-o-cyclohexyl phenol	4-Nitrophenol	Phenols (Total Non Halogenated)	Organochlorine pesticides EPAVic	Other organochlorine pesticides EPAVic	4,4'-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						1	1	1	1	1	1	1	1	1	1	0.5	0.5	0.5	1	1	1	1	1	1	2	30	10	1	1	1	2	1	30	30	100	30	100	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
ADWG 2011 Health (v3.7 updated 2022)																0.01	0.01		300	200		20			10																		0.3		2
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																																												
ANZECC 2000 - Stock Watering																																												
ANZG (2018) - FW - 95% (updated 26 July 2021)										1.4			16	2					490	160		20			10			320					45											0.08
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																												
2-4m													NL[#13]																																
4-8m													NL[#13]																																
>8m													NL[#13]																																
Package	**Location Code**	**Sample Date**	**Field ID**	**Sample Type**	**Lab Report Number**																																								
M12 - West	BH107	18-Jul-19	BH107	Normal	ES1922601	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		20-Aug-19	BH107	Normal	ES1926460	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		24-Sep-19	BH107	Normal	ES1930997	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		22-Oct-19	BH107	Normal	ES1934707	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		07-Nov-19	BH107	Normal	ES1936840	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		12-Dec-19	BH107	Normal	ES1941279	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		20-Feb-20	BH107	Normal	ES2005947	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		23-Apr-20	BH107	Normal	ES2013858	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		21-May-20	BH107	Normal	ES2017665	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		30-Jul-20	BH107	Normal	ES2026408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11-Aug-20	BH107	Normal	ES2027951	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Sep-20	BH107	Normal	ES2032115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Oct-20	BH107	Normal	ES2035519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-20	BH107	Normal	ES2043799	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		14-Jan-21	BH107	Normal	ES2101242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11-Feb-21	BH107	Normal	ES2104999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Mar-21	BH107	Normal	ES2108508	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Apr-21	BH107	Normal	ES2112804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		03-May-21	BH107	Normal	ES2116634	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Jun-21	BH107	Normal	ES2121745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Jul-21	BH107	Normal	ES2125048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Aug-21	BH107	Normal	ES2129596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		01-Sep-21	BH107	Normal	ES2131753	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15-Oct-21	GWDUP2	Interlab_D	833147	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15-Oct-21	BH107	Normal	ES2137338	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Nov-21	BH107	Normal	ES2140334	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-21	GWDUP2	Interlab_D	849475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-21	BH107	Normal	ES2144782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Jan-22	BH107	Normal	ES2201179	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Feb-22	BH107	Normal	ES2204606	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18-Mar-22	BH107	Normal	ES2209694	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2209694	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		25-May-22	BH107	Normal	ES2218210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		27-Jun-22	BH107	Normal	ES2222571	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20-Jul-22	BH107	Normal	ES2225656	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH112	18-Jul-19	BH112	Normal	ES1922601	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		20-Aug-19	BH112	Normal	ES1926460	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		25-Sep-19	BH112	Normal	ES1931244	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		22-Oct-19	BH112	Normal	ES1934707	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		07-Nov-19	BH112	Normal	ES1936840	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		12-Dec-19	BH112	Normal	ES1941279	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		20-Feb-20	BH112	Normal	ES2005947	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		21-Apr-20	BH112	Normal	ES2013464	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		21-May-20	BH112	Normal	ES2017665	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		30-Jul-20	BH112	Normal	ES2026408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Aug-20	BH112	Normal	ES2028325	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Sep-20	BH112	Normal	ES2032115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Oct-20	BH112	Normal	ES2035519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-20	BH112	Normal	ES2043799	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		14-Jan-21	BH112	Normal	ES2101242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11-Feb-21	BH112	Normal	ES2104999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Mar-21	BH112	Normal	ES2108508	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Apr-21	BH112	Normal	ES2112804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		04-May-21	BH112	Normal	ES2116634	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Jun-21	BH112	Normal	ES2121745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Jul-21	BH112	Normal	ES2125048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Aug-21	BH112	Normal	ES2129596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		01-Sep-21	BH112	Normal	ES2131753	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15-Oct-21	BH112	Normal	ES2137338	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

						PAHs - standard 16													Phenols - Halogenated										Phenols - Non-Halogenated										OC Pesticides								
						Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene-PAH	Phenanthrene	Pyrene	Sum of standard 16 PAHs	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	2-Chlorophenol	2,4-Dichlorophenol	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,6-Dichlorophenol	4-Chloro-3-methylphenol	Pentachlorophenol	tetrachlorophenols	Phenols (halogenated)	Phenol	2-Nitrophenol	2-Methylphenol (o-Cresol)	3,4-Methylphenol (m,p-cresol)	2,4-Dimethylphenol	2,4-Dinitrophenol	4,6-Dinitro-2-methylphenol	4,6-Dinitro-o-cyclohexyl phenol	4-Nitrophenol	Phenols (Total Non Halogenated)	Organochlorine pesticides EPAVic	Other organochlorine pesticides EPAVic	4,4'-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						1	1	1	1	1	1	1	1	1	1	0.5	0.5	0.5	1	1	1	1	1	1	2	30	10	1	1	1	2	1	30	30	100	30	100	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
ADWG 2011 Health (v3.7 updated 2022)																0.01	0.01		300	200		20			10																		0.3		2
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																																													
ANZECC 2000 - Stock Watering																																													
ANZG (2018) - FW - 95% (updated 26 July 2021)										1.4			16	2					490	160		20			10			320					45												0.08
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																													
2-4m													NL[#13]																																	
4-8m													NL[#13]																																	
>8m													NL[#13]																																	
Package	**Location Code**	**Sample Date**	**Field ID**	**Sample Type**	**Lab Report Number**																																									
M12 - West	BH112	08-Nov-21	BH112	Normal	ES2140334	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-21	BH112	Normal	ES2144782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Jan-22	GWDUP2	Interlab_D	856978	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Jan-22	BH112	Normal	ES2201179	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Feb-22	BH112	Normal	ES2204606	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWPDUP1	Field_D	ES2204606	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18-Mar-22	GWDUP2	Interlab_D	874238	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18-Mar-22	BH112	Normal	ES2209694	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		25-May-22	BH112	Normal	ES2218210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		27-Jun-22	BH112	Normal	ES2222571	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20-Jul-22	BH112	Normal	ES2225656	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M12 - Central	BH145	13-Jun-19	BH145	Normal	ES1918214	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		17-Jul-19	BH145	Normal	ES1922407	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		21-Aug-19	BH145	Normal	ES1926628	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		26-Sep-19	BH145	Normal	ES1931491	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		23-Oct-19	BH145	Normal	ES1934911	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		12-Dec-19	BH145	Normal	ES1941279	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	-	<0.5	<1	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		21-May-20	BH145	Normal	ES2017665	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	-	<0.01	<0.01
		30-Jul-20	BD01	Field_D	ES2026408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			BH145	Normal	ES2026408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Aug-20	BH145	Normal	ES2028325	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		26-Aug-20	BH145	Normal	740880	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Sep-20	BH145	Normal	ES2032115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Oct-20	BH145	Normal	ES2035519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11-Nov-20	BH145	Normal	ES2040330	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12-Nov-20	BD01	Field_D	ES2040667	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Dec-20	BH145	Normal	ES2043799	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12-Jan-21	BH145	Normal	ES2101242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Feb-21	BH145	Normal	ES2104999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Mar-21	BH145	Normal	ES2108508	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Apr-21	BH145	Normal	ES2112804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Jun-21	BH145	Normal	ES2121745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Jul-21	BH145	Normal	ES2125048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		01-Sep-21	BH145	Normal	ES2131753	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15-Oct-21	BH145	Normal	ES2137338	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Nov-21	GWDUP2	Interlab_D	839397	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Nov-21	BH145	Normal	ES2140334	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-21	BH145	Normal	ES2144782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Jan-22	BH145	Normal	ES2201179	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Feb-22	BH145	Normal	ES2204606	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18-Mar-22	BH145	Normal	ES2209694	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<2	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		25-May-22	GWDUP2	Interlab_D	892529	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		25-May-22	BH145	Normal	ES2218210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2218210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		27-Jun-22	BH145	Normal	ES2222571	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2222571	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20-Jul-22	BH145	Normal	ES2225656	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2225656	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	PAHs - standard 16													Phenols - Halogenated									Phenols - Non-Halogenated									OC Pesticides								
	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene-PAH	Phenanthrene	Pyrene	Sum of standard 16 PAHs	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	2-Chlorophenol	2,4-Dichlorophenol	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,6-Dichlorophenol	4-Chloro-3-methylphenol	Pentachlorophenol	tetrachlorophenols	Phenols (halogenated)	Phenol	2-Nitrophenol	2-Methylphenol (o-Cresol)	3,4-Methylphenol (m,p-cresol)	2,4-Dimethylphenol	2,4-Dinitrophenol	4,6-Dinitro-2-methylphenol	4,6-Dinitro-o-cyclohexyl phenol	4-Nitrophenol	Phenols (Total Non Halogenated)	Organochlorine pesticides EPAVic	Other organochlorine pesticides EPAVic	4,4'-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	1	1	1	1	1	1	1	1	1	1	0.5	0.5	0.5	1	1	1	1	1	1	2	30	10	1	1	1	2	1	30	30	100	30	100	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
ADWG 2011 Health (v3.7 updated 2022)											0.01	0.01		300	200		20			10																	0.3		2
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																																							
ANZECC 2000 - Stock Watering																																								
ANZG (2018) - FW - 95% (updated 26 July 2021)					1.4			16	2					490	160		20			10			320				45													0.08
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																								
2-4m								NL[#13]																																
4-8m								NL[#13]																																
>8m								NL[#13]																																

Statistical Summary

Number of Results	50	50	50	50	50	50	50	50	50	50	24	26	49	50	50	50	50	50	50	50	1	1	50	50	50	50	50	1	1	1	1	1	1	1	38	38	38	1	38	38
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<2	<30	<10	<1	<1	<1	<2	<1	<30	<30	<100	<30	<100	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<0.5	<3	<3	<10	<10	<3	<10	<10	<30	<10	<3	<10	<3	<6	<3	<30	<30	<100	<30	<100	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.25	0.26	0.25	0.52	0.52	0.59	0.59	0.52	0.59	1.1			0.52	0.59	0.52	1	0.52								0.005	0.005	0.005		0.005	0.005
Geometric Average	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.25	0.26	0.25	0.51	0.51	0.52	0.52	0.51	0.52	1			0.51	0.52	0.51	1	0.51								0.005	0.005	0.005		0.005	0.005
Median Concentration	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.25	0.25	0.25	0.5	0.5	0.5	0.5	0.5	0.5	1	15	5	0.5	0.5	0.5	1	0.5	15	15	50	15	50	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0.049	0	0.14	0.14	0.64	0.64	0.14	0.64	0.57			0.14	0.64	0.14	0.28	0.14								0	0	0		0	0
Geometric Standard Deviation												1.1		1.2	1.2	1.4	1.4	1.2	1.4	1.3			1.2	1.4	1.2	1.2	1.2														
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	24	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Results at or above the Detect Limit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Results below the Detect Limit	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% of Detects at or above Guidelines	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Results Below Guidelines or Non-Detect	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

A Non-Detect multiplier of 0.5 has been applied.

Env Stds Comments
#1:Not specifically guideline value: >500mg/L can have purgative effects
#2:Guideline value calculated by dividing Nitrate (as Nitrate) value (50 mg/L) by 4.427
#3:Guideline value calculated by dividing Nitrite (as Nitrite) value (0.3 mg/L) by molecular weight (3.2967033).
#4:Calculated from ammonia NH4
#5:Loss of production expected at 5000 mg/L for beef cattle, 4000 mg/L dairy cattle, 10000 mg/L sheep, 6000 mg/L horses and pigs, 3000 mg/L poultry
#6:400 mg/L divided by molecular weight, stock may tolerate higher nitrate concentrations if nitrate in feed are not high, water containing >1500 mg/L (as NO3) is likely to be toxic.
#7:30 mg/L divided by molecular weight
#8:>0.5 mg/L hazardous to sheep, >1 mg/L for cattle, >5 mg/L pigs and poulty
#9:Measured as NH3-N at pH 8
#10:Values taken from "Updating nitrate toxicity effects on freshwater aquatic species, 2013"
#11:In absence of total As guideline, As (V) guideline has been adopted.
#12:In absence of total Cr guideline, Cr (VI) guideline has been adopted.
#13:Not limiting: Derived water HSL exceeds water solubility limit
#14:To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

Data Comments
#1 Reported Analyte LOR is higher than Requested Analyte LOR

						OC Pesticides																					OP Pesticides													
						Chlordane (cis)	Chlordane (trans)	d-BHC	4,4 DDD	4,4 DDT	DDT+DDE+DDD - Lab Calc	Dieldrin	Endosulfan	Endosulfan I (alpha)	Endosulfan II (beta)	Endosulfan Sulfate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Oxychlordane	Toxaphene	Bensulide	Naftalofos	Tokuthion	Azinphos methyl	Bolstar (Sulprofos)	Bromophos-ethyl	Carbophenothion	Azinphos Ethyl	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O	Demeton-S
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.005	0.01	0.01	0.01	0.01	0.01	0.1	1	1	0.02	0.05	0.1	0.02	0.02	0.02	0.02	0.2	0.01	0.02	0.02
ADWG 2011 Health (v3.7 updated 2022)										9			20							10	0.3			300						30	10	10	0.5		2	10				
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																																								
ANZECC 2000 - Stock Watering																																								
ANZG (2018) - FW - 95% (updated 26 July 2021)										0.01			0.2				0.02			0.2	0.09		0.1			0.2				0.02						0.01				
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																								
2-4m																																								
4-8m																																								
>8m																																								
Package	**Location Code**	**Sample Date**	**Field ID**	**Sample Type**	**Lab Report Number**																																			
M12 - West	BH104	16-Jul-19	BH104	Normal	ES1922192	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		20-Aug-19	BH104	Normal	ES1926460	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		24-Sep-19	BH104	Normal	ES1930997	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		22-Oct-19	BH104	Normal	ES1934707	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		07-Nov-19	BH104	Normal	ES1936840	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		12-Dec-19	BH104	Normal	ES1941279	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		16-Jan-20	BH104	Normal	ES2001376	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		18-Feb-20	BH104	Normal	ES2005577	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		12-Mar-20	SD01	Interlab_D	707829	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	-	-	<1	<1	<1	-	-	-	<1	<10	<1	<10	<1	<10
		12-Mar-20	BD01	Field_D	ES2008731	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
			BH104	Normal	ES2008731	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		23-Apr-20	BH104	Normal	ES2013858	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		19-May-20	BH104	Normal	ES2017191	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		30-Jul-20	BH104	Normal	ES2026408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11-Aug-20	BH104	Normal	ES2027951	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Sep-20	BD01	Field_D	ES2032115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			BH104	Normal	ES2032115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Oct-20	BD01	Field_D	ES2035519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			BH104	Normal	ES2035519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Nov-20	BH104	Normal	ES2040330	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-20	BH104	Normal	ES2043799	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GW_DUP	Field_D	ES2043799	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		14-Jan-21	BH104	Normal	ES2101242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2101242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11-Feb-21	BH104	Normal	ES2104999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2104999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Mar-21	BH104	Normal	ES2108508	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2108508	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Apr-21	BH104	Normal	ES2112804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2112804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		04-May-21	BH104	Normal	ES2116634	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2116634	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Jun-21	BH104	Normal	ES2121745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2121745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Jul-21	BH104	Normal	ES2125048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2125048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Aug-21	BH104	Normal	ES2129596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2129596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		01-Sep-21	BH104	Normal	ES2131753	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2131753	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15-Oct-21	BH104	Normal	ES2137338	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15-Oct-21	GWDUP1	Field_D	ES2137338	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Nov-21	BH104	Normal	ES2140334	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2140334	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-21	BH104	Normal	ES2144782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2144782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Jan-22	BH104	Normal	ES2201179	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2201179	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Feb-22	GWDUP2	Interlab_D	863166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Feb-22	BH104	Normal	ES2204606	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18-Mar-22	BH104	Normal	ES2209694	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		25-May-22	BH104	Normal	ES2218210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		27-Jun-22	GWDUP2	Interlab_D	901087	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		27-Jun-22	BH104	Normal	ES2222571	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20-Jul-22	GWDUP2	Interlab_D	907459	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20-Jul-22	BH104	Normal	ES2225656	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

						OC Pesticides																					OP Pesticides													
						Chlordane (cis)	Chlordane (trans)	d-BHC	4,4 DDD	4,4 DDT	DDT+DDE+DDD - Lab Calc	Dieldrin	Endosulfan	Endosulfan I (alpha)	Endosulfan II (beta)	Endosulfan Sulfate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Oxychlordane	Toxaphene	Bensulide	Naftalofos	Tokuthion	Azinphos methyl	Bolstar (Sulprofos)	Bromophos-ethyl	Carbophenothion	Azinphos Ethyl	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O	Demeton-S
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.005	0.01	0.01	0.01	0.01	0.01	0.1	1	1	0.02	0.05	0.1	0.02	0.02	0.02	0.02	0.2	0.01	0.02	0.02
ADWG 2011 Health (v3.7 updated 2022)										9			20							10	0.3			300						30	10	10	0.5		2	10				
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																																								
ANZECC 2000 - Stock Watering																																								
ANZG (2018) - FW - 95% (updated 26 July 2021)										0.01			0.2				0.02			0.2	0.09		0.1			0.2				0.02						0.01				
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																								
2-4m																																								
4-8m																																								
>8m																																								
Package	**Location Code**	**Sample Date**	**Field ID**	**Sample Type**	**Lab Report Number**																																			
M12 - West	BH107	18-Jul-19	BH107	Normal	ES1922601	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		20-Aug-19	BH107	Normal	ES1926460	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		24-Sep-19	BH107	Normal	ES1930997	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		22-Oct-19	BH107	Normal	ES1934707	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		07-Nov-19	BH107	Normal	ES1936840	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		12-Dec-19	BH107	Normal	ES1941279	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		20-Feb-20	BH107	Normal	ES2005947	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		23-Apr-20	BH107	Normal	ES2013858	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		21-May-20	BH107	Normal	ES2017665	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		30-Jul-20	BH107	Normal	ES2026408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11-Aug-20	BH107	Normal	ES2027951	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Sep-20	BH107	Normal	ES2032115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Oct-20	BH107	Normal	ES2035519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-20	BH107	Normal	ES2043799	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		14-Jan-21	BH107	Normal	ES2101242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11-Feb-21	BH107	Normal	ES2104999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Mar-21	BH107	Normal	ES2108508	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Apr-21	BH107	Normal	ES2112804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		03-May-21	BH107	Normal	ES2116634	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Jun-21	BH107	Normal	ES2121745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Jul-21	BH107	Normal	ES2125048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Aug-21	BH107	Normal	ES2129596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		01-Sep-21	BH107	Normal	ES2131753	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15-Oct-21	GWDUP2	Interlab_D	833147	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15-Oct-21	BH107	Normal	ES2137338	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Nov-21	BH107	Normal	ES2140334	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-21	GWDUP2	Interlab_D	849475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-21	BH107	Normal	ES2144782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Jan-22	BH107	Normal	ES2201179	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Feb-22	BH107	Normal	ES2204606	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18-Mar-22	BH107	Normal	ES2209694	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2209694	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		25-May-22	BH107	Normal	ES2218210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		27-Jun-22	BH107	Normal	ES2222571	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20-Jul-22	BH107	Normal	ES2225656	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH112	18-Jul-19	BH112	Normal	ES1922601	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		20-Aug-19	BH112	Normal	ES1926460	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		25-Sep-19	BH112	Normal	ES1931244	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		22-Oct-19	BH112	Normal	ES1934707	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		07-Nov-19	BH112	Normal	ES1936840	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		12-Dec-19	BH112	Normal	ES1941279	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		20-Feb-20	BH112	Normal	ES2005947	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		21-Apr-20	BH112	Normal	ES2013464	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		21-May-20	BH112	Normal	ES2017665	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		30-Jul-20	BH112	Normal	ES2026408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Aug-20	BH112	Normal	ES2028325	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Sep-20	BH112	Normal	ES2032115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Oct-20	BH112	Normal	ES2035519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-20	BH112	Normal	ES2043799	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		14-Jan-21	BH112	Normal	ES2101242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11-Feb-21	BH112	Normal	ES2104999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Mar-21	BH112	Normal	ES2108508	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Apr-21	BH112	Normal	ES2112804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		04-May-21	BH112	Normal	ES2116634	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Jun-21	BH112	Normal	ES2121745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Jul-21	BH112	Normal	ES2125048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Aug-21	BH112	Normal	ES2129596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		01-Sep-21	BH112	Normal	ES2131753	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15-Oct-21	BH112	Normal	ES2137338	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

OC Pesticides

Package	Location Code	Sample Date	Field ID	Sample Type	Lab Report Number	Chlordane (cis)	Chlordane (trans)	d-BHC	4,4 DDD	4,4 DDT	DDT+DDE+DDD - Lab Calc	Dieldrin	Endosulfan	Endosulfan I (alpha)	Endosulfan II (beta)	Endosulfan Sulfate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Oxychlordane	Toxaphene
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.005	0.01	0.01	0.01	0.01	0.01
ADWG 2011 Health (v3.7 updated 2022)										9			20							10	0.3			300		
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																										
ANZECC 2000 - Stock Watering																										
ANZG (2018) - FW - 95% (updated 26 July 2021)										0.01			0.2				0.02			0.2	0.09		0.1			0.2
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																										
2-4m																										
4-8m																										
>8m																										
M12 - West	BH112	08-Nov-21	BH112	Normal	ES2140334	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-21	BH112	Normal	ES2144782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Jan-22	GWDUP2	Interlab_D	856978	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Jan-22	BH112	Normal	ES2201179	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Feb-22	BH112	Normal	ES2204606	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWPDUP1	Field_D	ES2204606	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18-Mar-22	GWDUP2	Interlab_D	874238	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18-Mar-22	BH112	Normal	ES2209694	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		25-May-22	BH112	Normal	ES2218210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		27-Jun-22	BH112	Normal	ES2222571	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20-Jul-22	BH112	Normal	ES2225656	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M12 - Central	BH145	13-Jun-19	BH145	Normal	ES1918214	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-
		17-Jul-19	BH145	Normal	ES1922407	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-
		21-Aug-19	BH145	Normal	ES1926628	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-
		26-Sep-19	BH145	Normal	ES1931491	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-
		23-Oct-19	BH145	Normal	ES1934911	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-
		12-Dec-19	BH145	Normal	ES1941279	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-
		21-May-20	BH145	Normal	ES2017665	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	-
		30-Jul-20	BD01	Field_D	ES2026408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			BH145	Normal	ES2026408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Aug-20	BH145	Normal	ES2028325	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		26-Aug-20	BH145	Normal	740880	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Sep-20	BH145	Normal	ES2032115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Oct-20	BH145	Normal	ES2035519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11-Nov-20	BH145	Normal	ES2040330	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12-Nov-20	BD01	Field_D	ES2040667	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Dec-20	BH145	Normal	ES2043799	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12-Jan-21	BH145	Normal	ES2101242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Feb-21	BH145	Normal	ES2104999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Mar-21	BH145	Normal	ES2108508	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Apr-21	BH145	Normal	ES2112804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Jun-21	BH145	Normal	ES2121745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Jul-21	BH145	Normal	ES2125048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		01-Sep-21	BH145	Normal	ES2131753	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15-Oct-21	BH145	Normal	ES2137338	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Nov-21	GWDUP2	Interlab_D	839397	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Nov-21	BH145	Normal	ES2140334	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-21	BH145	Normal	ES2144782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Jan-22	BH145	Normal	ES2201179	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Feb-22	BH145	Normal	ES2204606	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18-Mar-22	BH145	Normal	ES2209694	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		25-May-22	GWDUP2	Interlab_D	892529	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		25-May-22	BH145	Normal	ES2218210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2218210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		27-Jun-22	BH145	Normal	ES2222571	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2222571	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20-Jul-22	BH145	Normal	ES2225656	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2225656	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

OP Pesticides

Package	Location Code	Sample Date	Field ID	Sample Type	Lab Report Number	Bensulide	Naftalofos	Tokuthion	Azinphos methyl	Bolstar (Sulprofos)	Bromophos-ethyl	Carbophenothion	Azinphos Ethyl	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O	Demeton-S
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						0.1	1	1	0.02	0.05	0.1	0.02	0.02	0.02	0.02	0.2	0.01	0.02	0.02
ADWG 2011 Health (v3.7 updated 2022)									30	10	10	0.5		2	10				
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																			
ANZECC 2000 - Stock Watering																			
ANZG (2018) - FW - 95% (updated 26 July 2021)									0.02						0.01				
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																			
2-4m																			
4-8m																			
>8m																			
M12 - West	BH112	08-Nov-21	BH112	Normal	ES2140334	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-21	BH112	Normal	ES2144782	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Jan-22	GWDUP2	Interlab_D	856978	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Jan-22	BH112	Normal	ES2201179	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Feb-22	BH112	Normal	ES2204606	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWPDUP1	Field_D	ES2204606	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18-Mar-22	GWDUP2	Interlab_D	874238	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18-Mar-22	BH112	Normal	ES2209694	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		25-May-22	BH112	Normal	ES2218210	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		27-Jun-22	BH112	Normal	ES2222571	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20-Jul-22	BH112	Normal	ES2225656	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M12 - Central	BH145	13-Jun-19	BH145	Normal	ES1918214	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		17-Jul-19	BH145	Normal	ES1922407	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		21-Aug-19	BH145	Normal	ES1926628	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		26-Sep-19	BH145	Normal	ES1931491	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		23-Oct-19	BH145	Normal	ES1934911	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		12-Dec-19	BH145	Normal	ES1941279	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		21-May-20	BH145	Normal	ES2017665	<0.1	<1	-	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
		30-Jul-20	BD01	Field_D	ES2026408	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			BH145	Normal	ES2026408	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Aug-20	BH145	Normal	ES2028325	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		26-Aug-20	BH145	Normal	740880	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Sep-20	BH145	Normal	ES2032115	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Oct-20	BH145	Normal	ES2035519	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11-Nov-20	BH145	Normal	ES2040330	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12-Nov-20	BD01	Field_D	ES2040667	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Dec-20	BH145	Normal	ES2043799	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12-Jan-21	BH145	Normal	ES2101242	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Feb-21	BH145	Normal	ES2104999	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Mar-21	BH145	Normal	ES2108508	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Apr-21	BH145	Normal	ES2112804	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Jun-21	BH145	Normal	ES2121745	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Jul-21	BH145	Normal	ES2125048	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		01-Sep-21	BH145	Normal	ES2131753	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15-Oct-21	BH145	Normal	ES2137338	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Nov-21	GWDUP2	Interlab_D	839397	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Nov-21	BH145	Normal	ES2140334	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-21	BH145	Normal	ES2144782	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Jan-22	BH145	Normal	ES2201179	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Feb-22	BH145	Normal	ES2204606	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18-Mar-22	BH145	Normal	ES2209694	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		25-May-22	GWDUP2	Interlab_D	892529	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		25-May-22	BH145	Normal	ES2218210	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2218210	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		27-Jun-22	BH145	Normal	ES2222571	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2222571	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20-Jul-22	BH145	Normal	ES2225656	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2225656	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	OC Pesticides																				OP Pesticides													
	Chlordane (cis)	Chlordane (trans)	d-BHC	4,4 DDD	4,4 DDT	DDT+DDE+DDD - Lab Calc	Dieldrin	Endosulfan	Endosulfan I (alpha)	Endosulfan II (beta)	Endosulfan Sulfate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Oxychlordane	Toxaphene	Bensulide	Naftalofos	Tokuthion	Azinphos methyl	Bolstar (Sulprofos)	Bromophos-ethyl	Carbophenothion	Azinphos Ethyl	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O	Demeton-S
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.005	0.01	0.01	0.01	0.01	0.01	0.1	1	1	0.02	0.05	0.1	0.02	0.02	0.02	0.02	0.2	0.01	0.02	0.02
ADWG 2011 Health (v3.7 updated 2022)					9			20							10	0.3			300						30	10	10	0.5		2	10				
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																																			
ANZECC 2000 - Stock Watering																																			
ANZG (2018) - FW - 95% (updated 26 July 2021)					0.01			0.2				0.02			0.2	0.09		0.1			0.2				0.02						0.01				
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																			
2-4m																																			
4-8m																																			
>8m																																			

Statistical Summary

Number of Results	37	37	38	38	38	38	38	37	38	38	38	38	38	38	38	38	38	38	38	37	1	37	37	1	38	38	37	37	37	38	38	38	38	38	38
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<1	<1	<0.02	<0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.2	<0.01	<0.02	<0.02
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<1	<1	<1	<1	<0.1	<0.02	<0.02	<1	<10	<1	<10	<1	<10
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.0026	0.005	0.005	0.005	0.005		0.05	0.5		0.023	0.038	0.05	0.01	0.01	0.023	0.14	0.11	0.14	0.023	0.14
Geometric Average	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.0025	0.005	0.005	0.005	0.005		0.05	0.5		0.011	0.027	0.05	0.01	0.01	0.011	0.012	0.1	0.006	0.011	0.012
Median Concentration	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.0025	0.005	0.005	0.005	0.005	0.005	0.05	0.5	0.5	0.01	0.025	0.05	0.01	0.01	0.01	0.01	0.1	0.005	0.01	0.01
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00041	0	0	0	0		0	0		0.079	0.077	0	0	0	0.079	0.81	0.065	0.81	0.079	0.81
Geometric Standard Deviation																1.1									1.9	1.6				1.9	2.7	1.3	3.1	1.9	2.7
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	38	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Results at or above the Detect Limit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Results below the Detect Limit	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% of Detects at or above Guidelines	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Results Below Guidelines or Non-Detect	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

A Non-Detect multiplier of 0.5 has been applied.

Env Stds Comments
#1:Not specifically guideline value: >500mg/L can have purgative effects
#2:Guideline value calculated by dividing Nitrate (as Nitrate) value (50 mg/L) by 4.427
#3:Guideline value calculated by dividing Nitrite (as Nitrite) value (0.3 mg/L) by molecular weight (3.2967033).
#4:Calculated from ammonia NH4
#5:Loss of production expected at 5000 mg/L for beef cattle, 4000 mg/L dairy cattle, 10000 mg/L sheep, 6000 mg/L horses and pigs, 3000 mg/L poultry
#6:400 mg/L divided by molecular weight, stock may tolerate higher nitrate concentrations if nitrate in feed are not high, water containing >1500 mg/L (as NO3) is likely to be toxic.
#7:30 mg/L divided by molecular weight
#8:>0.5 mg/L hazardous to sheep, >1 mg/L for cattle, >5 mg/L pigs and poulty
#9:Measured as NH3-N at pH 8
#10:Values taken from "Updating nitrate toxicity effects on freshwater aquatic species, 2013"
#11:In absence of total As guideline, As (V) guideline has been adopted.
#12:In absence of total Cr guideline, Cr (VI) guideline has been adopted.
#13:Not limiting: Derived water HSL exceeds water solubility limit
#14:To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

Data Comments
#1 Reported Analyte LOR is higher than Requested Analyte LOR

						OP Pesticides																																	
						Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Disulfoton	EPN	Ethion	Ethoprop	Fenamiphos	Fenitrothion	Fensulfothion	Fenthion	Malathion	Merphos	Methidathion	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)	Omethoate	Parathion	Phorate	Pirimphos-ethyl	Pirimiphos-methyl	Profenofos	Prothiofos	Pyrazophos	Ronnel	Sulfotepp	Terbufos	Thiometon	Trichloronate	Tetrachlorvinphos
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						0.02	0.01	0.2	0.02	0.05	0.05	0.02	0.01	0.01	2	0.01	0.05	0.02	1	0.1	0.5	0.02	0.02	1	0.01	0.2	0.1	0.01	0.01	0.01	0.1	0.1	10	0.005	0.01	0.5	0.5	0.01
ADWG 2011 Health (v3.7 updated 2022)							4	5	7	4		4	1	0.5	7	10	7	70		6	0.7	5	2		1	20		0.5	90	0.3		20			0.9	4		100
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																																							
ANZECC 2000 - Stock Watering																																							
ANZG (2018) - FW - 95% (updated 26 July 2021)							0.01		0.15						0.2			0.05								0.004													
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																							
2-4m																																							
4-8m																																							
>8m																																							
Package	**Location Code**	**Sample Date**	**Field ID**	**Sample Type**	**Lab Report Number**																																		
M12 - West	BH104	16-Jul-19	BH104	Normal	ES1922192	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		20-Aug-19	BH104	Normal	ES1926460	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		24-Sep-19	BH104	Normal	ES1930997	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		22-Oct-19	BH104	Normal	ES1934707	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		07-Nov-19	BH104	Normal	ES1936840	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		12-Dec-19	BH104	Normal	ES1941279	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		16-Jan-20	BH104	Normal	ES2001376	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		18-Feb-20	BH104	Normal	ES2005577	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		12-Mar-20	SD01	Interlab_D	707829	-	<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	-	<10	-	-	<1	<1	-	<1	-	<1	<1
		12-Mar-20	BD01	Field_D	ES2008731	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
			BH104	Normal	ES2008731	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		23-Apr-20	BH104	Normal	ES2013858	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		19-May-20	BH104	Normal	ES2017191	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		30-Jul-20	BH104	Normal	ES2026408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11-Aug-20	BH104	Normal	ES2027951	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Sep-20	BD01	Field_D	ES2032115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			BH104	Normal	ES2032115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Oct-20	BD01	Field_D	ES2035519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			BH104	Normal	ES2035519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Nov-20	BH104	Normal	ES2040330	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-20	BH104	Normal	ES2043799	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GW_DUP	Field_D	ES2043799	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		14-Jan-21	BH104	Normal	ES2101242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2101242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11-Feb-21	BH104	Normal	ES2104999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2104999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Mar-21	BH104	Normal	ES2108508	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2108508	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Apr-21	BH104	Normal	ES2112804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2112804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		04-May-21	BH104	Normal	ES2116634	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2116634	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Jun-21	BH104	Normal	ES2121745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2121745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Jul-21	BH104	Normal	ES2125048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2125048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Aug-21	BH104	Normal	ES2129596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2129596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		01-Sep-21	BH104	Normal	ES2131753	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2131753	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15-Oct-21	BH104	Normal	ES2137338	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15-Oct-21	GWDUP1	Field_D	ES2137338	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Nov-21	BH104	Normal	ES2140334	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2140334	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-21	BH104	Normal	ES2144782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2144782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Jan-22	BH104	Normal	ES2201179	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2201179	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Feb-22	GWDUP2	Interlab_D	863166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Feb-22	BH104	Normal	ES2204606	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18-Mar-22	BH104	Normal	ES2209694	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		25-May-22	BH104	Normal	ES2218210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		27-Jun-22	GWDUP2	Interlab_D	901087	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		27-Jun-22	BH104	Normal	ES2222571	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20-Jul-22	GWDUP2	Interlab_D	907459	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20-Jul-22	BH104	Normal	ES2225656	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

																OP Pesticides																							
						Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Disulfoton	EPN	Ethion	Ethoprop	Fenamiphos	Fenitrothion	Fensulfothion	Fenthion	Malathion	Merphos	Methidathion	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)	Omethoate	Parathion	Phorate	Pirimphos-ethyl	Pirimiphos-methyl	Profenofos	Prothiofos	Pyrazophos	Ronnel	Sulfotepp	Terbufos	Thiometon	Trichloronate	Tetrachlorvinphos
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						0.02	0.01	0.2	0.02	0.05	0.05	0.02	0.01	0.01	2	0.01	0.05	0.02	1	0.1	0.5	0.02	0.02	1	0.01	0.2	0.1	0.01	0.01	0.01	0.1	0.1	10	0.005	0.01	0.5	0.5	0.01
ADWG 2011 Health (v3.7 updated 2022)							4	5	7	4		4	1	0.5	7	10	7	70		6	0.7	5	2		1	20		0.5	90	0.3		20			0.9	4		100
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																																						
ANZECC 2000 - Stock Watering																																						
ANZG (2018) - FW - 95% (updated 26 July 2021)							0.01		0.15						0.2			0.05								0.004												
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																						
2-4m																																						
4-8m																																						
>8m																																						
Package	**Location Code**	**Sample Date**	**Field ID**	**Sample Type**	**Lab Report Number**																																		
M12 - West	BH107	18-Jul-19	BH107	Normal	ES1922601	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		20-Aug-19	BH107	Normal	ES1926460	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		24-Sep-19	BH107	Normal	ES1930997	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		22-Oct-19	BH107	Normal	ES1934707	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		07-Nov-19	BH107	Normal	ES1936840	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		12-Dec-19	BH107	Normal	ES1941279	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		20-Feb-20	BH107	Normal	ES2005947	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		23-Apr-20	BH107	Normal	ES2013858	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		21-May-20	BH107	Normal	ES2017665	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		30-Jul-20	BH107	Normal	ES2026408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11-Aug-20	BH107	Normal	ES2027951	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Sep-20	BH107	Normal	ES2032115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Oct-20	BH107	Normal	ES2035519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-20	BH107	Normal	ES2043799	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		14-Jan-21	BH107	Normal	ES2101242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11-Feb-21	BH107	Normal	ES2104999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Mar-21	BH107	Normal	ES2108508	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Apr-21	BH107	Normal	ES2112804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		03-May-21	BH107	Normal	ES2116634	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Jun-21	BH107	Normal	ES2121745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Jul-21	BH107	Normal	ES2125048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Aug-21	BH107	Normal	ES2129596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		01-Sep-21	BH107	Normal	ES2131753	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15-Oct-21	GWDUP2	Interlab_D	833147	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15-Oct-21	BH107	Normal	ES2137338	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Nov-21	BH107	Normal	ES2140334	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-21	GWDUP2	Interlab_D	849475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-21	BH107	Normal	ES2144782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Jan-22	BH107	Normal	ES2201179	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Feb-22	BH107	Normal	ES2204606	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18-Mar-22	BH107	Normal	ES2209694	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2209694	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		25-May-22	BH107	Normal	ES2218210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		27-Jun-22	BH107	Normal	ES2222571	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20-Jul-22	BH107	Normal	ES2225656	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH112	18-Jul-19	BH112	Normal	ES1922601	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		20-Aug-19	BH112	Normal	ES1926460	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		25-Sep-19	BH112	Normal	ES1931244	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		22-Oct-19	BH112	Normal	ES1934707	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		07-Nov-19	BH112	Normal	ES1936840	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		12-Dec-19	BH112	Normal	ES1941279	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		20-Feb-20	BH112	Normal	ES2005947	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		21-Apr-20	BH112	Normal	ES2013464	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		21-May-20	BH112	Normal	ES2017665	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		30-Jul-20	BH112	Normal	ES2026408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Aug-20	BH112	Normal	ES2028325	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Sep-20	BH112	Normal	ES2032115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Oct-20	BH112	Normal	ES2035519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-20	BH112	Normal	ES2043799	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		14-Jan-21	BH112	Normal	ES2101242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11-Feb-21	BH112	Normal	ES2104999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Mar-21	BH112	Normal	ES2108508	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Apr-21	BH112	Normal	ES2112804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		04-May-21	BH112	Normal	ES2116634	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Jun-21	BH112	Normal	ES2121745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Jul-21	BH112	Normal	ES2125048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Aug-21	BH112	Normal	ES2129596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		01-Sep-21	BH112	Normal	ES2131753	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15-Oct-21	BH112	Normal	ES2137338	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Package	Location Code	Sample Date	Field ID	Sample Type	Lab Report Number	OP Pesticides																																
						Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Disulfoton	EPN	Ethion	Ethoprop	Fenamiphos	Fenitrothion	Fensulfothion	Fenthion	Malathion	Merphos	Methidathion	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)	Omethoate	Parathion	Phorate	Pirimphos-ethyl	Pirimiphos-methyl	Profenofos	Prothiofos	Pyrazophos	Ronnel	Sulfotepp	Terbufos	Thiometon	Trichloronate	Tetrachlorvinphos
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						0.02	0.01	0.2	0.02	0.05	0.05	0.02	0.01	0.01	2	0.01	0.05	0.02	1	0.1	0.5	0.02	0.02	1	0.01	0.2	0.1	0.01	0.01	0.01	0.1	0.1	10	0.005	0.01	0.5	0.5	0.01
ADWG 2011 Health (v3.7 updated 2022)							4	5	7	4		4	1	0.5	7	10	7	70		6	0.7	5	2		1	20		0.5	90	0.3		20			0.9	4		100
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																																						
ANZECC 2000 - Stock Watering																																						
ANZG (2018) - FW - 95% (updated 26 July 2021)							0.01		0.15						0.2			0.05								0.004												
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																						
2-4m																																						
4-8m																																						
>8m																																						
M12 - West	BH112	08-Nov-21	BH112	Normal	ES2140334	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-21	BH112	Normal	ES2144782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Jan-22	GWDUP2	Interlab_D	856978	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Jan-22	BH112	Normal	ES2201179	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Feb-22	BH112	Normal	ES2204606	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWPDUP1	Field_D	ES2204606	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18-Mar-22	GWDUP2	Interlab_D	874238	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18-Mar-22	BH112	Normal	ES2209694	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		25-May-22	BH112	Normal	ES2218210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		27-Jun-22	BH112	Normal	ES2222571	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20-Jul-22	BH112	Normal	ES2225656	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M12 - Central	BH145	13-Jun-19	BH145	Normal	ES1918214	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		17-Jul-19	BH145	Normal	ES1922407	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		21-Aug-19	BH145	Normal	ES1926628	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		26-Sep-19	BH145	Normal	ES1931491	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		23-Oct-19	BH145	Normal	ES1934911	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		12-Dec-19	BH145	Normal	ES1941279	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		21-May-20	BH145	Normal	ES2017665	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<2	<0.01	<0.05	<0.02	-	<0.1	<0.5	<0.02	<0.02	-	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<10	<0.005	<0.01	<0.5	<0.5	<0.01
		30-Jul-20	BD01	Field_D	ES2026408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			BH145	Normal	ES2026408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Aug-20	BH145	Normal	ES2028325	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		26-Aug-20	BH145	Normal	740880	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Sep-20	BH145	Normal	ES2032115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Oct-20	BH145	Normal	ES2035519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11-Nov-20	BH145	Normal	ES2040330	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12-Nov-20	BD01	Field_D	ES2040667	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Dec-20	BH145	Normal	ES2043799	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12-Jan-21	BH145	Normal	ES2101242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09-Feb-21	BH145	Normal	ES2104999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Mar-21	BH145	Normal	ES2108508	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Apr-21	BH145	Normal	ES2112804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Jun-21	BH145	Normal	ES2121745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07-Jul-21	BH145	Normal	ES2125048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		01-Sep-21	BH145	Normal	ES2131753	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15-Oct-21	BH145	Normal	ES2137338	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Nov-21	GWDUP2	Interlab_D	839397	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Nov-21	BH145	Normal	ES2140334	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08-Dec-21	BH145	Normal	ES2144782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13-Jan-22	BH145	Normal	ES2201179	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10-Feb-22	BH145	Normal	ES2204606	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18-Mar-22	BH145	Normal	ES2209694	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		25-May-22	GWDUP2	Interlab_D	892529	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		25-May-22	BH145	Normal	ES2218210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2218210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		27-Jun-22	BH145	Normal	ES2222571	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2222571	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20-Jul-22	BH145	Normal	ES2225656	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2225656	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	OP Pesticides																																
	Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Disulfoton	EPN	Ethion	Ethoprop	Fenamiphos	Fenitrothion	Fensulfothion	Fenthion	Malathion	Merphos	Methidathion	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)	Omethoate	Parathion	Phorate	Pirimphos-ethyl	Pirimiphos-methyl	Profenofos	Prothiofos	Pyrazophos	Ronnel	Sulfotepp	Terbufos	Thiometon	Trichloronate	Tetrachlorvinphos
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.02	0.01	0.2	0.02	0.05	0.05	0.02	0.01	0.01	2	0.01	0.05	0.02	1	0.1	0.5	0.02	0.02	1	0.01	0.2	0.1	0.01	0.01	0.01	0.1	0.1	10	0.005	0.01	0.5	0.5	0.01
ADWG 2011 Health (v3.7 updated 2022)		4	5	7	4		4	1	0.5	7	10	7	70		6	0.7	5	2		1	20		0.5	90	0.3		20			0.9	4		100
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																																	
ANZECC 2000 - Stock Watering																																	
ANZG (2018) - FW - 95% (updated 26 July 2021)		0.01		0.15						0.2			0.05								0.004												
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																	
2-4m																																	
4-8m																																	
>8m																																	

Statistical Summary

Number of Results	37	38	38	38	38	38	38	38	37	38	38	38	38	1	37	38	38	38	1	38	38	38	37	38	37	37	38	38	37	38	37	38	38
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.02	<0.01	<0.2	<0.02	<0.05	<0.05	<0.02	<0.01	<0.01	<1	<0.01	<0.05	<0.02	<1	<0.1	<0.5	<0.02	<0.02	<1	<0.01	<0.2	<0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<1	<0.005	<0.01	<0.5	<0.5	<0.01
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.02	<1	<1	<1	<1	<1	<1	<1	<0.01	<2	<1	<1	<1	<1	<0.1	<1	<1	<1	<1	<1	<1	<1	<0.01	<10	<0.01	<0.1	<1	<10	<0.005	<1	<0.5	<1	<1
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration	0.01	0.018	0.11	0.023	0.038	0.038	0.023	0.018	0.005	0.99	0.018	0.038	0.023		0.05	0.26	0.023	0.023		0.018	0.11	0.062	0.005	0.14	0.005	0.05	0.062	4.9	0.0025	0.018	0.25	0.26	0.018
Geometric Average	0.01	0.0056	0.1	0.011	0.027	0.027	0.011	0.0056	0.005	0.98	0.0056	0.027	0.011		0.05	0.25	0.011	0.011		0.0056	0.1	0.053	0.005	0.006	0.005	0.05	0.053	4.7	0.0025	0.0056	0.25	0.25	0.0056
Median Concentration	0.01	0.005	0.1	0.01	0.025	0.025	0.01	0.005	0.005	1	0.005	0.025	0.01	0.5	0.05	0.25	0.01	0.01	0.5	0.005	0.1	0.05	0.005	0.005	0.005	0.05	0.05	5	0.0025	0.005	0.25	0.25	0.005
Standard Deviation	0	0.08	0.065	0.079	0.077	0.077	0.079	0.08	0	0.081	0.08	0.077	0.079		0	0.041	0.079	0.079		0.08	0.065	0.073	0	0.81	0	0	0.073	0.73	0	0.08	0	0.041	0.08
Geometric Standard Deviation		2.1	1.3	1.9	1.6	1.6	1.9	2.1		1.1	2.1	1.6	1.9			1.1	1.9	1.9		2.1	1.3	1.5		3.1			1.5	1.5		2.1		1.1	2.1
Number of Guideline Exceedances	0	1	0	1	0	0	0	0	0	38	0	0	1	0	0	1	0	0	0	0	38	0	0	0	0	0	0	0	0	1	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Results at or above the Detect Limit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Results below the Detect Limit	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% of Detects at or above Guidelines	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Results Below Guidelines or Non-Detect	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

A Non-Detect multiplier of 0.5 has been applied.

Env Stds Comments
#1:Not specifically guideline value: >500mg/L can have purgative effects
#2:Guideline value calculated by dividing Nitrate (as Nitrate) value (50 mg/L) by 4.427
#3:Guideline value calculated by dividing Nitrite (as Nitrite) value (0.3 mg/L) by molecular weight (3.2967033).
#4:Calculated from ammonia NH4
#5:Loss of production expected at 5000 mg/L for beef cattle, 4000 mg/L dairy cattle, 10000 mg/L sheep, 6000 mg/L horses and pigs, 3000 mg/L poultry
#6:400 mg/L divided by molecular weight, stock may tolerate higher nitrate concentrations if nitrate in feed are not high, water containing >1500 mg/L (as NO3) is likely to be toxic.
#7:30 mg/L divided by molecular weight
#8:>0.5 mg/L hazardous to sheep, >1 mg/L for cattle, >5 mg/L pigs and poulty
#9:Measured as NH3-N at pH 8
#10:Values taken from "Updating nitrate toxicity effects on freshwater aquatic species, 2013"
#11:In absence of total As guideline, As (V) guideline has been adopted.
#12:In absence of total Cr guideline, Cr (VI) guideline has been adopted.
#13:Not limiting: Derived water HSL exceeds water solubility limit
#14:To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

Data Comments
#1 Reported Analyte LOR is higher than Requested Analyte LOR

						Pesticides						Fungicides	Herbicides
						Acephate	Demeton-O & Demeton-S	Formothion	Temephos	Trichlorfon	Triazophos	Fosetyl-al	Dinoseb
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						0.5	0.02	20	0.02	0.02	0.005	10	100
ADWG 2011 Health (v3.7 updated 2022)						8		50	400	7			
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)													
ANZECC 2000 - Stock Watering													
ANZG (2018) - FW - 95% (updated 26 July 2021)													
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand													
2-4m													
4-8m													
>8m													
Package	**Location Code**	**Sample Date**	**Field ID**	**Sample Type**	**Lab Report Number**								
M12 - West	BH104	16-Jul-19	BH104	Normal	ES1922192	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		20-Aug-19	BH104	Normal	ES1926460	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		24-Sep-19	BH104	Normal	ES1930997	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		22-Oct-19	BH104	Normal	ES1934707	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		07-Nov-19	BH104	Normal	ES1936840	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		12-Dec-19	BH104	Normal	ES1941279	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		16-Jan-20	BH104	Normal	ES2001376	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		18-Feb-20	BH104	Normal	ES2005577	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		12-Mar-20	SD01	Interlab_D	707829	-	-	-	-	-	-	-	<100
		12-Mar-20	BD01	Field_D	ES2008731	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
			BH104	Normal	ES2008731	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		23-Apr-20	BH104	Normal	ES2013858	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		19-May-20	BH104	Normal	ES2017191	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		30-Jul-20	BH104	Normal	ES2026408	-	-	-	-	-	-	-	-
		11-Aug-20	BH104	Normal	ES2027951	-	-	-	-	-	-	-	-
		10-Sep-20	BD01	Field_D	ES2032115	-	-	-	-	-	-	-	-
			BH104	Normal	ES2032115	-	-	-	-	-	-	-	-
		09-Oct-20	BD01	Field_D	ES2035519	-	-	-	-	-	-	-	-
			BH104	Normal	ES2035519	-	-	-	-	-	-	-	-
		13-Nov-20	BH104	Normal	ES2040330	-	-	-	-	-	-	-	-
		08-Dec-20	BH104	Normal	ES2043799	-	-	-	-	-	-	-	-
			M12GW_DUP	Field_D	ES2043799	-	-	-	-	-	-	-	-
		14-Jan-21	BH104	Normal	ES2101242	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2101242	-	-	-	-	-	-	-	-
		11-Feb-21	BH104	Normal	ES2104999	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2104999	-	-	-	-	-	-	-	-
		10-Mar-21	BH104	Normal	ES2108508	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2108508	-	-	-	-	-	-	-	-
		07-Apr-21	BH104	Normal	ES2112804	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2112804	-	-	-	-	-	-	-	-
		04-May-21	BH104	Normal	ES2116634	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2116634	-	-	-	-	-	-	-	-
		08-Jun-21	BH104	Normal	ES2121745	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2121745	-	-	-	-	-	-	-	-
		07-Jul-21	BH104	Normal	ES2125048	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2125048	-	-	-	-	-	-	-	-
		13-Aug-21	BH104	Normal	ES2129596	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2129596	-	-	-	-	-	-	-	-
		01-Sep-21	BH104	Normal	ES2131753	-	-	-	-	-	-	-	-
			M12GWDUP	Field_D	ES2131753	-	-	-	-	-	-	-	-
		15-Oct-21	BH104	Normal	ES2137338	-	-	-	-	-	-	-	-
		15-Oct-21	GWDUP1	Field_D	ES2137338	-	-	-	-	-	-	-	-
		08-Nov-21	BH104	Normal	ES2140334	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2140334	-	-	-	-	-	-	-	-
		08-Dec-21	BH104	Normal	ES2144782	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2144782	-	-	-	-	-	-	-	-
		13-Jan-22	BH104	Normal	ES2201179	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2201179	-	-	-	-	-	-	-	-
		10-Feb-22	GWDUP2	Interlab_D	863166	-	-	-	-	-	-	-	-
		10-Feb-22	BH104	Normal	ES2204606	-	-	-	-	-	-	-	-
		18-Mar-22	BH104	Normal	ES2209694	-	-	-	-	-	-	-	-
		25-May-22	BH104	Normal	ES2218210	-	-	-	-	-	-	-	-
		27-Jun-22	GWDUP2	Interlab_D	901087	-	-	-	-	-	-	-	-
		27-Jun-22	BH104	Normal	ES2222571	-	-	-	-	-	-	-	-
		20-Jul-22	GWDUP2	Interlab_D	907459	-	-	-	-	-	-	-	-
		20-Jul-22	BH104	Normal	ES2225656	-	-	-	-	-	-	-	-

						Pesticides						Fungicides	Herbicides
						Acephate	Demeton-O & Demeton-S	Formothion	Temephos	Trichlorfon	Triazophos	Fosetyl-al	Dinoseb
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						0.5	0.02	20	0.02	0.02	0.005	10	100
ADWG 2011 Health (v3.7 updated 2022)						8		50	400	7			
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)													
ANZECC 2000 - Stock Watering													
ANZG (2018) - FW - 95% (updated 26 July 2021)													
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand													
2-4m													
4-8m													
>8m													
Package	**Location Code**	**Sample Date**	**Field ID**	**Sample Type**	**Lab Report Number**								
M12 - West	BH107	18-Jul-19	BH107	Normal	ES1922601	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		20-Aug-19	BH107	Normal	ES1926460	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		24-Sep-19	BH107	Normal	ES1930997	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		22-Oct-19	BH107	Normal	ES1934707	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		07-Nov-19	BH107	Normal	ES1936840	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		12-Dec-19	BH107	Normal	ES1941279	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		20-Feb-20	BH107	Normal	ES2005947	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		23-Apr-20	BH107	Normal	ES2013858	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		21-May-20	BH107	Normal	ES2017665	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		30-Jul-20	BH107	Normal	ES2026408	-	-	-	-	-	-	-	-
		11-Aug-20	BH107	Normal	ES2027951	-	-	-	-	-	-	-	-
		10-Sep-20	BH107	Normal	ES2032115	-	-	-	-	-	-	-	-
		09-Oct-20	BH107	Normal	ES2035519	-	-	-	-	-	-	-	-
		08-Dec-20	BH107	Normal	ES2043799	-	-	-	-	-	-	-	-
		14-Jan-21	BH107	Normal	ES2101242	-	-	-	-	-	-	-	-
		11-Feb-21	BH107	Normal	ES2104999	-	-	-	-	-	-	-	-
		10-Mar-21	BH107	Normal	ES2108508	-	-	-	-	-	-	-	-
		07-Apr-21	BH107	Normal	ES2112804	-	-	-	-	-	-	-	-
		03-May-21	BH107	Normal	ES2116634	-	-	-	-	-	-	-	-
		08-Jun-21	BH107	Normal	ES2121745	-	-	-	-	-	-	-	-
		07-Jul-21	BH107	Normal	ES2125048	-	-	-	-	-	-	-	-
		13-Aug-21	BH107	Normal	ES2129596	-	-	-	-	-	-	-	-
		01-Sep-21	BH107	Normal	ES2131753	-	-	-	-	-	-	-	-
		15-Oct-21	GWDUP2	Interlab_D	833147	-	-	-	-	-	-	-	-
		15-Oct-21	BH107	Normal	ES2137338	-	-	-	-	-	-	-	-
		08-Nov-21	BH107	Normal	ES2140334	-	-	-	-	-	-	-	-
		08-Dec-21	GWDUP2	Interlab_D	849475	-	-	-	-	-	-	-	-
		08-Dec-21	BH107	Normal	ES2144782	-	-	-	-	-	-	-	-
		13-Jan-22	BH107	Normal	ES2201179	-	-	-	-	-	-	-	-
		10-Feb-22	BH107	Normal	ES2204606	-	-	-	-	-	-	-	-
		18-Mar-22	BH107	Normal	ES2209694	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2209694	-	-	-	-	-	-	-	-
		25-May-22	BH107	Normal	ES2218210	-	-	-	-	-	-	-	-
		27-Jun-22	BH107	Normal	ES2222571	-	-	-	-	-	-	-	-
		20-Jul-22	BH107	Normal	ES2225656	-	-	-	-	-	-	-	-
	BH112	18-Jul-19	BH112	Normal	ES1922601	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		20-Aug-19	BH112	Normal	ES1926460	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		25-Sep-19	BH112	Normal	ES1931244	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		22-Oct-19	BH112	Normal	ES1934707	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		07-Nov-19	BH112	Normal	ES1936840	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		12-Dec-19	BH112	Normal	ES1941279	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		20-Feb-20	BH112	Normal	ES2005947	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		21-Apr-20	BH112	Normal	ES2013464	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		21-May-20	BH112	Normal	ES2017665	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		30-Jul-20	BH112	Normal	ES2026408	-	-	-	-	-	-	-	-
		13-Aug-20	BH112	Normal	ES2028325	-	-	-	-	-	-	-	-
		10-Sep-20	BH112	Normal	ES2032115	-	-	-	-	-	-	-	-
		09-Oct-20	BH112	Normal	ES2035519	-	-	-	-	-	-	-	-
		08-Dec-20	BH112	Normal	ES2043799	-	-	-	-	-	-	-	-
		14-Jan-21	BH112	Normal	ES2101242	-	-	-	-	-	-	-	-
		11-Feb-21	BH112	Normal	ES2104999	-	-	-	-	-	-	-	-
		10-Mar-21	BH112	Normal	ES2108508	-	-	-	-	-	-	-	-
		07-Apr-21	BH112	Normal	ES2112804	-	-	-	-	-	-	-	-
		04-May-21	BH112	Normal	ES2116634	-	-	-	-	-	-	-	-
		08-Jun-21	BH112	Normal	ES2121745	-	-	-	-	-	-	-	-
		07-Jul-21	BH112	Normal	ES2125048	-	-	-	-	-	-	-	-
		13-Aug-21	BH112	Normal	ES2129596	-	-	-	-	-	-	-	-
		01-Sep-21	BH112	Normal	ES2131753	-	-	-	-	-	-	-	-
		15-Oct-21	BH112	Normal	ES2137338	-	-	-	-	-	-	-	-

						Pesticides						Fungicides	Herbicides
						Acephate	Demeton-O & Demeton-S	Formothion	Temephos	Trichlorfon	Triazophos	Fosetyl-al	Dinoseb
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						0.5	0.02	20	0.02	0.02	0.005	10	100
ADWG 2011 Health (v3.7 updated 2022)						8		50	400	7			
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)													
ANZECC 2000 - Stock Watering													
ANZG (2018) - FW - 95% (updated 26 July 2021)													
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand													
2-4m													
4-8m													
>8m													
Package	**Location Code**	**Sample Date**	**Field ID**	**Sample Type**	**Lab Report Number**								
M12 - West	BH112	08-Nov-21	BH112	Normal	ES2140334	-	-	-	-	-	-	-	-
		08-Dec-21	BH112	Normal	ES2144782	-	-	-	-	-	-	-	-
		13-Jan-22	GWDUP2	Interlab_D	856978	-	-	-	-	-	-	-	-
		13-Jan-22	BH112	Normal	ES2201179	-	-	-	-	-	-	-	-
		10-Feb-22	BH112	Normal	ES2204606	-	-	-	-	-	-	-	-
			GWPDUP1	Field_D	ES2204606	-	-	-	-	-	-	-	-
		18-Mar-22	GWDUP2	Interlab_D	874238	-	-	-	-	-	-	-	-
		18-Mar-22	BH112	Normal	ES2209694	-	-	-	-	-	-	-	-
		25-May-22	BH112	Normal	ES2218210	-	-	-	-	-	-	-	-
		27-Jun-22	BH112	Normal	ES2222571	-	-	-	-	-	-	-	-
		20-Jul-22	BH112	Normal	ES2225656	-	-	-	-	-	-	-	-
M12 - Central	BH145	13-Jun-19	BH145	Normal	ES1918214	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		17-Jul-19	BH145	Normal	ES1922407	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		21-Aug-19	BH145	Normal	ES1926628	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		26-Sep-19	BH145	Normal	ES1931491	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		23-Oct-19	BH145	Normal	ES1934911	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		12-Dec-19	BH145	Normal	ES1941279	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		21-May-20	BH145	Normal	ES2017665	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	-
		30-Jul-20	BD01	Field_D	ES2026408	-	-	-	-	-	-	-	-
			BH145	Normal	ES2026408	-	-	-	-	-	-	-	-
		13-Aug-20	BH145	Normal	ES2028325	-	-	-	-	-	-	-	-
		26-Aug-20	BH145	Normal	740880	-	-	-	-	-	-	-	-
		09-Sep-20	BH145	Normal	ES2032115	-	-	-	-	-	-	-	-
		08-Oct-20	BH145	Normal	ES2035519	-	-	-	-	-	-	-	-
		11-Nov-20	BH145	Normal	ES2040330	-	-	-	-	-	-	-	-
		12-Nov-20	BD01	Field_D	ES2040667	-	-	-	-	-	-	-	-
		09-Dec-20	BH145	Normal	ES2043799	-	-	-	-	-	-	-	-
		12-Jan-21	BH145	Normal	ES2101242	-	-	-	-	-	-	-	-
		09-Feb-21	BH145	Normal	ES2104999	-	-	-	-	-	-	-	-
		10-Mar-21	BH145	Normal	ES2108508	-	-	-	-	-	-	-	-
		07-Apr-21	BH145	Normal	ES2112804	-	-	-	-	-	-	-	-
		08-Jun-21	BH145	Normal	ES2121745	-	-	-	-	-	-	-	-
		07-Jul-21	BH145	Normal	ES2125048	-	-	-	-	-	-	-	-
		01-Sep-21	BH145	Normal	ES2131753	-	-	-	-	-	-	-	-
		15-Oct-21	BH145	Normal	ES2137338	-	-	-	-	-	-	-	-
		08-Nov-21	GWDUP2	Interlab_D	839397	-	-	-	-	-	-	-	-
		08-Nov-21	BH145	Normal	ES2140334	-	-	-	-	-	-	-	-
		08-Dec-21	BH145	Normal	ES2144782	-	-	-	-	-	-	-	-
		13-Jan-22	BH145	Normal	ES2201179	-	-	-	-	-	-	-	-
		10-Feb-22	BH145	Normal	ES2204606	-	-	-	-	-	-	-	-
		18-Mar-22	BH145	Normal	ES2209694	-	-	-	-	-	-	-	-
		25-May-22	GWDUP2	Interlab_D	892529	-	-	-	-	-	-	-	-
		25-May-22	BH145	Normal	ES2218210	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2218210	-	-	-	-	-	-	-	-
		27-Jun-22	BH145	Normal	ES2222571	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2222571	-	-	-	-	-	-	-	-
		20-Jul-22	BH145	Normal	ES2225656	-	-	-	-	-	-	-	-
			GWDUP1	Field_D	ES2225656	-	-	-	-	-	-	-	-

	Pesticides						Fungicides	Herbicides
	Acephate	Demeton-O & Demeton-S	Formothion	Temephos	Trichlorfon	Triazophos	Fosetyl-al	Dinoseb
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.5	0.02	20	0.02	0.02	0.005	10	100
ADWG 2011 Health (v3.7 updated 2022)	8		50	400	7			
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)								
ANZECC 2000 - Stock Watering								
ANZG (2018) - FW - 95% (updated 26 July 2021)								
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand								
2-4m								
4-8m								
>8m								

Statistical Summary

Number of Results	37	37	37	37	37	37	37	1
Number of Detects	0	0	0	0	0	0	0	0
Minimum Concentration	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	<100
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.5	<0.02	<20	<0.02	<0.02	<0.005	<10	<100
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration	0.25	0.01	10	0.01	0.01	0.0025	5	
Geometric Average	0.25	0.01	10	0.01	0.01	0.0025	5	
Median Concentration	0.25	0.01	10	0.01	0.01	0.0025	5	50
Standard Deviation	0	0	0	0	0	0	0	
Geometric Standard Deviation								
Number of Guideline Exceedances	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0
% of Results at or above the Detect Limit	0	0	0	0	0	0	0	0
% of Results below the Detect Limit	100	100	100	100	100	100	100	100
% of Detects at or above Guidelines	0	0	0	0	0	0	0	0
% of Results Below Guidelines or Non-Detect	100	100	100	100	100	100	100	100

A Non-Detect multiplier of 0.5 has been applied.

Env Stds Comments
#1:Not specifically guideline value: >500mg/L can have purgative effects
#2:Guideline value calculated by dividing Nitrate (as Nitrate) value (50 mg/L) by 4.427
#3:Guideline value calculated by dividing Nitrite (as Nitrite) value (0.3 mg/L) by molecular weight (3.2967033).
#4:Calculated from ammonia NH4
#5:Loss of production expected at 5000 mg/L for beef cattle, 4000 mg/L dairy cattle, 10000 mg/L sheep, 6000 mg/L horses and pigs, 3000 mg/L poultry
#6:400 mg/L divided by molecular weight, stock may tolerate higher nitrate concentrations if nitrate in feed are not high, water containing >1500 mg/L (as NO3) is likely to be toxic.
#7:30 mg/L divided by molecular weight
#8:>0.5 mg/L hazardous to sheep, >1 mg/L for cattle, >5 mg/L pigs and poulty
#9:Measured as NH3-N at pH 8
#10:Values taken from "Updating nitrate toxicity effects on freshwater aquatic species, 2013"
#11:In absence of total As guideline, As (V) guideline has been adopted.
#12:In absence of total Cr guideline, Cr (VI) guideline has been adopted.
#13:Not limiting: Derived water HSL exceeds water solubility limit
#14:To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

Data Comments
#1 Reported Analyte LOR is higher than Requested Analyte LOR

Appendix B
Table B4
Analytical Results for Construction Monitoring Period (August 2022 to March 2025)

	Inorganics		Acidity & Alkalinity			Major Ions										Minor Ions		Nutrients									Metals												BTEXN							
	Total Dissolved Solids	Total Suspended Solids	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Hardness as CaCO3 (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)	Chloride	Sulfate (filtered)	Cations Total	Anions Total	Ionic Balance		Bicarbonate ion (HCO3-)	Carbonate ion	Ammonia as N	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)	Kjeldahl Nitrogen Total	Reactive Phosphorus as P	Reactive Phosphorus as P (filtered)	Phosphorus (Total)	Arsenic (filtered)	Cadmium (filtered)	Chromium (III+VI) (filtered)	Copper (filtered)	Iron (filtered)	Lead (filtered)	Manganese (filtered)	Mercury (filtered)	Nickel (filtered)	Zinc (filtered)		Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	BTEX (Sum of Total) - Lab Calc	Naphthalene (BTEXN suite)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	%		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	10	5	1	1	1	1	1	1	1	1	1	0.01	0.01	0.01		1	1	0.01	0.01	0.01	0.01	0.1	0.1	0.01	0.01	0.01	0.001	0.0001	0.001	0.001	0.05	0.001	0.001	0.0001	0.001	0.005		1	2	2	2	2	2	1	5
ADWG 2011 Health (v3.7 updated 2022)											500[#1]								11.29[#2]	0.91[#3]							0.01	0.002		2		0.01	0.5	0.001	0.02			1	800	300			600		
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)		**6**																**0.01165[#4]**			**0.04**	**0.35**		**0.008**	**0.008**	**0.025**																			
ANZECC 2000 - Stock Watering	*5000[#5]*					*1000*					*1000*								*90[#6]*	*9.1[#7]*							*0.5*	*0.01*	*1*	*1[#8]*		*0.1*		*0.002*	*1*	*20*									
ANZG (2018) - FW - 95% (updated 26 July 2021)																		0.9[#9]	2.4[#10]								0.013[#11]	0.0002	0.001[#12]	0.0014		0.0034	1.9	0.0006	0.011	0.008		950	180	80	350				16
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																														
>=2m, <4m																																						5000	NL[#13]	NL[#13]				NL[#13]		NL[#13]
>=4m, <8m																																						5000	NL[#13]	NL[#13]				NL[#13]		NL[#13]
>=8m																																						5000	NL[#13]	NL[#13]				NL[#13]		NL[#13]

Package	Location	Date	Field ID	Lab Report																																											
M12 - West	BH104	15/08/2022	BH104	ES2229015	*15000*	**14**	<1	918	3980	277	799	31	3580	8150	886	236	267	6.08	918	<1	**0.03**	7.92	<0.01	**7.92**	**8.2**	0.3	<0.01	-	**0.04**	<0.001	<0.0001	<0.001	0.081	<0.05	<0.001	0.135	<0.0001	0.008	0.006	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2229015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.0001	<0.001	0.084	-	<0.001	-	<0.0001	0.008	0.007	-	-	-	-	-	-	-	-
		19/09/2022	BH104	ES2233729	*15600*	**28**	<1	882	4140	335	801	33	3760	7280	842	247	240	1.34	882	<1	**0.08**	8.42	<0.01	**8.42**	**9.3**	0.9	<0.01	-	**0.05**	<0.001	<0.0001	<0.001	0.087	<0.05	<0.001	0.124	<0.0001	0.071	0.016	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2233729	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.0001	<0.001	0.088	-	<0.001	-	<0.0001	0.073	0.016	-	-	-	-	-	-	-	-
		20/10/2022	BH104	ES2237811	*15100*	**31**	<1	806	4020	291	801	32	3690	7660	754	242	248	1.25	806	<1	**0.12**	7.50	0.04	**7.54**	**8.5**	1.0	<0.01	-	**0.05**	<0.001	<0.0001	<0.001	0.028	<0.05	<0.001	0.139	<0.0001	0.010	0.011	<1	<2	<2	<2	<2	<2	<1	<5
		16/11/2022	BH104	ES2241428	*16500*	**24**	<1	910	4320	333	847	30	3880	8520	781	256	275	3.56	910	<1	<0.10[#14]	7.61	0.04	**7.65**	**9.2**	1.6	**0.01**	-	**0.09**	<0.001	<0.0001	<0.001	0.036	<0.05	<0.001	0.278	<0.0001	0.008	0.007	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2241428	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.0001	<0.001	0.036	-	<0.001	-	<0.0001	0.008	0.007	-	-	-	-	-	-	-	-
	BH104R	16/12/2022	BH104R	ES2245760	4370	**198**	<1	931	823	107	135	18	1320	1990	154	74.3	77.9	2.37	931	<1	**1.45**	<0.01	<0.01	<0.01	**1.6**	1.6	<0.01	-	**0.15**	0.004	<0.0001	<0.001	<0.001	0.83	<0.001	0.342	<0.0001	0.001	0.006	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP2	951385	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.004	<0.0002	<0.001	<0.001	-	<0.001	-	<0.0001	<0.001	<0.005	-	-	-	-	-	-	-	-
		18/01/2023	BH104R	ES2301690	4960	**139**	<1	877	1180	130	207	19	1430	3260	128	86.2	112	13.1	877	<1	**1.41**	0.04	<0.01	**0.04**	**2.5**	2.5	<0.01	-	**0.30**	0.005	<0.0001	<0.001	<0.001	1.47	<0.001	0.314	<0.0001	0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2301690	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.005	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	0.001	<0.005	-	-	-	-	-	-	-	-
			GWDUP2	957071	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.005	<0.0002	<0.001	<0.001	-	<0.001	-	<0.0001	0.001	<0.005	-	-	-	-	-	-	-	-
		08/02/2023	BH104R	ES2304063	*5000*	**162**	<1	757	1060	121	183	18	1480	2420	147	85.9	86.4	0.30	757	<1	**1.46**	0.02	<0.01	0.02	**1.8**	1.8	<0.01	-	**0.18**	0.003	<0.0001	<0.001	<0.001	1.38	<0.001	0.254	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2304063	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.003	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	<0.001	<0.005	-	-	-	-	-	-	-	-
			GWDUP2	962102	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.003	<0.0002	<0.001	<0.001	-	<0.001	-	<0.0001	0.001	<0.005	-	-	-	-	-	-	-	-
		03/03/2023	BH104R	ES2307153	*5060*	**158**	<1	874	1300	137	232	17	1540	2410	132	93.4	88.2	2.84	874	<1	**1.29**	0.05	<0.01	**0.05**	**1.6**	1.5	<0.01	-	**0.18**	0.002	<0.0001	<0.001	<0.001	1.33	<0.001	0.250	<0.0001	0.001	0.067	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2307153	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.003	<0.0001	<0.001	0.001	-	<0.001	-	<0.0001	<0.001	0.068	-	-	-	-	-	-	-	-
		04/04/2023	BH104R	ES2311426	*5260*	**366**	<1	877	1380	155	241	20	1440	2570	137	90.7	92.9	1.17	877	<1	**1.20**	0.02	<0.01	0.02	**1.7**	1.7	<0.01	-	**0.32**	0.003	<0.0001	<0.001	<0.001	1.27	<0.001	0.269	<0.0001	0.014	0.008	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2311426	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.003	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	0.012	0.009	-	-	-	-	-	-	-	-
		02/05/2023	BH104R	ES2314383	*5030*	**100**	<1	888	1180	155	193	17	1330	2640	125	81.9	94.8	7.30	888	<1	**1.35**	0.02	<0.01	0.02	**1.3**	1.3	<0.01	-	**0.10**	0.003	<0.0001	<0.001	<0.001	1.24	<0.001	0.194	<0.0001	0.004	0.036	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2314383	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.003	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	0.004	0.035	-	-	-	-	-	-	-	-
		07/06/2023	BH104R	ES2319027	*5250*	**83**	<1	802	1520	171	265	19	1430	2870	135	93.0	99.8	3.51	802	<1	**1.10**	0.06	<0.01	**0.06**	**1.3**	1.2	<0.01	-	**0.07**	0.001	<0.0001	<0.001	0.002	0.48	<0.001	0.198	<0.0001	0.003	0.007	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP2	997826	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	<0.0002	<0.001	<0.001	-	<0.001	-	<0.0001	0.002	<0.005	-	-	-	-	-	-	-	-
		07/07/2023	BH104R	ES2322790	*5540*	**144**	<1	840	1360	143	243	18	1490	2710	120	92.4	95.7	1.76	840	<1	**1.06**	0.04	<0.01	**0.04**	**1.3**	1.3	<0.01	-	**0.14**	0.002	<0.0001	<0.001	<0.001	0.91	<0.001	0.178	<0.0001	0.003	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP2	1006932	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	<0.0002	<0.001	<0.001	-	<0.001	-	<0.0001	0.001	<0.005	-	-	-	-	-	-	-	-
		09/08/2023	BH104R	ES2326796	*5430*	**405**	<1	890	1570	194	264	20	1500	2550	123	97.2	92.3	2.58	890	<1	**1.11**	0.04	0.02	**0.06**	**3.9**	3.8	<0.01	-	**0.38**	<0.001	<0.0001	<0.001	<0.001	<0.05	<0.001	0.154	<0.0001	0.002	0.012	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2326796	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.001	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	0.002	0.014	-	-	-	-	-	-	-	-
		05/09/2023	BH104R	ES2330598	*5010*	**128**	<1	884	1190	163	191	18	1510	2500	171	90.0	91.7	0.96	884	<1	**1.46**	0.02	0.02	**0.04**	**1.7**	1.7	<0.01	-	**0.18**	0.001	<0.0001	<0.001	<0.001	0.92	<0.001	0.178	<0.0001	0.001	0.005	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP2	1024024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	<0.0002	<0.001	<0.001	-	<0.001	-	<0.0001	0.001	<0.005	-	-	-	-	-	-	-	-
		06/10/2023	BH104R	ES2334429	4970	**102**	<1	914	1370	172	229	19	1530	2500	152	94.5	91.9	1.35	914	<1	**1.04**	0.01	0.08	**0.09**	**1.4**	1.3	<0.01	-	**0.13**	0.002	<0.0001	<0.001	<0.001	0.70	<0.001	0.158	<0.0001	0.023	0.023	<1	<2	<2	<2	<2	<2	<1	<5
		08/11/2023	BH104R	ES2338893-AF	*5170*	**114**	<1	850	1100	134	185	19	1530	2460	157	88.9	89.6	0.39	850	<1	**1.17**	<0.01	0.04	**0.04**	**1.4**	1.4	<0.01	-	**0.12**	0.002	<0.0001	<0.001	0.002	0.70	<0.001	0.120	<0.0001	0.001	0.006	<1	<2	<2	<2	<2	<2	<1	<5
		06/12/2023	BH104R	ES2342531	*5060*	**79**	<1	1020	888	123	141	19	1590	2160	157	87.4	84.6	1.63	1020	<1	**1.90**	<0.01	<0.01	<0.01	**2.1**	2.1	<0.01	-	**0.10**	0.002	<0.0001	<0.001	<0.001	1.13	<0.001	0.115	<0.0001	<0.001	0.006	<1	<2	<2	<2	<2	<2	<1	<5
		19/01/2024	BH104R	ES2401985	*5060*	**82**	<1	993	936	131	148	17	1650	2080	196	90.9	82.6	4.80	993	<1	**1.69**	<0.01	<0.01	<0.01	**1.8**	1.8	-	-	**0.12**	0.003	<0.0001	<0.001	<0.001	1.40	<0.001	0.126	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP2	1061811	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.003	<0.0002	<0.001	<0.001	-	<0.001	-	<0.0001	<0.001	<0.005	-	-	-	-	-	-	-	-
		13/02/2024	BH104R	ES2404914	*5450*	**142**	<1	1050	882	111	147	17	1330	2210	232	75.9	88.2	7.45	1050	<1	**1.45**	<0.01	0.08	<0.01	**1.7**	1.7	<0.01	-	**0.14**	0.002	<0.0001	<0.001	<0.001	1.04	<0.001	0.124	<0.0001	0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
		15/03/2024	BH104R	ES2408629	4730	**135**	<1	1080	920	144	136	18	1600	2170	197	88.4	86.9	0.88	1080	<1	**1.57**	<0.01	0.01	0.01	**2.0**	2.0	<0.01	-	**0.16**	0.004	<0.0001	<0.001	<0.001	1.91	<0.001	0.190	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP2	1079293	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.004	<0.0002	<0.001	<0.001	-	<0.001	-	<0.0001	<0.001	<0.005	-	-	-	-	-	-	-	-
		11/04/2024	BH104R	ES2411734	4860	**72**	<1	1090	787	99	131	16	1550	2190	208	83.6	87.9	2.53	1090	<1	**1.56**	<0.01	<0.01	<0.01	**1.8**	1.8	<0.01	-	**0.10**	0.003	<0.0001	<0.001	<0.001	1.03	<0.001	0.103	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
		15/05/2024	BH104R	ES2415903	4840	**89**	<1	993	809	108	131	17	1620	2060	220	87.1	82.5	2.68	993	<1	**1.70**	<0.01	0.01	<0.01	**2.0**	2.0	<0.01	-	**0.12**	0.003	<0.0001	<0.001	<0.001	1.43	<0.001	0.103	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2415903	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.003	<0.0001	<0.001	0.001	-	<0.001	-	<0.0001	0.002	<0.005	-	-	-	-	-	-	-	-
		12/06/2024	BH104R	ES2419514	4840	**64**	<1	1010	798	102	132	17	1610	2300	216	86.4	89.6	1.78	1010	<1	**1.72**	<0.01	<0.01	<0.01	**1.7**	1.7	<0.01	-	**0.07**	0.003	<0.0001	<0.001	0.003	1.38	<0.001	0.099	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
		11/07/2024	BH104R	ES2422922	4910	**72**	<1	1070	742	96	122	14	1340	1810	214	73.5	76.9	2.27	1070	<1	**1.92**	0.03	<0.01	0.03	**2.1**	2.1	<0.01	-	**0.08**	0.003	<0.0001	<0.001	<0.001	1.38	<0.001	0.095	<0.0001	<0.001	0.008	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2422922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.003	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	0.002	<0.005	-	-	-	-	-	-	-	-
		06/08/2024	BH104R	ES2425825	4100	**52**	<1	1100	779	106	125	17	1610	1800	218	86.0	77.3	5.36	1100	<1	**1.78**	<0.01	<0.01	<0.01	**2.2**	2.2	<0.01	-	**0.08**	0.003	<0.0001	<0.001	<0.001	1.58	<0.001	0.096	<0.0001	0.011	0.018	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP2	1127260	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.003	<0.0002	<0.001	<0.001	-	<0.001	-	<0.0001	0.010	0.010	-	-	-	-	-	-	-	-
		12/09/2024	BH104R	ES2429962	4620	**38**	<1	1090	732	100	117	17	1540	1980	224	82.0	82.3	0.16	1090	<1	**1.81**	<0.01	<0.01	<0.01	**2.0**	2.0	<0.01	-	**0.06**	0.003	<0.0001	<0.001	<0.001	1.24	<0.001	0.072	<0.0001	0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP2	1139072	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.003	<0.0002	<0.001	0.002	-	<0.001	-	<0.0001	0.001	0.005	-	-	-	-	-	-	-	-
		09/10/2024	BH104R	ES2433147	4680	**18**	<1	1100	771	119	115	17	1600	2470	215	85.4	96.1	5.89	1100	<1	**1.92**	<0.01	<0.01	<0.01	**1.9**	1.9	<0.01	-	**0.08**	0.003	<0.0001	<0.001	<0.001	1.44	<0.001	0.082	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
		10/10/2024	GWDUP1	ES2433147	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.003	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	<0.001	<0.005	-	-	-	-	-	-	-	-
		06/11/2024	GWDUP2	1158219	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.003	<0.0002	<0.001	<0.001	-	<0.001	-	<0.0001	<0.001	<0.005	-	-	-	-	-	-	-	-
		07/11/2024	BH104R	ES2436306	4390	**82**	<1	1130	815	112	130	17	1590	1750	189	85.9	75.9	6.18	1130	<1	**1.56**	0.06	<0.01	**0.06**	**2.1**	2.0	**0.01**	-	**0.13**	0.004	<0.0001	<0.001	<0.001	1.28	<0.001	0.092	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
		12/12/2024	BH104R	ES2440696	4620	**66**	<1	1070	722	116	105	16	1500	1920	252	80.1	80.8	0.44	1070	<1	**1.75**	0.02	<0.01	0.02	**2.0**	2.0	<0.01	-	**0.07**	0.003	<0.0001	<0.001	<0.001	1.15	<0.001	0.075	<0.0001	0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP2	1171608	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	<0.0002	<0.001	<0.001	-	<0.001	-	<0.0001	<0.001	<0.005	-	-	-	-	-	-	-	-
		23/01/2025	BH104R	ES2501516	4640	**130**	<1	1060	841	111	137	16	1510	1660	204	82.9	72.2	6.86	1060	<1	**0.64**	0.58	0.18	**0.76**	**1.9**	1.1	**0.01**	-	**0.20**	0.001	<0.0001	<0.001	0.001	1.38	<0.001	0.051	<0.0001	0.002	0.007	<1	<2	<2	<2	<2	<2	<1	<5
		18/02/2025	BH104R	ES2504804	-	-	<1	1140	704	94	114	17	1650	1910	232	86.3	81.5	2.86	1140	<1	**1.80**	<0.01	0.02	0.02	**2.3**	2.3	-	<0.01	**0.06**	0.002	<0.0001	<0.001	<0.001	0.96	<0.001	0.066	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
		11/03/2025	BH104R	ES2507162	4550	**37**	<1	1030	842	123	130	17	1410	2140	230	78.6	85.7	4.34	1030	<1	**1.10**	0.14	<0.01	**0.14**	**1.3**	1.2	-	<0.01	**0.10**	0.002	<0.0001	<0.001	<0.001	0.64	<0.001	0.055	<0.0001	0.001	0.006	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2507162	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	<0.001	<0.005	-	-	-	-	-	-	-	-
			GWDUP2	1197874	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	<0.0002	<0.001	<0.001	-	<0.001	-	<0.0001	<0.001	<0.005	-	-	-	-	-	-	-	-
	BH107	15/08/2022	BH107	ES2229015	2920	**116**	<1	1480	516	35	104	22	929	726	169	51.3	53.6	2.18	1480	<1	<0.01	12.3	<0.01	**12.3**	**14.2**	1.9	<0.01	-	**0.10**	<0.001	<0.0001	<0.001	0.004	<0.05	<0.001	<0.001	<0.0001	<0.001	0.007	<1	<2	<2	<2	<2	<2	<1	<5
		19/09/2022	BH107	ES2233729	2980	**184**	<1	1470	485	36	96	24	959	627	205	52.0	51.3	0.68	1470	<1	<0.01	12.5	<0.01	**12.5**	**13.7**	1.2	**0.01**	-	**0.06**	<0.001	<0.0001	<0.001	0.004	<0.05	<0.001	<0.001	<0.0001	<0.001	0.006	<1	<2	<2	<2	<2	<2	<1	<5
		20/10/2022	BH107	ES2237811	3200	**35**	<1	1200	575	44	113	21	1030	973	240	56.8	56.4	0.37	1200	<1	<0.01	7.34	0.11	**7.45**	**9.4**	1.9	<0.01	-	**0.04**	<0.001	<0.0001	<0.001	0.005	<0.05	<0.001	0.122	<0.0001	0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP2	934854	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.0002	<0.001	0.002	-	<0.001	-	<0.0001	0.001	<0.005	-	-	-	-	-	-	-	-
		16/11/2022	BH107	ES2241428	3130	**143**	<1	1410	555	41	110	22	998	911	230	55.1	58.6	3.15	1410	<1	<0.01	9.26	0.05	**9.31**	**10.7**	1.4	**0.01**	-	**0.09**	<0.001	<0.0001	<0.001	0.002	<0.05	<0.001	0.086	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP2	941927	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.0002	<0.001	0.003	-	<0.001	-	<0.0001	<0.001	<0.005	-	-	-	-	-	-	-	-

Appendix B
Table B4
Analytical Results for Construction Monitoring Period (August 2022 to March 2025)

Package	Location	Date	Field ID	Lab Report	Total Dissolved Solids (Inorganics)	Total Suspended Solids (Inorganics)	Alkalinity (Hydroxide as CaCO3) (Acidity & Alkalinity)	Alkalinity (total as CaCO3)	Hardness as CaCO3 (filtered)	Calcium (filtered) (Major Ions)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)	Chloride	Sulfate (filtered)	Cations Total	Anions Total	Ionic Balance	Bicarbonate ion (HCO3-) (Minor Ions)	Carbonate ion
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	%	mg/L	mg/L
EQL					10	5	1	1	1	1	1	1	1	1	1	0.01	0.01	0.01	1	1
ADWG 2011 Health (v3.7 updated 2022)															500#1					
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)						6														
ANZECC 2000 - Stock Watering					5000#5					1000					1000					
ANZG (2018) - FW - 95% (updated 26 July 2021)																				
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																				
>=2m, <4m																				
>=4m, <8m																				
>=8m																				
M12 - West	BH107R	16/12/2022	BH107R	ES2245760	2040	**1890**	<1	1280	360	32	68	15	628	318	180	34.9	38.3	4.64	1280	<1
			GWDUP1	ES2245760	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08/02/2023	BH107R	ES2304063	2250	**258**	<1	1430	380	30	74	14	715	296	181	39.0	40.7	2.06	1430	<1
		03/03/2023	BH107R	ES2307153	2120	**275**	<1	1420	437	30	88	13	765	283	186	42.3	40.2	2.57	1420	<1
			GWDUP2	969408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		04/04/2023	BH107R	ES2311426	2240	**248**	<1	1470	427	34	83	15	746	306	207	41.4	42.3	1.14	1470	<1
		05/04/2023	GWDUP2	979752	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		02/05/2023	BH107R	ES2314383	2160	**155**	<1	1430	397	32	77	12	598	270	172	34.2	39.8	7.45	1430	<1
			GWDUP2	986190	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07/07/2023	BH107R	ES2322790	1840	**161**	<1	1360	447	29	91	12	622	183	156	36.3	35.6	1.00	1360	<1
			GWDUP1	ES2322790	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09/08/2023	BH107R	ES2326796	2190	**315**	<1	1500	470	38	91	13	708	265	199	40.5	41.6	1.31	1500	<1
			GWDUP2	1015966	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		05/09/2023	BH107R	ES2330598	2120	**49**	<1	1420	503	40	98	14	685	264	209	40.2	40.2	0.06	1420	<1
			GWDUP1	ES2330598	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		06/10/2023	BH107R	ES2334429	2250	**208**	<1	1560	508	42	98	15	765	356	223	43.8	45.8	2.27	1550	11
			GWDUP2	1033274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08/11/2023	BH107R	ES2338893-AF	2220	**496**	<1	1340	512	37	102	15	689	272	194	40.6	38.5	2.67	1340	<1
			GWDUP2	1043528	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		06/12/2023	BH107R	ES2342531	2320	**106**	<1	1530	511	38	101	14	649	277	158	38.8	41.7	3.57	1530	<1
			GWDUP2	1052387	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		19/01/2024	BH107R	ES2401985	2550	**108**	<1	1490	535	41	105	14	795	328	203	45.6	43.2	2.67	1490	<1
		13/02/2024	BH107R	ES2404914	3010	**40**	<1	1580	515	38	102	15	629	320	220	38.0	45.2	8.58	1580	<1
			GWDUP2	1069861	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15/03/2024	BH107R	ES2408629	2120	**65**	<1	1570	568	43	112	15	709	272	197	42.6	43.1	0.65	1480	89
		11/04/2024	BH107R	ES2411734	2330	**28**	<1	1600	536	38	107	15	739	308	200	43.2	44.8	1.80	1600	<1
			GWDUP2	1087440	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15/05/2024	BH107R	ES2415903	2160	**17**	<1	1440	547	41	108	15	735	301	210	43.3	41.6	1.95	1440	<1
		16/05/2024	GWDUP2	1099024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12/06/2024	BH107R	ES2419514	2260	**27**	<1	1370	526	39	104	14	708	315	207	41.6	40.6	1.33	1370	<1
		11/07/2024	BH107R	ES2422922	2270	**12**	<1	1530	507	35	102	12	593	351	175	36.2	44.1	9.80	1530	<1
			GWDUP2	1117977	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		06/08/2024	BH107R	ES2425825	2120	**24**	<1	1570	531	41	104	15	754	325	205	43.8	44.8	1.15	1570	<1
			GWDUP1	ES2425825	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12/09/2024	BH107R	ES2429962	2270	**22**	<1	1570	522	41	102	15	754	323	228	43.6	45.2	1.81	1570	<1
		09/10/2024	BH107R	ES2433147	2140	**20**	<1	1540	507	38	100	15	745	327	184	42.9	43.8	1.05	1540	<1
		10/10/2024	GWDUP2	1148295	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07/11/2024	BH107R	ES2436306	1930	**145**	<1	1490	548	38	110	14	688	248	170	41.2	40.3	1.14	1490	<1
		12/12/2024	BH107R	ES2440696	2130	**49**	<1	1460	421	40	78	14	739	328	468	40.9	48.2	8.14	1420	43
		23/01/2025	BH107R	ES2501516	2260	**30**	<1	1440	514	36	103	14	691	258	204	40.7	40.3	0.48	1440	<1
		18/02/2025	BH107R	ES2504804	2510	<5	<1	1570	542	39	108	15	757	339	232	44.1	45.8	1.80	1570	<1
		11/03/2025	BH107R	ES2507162	2030	**127**	<1	1400	467	37	91	14	597	273	223	35.7	40.3	6.12	1400	<1
	BH112	15/08/2022	BH112	ES2229015	1930	**2120**	<1	948	261	17	53	10	657	576	100	34.0	37.3	4.52	948	<1
			GWDUP2	915049	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		19/09/2022	BH112	ES2233729	2020	**1620**	<1	940	268	20	53	11	683	518	103	35.4	35.5	0.26	940	<1
			GWDUP2	925349	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20/10/2022	BH112	ES2237811	2070	**1640**	<1	922	283	21	56	14	737	570	101	38.1	36.6	1.97	922	<1
			GWDUP1	ES2237811	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		16/11/2022	BH112	ES2241428	2150	**2710**	<1	1040	260	20	51	12	713	628	114	36.5	40.9	5.62	1040	<1
	BH112R	09/08/2023	BH112R	ES2326796	*10200*	**566**	<1	1350	2630	280	468	46	3220	3930	*1700*	194	173	5.59	1350	<1
		05/09/2023	BH112R	ES2330598	*9920*	**80**	<1	1290	2360	266	412	41	2830	4180	*1880*	171	183	3.25	1290	<1
		06/10/2023	BH112R	ES2334429	*9750*	**72**	<1	1370	2290	229	417	41	2890	3960	*2060*	172	182	2.67	1370	<1
			GWDUP1	ES2334429	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08/11/2023	BH112R	ES2338893-AF	*10600*	**123**	<1	1200	2100	196	392	40	2770	4270	*1780*	164	181	5.20	1200	<1
			GWDUP1	ES2338893-AF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		06/12/2023	BH112R	ES2342531	*11400*	**77**	<1	1340	2270	228	414	46	2970	3930	*1290*	176	164	3.33	1340	<1
		19/01/2024	BH112R	ES2401985	*10700*	**60**	<1	1260	2460	251	446	42	3140	4040	*1620*	187	173	3.90	1260	<1
		13/02/2024	BH112R	ES2404914	*11100*	**48**	<1	1340	1930	202	347	42	2480	4050	*1700*	148	176	8.90	1340	<1
			GWDUP1	ES2404914	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15/03/2024	BH112R	ES2408629	*9900*	**52**	<1	1350	2330	270	403	42	2910	4320	*1740*	174	185	3.00	1350	<1
		11/04/2024	BH112R	ES2411734	*10100*	**22**	<1	1340	2130	192	401	41	2930	4040	*1490*	171	172	0.20	1340	<1
			GWDUP1	ES2411734	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15/05/2024	BH112R	ES2415903	*10100*	**51**	<1	1230	2220	202	416	42	2970	4110	*2090*	174	184	2.63	1230	<1
		12/06/2024	BH112R	ES2419514	*10000*	**115**	<1	1150	2110	193	395	40	2880	4130	*1600*	168	173	1.28	1150	<1
			GWDUP2	1109038	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11/07/2024	BH112R	ES2422922	*10400*	**46**	<1	1310	2130	191	401	35	2600	4670	*1600*	156	191	9.98	1310	<1
		06/08/2024	BH112R	ES2425825	*9370*	**49**	<1	1340	2300	222	425	42	3050	4420	*1850*	180	190	2.75	1340	<1
		12/09/2024	BH112R	ES2429962	*9860*	**24**	<1	1320	2220	211	410	41	2880	3890	*1860*	170	175	1.23	1320	<1
		09/10/2024	BH112R	ES2433147	*10200*	**20**	<1	1340	2320	245	416	42	3040	4670	*1510*	180	190	2.75	1340	<1
		06/11/2024	BH112R	ES2436306	*9750*	**84**	<1	1340	2430	256	434	45	3140	4230	*1660*	186	181	1.52	1340	<1
			GWDUP1	ES2436306	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12/12/2024	BH112R	ES2440696	*10400*	<5	<1	1250	2230	255	388	41	2790	4390	*1560*	167	181	4.08	1250	<1
		23/01/2025	BH112R	ES2501516	*10600*	**241**	<1	1280	2340	252	416	42	3020	3930	*1790*	179	174	1.57	1280	<1
		18/02/2025	BH112R	ES2504804	*11200*	<5	<1	1340	2330	216	434	42	3130	4390	*1750*	184	187	0.90	1340	<1
		11/03/2025	BH112R	ES2507162	*10200*	**993**	<1	1030	2190	254	377	44	2820	4320	*1930*	167	183	4.32	1030	<1

Location	Date	Field ID	Lab Report	Ammonia as N (Nutrients)	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)	Kjeldahl Nitrogen Total	Reactive Phosphorus as P	Reactive Phosphorus as P (filtered)	Phosphorus (Total)
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL				0.01	0.01	0.01	0.01	0.1	0.1	0.01	0.01	0.01
ADWG 2011 Health (v3.7 updated 2022)					11.29#2	0.91#3						
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)				0.01165#4			0.04	0.35		0.008	0.008	0.025
ANZECC 2000 - Stock Watering					90#6	9.1#7						
ANZG (2018) - FW - 95% (updated 26 July 2021)				0.9#9	2.4#10							
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand												
>=2m, <4m												
>=4m, <8m												
>=8m												
BH107R	16/12/2022	BH107R	ES2245760	0.44	0.18	0.08	0.26	2.9	2.6	<0.01	-	1.05
		GWDUP1	ES2245760	-	-	-	-	-	-	-	-	-
	08/02/2023	BH107R	ES2304063	0.23	0.22	0.08	0.30	1.1	0.8	<0.01	-	0.14
	03/03/2023	BH107R	ES2307153	0.22	0.97	<0.01	0.97	1.6	0.6	<0.01	-	0.15
		GWDUP2	969408	-	-	-	-	-	-	-	-	-
	04/04/2023	BH107R	ES2311426	0.23	0.83	<0.01	0.83	1.4	0.6	<0.01	-	0.13
	05/04/2023	GWDUP2	979752	-	-	-	-	-	-	-	-	-
	02/05/2023	BH107R	ES2314383	0.12	2.08	<0.01	2.08	2.7	0.6	<0.01	-	0.09
		GWDUP2	986190	-	-	-	-	-	-	-	-	-
	07/07/2023	BH107R	ES2322790	0.03	3.23	<0.01	3.23	4.0	0.8	<0.01	-	0.09
		GWDUP1	ES2322790	-	-	-	-	-	-	-	-	-
	09/08/2023	BH107R	ES2326796	0.12	2.55	<0.01	2.55	3.2	0.6	0.03	-	0.10
		GWDUP2	1015966	-	-	-	-	-	-	-	-	-
	05/09/2023	BH107R	ES2330598	0.02	3.03	<0.01	3.03	3.5	0.5	0.03	-	0.05
		GWDUP1	ES2330598	-	-	-	-	-	-	-	-	-
	06/10/2023	BH107R	ES2334429	0.09	2.52	0.06	2.58	3.1	0.5	0.01	-	0.10
		GWDUP2	1033274	-	-	-	-	-	-	-	-	-
	08/11/2023	BH107R	ES2338893-AF	0.02	2.77	<0.01	2.77	4.4	1.6	<0.01	-	0.26
		GWDUP2	1043528	-	-	-	-	-	-	-	-	-
	06/12/2023	BH107R	ES2342531	<0.01	2.50	<0.01	2.50	2.9	0.4	<0.01	-	0.06
		GWDUP2	1052387	-	-	-	-	-	-	-	-	-
	19/01/2024	BH107R	ES2401985	0.04	2.13	<0.01	2.13	2.4	0.3	-	-	0.08
	13/02/2024	BH107R	ES2404914	0.05	2.27	<0.01	2.27	2.7	0.4	<0.01	-	0.05
		GWDUP2	1069861	-	-	-	-	-	-	-	-	-
	15/03/2024	BH107R	ES2408629	<0.01	2.40	<0.01	2.40	3.4	1.0	<0.01	-	0.04
	11/04/2024	BH107R	ES2411734	0.02	2.20	<0.01	2.20	2.6	0.4	0.02	-	0.03
		GWDUP2	1087440	-	-	-	-	-	-	-	-	-
	15/05/2024	BH107R	ES2415903	0.19	2.30	<0.01	2.30	2.6	0.3	<0.01	-	0.04
	16/05/2024	GWDUP2	1099024	-	-	-	-	-	-	-	-	-
	12/06/2024	BH107R	ES2419514	0.02	2.24	<0.01	2.24	2.6	0.4	<0.01	-	<0.01
	11/07/2024	BH107R	ES2422922	<0.01	2.22	<0.01	2.22	2.6	0.4	0.01	-	0.02
		GWDUP2	1117977	-	-	-	-	-	-	-	-	-
	06/08/2024	BH107R	ES2425825	0.04	1.99	<0.01	1.99	2.4	0.4	<0.01	-	0.04
		GWDUP1	ES2425825	-	-	-	-	-	-	-	-	-
	12/09/2024	BH107R	ES2429962	0.02	2.45	<0.01	2.45	2.8	0.3	<0.01	-	0.04
	09/10/2024	BH107R	ES2433147	0.04	2.43	<0.01	2.43	2.8	0.4	<0.01	-	0.03
	10/10/2024	GWDUP2	1148295	-	-	-	-	-	-	-	-	-
	07/11/2024	BH107R	ES2436306	<0.01	2.77	<0.01	2.77	3.5	0.7	0.01	-	0.07
	12/12/2024	BH107R	ES2440696	0.05	2.26	<0.01	2.26	2.7	0.4	<0.01	-	0.03
	23/01/2025	BH107R	ES2501516	<0.01	2.50	<0.01	2.50	3.1	0.6	<0.01	-	0.04
	18/02/2025	BH107R	ES2504804	0.05	2.11	<0.01	2.11	2.5	0.4	-	<0.01	0.01
	11/03/2025	BH107R	ES2507162	0.02	2.68	<0.01	2.68	3.2	0.5	-	<0.01	0.13
BH112	15/08/2022	BH112	ES2229015	<0.01	0.22	<0.01	0.22	0.2	<0.1	<0.01	-	0.24
		GWDUP2	915049	-	-	-	-	-	-	-	-	-
	19/09/2022	BH112	ES2233729	0.01	0.15	<0.01	0.15	0.6	0.4	<0.01	-	0.15
		GWDUP2	925349	-	-	-	-	-	-	-	-	-
	20/10/2022	BH112	ES2237811	0.04	0.13	<0.01	0.13	1.4	1.3	<0.01	-	0.39
		GWDUP1	ES2237811	-	-	-	-	-	-	-	-	-
	16/11/2022	BH112	ES2241428	0.23	0.14	<0.01	0.14	1.8	1.7	<0.01	-	1.06
BH112R	09/08/2023	BH112R	ES2326796	2.32	0.55	2.00	2.55	5.4	2.8	0.35	-	1.04
	05/09/2023	BH112R	ES2330598	2.39	1.39	1.34	2.73	6.1	3.4	0.36	-	0.37
	06/10/2023	BH112R	ES2334429	2.66	1.72	0.32	2.04	4.8	2.8	0.22	-	0.29
		GWDUP1	ES2334429	-	-	-	-	-	-	-	-	-
	08/11/2023	BH112R	ES2338893-AF	1.93	1.86	0.31	2.17	4.8	2.6	0.16	-	0.23
		GWDUP1	ES2338893-AF	-	-	-	-	-	-	-	-	-
	06/12/2023	BH112R	ES2342531	2.23	1.63	0.07	1.70	4.2	2.5	0.12	-	0.19
	19/01/2024	BH112R	ES2401985	2.26	0.94	0.12	1.06	3.5	2.4	-	-	0.18
	13/02/2024	BH112R	ES2404914	2.20	0.34	0.16	0.50	3.1	2.6	0.09	-	0.14
		GWDUP1	ES2404914	-	-	-	-	-	-	-	-	-
	15/03/2024	BH112R	ES2408629	2.51	0.26	0.02	0.28	3.2	2.9	0.08	-	0.11
	11/04/2024	BH112R	ES2411734	2.55	0.24	0.10	0.34	3.0	2.7	0.07	-	0.15
		GWDUP1	ES2411734	-	-	-	-	-	-	-	-	-
	15/05/2024	BH112R	ES2415903	2.70	0.26	0.05	0.31	3.1	2.8	0.06	-	0.11
	12/06/2024	BH112R	ES2419514	2.57	0.40	0.05	0.45	3.2	2.7	0.05	-	0.14
		GWDUP2	1109038	-	-	-	-	-	-	-	-	-
	11/07/2024	BH112R	ES2422922	2.14	0.88	0.05	0.93	3.5	2.6	0.05	-	0.09
	06/08/2024	BH112R	ES2425825	2.50	0.29	0.03	0.32	3.4	3.1	0.04	-	0.11
	12/09/2024	BH112R	ES2429962	2.40	0.39	0.01	0.40	3.0	2.6	0.04	-	0.11
	09/10/2024	BH112R	ES2433147	2.37	0.35	0.03	0.38	2.7	2.3	0.03	-	0.06
	06/11/2024	BH112R	ES2436306	2.10	0.16	0.32	0.48	2.9	2.4	0.03	-	0.14
		GWDUP1	ES2436306	-	-	-	-	-	-	-	-	-
	12/12/2024	BH112R	ES2440696	2.02	0.42	0.05	0.47	2.8	2.3	0.03	-	0.10
	23/01/2025	BH112R	ES2501516	1.96	0.37	0.19	0.56	4.1	3.5	0.03	-	0.53
	18/02/2025	BH112R	ES2504804	2.16	0.44	0.06	0.50	3.0	2.5	-	0.02	0.08
	11/03/2025	BH112R	ES2507162	2.24	0.11	0.26	0.37	4.0	3.6	-	0.02	1.14

Location	Date	Field ID	Lab Report	Arsenic (filtered) (Metals)	Cadmium (filtered)	Chromium (III+VI) (filtered)	Copper (filtered)	Iron (filtered)	Lead (filtered)	Manganese (filtered)	Mercury (filtered)	Nickel (filtered)	Zinc (filtered)	Benzene (BTEXN)	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	BTEX (Sum of Total) - Lab Calc	Naphthalene (BTEXN suite)
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				0.001	0.0001	0.001	0.001	0.05	0.001	0.001	0.0001	0.001	0.005	1	2	2	2	2	2	1	5
ADWG 2011 Health (v3.7 updated 2022)				0.01	0.002		2		0.01	0.5	0.001	0.02		1	800	300			600		
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																					
ANZECC 2000 - Stock Watering				0.5	0.01	1	1#8		0.1		0.002	1	20								
ANZG (2018) - FW - 95% (updated 26 July 2021)				0.013#11	0.0002	0.001#12	0.0014		0.0034	1.9	0.0006	0.011	0.008	950	180	80	350				16
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																					
>=2m, <4m														5000	NL#13	NL#13			NL#13		NL#13
>=4m, <8m														5000	NL#13	NL#13			NL#13		NL#13
>=8m														5000	NL#13	NL#13			NL#13		NL#13
BH107R	16/12/2022	BH107R	ES2245760	0.003	<0.0001	<0.001	0.003	<0.05	<0.001	0.168	<0.0001	0.002	0.012	<1	<2	<2	<2	<2	<2	<1	<5
		GWDUP1	ES2245760	0.003	<0.0001	<0.001	0.002	-	<0.001	-	<0.0001	0.002	0.010	-	-	-	-	-	-	-	-
	08/02/2023	BH107R	ES2304063	<0.001	<0.0001	<0.001	0.006	<0.05	<0.001	0.074	<0.0001	0.001	0.007	<1	<2	<2	<2	<2	<2	<1	<5
	03/03/2023	BH107R	ES2307153	<0.001	<0.0001	<0.001	0.004	<0.05	<0.001	0.091	<0.0001	0.002	0.125	<1	<2	<2	<2	<2	<2	<1	<5
		GWDUP2	969408	0.001	<0.0002	<0.001	0.005	-	<0.001	-	<0.0001	0.002	0.11	-	-	-	-	-	-	-	-
	04/04/2023	BH107R	ES2311426	<0.001	<0.0001	<0.001	0.005	<0.05	<0.001	0.089	<0.0001	0.006	0.010	<1	<2	<2	<2	<2	<2	<1	<5
	05/04/2023	GWDUP2	979752	0.001	<0.0002	<0.001	0.004	-	<0.001	-	<0.0001	0.005	0.008	-	-	-	-	-	-	-	-
	02/05/2023	BH107R	ES2314383	<0.001	<0.0001	<0.001	0.005	<0.05	<0.001	0.042	<0.0001	0.010	0.026	<1	<2	<2	<2	<2	<2	<1	<5
		GWDUP2	986190	<0.001	<0.0002	<0.001	0.006	-	<0.001	-	<0.0001	0.008	0.025	-	-	-	-	-	-	-	-
	07/07/2023	BH107R	ES2322790	<0.001	<0.0001	0.001	0.005	<0.05	<0.001	0.033	<0.0001	0.002	0.012	<1	<2	<2	<2	<2	<2	<1	<5
		GWDUP1	ES2322790	<0.001	<0.0001	<0.001	0.005	-	<0.001	-	<0.0001	0.001	0.007	-	-	-	-	-	-	-	-
	09/08/2023	BH107R	ES2326796	<0.001	<0.0001	<0.001	0.002	<0.05	<0.001	0.033	<0.0001	0.002	0.006	<1	<2	<2	<2	<2	<2	<1	<5
		GWDUP2	1015966	<0.001	<0.0002	<0.001	0.004	-	<0.001	-	<0.0001	0.002	0.006	-	-	-	-	-	-	-	-
	05/09/2023	BH107R	ES2330598	<0.001	<0.0001	<0.001	0.009	<0.05	<0.001	0.018	<0.0001	0.002	0.009	<1	<2	<2	<2	<2	<2	<1	<5
		GWDUP1	ES2330598	<0.001	<0.0001	<0.001	0.009	-	<0.001	-	<0.0001	0.002	0.010	-	-	-	-	-	-	-	-
	06/10/2023	BH107R	ES2334429	<0.001	<0.0001	<0.001	0.004	<0.05	<0.001	0.030	<0.0001	0.006	0.018	<1	<2	<2	<2	<2	<2	<1	<5
		GWDUP2	1033274	<0.001	<0.0002	<0.001	0.003	-	<0.001	-	<0.0001	0.006	0.014	-	-	-	-	-	-	-	-
	08/11/2023	BH107R	ES2338893-AF	<0.001	<0.0001	<0.001	0.007	<0.05	<0.001	0.010	<0.0001	0.005	0.018	<1	<2	<2	<2	<2	<2	<1	<5
		GWDUP2	1043528	<0.001	<0.0002	<0.001	0.005	-	<0.001	-	<0.0001	0.004	0.012	-	-	-	-	-	-	-	-
	06/12/2023	BH107R	ES2342531	<0.001	<0.0001	<0.001	<0.001	<0.05	<0.001	0.007	<0.0001	0.002	0.007	<1	<2	<2	<2	<2	<2	<1	<5
		GWDUP2	1052387	<0.001	<0.0002	<0.001	0.002	-	<0.001	-	<0.0001	0.002	0.007	-	-	-	-	-	-	-	-
	19/01/2024	BH107R	ES2401985	<0.001	<0.0001	<0.001	0.002	<0.05	<0.001	0.025	<0.0001	0.001	0.006	<1	<2	<2	<2	<2	<2	<1	<5
	13/02/2024	BH107R	ES2404914	<0.001	<0.0001	<0.001	0.001	<0.05	<0.001	0.012	<0.0001	0.001	0.010	<1	<2	<2	<2	<2	<2	<1	<5
		GWDUP2	1069861	<0.001	<0.0002	<0.001	0.002	-	<0.001	-	<0.0001	<0.001	<0.005	-	-	-	-	-	-	-	-
	15/03/2024	BH107R	ES2408629	<0.001	<0.0001	<0.001	0.003	<0.05	<0.001	0.005	<0.0001	0.002	0.011	<1	<2	<2	<2	<2	<2	<1	<5
	11/04/2024	BH107R	ES2411734	<0.001	<0.0001	<0.001	0.001	<0.05	<0.001	0.004	<0.0001	<0.001	0.006	<1	<2	<2	<2	<2	<2	<1	<5
		GWDUP2	1087440	<0.001	<0.0002	<0.001	0.002	-	<0.001	-	<0.0001	0.001	0.015	-	-	-	-	-	-	-	-
	15/05/2024	BH107R	ES2415903	<0.001	<0.0001	<0.001	0.002	<0.05	<0.001	0.006	<0.0001	0.001	0.009	<1	<2	<2	<2	<2	<2	<1	<5
	16/05/2024	GWDUP2	1099024	<0.001	<0.0002	<0.001	0.002	-	<0.001	-	<0.0001	0.001	0.010	-	-	-	-	-	-	-	-
	12/06/2024	BH107R	ES2419514	<0.001	<0.0001	<0.001	0.002	<0.05	<0.001	0.003	<0.0001	0.001	0.008	<1	<2	<2	<2	<2	<2	<1	<5
	11/07/2024	BH107R	ES2422922	<0.001	<0.0001	<0.001	0.003	<0.05	<0.001	0.002	<0.0001	0.001	0.013	<1	<2	<2	<2	<2	<2	<1	<5
		GWDUP2	1117977	<0.001	<0.0002	<0.001	0.003	-	<0.001	-	<0.0001	0.001	0.012	-	-	-	-	-	-	-	-
	06/08/2024	BH107R	ES2425825	<0.001	<0.0001	<0.001	0.001	<0.05	<0.001	0.007	<0.0001	0.010	0.017	<1	<2	<2	<2	<2	<2	<1	<5
		GWDUP1	ES2425825	<0.001	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	0.008	<0.005	-	-	-	-	-	-	-	-
	12/09/2024	BH107R	ES2429962	<0.001	<0.0001	<0.001	0.002	<0.05	<0.001	0.004	<0.0001	<0.001	0.007	<1	<2	<2	<2	<2	<2	<1	<5
	09/10/2024	BH107R	ES2433147	<0.001	<0.0001	<0.001	<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
	10/10/2024	GWDUP2	1148295	<0.001	<0.0002	<0.001	0.002	-	<0.001	-	<0.0001	<0.001	0.007	-	-	-	-	-	-	-	-
	07/11/2024	BH107R	ES2436306	<0.001	<0.0001	<0.001	<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	0.006	<1	<2	<2	<2	<2	<2	<1	<5
	12/12/2024	BH107R	ES2440696	<0.001	<0.0001	<0.001	0.003	<0.05	<0.001	0.023	<0.0001	0.003	0.010	<1	<2	<2	<2	<2	<2	<1	<5
	23/01/2025	BH107R	ES2501516	<0.001	<0.0001	<0.001	0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
	18/02/2025	BH107R	ES2504804	<0.001	<0.0001	<0.001	0.002	<0.05	<0.001	0.004	<0.0001	0.001	0.008	<1	<2	<2	<2	<2	<2	<1	<5
	11/03/2025	BH107R	ES2507162	<0.001	<0.0001	<0.001	0.002	<0.05	<0.001	0.002	<0.0001	0.001	0.010	<1	<2	<2	<2	<2	<2	<1	<5
BH112	15/08/2022	BH112	ES2229015	<0.001	<0.0001	<0.001	0.003	<0.05	<0.001	0.007	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
		GWDUP2	915049	<0.001	<0.0002	<0.001	0.003	-	<0.001	-	<0.0001	<0.001	<0.005	-	-	-	-	-	-	-	-
	19/09/2022	BH112	ES2233729	<0.001	<0.0001	<0.001	0.002	<0.05	<0.001	0.002	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
		GWDUP2	925349	<0.001	<0.0002	0.003	0.003	-	<0.001	-	<0.0001	<0.001	<0.005	-	-	-	-	-	-	-	-
	20/10/2022	BH112	ES2237811	<0.001	<0.0001	<0.001	0.006	<0.05	<0.001	0.525	<0.0001	0.005	0.049	<1	<2	<2	<2	<2	<2	<1	<5
		GWDUP1	ES2237811	0.001	<0.0001	<0.001	0.003	-	<0.001	-	<0.0001	0.006	<0.005	-	-	-	-	-	-	-	-
	16/11/2022	BH112	ES2241428	<0.001	<0.0001	<0.001	0.003	<0.05	<0.001	0.051	<0.0001	0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
BH112R	09/08/2023	BH112R	ES2326796	0.018	<0.0001	<0.001	0.001	<0.05	<0.001	0.130	<0.0001	0.018	0.008	<1	<2	<2	<2	<2	<2	<1	<5
	05/09/2023	BH112R	ES2330598	0.014	<0.0001	<0.001	0.013	<0.05	<0.001	0.152	<0.0001	0.047	0.019	<1	<2	<2	<2	<2	<2	<1	<5
	06/10/2023	BH112R	ES2334429	0.011	<0.0001	<0.001	0.016	<0.05	<0.001	0.133	<0.0001	0.016	0.048	<1	<2	<2	<2	<2	<2	<1	<5
		GWDUP1	ES2334429	0.010	<0.0001	<0.001	0.014	-	<0.001	-	<0.0001	0.016	0.046	-	-	-	-	-	-	-	-
	08/11/2023	BH112R	ES2338893-AF	0.008	<0.0001	<0.001	0.006	<0.05	<0.001	0.114	<0.0001	0.009	0.012	<1	<2	<2	<2	<2	<2	<1	<5
		GWDUP1	ES2338893-AF	0.008	<0.0001	<0.001	0.008	-	<0.001	-	<0.0001	0.009	0.017	-	-	-	-	-	-	-	-
	06/12/2023	BH112R	ES2342531	0.006	<0.0001	<0.001	<0.001	<0.05	<0.001	0.109	<0.0001	0.008	0.016	<1	<2	<2	<2	<2	<2	<1	<5
	19/01/2024	BH112R	ES2401985	0.006	<0.0001	<0.001	0.004	<0.05	<0.001	0.098	<0.0001	0.007	0.013	<1	<2	<2	<2	<2	<2	<1	<5
	13/02/2024	BH112R	ES2404914	0.004	<0.0001	<0.001	0.006	<0.05	<0.001	0.099	<0.0001	0.007	0.014	<1	<2	<2	<2	<2	<2	<1	<5
		GWDUP1	ES2404914	0.004	<0.0001	<0.001	0.006	-	<0.001	-	<0.0001	0.007	0.013	-	-	-	-	-	-	-	-
	15/03/2024	BH112R	ES2408629	0.003	<0.0001	<0.001	0.009	<0.05	<0.001	0.086	<0.0001	0.006	0.017	<1	<2	<2	<2	<2	<2	<1	<5
	11/04/2024	BH112R	ES2411734	0.003	<0.0001	<0.001	0.007	<0.05	<0.001	0.094	<0.0001	0.006	0.009	<1	<2	<2	<2	<2	<2	<1	<5
		GWDUP1	ES2411734	0.004	<0.0001	<0.001	0.008	-	<0.001	-	<0.0001	0.006	0.012	-	-	-	-	-	-	-	-
	15/05/2024	BH112R	ES2415903	0.004	<0.0001	<0.001	0.005	<0.05	<0.001	0.090	<0.0001	0.006	0.015	<1	<2	<2	<2	<2	<2	<1	<5
	12/06/2024	BH112R	ES2419514	0.002	<0.0001	<0.001	0.006	<0.05	<0.001	0.087	<0.0001	0.005	0.034	<1	<2	<2	<2	<2	<2	<1	<5
		GWDUP2	1109038	0.003	<0.0002	<0.001	0.007	-	<0.001	-	<0.0001	0.005	0.042	-	-	-	-	-	-	-	-
	11/07/2024	BH112R	ES2422922	0.002	<0.0001	<0.001	0.005	<0.05	<0.001	0.079	<0.0001	0.005	0.013	<1	<2	<2	<2	<2	<2	<1	<5
	06/08/2024	BH112R	ES2425825	0.002	<0.0001	<0.001	0.005	0.30	0.001	0.094	<0.0001	0.048	0.033	<1	<2	<2	<2	<2	<2	<1	<5
	12/09/2024	BH112R	ES2429962	0.002	<0.0001	<0.001	0.004	<0.05	<0.001	0.077	<0.0001	0.005	0.013	<1	<2	<2	<2	<2	<2	<1	<5
	09/10/2024	BH112R	ES2433147	0.002	<0.0001	<0.001	<0.001	<0.05	<0.001	0.076	<0.0001	0.004	0.010	<1	<2	<2	<2	<2	<2	<1	<5
	06/11/2024	BH112R	ES2436306	0.002	<0.0001	<0.001	0.004	<0.05	<0.001	0.084	<0.0001	0.004	0.017	<1	<2	<2	<2	<2	<2	<1	<5
		GWDUP1	ES2436306	0.003	<0.0001	<0.001	0.005	-	<0.001	-	<0.0001	0.004	0.016	-	-	-	-	-	-	-	-
	12/12/2024	BH112R	ES2440696	0.002	<0.0001	<0.001	0.004	<0.05	<0.001	0.082	<0.0001	0.030	0.019	<1	<2	<2	<2	<2	<2	<1	<5
	23/01/2025	BH112R	ES2501516	0.001	<0.0001	<0.001	<0.001	<0.05	<0.001	0.081	<0.0001	0.005	0.013	<1	<2	<2	<2	<2	<2	<1	<5
	18/02/2025	BH112R	ES2504804	0.001	<0.0001	<0.001	0.001	<0.05	<0.001	0.084	<0.0001	0.004	0.011	<1	<2	<2	<2	<2	<2	<1	<5
	11/03/2025	BH112R	ES2507162	0.003	<0.0001	<0.001	<0.001	<0.05	<0.001	0.091	<0.0001	0.006	0.005	<1	<2	<2	<2	<2	<2	<1	<5

Appendix B
Table B4
Analytical Results for Construction Monitoring Period (August 2022 to March 2025)

Transport for NSW
M12 Motorway
M12 Motorway water quality and level monitoring

					Inorganics		Acidity & Alkalinity			Major Ions									Minor Ions		Nutrients									Metals											BTEXN							
					Total Dissolved Solids	Total Suspended Solids	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Hardness as CaCO3 (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)	Chloride	Sulfate (filtered)	Cations Total	Anions Total	Ionic Balance	Bicarbonate ion (HCO3-)	Carbonate ion	Ammonia as N	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)	Kjeldahl Nitrogen Total	Reactive Phosphorus as P	Reactive Phosphorus as P (filtered)	Phosphorus (Total)	Arsenic (filtered)	Cadmium (filtered)	Chromium (III+VI) (filtered)	Copper (filtered)	Iron (filtered)	Lead (filtered)	Manganese (filtered)	Mercury (filtered)	Nickel (filtered)	Zinc (filtered)	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	BTEX (Sum of Total) - Lab Calc	Naphthalene (BTEXN suite)
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL					10	5	1	1	1	1	1	1	1	1	1	0.01	0.01	0.01	1	1	0.01	0.01	0.01	0.01	0.1	0.1	0.01	0.01	0.01	0.001	0.0001	0.001	0.001	0.05	0.001	0.001	0.0001	0.001	0.005	1	2	2	2	2	2	1	5
ADWG 2011 Health (v3.7 updated 2022)															500[#1]							11.29[#2]	0.91[#3]						0.01	0.002		2		0.01	0.5	0.001	0.02		1	800	300			600		
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)						**6**															**0.01165[#4]**			**0.04**	**0.35**		**0.008**	**0.008**	**0.025**																	
ANZECC 2000 - Stock Watering					*5000[#5]*					*1000*					*1000*							*90[#6]*	*9.1[#7]*						*0.5*	*0.01*	*1*	*1[#8]*		*0.1*		*0.002*	*1*	*20*							
ANZG (2018) - FW - 95% (updated 26 July 2021)																					0.9[#9]	2.4[#10]								0.013[#11]	0.0002	0.001[#12]	0.0014		0.0034	1.9	0.0006	0.011	0.008	950	180	80	350				16
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																														
>=2m, <4m																																							5000	NL[#13]	NL[#13]			NL[#13]		NL[#13]
>=4m, <8m																																							5000	NL[#13]	NL[#13]			NL[#13]		NL[#13]
>=8m																																							5000	NL[#13]	NL[#13]			NL[#13]		NL[#13]
Package	**Location**	**Date**	**Field ID**	**Lab Report**																																										
M12 - Central	BH144	15/11/2022	BH144	ES2241428	2570	**8920**	<1	250	21	5	2	2	336	376	32	15.1	16.3	3.79	250	<1	**0.67**	10.7	0.13	**10.8**	**26.4**	15.6	<0.05	-	**3.51**	<0.001	<0.0001	<0.001	0.007	0.29	<0.001	0.074	<0.0001	0.003	0.006	<1	<2	<2	<2	<2	<2	<1	<5
	BH145	15/08/2022	BH145	ES2229015	2510	**2900**	<1	322	60	14	6	4	904	1100	71	40.6	38.9	2.10	322	<1	**0.52**	45.7	1.16	**46.9**	**48.4**	1.5	<0.01	-	**0.04**	<0.001	<0.0001	<0.001	0.001	0.06	<0.001	0.755	<0.0001	0.003	0.102	<1	<2	<2	<2	<2	<2	<1	<5
		19/09/2022	BH145	ES2233729	2950	**5390**	<1	377	97	24	9	6	1140	1330	86	51.7	46.8	4.91	377	<1	**0.73**	50.9	1.51	**52.4**	**63.7**	11.3	<0.01	-	**3.22**	<0.001	<0.0001	<0.001	0.002	0.13	<0.001	0.908	<0.0001	0.002	0.075	<1	<2	<2	<2	<2	<2	<1	<5
		20/10/2022	BH145	ES2237811	3030	**624**	<1	320	215	68	11	6	1280	1250	87	60.1	50.4	8.84	320	<1	**0.39**	72.0	0.60	**72.6**	**96.4**	23.8	<0.01	-	**0.06**	<0.001	<0.0001	<0.001	0.007	<0.05	<0.001	1.03	<0.0001	0.003	0.101	<1	<2	<2	<2	<2	<2	<1	<5
		15/11/2022	BH145	ES2241428	2770	**3310**	<1	387	70	18	6	4	952	1170	81	42.9	42.4	0.56	387	<1	**0.24**	51.8	0.57	**52.4**	**59.3**	6.9	<0.01	-	**0.22**	<0.001	<0.0001	<0.001	0.005	<0.05	<0.001	0.672	<0.0001	0.002	0.068	<1	<2	<2	<2	<2	<2	<1	<5
		14/12/2022	BH145	ES2245760	3180	**5850**	<1	401	94	23	9	6	1120	1410	86	50.8	49.6	1.18	401	<1	**0.25**	50.0	0.68	**50.7**	**57.0**	6.3	<0.01	-	**0.18**	<0.001	<0.0001	<0.001	0.004	<0.05	<0.001	0.837	<0.0001	0.002	0.072	<1	<2	<2	<2	<2	<2	<1	<5
		17/01/2023	BH145	ES2301690	3750	**12800**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.35**	65.2	0.99	**66.2**	**71.7**	5.5	<0.01	-	**0.77**	<0.001	<0.0001	<0.001	0.002	<0.05	<0.001	1.07	<0.0001	0.003	0.058	<1	<2	<2	<2	<2	<2	<1	<5
		07/02/2023	BH145	ES2304063	-	-	<1	404	118	29	11	7	1390	1620	99	63.0	55.8	6.03	404	<1	**0.22**	88.8	0.75	**89.6**	**107**	17.0	<0.01	-	**1.28**	<0.001	<0.0001	<0.001	0.003	<0.05	<0.001	1.23	<0.0001	0.003	0.061	<1	<2	<2	<2	<2	<2	<1	<5
		02/03/2023	BH145	ES2307153	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.0001	<0.001	0.005	1.30	0.001	1.56	<0.0001	0.005	0.034	<1	<2	<2	<2	<2	<2	<1	<5
	BH145R	05/04/2023	BH145R	ES2311426	*5710*	**38**	<1	696	974	80	188	14	1740	3040	243	95.5	105	4.60	696	<1	**1.40**	0.01	0.01	0.02	**1.8**	1.8	<0.01	-	**0.07**	0.016	<0.0001	<0.001	<0.001	3.66	<0.001	0.639	<0.0001	0.028	<0.005	1	3	<2	<2	<2	<2	4	<5
		02/05/2023	BH145R	ES2314383	*6230*	**79**	<1	818	1170	105	221	13	1870	3400	241	105	117	5.47	818	<1	**1.67**	<0.01	<0.01	<0.01	**1.9**	1.9	<0.01	-	**0.09**	0.016	<0.0001	<0.001	<0.001	3.32	<0.001	0.494	<0.0001	0.005	0.006	1	3	<2	<2	<2	<2	4	<5
		06/06/2023	BH145R	ES2319027	*7490*	**67**	<1	834	1580	125	308	14	2270	4270	269	131	143	4.40	834	<1	**1.82**	<0.01	<0.01	<0.01	**1.9**	1.9	<0.01	-	**0.05**	0.012	<0.0001	<0.001	<0.001	5.08	<0.001	0.508	<0.0001	0.002	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2319027	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.010	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	0.002	<0.005	-	-	-	-	-	-	-	-
		07/07/2023	BH145R	ES2322790	*8730*	**111**	<1	881	1830	126	368	15	2480	4220	271	145	142	0.89	881	<1	**1.86**	<0.01	<0.01	<0.01	**1.9**	1.9	<0.01	-	**0.11**	0.006	<0.0001	<0.001	<0.001	0.002	4.40	<0.001	0.352	<0.0001	0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
		09/08/2023	BH145R	ES2326796	*9290*	**288**	<1	903	2380	197	458	19	2980	4410	318	178	149	8.74	903	<1	**1.77**	<0.01	<0.01	<0.01	**2.2**	2.2	<0.01	-	**0.51**	0.008	<0.0001	<0.001	<0.001	4.82	<0.001	0.348	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
		06/09/2023	BH145R	ES2330598	*9970*	**89**	<1	884	2090	181	398	15	2480	5020	334	150	166	5.12	884	<1	**1.87**	<0.01	<0.01	<0.01	**2.0**	2.0	<0.01	-	**0.06**	0.005	<0.0001	<0.001	<0.001	4.42	<0.001	0.283	<0.0001	0.025	0.006	<1	<2	<2	<2	<2	<2	<1	<5
		06/10/2023	BH145R	ES2334429	*10200*	**47**	<1	969	2510	202	487	18	2980	5150	350	180	172	2.36	969	<1	**1.97**	<0.01	<0.01	<0.01	**2.2**	2.2	<0.01	-	**0.04**	0.003	<0.0001	<0.001	<0.001	4.03	<0.001	0.249	<0.0001	0.022	0.023	<1	<2	<2	<2	<2	<2	<1	<5
		09/11/2023	BH145R	ES2338893-AF	*11900*	**44**	<1	890	2500	192	490	18	3020	5310	384	182	176	1.72	890	<1	**1.97**	0.01	<0.01	0.01	**2.2**	2.2	<0.01	-	**0.03**	<0.001	<0.0001	<0.001	<0.001	2.83	<0.001	0.185	<0.0001	<0.001	0.005	<1	<2	<2	<2	<2	<2	<1	<5
		05/12/2023	BH145R	ES2342531	*11000*	**17**	<1	998	2610	212	506	19	3030	5800	383	184	192	1.87	998	<1	**2.14**	<0.01	<0.01	<0.01	**2.2**	2.2	<0.01	-	**0.04**	<0.001	<0.0001	<0.001	<0.001	2.98	<0.001	0.158	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2342531	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.001	<0.0001	0.002	<0.001	-	<0.001	-	<0.0001	<0.001	<0.005	-	-	-	-	-	-	-	-
		19/01/2024	BH145R	ES2401985	*13300*	**99**	<1	980	2890	227	564	18	3280	5810	375	201	191	2.45	980	<1	**2.09**	<0.01	<0.01	<0.01	**2.3**	2.3	-	-	**0.11**	0.002	<0.0001	<0.001	<0.001	3.65	<0.001	0.150	<0.0001	0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2401985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	0.001	<0.005	-	-	-	-	-	-	-	-
		14/02/2024	BH145R	ES2404914	*14500*	**115**	<1	1050	2460	206	473	19	2720	5600	385	168	187	5.34	1050	<1	**2.12**	<0.01	<0.01	<0.01	**2.3**	2.3	<0.01	-	**0.08**	<0.001	<0.0001	<0.001	<0.001	4.03	<0.001	0.249	<0.0001	0.022	0.023	<1	<2	<2	<2	<2	<2	<1	<5
		14/03/2024	BH145R	ES2408629	*11900*	**38**	<1	1070	2920	254	554	19	3190	6170	372	198	203	1.41	1070	<1	**2.23**	0.16	<0.01	**0.16**	**2.5**	2.3	<0.01	-	**0.03**	0.003	<0.0001	<0.001	<0.001	3.23	<0.001	0.136	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2408629	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.003	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	<0.001	<0.005	-	-	-	-	-	-	-	-
		12/04/2024	BH145R	ES2411734	*8570*	**34**	<1	788	1900	141	377	16	2270	4110	280	137	138	0.11	788	<1	**1.77**	0.79	0.02	**0.81**	**3.0**	2.2	<0.01	-	**0.05**	0.002	<0.0001	<0.001	0.001	0.70	<0.001	0.238	<0.0001	0.002	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
		16/05/2024	BH145R	ES2415903	*10500*	**44**	<1	891	2590	200	508	18	3020	5230	333	184	172	3.19	891	<1	**2.24**	0.04	<0.01	**0.04**	**2.2**	2.2	<0.01	-	**0.04**	0.004	<0.0001	<0.001	0.001	3.00	<0.001	0.166	<0.0001	<0.001	0.008	<1	<2	<2	<2	<2	<2	<1	<5
		06/06/2024	BH145R	ES2418682	*10800*	**38**	<1	1010	2750	202	546	17	3050	5560	341	188	184	1.07	1010	<1	**2.10**	0.02	<0.01	0.02	**2.0**	2.0	<0.01	-	**0.03**	0.002	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2418682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	<0.001	0.008	-	-	-	-	-	-	-	-
		10/07/2024	BH145R	ES2422922	*6030*	**464**	<1	896	1400	112	271	11	1840	3650	208	108	125	7.28	896	<1	**3.14**	<0.01	<0.01	<0.01	**3.7**	3.7	<0.01	-	**0.12**	0.007	<0.0001	<0.001	0.001	1.75	<0.001	0.131	<0.0001	0.001	0.008	3	<2	<2	<2	<2	<2	3	<5
		07/08/2024	BH145R	ES2425825	*10000*	**53**	<1	1050	2830	217	556	18	3240	6070	332	198	199	0.29	1050	<1	**2.30**	0.01	<0.01	0.01	**2.8**	2.8	<0.01	-	**0.07**	0.003	<0.0001	<0.001	<0.001	3.13	<0.001	0.136	<0.0001	0.024	0.015	<1	<2	<2	<2	<2	<2	<1	<5
		11/09/2024	BH145R	ES2429962	*11100*	**25**	<1	1050	2690	209	526	18	3100	6320	333	189	206	4.34	1050	<1	**2.17**	<0.01	<0.01	<0.01	**2.3**	2.3	<0.01	-	**0.04**	0.002	<0.0001	<0.001	<0.001	2.43	<0.001	0.099	<0.0001	0.001	0.007	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2429962	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	0.001	0.007	-	-	-	-	-	-	-	-
		09/10/2024	BH145R	ES2433147	*11400*	**66**	<1	1070	2800	231	540	18	3260	6430	337	198	210	2.83	1070	<1	**2.25**	<0.01	<0.01	<0.01	**2.2**	2.2	<0.01	-	**0.04**	0.002	<0.0001	<0.001	<0.001	3.14	<0.001	0.109	<0.0001	<0.001	0.008	<1	<2	<2	<2	<2	<2	<1	<5
		07/11/2024	BH145R	ES2436306	*10200*	**234**	<1	1080	2490	202	483	18	2970	5310	337	179	178	0.31	1080	<1	**1.43**	0.06	<0.01	**0.06**	**2.1**	2.0	<0.01	-	**0.15**	0.004	<0.0001	<0.001	<0.001	2.34	<0.001	0.116	<0.0001	<0.001	0.010	<1	<2	<2	<2	<2	<2	<1	<5
		11/12/2024	BH145R	ES2440696	*12400*	**10**	<1	1020	2680	235	508	17	2960	5610	357	183	186	0.90	1020	<1	**2.06**	0.01	<0.01	0.01	**2.3**	2.3	<0.01	-	**0.04**	0.001	<0.0001	<0.001	<0.001	2.60	<0.001	0.095	<0.0001	0.019	0.019	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2440696	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.0001	<0.001	<0.001	2.82	<0.001	0.092	-	0.017	0.014	-	-	-	-	-	-	-	-
		17/01/2025	BH145R	ES2501188	*11600*	<5	<1	558	2440	185	481	15	2900	5480	371	175	173	0.54	558	<1	**1.96**	0.04	<0.01	**0.04**	**2.0**	2.0	<0.01	-	**0.04**	0.003	<0.0001	<0.001	0.004	<0.05	<0.001	0.102	<0.0001	0.002	0.009	<1	<2	<2	<2	<2	<2	<1	<5
		19/02/2025	BH145R	ES2504804	*13800*	**39**	<1	1090	2880	217	569	19	3370	6130	370	205	202	0.57	1090	<1	**2.45**	<0.01	<0.01	<0.01	**2.6**	2.6	-	<0.01	**0.07**	0.002	<0.0001	<0.001	<0.001	3.08	<0.001	0.097	<0.0001	<0.001	0.007	<1	<2	<2	<2	<2	<2	<1	<5
		12/03/2025	BH145R	ES2507162	*13000*	**78**	<1	835	2600	237	489	19	2970	5800	369	182	188	1.68	835	<1	**1.92**	0.01	<0.01	0.01	**2.2**	2.2	-	<0.01	**0.08**	0.002	<0.0001	<0.001	<0.001	2.18	<0.001	0.098	<0.0001	0.001	0.017	<1	<2	<2	<2	<2	<2	<1	<5

Comments
#1 Not specifically guideline value: >500mg/L can have purgative effects
#2 Guideline value calculated by dividing Nitrate (as Nitrate) value (50 mg/L) by 4.427
#3 Guideline value calculated by dividing Nitrite (as Nitrite) value (0.3 mg/L) by molecular weight (3.2967033).
#4 Calculated from ammonia NH4
#5 Loss of production expected at 5000 mg/L for beef cattle, 4000 mg/L dairy cattle, 10000 mg/L sheep, 6000 mg/L horses and pigs, 3000 mg/L poultry
#6 400 mg/L divided by molecular weight, stock may tolerate higher nitrate concentrations if nitrate in feed are not high, water containing >1500 mg/L (as NO3) is likely to be toxic.
#7 30 mg/L divided by molecular weight
#8 >0.5 mg/L hazardous to sheep, >1 mg/L for cattle, >5 mg/L pigs and poulty
#9 Measured as NH3-N at pH 8
#10 Values taken from "Updating nitrate toxicity effects on freshwater aquatic species, 2013"
#11 In absence of total As guideline, As (V) guideline has been adopted.
#12 In absence of total Cr guideline, Cr (VI) guideline has been adopted.
#13 Not limiting: Derived water HSL exceeds water solubility limit
#14 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#15 Reported Analyte LOR is higher than Requested Analyte LOR

Appendix B
Table B4
Analytical Results for Construction Monitoring Period (August 2022 to March 2025)

					TRH - NEPM 2013							TRH - NEPM 1999					PAHs - standard 16																Phenols - Halogenated							Phenols - Non-Halogenated					
					F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 (Sum of Total)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo[b+j]fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene-PAH	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) Lab Calc	2-Chlorophenol	2,4-Dichlorophenol	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,6-Dichlorophenol	4-Chloro-3-methylphenol	Pentachlorophenol	Phenol	2-Nitrophenol	2-Methylphenol (o-Cresol)	3,4-Methylphenol (m,p-cresol)	2,4-Dimethylphenol
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL					20	20	100	100	100	100	100	20	50	100	50	50	1	1	1	1	0.5	1	1	1	1	1	1	1	1	1	1	1	0.5	0.5	1	1	1	1	1	1	2	1	1	1	2	1
ADWG 2011 Health (v3.7 updated 2022)																					0.01												0.01		300	200		20			10					
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																																													
ANZECC 2000 - Stock Watering																																													
ANZG (2018) - FW - 95% (updated 26 July 2021)																			0.4		0.2						1.4			16	2				490	160		20			10	320				
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																													
>=2m, <4m					6000[#14]		NL[#13]																							NL[#13]																	
>=4m, <8m					6000		NL[#13]																							NL[#13]																	
>=8m					7000		NL[#13]																							NL[#13]																	
Package	**Location**	**Date**	**Field ID**	**Lab Report**																																										
M12 - West	BH104	15/08/2022	BH104	ES2229015	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2229015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		19/09/2022	BH104	ES2233729	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2233729	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20/10/2022	BH104	ES2237811	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		16/11/2022	BH104	ES2241428	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2241428	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH104R	16/12/2022	BH104R	ES2245760	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	951385	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18/01/2023	BH104R	ES2301690	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2301690	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	957071	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08/02/2023	BH104R	ES2304063	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2304063	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	962102	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		03/03/2023	BH104R	ES2307153	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2307153	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		04/04/2023	BH104R	ES2311426	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2311426	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		02/05/2023	BH104R	ES2314383	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2314383	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07/06/2023	BH104R	ES2319027	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	997826	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07/07/2023	BH104R	ES2322790	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1006932	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09/08/2023	BH104R	ES2326796	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2326796	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		05/09/2023	BH104R	ES2330598	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1024024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		06/10/2023	BH104R	ES2334429	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08/11/2023	BH104R	ES2338893-AF	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		06/12/2023	BH104R	ES2342531	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		19/01/2024	BH104R	ES2401985	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<2.0	<1.0
			GWDUP2	1061811	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13/02/2024	BH104R	ES2404914	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15/03/2024	BH104R	ES2408629	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1079293	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11/04/2024	BH104R	ES2411734	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15/05/2024	BH104R	ES2415903	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2415903	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12/06/2024	BH104R	ES2419514	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11/07/2024	BH104R	ES2422922	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2422922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		06/08/2024	BH104R	ES2425825	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1127260	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12/09/2024	BH104R	ES2429962	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1139072	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09/10/2024	BH104R	ES2433147	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10/10/2024	GWDUP1	ES2433147	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		06/11/2024	GWDUP2	1158219	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07/11/2024	BH104R	ES2436306	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12/12/2024	BH104R	ES2440696	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1171608	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		23/01/2025	BH104R	ES2501516	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18/02/2025	BH104R	ES2504804	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11/03/2025	BH104R	ES2507162	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<2.0	<1.0
			GWDUP1	ES2507162	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1197874	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH107	15/08/2022	BH107	ES2229015	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		19/09/2022	BH107	ES2233729	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20/10/2022	BH107	ES2237811	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	934854	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		16/11/2022	BH107	ES2241428	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	941927	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix B
Table B4
Analytical Results for Construction Monitoring Period (August 2022 to March 2025)

					TRH - NEPM 2013							TRH - NEPM 1999					PAHs - standard 16																Phenols - Halogenated							Phenols - Non-Halogenated					
					F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 (Sum of Total)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo[b+j]fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene-PAH	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) Lab Calc	2-Chlorophenol	2,4-Dichlorophenol	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,6-Dichlorophenol	4-Chloro-3-methylphenol	Pentachlorophenol	Phenol	2-Nitrophenol	2-Methylphenol (o-Cresol)	3,4-Methylphenol (m,p-cresol)	2,4-Dimethylphenol
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL					20	20	100	100	100	100	100	20	50	100	50	50	1	1	1	1	0.5	1	1	1	1	1	1	1	1	1	1	1	0.5	0.5	1	1	1	1	1	1	2	1	1	1	2	1
ADWG 2011 Health (v3.7 updated 2022)																					0.01												0.01		300	200		20			10					
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																																													
ANZECC 2000 - Stock Watering																																													
ANZG (2018) - FW - 95% (updated 26 July 2021)																			0.4		0.2						1.4			16	2				490	160		20			10	320				
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																													
>=2m, <4m					6000[#14]		NL[#13]																							NL[#13]																
>=4m, <8m					6000		NL[#13]																							NL[#13]																
>=8m					7000		NL[#13]																							NL[#13]																
Package	**Location**	**Date**	**Field ID**	**Lab Report**																																									
M12 - West	BH107R	16/12/2022	BH107R	ES2245760	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2245760	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08/02/2023	BH107R	ES2304063	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		03/03/2023	BH107R	ES2307153	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	969408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		04/04/2023	BH107R	ES2311426	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		05/04/2023	GWDUP2	979752	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		02/05/2023	BH107R	ES2314383	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	986190	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07/07/2023	BH107R	ES2322790	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2322790	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09/08/2023	BH107R	ES2326796	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1015966	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		05/09/2023	BH107R	ES2330598	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2330598	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		06/10/2023	BH107R	ES2334429	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1033274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08/11/2023	BH107R	ES2338893-AF	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1043528	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		06/12/2023	BH107R	ES2342531	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1052387	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		19/01/2024	BH107R	ES2401985	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<2.0	<1.0
		13/02/2024	BH107R	ES2404914	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1069861	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15/03/2024	BH107R	ES2408629	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11/04/2024	BH107R	ES2411734	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1087440	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15/05/2024	BH107R	ES2415903	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		16/05/2024	GWDUP2	1099024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12/06/2024	BH107R	ES2419514	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11/07/2024	BH107R	ES2422922	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1117977	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		06/08/2024	BH107R	ES2425825	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2425825	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12/09/2024	BH107R	ES2429962	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09/10/2024	BH107R	ES2433147	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10/10/2024	GWDUP2	1148295	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07/11/2024	BH107R	ES2436306	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12/12/2024	BH107R	ES2440696	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		23/01/2025	BH107R	ES2501516	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18/02/2025	BH107R	ES2504804	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11/03/2025	BH107R	ES2507162	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<2.0	<1.0
	BH112	15/08/2022	BH112	ES2229015	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	915049	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		19/09/2022	BH112	ES2233729	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	925349	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20/10/2022	BH112	ES2237811	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2237811	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		16/11/2022	BH112	ES2241428	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH112R	09/08/2023	BH112R	ES2326796	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		05/09/2023	BH112R	ES2330598	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		06/10/2023	BH112R	ES2334429	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2334429	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		08/11/2023	BH112R	ES2338893-AF	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2338893-AF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		06/12/2023	BH112R	ES2342531	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		19/01/2024	BH112R	ES2401985	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<2.0	<1.0
		13/02/2024	BH112R	ES2404914	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2404914	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15/03/2024	BH112R	ES2408629	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11/04/2024	BH112R	ES2411734	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2411734	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15/05/2024	BH112R	ES2415903	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12/06/2024	BH112R	ES2419514	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1109038	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11/07/2024	BH112R	ES2422922	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		06/08/2024	BH112R	ES2425825	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12/09/2024	BH112R	ES2429962	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09/10/2024	BH112R	ES2433147	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		06/11/2024	BH112R	ES2436306	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2436306	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12/12/2024	BH112R	ES2440696	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		23/01/2025	BH112R	ES2501516	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18/02/2025	BH112R	ES2504804	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11/03/2025	BH112R	ES2507162	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<2.0	<1.0

Appendix B
Table B4
Analytical Results for Construction Monitoring Period (August 2022 to March 2025)

						TRH - NEPM 2013							TRH - NEPM 1999					PAHs - standard 16																				Phenols - Halogenated							Phenols - Non-Halogenated					
						F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 (Sum of Total)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo[b+j]fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene-PAH	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) Lab Calc	2-Chlorophenol	2,4-Dichlorophenol	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,6-Dichlorophenol	4-Chloro-3-methylphenol	Pentachlorophenol	Phenol	2-Nitrophenol	2-Methylphenol (o-Cresol)	3,4-Methylphenol (m,p-cresol)	2,4-Dimethylphenol
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						20	20	100	100	100	100	100	20	50	100	50	50	1	1	1	1	0.5	1	1	1	1	1	1	1	1	1	1	1	0.5	0.5	1	1	1	1	1	1	2	1	1	1	2	1
ADWG 2011 Health (v3.7 updated 2022)																						0.01												0.01		300	200		20			10						
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																																																
ANZECC 2000 - Stock Watering																																																
ANZG (2018) - FW - 95% (updated 26 July 2021)																				0.4		0.2						1.4			16	2				490	160		20			10	320					
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																																
>=2m, <4m						6000[#14]		NL[#13]																							NL[#13]																			
>=4m, <8m						6000		NL[#13]																							NL[#13]																			
>=8m						7000		NL[#13]																							NL[#13]																			
Package	**Location**	**Date**	**Field ID**	**Lab Report**																																													
M12 - Central	BH144	15/11/2022	BH144	ES2241428		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH145	15/08/2022	BH145	ES2229015		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		19/09/2022	BH145	ES2233729		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		20/10/2022	BH145	ES2237811		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		15/11/2022	BH145	ES2241428		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		14/12/2022	BH145	ES2245760		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		17/01/2023	BH145	ES2301690		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07/02/2023	BH145	ES2304063		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		02/03/2023	BH145	ES2307153		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH145R	05/04/2023	BH145R	ES2311426		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		02/05/2023	BH145R	ES2314383		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		06/06/2023	BH145R	ES2319027		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2319027		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07/07/2023	BH145R	ES2322790		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09/08/2023	BH145R	ES2326796		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		06/09/2023	BH145R	ES2330598		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		06/10/2023	BH145R	ES2334429		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09/11/2023	BH145R	ES2338893-AF		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		05/12/2023	BH145R	ES2342531		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2342531		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		19/01/2024	BH145R	ES2401985		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<2.0	<1.0
			GWDUP1	ES2401985		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		14/02/2024	BH145R	ES2404914		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		14/03/2024	BH145R	ES2408629		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2408629		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12/04/2024	BH145R	ES2411734		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		16/05/2024	BH145R	ES2415903		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		06/06/2024	BH145R	ES2418682		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2418682		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10/07/2024	BH145R	ES2422922		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07/08/2024	BH145R	ES2425825		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11/09/2024	BH145R	ES2429962		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2429962		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		09/10/2024	BH145R	ES2433147		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07/11/2024	BH145R	ES2436306		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11/12/2024	BH145R	ES2440696		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2440696		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		17/01/2025	BH145R	ES2501188		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		19/02/2025	BH145R	ES2504804		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12/03/2025	BH145R	ES2507162		<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<2.0	<1.0

Comments

#1 Not specifically guideline value: >500mg/L can have purgative effects
#2 Guideline value calculated by dividing Nitrate (as Nitrate) value (50 mg/L) b
#3 Guideline value calculated by dividing Nitrite (as Nitrite) value (0.3 mg/L) by
#4 Calculated from ammonia NH4
#5 Loss of production expected at 5000 mg/L for beef cattle, 4000 mg/L dairy c
#6 400 mg/L divided by molecular weight, stock may tolerate higher nitrate co
#7 30 mg/L divided by molecular weight
#8 >0.5 mg/L hazardous to sheep, >1 mg/L for cattle, >5 mg/L pigs and poulty
#9 Measured as NH3-N at pH 8
#10 Values taken from "Updating nitrate toxicity effects on freshwater aquatic
#11 In absence of total As guideline, As (V) guideline has been adopted.
#12 In absence of total Cr guideline, Cr (VI) guideline has been adopted.
#13 Not limiting: Derived water HSL exceeds water solubility limit
#14 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10
#15 Reported Analyte LOR is higher than Requested Analyte LOR

Appendix B
Table B5
Analytical Results for Current Monitoring Period (October 2024 to March 2025)

Transport for NSW
M12 Motorway
M12 Motorway water quality and level monitoring

				Inorganics		Acidity & Alkalinity			Major Ions									Minor Ions		Nutrients									Metals										BTEXN								
				Total Dissolved Solids	Total Suspended Solids	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Hardness as CaCO3 (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)	Chloride	Sulfate (filtered)	Cations Total	Anions Total	Ionic Balance	Bicarbonate ion (HCO3-)	Carbonate ion	Ammonia as N	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)	Kjeldahl Nitrogen Total	Reactive Phosphorus as P	Reactive Phosphorus as P (filtered)	Phosphorus (Total)	Arsenic (filtered)	Cadmium (filtered)	Chromium (III+VI) (filtered)	Copper (filtered)	Iron (filtered)	Lead (filtered)	Manganese (filtered)	Mercury (filtered)	Nickel (filtered)	Zinc (filtered)	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	BTEX (Sum of Total) - Lab Calc	Naphthalene (BTEXN suite)
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				10	5	1	1	1	1	1	1	1	1	1	0.01	0.01	0.01	1	1	0.01	0.01	0.01	0.01	0.1	0.1	0.01	0.01	0.01	0.001	0.0001	0.001	0.001	0.05	0.001	0.001	0.0001	0.001	0.005	1	2	2	2	2	2	1	5
ADWG 2011 Health (v3.7 updated 2022)														500[#1]							11.29[#2]	0.91[#3]						0.01	0.002		2		0.01	0.5	0.001	0.02		1	800	300			600		
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)					**6**															**0.01165**[#4]			**0.04**	**0.35**		**0.008**	**0.008**	**0.025**																		
ANZECC 2000 - Stock Watering				*5000*[#5]					*1000*					*1000*							*90*[#6]	*9.1*[#7]						*0.5*	*0.01*	*1*	*1*[#8]		*0.1*		*0.002*	*1*	*20*								
ANZG (2018) - FW - 95% (updated 26 July 2021)																				0.9[#9]	2.4[#10]								0.013[#11]	0.0002	0.001[#12]	0.0014		0.0034	1.9	0.0006	0.011	0.008	950	180	80	350				16
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sa																																														
>=2m, <4m																																							5000	NL[#13]	NL[#13]			NL[#13]		NL[#13]
>=4m, <8m																																							5000	NL[#13]	NL[#13]			NL[#13]		NL[#13]
>=8m																																							5000	NL[#13]	NL[#13]			NL[#13]		NL[#13]
Package	**Location**	**Date**	**Field ID**	**Lab Report**																																										
M12 - Central	BH145R	09/10/2024	BH145R	ES2433147	*11400*	**66**	<1	1070	2800	231	540	18	3260	6430	337	198	210	2.83	1070	<1	**2.25**	<0.01	<0.01	<0.01	**2.2**	2.2	<0.01	-	**0.04**	0.002	<0.0001	<0.001	<0.001	3.14	<0.001	0.109	<0.0001	<0.001	0.008	<1	<2	<2	<2	<2	<2	<1	<5
		07/11/2024	BH145R	ES2436306	*10200*	**234**	<1	1080	2490	202	483	18	2970	5310	337	179	178	0.31	1080	<1	**1.43**	0.06	<0.01	**0.06**	**2.1**	2.0	<0.01	-	**0.15**	0.004	<0.0001	<0.001	<0.001	2.34	<0.001	0.116	<0.0001	<0.001	0.010	<1	<2	<2	<2	<2	<2	<1	<5
		11/12/2024	BH145R	ES2440696	*12400*	**10**	<1	1020	2680	235	508	17	2960	5610	357	183	186	0.90	1020	<1	**2.06**	0.01	<0.01	0.01	**2.3**	2.3	<0.01	-	**0.04**	0.001	<0.0001	<0.001	<0.001	2.60	<0.001	0.095	<0.0001	0.019	0.019	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2440696	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.0001	<0.001	<0.001	2.82	<0.001	0.092	-	0.017	0.014	-	-	-	-	-	-	-	-
		17/01/2025	BH145R	ES2501188	*11600*	<5	<1	558	2440	185	481	15	2900	5480	371	175	173	0.54	558	<1	**1.96**	0.04	<0.01	**0.04**	**2.0**	2.0	<0.01	-	**0.04**	0.003	<0.0001	<0.001	0.004	<0.05	<0.001	0.102	<0.0001	0.002	0.009	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2501188	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.003	<0.0001	<0.001	0.004	-	<0.001	-	<0.0001	0.003	0.016	-	-	-	-	-	-	-	-
			GWDUP2	1178885	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.004	<0.0002	<0.001	0.005	-	<0.001	-	<0.0001	0.003	0.011	-	-	-	-	-	-	-	-
		19/02/2025	BH145R	ES2504804	*13800*	**39**	<1	1090	2880	217	569	19	3370	6130	370	205	202	0.57	1090	<1	**2.45**	<0.01	<0.01	<0.01	**2.6**	2.6	-	<0.01	**0.07**	0.002	<0.0001	<0.001	<0.001	3.08	<0.001	0.097	<0.0001	<0.001	0.007	<1	<2	<2	<2	<2	<2	<1	<5
		12/03/2025	BH145R	ES2507162	*13000*	**78**	<1	835	2600	237	489	19	2970	5800	369	182	188	1.68	835	<1	**1.92**	0.01	<0.01	0.01	**2.2**	2.2	-	<0.01	**0.08**	0.002	<0.0001	<0.001	<0.001	2.18	<0.001	0.098	<0.0001	0.001	0.017	<1	<2	<2	<2	<2	<2	<1	<5
M12 - West	BH104R	09/10/2024	BH104R	ES2433147	4680	**18**	<1	1100	771	119	115	17	1600	2470	215	85.4	96.1	5.89	1100	<1	**1.92**	<0.01	<0.01	<0.01	**1.9**	1.9	<0.01	-	**0.08**	0.003	<0.0001	<0.001	<0.001	1.44	<0.001	0.082	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
		10/10/2024	GWDUP1	ES2433147	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.003	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	<0.001	<0.005	-	-	-	-	-	-	-	-
		06/11/2024	GWDUP2	1158219	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.003	<0.0002	<0.001	<0.001	-	<0.001	-	<0.0001	<0.001	<0.005	-	-	-	-	-	-	-	-
		07/11/2024	BH104R	ES2436306	4390	**82**	<1	1130	815	112	130	17	1590	1750	189	85.9	75.9	6.18	1130	<1	**1.56**	0.06	<0.01	**0.06**	**2.1**	2.0	**0.01**	-	**0.13**	0.004	<0.0001	<0.001	<0.001	1.28	<0.001	0.092	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
		12/12/2024	BH104R	ES2440696	4620	**66**	<1	1070	722	116	105	16	1500	1920	252	80.1	80.8	0.44	1070	<1	**1.75**	0.02	<0.01	0.02	**2.0**	2.0	<0.01	-	**0.07**	0.003	<0.0001	<0.001	<0.001	1.15	<0.001	0.075	<0.0001	0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP2	1171608	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	<0.0002	<0.001	<0.001	-	<0.001	-	<0.0001	<0.001	<0.005	-	-	-	-	-	-	-	-
		23/01/2025	BH104R	ES2501516	4640	**130**	<1	1060	841	111	137	16	1510	1660	204	82.9	72.2	6.86	1060	<1	**0.64**	0.58	0.18	**0.76**	**1.9**	1.1	**0.01**	-	**0.20**	0.001	<0.0001	<0.001	0.001	<0.05	<0.001	0.051	<0.0001	0.002	0.007	<1	<2	<2	<2	<2	<2	<1	<5
		18/02/2025	BH104R	ES2504804	-	-	<1	1140	704	94	114	17	1650	1910	232	86.3	81.5	2.86	1140	<1	**1.80**	<0.01	0.02	0.02	**2.3**	2.3	-	<0.01	**0.06**	0.002	<0.0001	<0.001	<0.001	0.96	<0.001	0.066	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2504804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.003	0.0001	<0.001	0.001	-	<0.001	-	<0.0001	0.001	<0.005	-	-	-	-	-	-	-	-
			GWDUP2	1190687	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	<0.0002	<0.001	<0.001	-	<0.001	-	<0.0001	<0.001	0.006	-	-	-	-	-	-	-	-
		11/03/2025	BH104R	ES2507162	4550	**37**	<1	1030	842	123	130	17	1410	2140	230	78.6	85.7	4.34	1030	<1	**1.10**	0.14	<0.01	**0.14**	**1.3**	1.2	-	<0.01	**0.10**	0.002	<0.0001	<0.001	<0.001	0.64	<0.001	0.055	<0.0001	0.001	0.006	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2507162	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	<0.0001	<0.001	<0.001	-	<0.001	-	<0.0001	<0.001	<0.005	-	-	-	-	-	-	-	-
			GWDUP2	1197874	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	<0.0002	<0.001	<0.001	-	<0.001	-	<0.0001	<0.001	<0.005	-	-	-	-	-	-	-	-
	BH107R	09/10/2024	BH107R	ES2433147	2140	**20**	<1	1540	507	38	100	15	745	327	184	42.9	43.8	1.05	1540	<1	**0.04**	2.43	<0.01	**2.43**	**2.8**	0.4	<0.01	-	**0.03**	<0.001	<0.0001	<0.001	<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
		10/10/2024	GWDUP2	1148295	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.0002	<0.001	0.002	-	<0.001	-	<0.0001	<0.001	0.007	-	-	-	-	-	-	-	-
		07/11/2024	BH107R	ES2436306	1930	**145**	<1	1490	548	38	110	14	688	248	170	41.2	40.3	1.14	1490	<1	<0.01	2.77	<0.01	**2.77**	**3.5**	0.7	**0.01**	-	**0.07**	<0.001	<0.0001	<0.001	<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	0.006	<1	<2	<2	<2	<2	<2	<1	<5
		12/12/2024	BH107R	ES2440696	2130	**49**	<1	1460	421	40	78	14	739	328	468	40.9	48.2	8.14	1420	43	**0.05**	2.26	<0.01	**2.26**	**2.7**	0.4	<0.01	-	**0.03**	<0.001	<0.0001	<0.001	0.003	<0.05	<0.001	0.023	<0.0001	0.003	0.010	<1	<2	<2	<2	<2	<2	<1	<5
		23/01/2025	BH107R	ES2501516	2260	**30**	<1	1440	514	36	103	14	691	258	204	40.7	40.3	0.48	1440	<1	<0.01	2.50	<0.01	**2.50**	**3.1**	0.6	<0.01	-	**0.04**	<0.001	<0.0001	<0.001	0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.005	<1	<2	<2	<2	<2	<2	<1	<5
		18/02/2025	BH107R	ES2504804	2510	<5	<1	1570	542	39	108	15	757	339	232	44.1	45.8	1.80	1570	<1	**0.05**	2.11	<0.01	**2.11**	**2.5**	0.4	-	<0.01	0.01	<0.001	<0.0001	<0.001	0.002	<0.05	<0.001	0.004	<0.0001	0.001	0.008	<1	<2	<2	<2	<2	<2	<1	<5
		11/03/2025	BH107R	ES2507162	2030	**127**	<1	1400	467	37	91	14	597	273	223	35.7	40.3	6.12	1400	<1	**0.02**	2.68	<0.01	**2.68**	**3.2**	0.5	-	<0.01	**0.13**	<0.001	<0.0001	<0.001	0.002	<0.05	<0.001	0.002	<0.0001	0.001	0.010	<1	<2	<2	<2	<2	<2	<1	<5
	BH112R	09/10/2024	BH112R	ES2433147	*10200*	**20**	<1	1340	2320	245	416	42	3040	4670	*1510*	180	190	2.75	1340	<1	**2.37**	0.35	0.03	**0.38**	**2.7**	2.3	**0.03**	-	**0.06**	0.002	<0.0001	<0.001	<0.001	<0.05	<0.001	0.076	<0.0001	0.004	0.010	<1	<2	<2	<2	<2	<2	<1	<5
		06/11/2024	BH112R	ES2436306	*9750*	**84**	<1	1340	2430	256	434	45	3140	4230	*1660*	186	181	1.52	1340	<1	**2.10**	0.16	0.32	**0.48**	**2.9**	2.4	**0.03**	-	**0.14**	0.002	<0.0001	<0.001	0.004	<0.05	<0.001	0.084	<0.0001	0.004	0.017	<1	<2	<2	<2	<2	<2	<1	<5
			GWDUP1	ES2436306	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.003	<0.0001	<0.001	0.005	-	<0.001	-	<0.0001	0.004	0.016	-	-	-	-	-	-	-	-
		12/12/2024	BH112R	ES2440696	*10400*	<5	<1	1250	2230	255	388	41	2790	4390	*1560*	167	181	4.08	1250	<1	**2.02**	0.42	0.05	**0.47**	**2.8**	2.3	**0.03**	-	**0.10**	0.002	<0.0001	<0.001	0.004	<0.05	<0.001	0.082	<0.0001	0.030	0.019	<1	<2	<2	<2	<2	<2	<1	<5
		23/01/2025	BH112R	ES2501516	*10600*	**241**	<1	1280	2340	252	416	42	3020	3930	*1790*	179	174	1.57	1280	<1	**1.96**	0.37	0.19	**0.56**	**4.1**	3.5	**0.03**	-	**0.53**	0.001	<0.0001	<0.001	<0.001	<0.05	<0.001	0.081	<0.0001	0.005	0.013	<1	<2	<2	<2	<2	<2	<1	<5
		18/02/2025	BH112R	ES2504804	*11200*	<5	<1	1340	2330	216	434	42	3130	4390	*1750*	184	187	0.90	1340	<1	**2.16**	0.44	0.06	**0.50**	**3.0**	2.5	-	**0.02**	**0.08**	0.001	<0.0001	<0.001	0.001	<0.05	<0.001	0.084	<0.0001	0.004	0.011	<1	<2	<2	<2	<2	<2	<1	<5
		11/03/2025	BH112R	ES2507162	*10200*	**993**	<1	1030	2190	254	377	44	2820	4320	*1930*	167	183	4.32	1030	<1	**2.24**	0.11	0.26	**0.37**	**4.0**	3.6	-	**0.02**	**1.14**	0.003	<0.0001	<0.001	<0.001	<0.05	<0.001	0.091	<0.0001	0.006	0.005	<1	<2	<2	<2	<2	<2	<1	<5

Comments
#1 Not specifically guideline value: >500mg/L can have purgative effects
#2 Guideline value calculated by dividing Nitrate (as Nitrate) value (50 mg/L) by 4.427
#3 Guideline value calculated by dividing Nitrite (as Nitrite) value (0.3 mg/L) by molecular weight (3.2967033).
#4 Calculated from ammonia NH4
#5 Loss of production expected at 5000 mg/L for beef cattle, 4000 mg/L dairy cattle, 10000 mg/L sheep, 6000 mg/L horses and pigs, 3000 mg/L poultry
#6 400 mg/L divided by molecular weight, stock may tolerate higher nitrate concentrations if nitrate in feed are not high, water containing >1500 mg/L (as NO3) is likely to be toxic.
#7 30 mg/L divided by molecular weight
#8 >0.5 mg/L hazardous to sheep, >1 mg/L for cattle, >5 mg/L pigs and poulty
#9 Measured as NH3-N at pH 8
#10 Values taken from "Updating nitrate toxicity effects on freshwater aquatic species, 2013"
#11 In absence of total As guideline, As (V) guideline has been adopted.
#12 In absence of total Cr guideline, Cr (VI) guideline has been adopted.
#13 Not limiting: Derived water HSL exceeds water solubility limit
#14 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

Appendix B
Table B5
Analytical Results for Current Monitoring Period (October 2024 to March 2025)

					TRH - NEPM 2013							TRH - NEPM 1999				
Package	Location	Date	Field ID	Lab Report	F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 (Sum of Total)
					μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L
EQL					20	20	100	100	100	100	100	20	50	100	50	50
ADWG 2011 Health (v3.7 updated 2022)																
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																
ANZECC 2000 - Stock Watering																
ANZG (2018) - FW - 95% (updated 26 July 2021)																
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sa																
>=2m, <4m					6000#14		NL#13									
>=4m, <8m					6000		NL#13									
>=8m					7000		NL#13									
M12 - Central	BH145R	09/10/2024	BH145R	ES2433147	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
		07/11/2024	BH145R	ES2436306	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
		11/12/2024	BH145R	ES2440696	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
			GWDUP1	ES2440696	-	-	-	-	-	-	-	-	-	-	-	-
		17/01/2025	BH145R	ES2501188	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
			GWDUP1	ES2501188	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1178885	-	-	-	-	-	-	-	-	-	-	-	-
		19/02/2025	BH145R	ES2504804	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
		12/03/2025	BH145R	ES2507162	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
M12 - West	BH104R	09/10/2024	BH104R	ES2433147	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
		10/10/2024	GWDUP1	ES2433147	-	-	-	-	-	-	-	-	-	-	-	-
		06/11/2024	GWDUP2	1158219	-	-	-	-	-	-	-	-	-	-	-	-
		07/11/2024	BH104R	ES2436306	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
		12/12/2024	BH104R	ES2440696	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
			GWDUP2	1171608	-	-	-	-	-	-	-	-	-	-	-	-
		23/01/2025	BH104R	ES2501516	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
		18/02/2025	BH104R	ES2504804	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
			GWDUP1	ES2504804	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1190687	-	-	-	-	-	-	-	-	-	-	-	-
		11/03/2025	BH104R	ES2507162	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
			GWDUP1	ES2507162	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1197874	-	-	-	-	-	-	-	-	-	-	-	-
	BH107R	09/10/2024	BH107R	ES2433147	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
		10/10/2024	GWDUP2	1148295	-	-	-	-	-	-	-	-	-	-	-	-
		07/11/2024	BH107R	ES2436306	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
		12/12/2024	BH107R	ES2440696	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
		23/01/2025	BH107R	ES2501516	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
		18/02/2025	BH107R	ES2504804	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
		11/03/2025	BH107R	ES2507162	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
	BH112R	09/10/2024	BH112R	ES2433147	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
		06/11/2024	BH112R	ES2436306	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
			GWDUP1	ES2436306	-	-	-	-	-	-	-	-	-	-	-	-
		12/12/2024	BH112R	ES2440696	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
		23/01/2025	BH112R	ES2501516	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
		18/02/2025	BH112R	ES2504804	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
		11/03/2025	BH112R	ES2507162	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50

					PAHs - standard 16																	
Package	Location	Date	Field ID	Lab Report	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo[b+j]fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene-PAH	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc
					μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L
EQL					1	1	1	1	0.5	1	1	1	1	1	1	1	1	1	1	1	0.5	0.5
ADWG 2011 Health (v3.7 updated 2022)									0.01												0.01	
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																						
ANZECC 2000 - Stock Watering																						
ANZG (2018) - FW - 95% (updated 26 July 2021)							0.4		0.2						1.4			16	2			
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sa																						
>=2m, <4m																		NL#13				
>=4m, <8m																		NL#13				
>=8m																		NL#13				
M12 - Central	BH145R	09/10/2024	BH145R	ES2433147	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07/11/2024	BH145R	ES2436306	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11/12/2024	BH145R	ES2440696	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2440696	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		17/01/2025	BH145R	ES2501188	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2501188	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1178885	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		19/02/2025	BH145R	ES2504804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12/03/2025	BH145R	ES2507162	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5
M12 - West	BH104R	09/10/2024	BH104R	ES2433147	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10/10/2024	GWDUP1	ES2433147	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		06/11/2024	GWDUP2	1158219	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07/11/2024	BH104R	ES2436306	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12/12/2024	BH104R	ES2440696	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1171608	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		23/01/2025	BH104R	ES2501516	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18/02/2025	BH104R	ES2504804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2504804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1190687	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11/03/2025	BH104R	ES2507162	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5
			GWDUP1	ES2507162	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1197874	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH107R	09/10/2024	BH107R	ES2433147	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10/10/2024	GWDUP2	1148295	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		07/11/2024	BH107R	ES2436306	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12/12/2024	BH107R	ES2440696	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		23/01/2025	BH107R	ES2501516	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18/02/2025	BH107R	ES2504804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11/03/2025	BH107R	ES2507162	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5
	BH112R	09/10/2024	BH112R	ES2433147	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		06/11/2024	BH112R	ES2436306	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2436306	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		12/12/2024	BH112R	ES2440696	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		23/01/2025	BH112R	ES2501516	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18/02/2025	BH112R	ES2504804	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		11/03/2025	BH112R	ES2507162	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5

					Phenols - Halogenated							Phenols - Non-Halogenated				
Package	Location	Date	Field ID	Lab Report	2-Chlorophenol	2,4-Dichlorophenol	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,6-Dichlorophenol	4-Chloro-3-methylphenol	Pentachlorophenol	Phenol	2-Nitrophenol	2-Methylphenol (o-Cresol)	3,4-Methylphenol (m,p-cresol)	2,4-Dimethylphenol
					μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L
EQL					1	1	1	1	1	1	2	1	1	1	2	1
ADWG 2011 Health (v3.7 updated 2022)					300	200		20			10					
ANZECC 2000 - Lowland Rivers (NSW coastal rivers)																
ANZECC 2000 - Stock Watering																
ANZG (2018) - FW - 95% (updated 26 July 2021)					490	160		20			10	320				
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sa																
>=2m, <4m																
>=4m, <8m																
>=8m																
M12 - Central	BH145R	09/10/2024	BH145R	ES2433147	-	-	-	-	-	-	-	-	-	-	-	-
		07/11/2024	BH145R	ES2436306	-	-	-	-	-	-	-	-	-	-	-	-
		11/12/2024	BH145R	ES2440696	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2440696	-	-	-	-	-	-	-	-	-	-	-	-
		17/01/2025	BH145R	ES2501188	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2501188	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1178885	-	-	-	-	-	-	-	-	-	-	-	-
		19/02/2025	BH145R	ES2504804	-	-	-	-	-	-	-	-	-	-	-	-
		12/03/2025	BH145R	ES2507162	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<2.0	<1.0
M12 - West	BH104R	09/10/2024	BH104R	ES2433147	-	-	-	-	-	-	-	-	-	-	-	-
		10/10/2024	GWDUP1	ES2433147	-	-	-	-	-	-	-	-	-	-	-	-
		06/11/2024	GWDUP2	1158219	-	-	-	-	-	-	-	-	-	-	-	-
		07/11/2024	BH104R	ES2436306	-	-	-	-	-	-	-	-	-	-	-	-
		12/12/2024	BH104R	ES2440696	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1171608	-	-	-	-	-	-	-	-	-	-	-	-
		23/01/2025	BH104R	ES2501516	-	-	-	-	-	-	-	-	-	-	-	-
		18/02/2025	BH104R	ES2504804	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2504804	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1190687	-	-	-	-	-	-	-	-	-	-	-	-
		11/03/2025	BH104R	ES2507162	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<2.0	<1.0
			GWDUP1	ES2507162	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP2	1197874	-	-	-	-	-	-	-	-	-	-	-	-
	BH107R	09/10/2024	BH107R	ES2433147	-	-	-	-	-	-	-	-	-	-	-	-
		10/10/2024	GWDUP2	1148295	-	-	-	-	-	-	-	-	-	-	-	-
		07/11/2024	BH107R	ES2436306	-	-	-	-	-	-	-	-	-	-	-	-
		12/12/2024	BH107R	ES2440696	-	-	-	-	-	-	-	-	-	-	-	-
		23/01/2025	BH107R	ES2501516	-	-	-	-	-	-	-	-	-	-	-	-
		18/02/2025	BH107R	ES2504804	-	-	-	-	-	-	-	-	-	-	-	-
		11/03/2025	BH107R	ES2507162	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<2.0	<1.0
	BH112R	09/10/2024	BH112R	ES2433147	-	-	-	-	-	-	-	-	-	-	-	-
		06/11/2024	BH112R	ES2436306	-	-	-	-	-	-	-	-	-	-	-	-
			GWDUP1	ES2436306	-	-	-	-	-	-	-	-	-	-	-	-
		12/12/2024	BH112R	ES2440696	-	-	-	-	-	-	-	-	-	-	-	-
		23/01/2025	BH112R	ES2501516	-	-	-	-	-	-	-	-	-	-	-	-
		18/02/2025	BH112R	ES2504804	-	-	-	-	-	-	-	-	-	-	-	-
		11/03/2025	BH112R	ES2507162	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<2.0	<1.0

Comments

#1 Not specifically guideline value: >500mg/L can have purgative ef
#2 Guideline value calculated by dividing Nitrate (as Nitrate) value (
#3 Guideline value calculated by dividing Nitrite (as Nitrite) value (0.
#4 Calculated from ammonia NH4
#5 Loss of production expected at 5000 mg/L for beef cattle, 4000 m
#6 400 mg/L divided by molecular weight, stock may tolerate higher
#7 30 mg/L divided by molecular weight
#8 >0.5 mg/L hazardous to sheep, >1 mg/L for cattle, >5 mg/L pigs a
#9 Measured as NH3-N at pH 8
#10 Values taken from "Updating nitrate toxicity effects on freshwat
#11 In absence of total As guideline, As (V) guideline has been adop
#12 In absence of total Cr guideline, Cr (VI) guideline has been adop
#13 Not limiting: Derived water HSL exceeds water solubility limit
#14 To obtain F1 subtract the sum of BTEX concentrations from the

Well ID	Sampling Event	Date Measured	SWL (mbTOC)	LNAPL present	Temp (°C)	pH	Electrical Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Redox Potential (mV)	Corrected Redox Potential* (mV)	Comments (sheen, colour, turbidity, sediment, odour)
BH104	Event 4 - July 2019	16/07/2019	9.74	Absent	18.7	6.07	17121	1.13	114.1	319.1	Clear, slight organic sheen
BH104	Event 5 - August 2019	20/08/2019	9.895	Absent	18.9	6.64	16734	1.04	10.04	215.04	Clear, no sheen, no odour
BH104	Event 6 - September 2019	24/09/2019	9.114	Absent	19.3	6.9	16787	2.19	-33	172	Grey-brown, slightly turbid, no sheen, no odour
BH104	Event 7 - October 2019	22/10/2019	10.32	Absent	21.3	7	18174	1.32	-51.4	153.6	Grey, slightly cloudy, no sheen, no odour
BH104	Event 8 - November 2019	07/11/2019	10.25	Absent	20.8	6.22	17997	1.88	47.8	252.8	Grey-brown, turbid, no sheen, no odour
BH104	Event 9 - December 2019	12/12/2019	10.555	Absent	20.1	6.32	17318	1.13	-8.8	196.2	Light grey, slight sheen, no odour
BH104	Event 10 - January 2020	16/01/2020	10.730	Absent	20.1	5.93	17195	1.47	2.6	207.6	Black, cloudy, no sheen, no odour
BH104	Event 11 - February 2020	18/02/2020	10.62	Absent	22.6	5.88	14411	1.01	61.2	266.2	Dark, grey, cloudy, no sheen, no odour
BH104	Event 12 - March 2020	12/03/2020	10.956	Absent	22.1	6.36	8946	1.74	190.6	395.6	Clear, slight organic sheen, no odour
BH104	Event 13 - April 2020	23/04/2020	10.995	Absent	20.3	7.01	12722	1.64	70.5	275.5	Clear, slight organic sheen, no odour
BH104	Event 14 - May 2020	19/05/2020	Not recorded	Absent	-	-	-	-	-	-	No data, grab sample collected
BH104	Event 16 - July 2020	30/07/2020	12.09	Absent	18.8	6.19	11525	0.36	64.8	269.8	Clear, no sheen, no odour
BH104	Event 17 - August 2020	11/08/2020	12.08	Absent	18.4	6.2	4255	1.18	129	334	Clear, no sheen, no odour
BH104	Event 18 - September 2020	10/09/2020	12.420	Absent	20.1	5.99	43.9	3.68	-60.5	144.5	Clear, no sheen, no odour, poor recharge, DO probe malfunction during purging
BH104	Event 19 - October 2020	09/10/2020	12.370	Absent	19.4	6.55	13327	1.40	-90.1	114.9	Clear, no sheen, no odour, poor recharge
BH104	Event 20 - November 2020	13/11/2020	12.400	Absent	20.0	6.23	14403	0.32	-110.5	94.5	Clear, slight organic sheen, no odour, poor recharge
BH104	Event 21 - December 2020	08/12/2020	12.560	Absent	21.0	5.79	15155	11.25	-162.3	42.7	Clearn, no sheen, no odour, poor recharge
BH104	Event 22 - January 2021	14/01/2021	12.740	Absent	20.1	6.26	14179	0.33	-139	66	Clearn, no sheen, no odour, poor recharge
BH104	Event 23 - February 2021	11/02/2021	12.850	Absent	19.9	6.50	14596	0.46	-121.2	83.8	Slightly turbid grey, effluent odour, poor recharge
BH104	Event 24 - March 2021	10/03/2021	12.935	Absent	19.7	6.42	14777	0.38	-121	84	Grey, cloudy, organic odour, no sheen
BH104	Event 25 - April 2021	07/04/2021	11.470	Absent	19.8	6.81	7572	0.58	-46.3	158.7	Dark grey colour
BH104	Event 26 - May 2021	03/05/2021	12.780	Absent	18.4	6.70	12444	1.00	23.4	228.4	Clear, no sheen, no odour, poor recharge
BH104	Event 27 - June 2021	08/06/2021	11.990	Absent	18.2	6.38	12364	7.52	-54.5	150.5	Very dark, black colour, no odour, no sheen, heavy sediment load
BH104	Event 28 - July 2021	07/07/2021	12.400	Absent	18.9	6.20	13097	6.21	-24	181	Clear water with grey tinge, low sediment load, no odour, no sheen, slow purge
BH104	Event 29 - August 2021	13/08/2021	12.430	Absent	18.3	6.21	12451	0.25	45	250	Grey, black tinge, low sediment load, no sheen, no odour, poor recharge, slow flow
BH104	Event 30 - September 2021	01/09/2021	12.450	Absent	19.1	6.64	12683	0.26	-74.3	130.7	Dark grey colour, slightly turbid, no odour, no sheen, poor recharge, slow purge
BH104	Event 31 - October 2021	15/10/2021	12.750	Absent	19.0	6.24	7169	1.02	-70.7	134.3	Black, sooty water. High sediment load, No odour/sheen. Slow recharge
BH104	Event 32 - November 2021	08/11/2021	13.170	Absent	18.4	6.55	12603	0.46	-86.1	118.9	Black, dark grey. High sediment (black silt), no odour/sheen. Good recharge
BH104	Event 33 - December 2021	08/12/2021	14.230	Absent	19.2	6.58	12059	0.21	-81.8	123.2	Clear water, dark grey sediment. No odour/sheen. Slow recharge.
BH104	Event 34 - January 2022	13/01/2022	12.720	Absent	19.4	6.71	11439	12.33	-103.3	101.7	Black, turbid water. Very dark grey sediment. No odour/sheen
BH104	Event 35 - February 2022	10/02/2022	13.900	Absent	19.2	6.64	7550	0.25	-112.6	92.4	Black/dark grey, high turbidity. No odour/sheen.
BH104	Event 36 - March 2022	18/03/2022	12.270	Absent	19	6.95	7451	1.15	-132.6	72.4	Black, no odour/sheen, Good recharge
BH104	Event 38 - May 2022	25/05/2022	12.005	Absent	19.4	6.88	12842	1.97	102.70	307.7	Cloudy, no sheen, no odour, bailer sampled.
BH104	Event 39 - June 2022	27/06/2022	11.55	Absent	18.7	6.47	20281	2.78	189.00	394	Grey tinge, slightly cloudy, no sheen, no odour.
BH104	Event 40 - July 2022	20/07/2022	11.1	Absent	18.5	6.26	23501	1.44	173.60	378.6	Grey/brown, cloudy, non-transparent, no odour, no sheen
BH107	Event 4 - July 2019	18/07/2019	10.705	Absent	-	-	-	-	-	-	No data, grab sample collected
BH107	Event 5 - August 2019	20/08/2019	10.735	Absent	19.7	7.05	8853	1.35	11.7	216.7	Grey, slightly cloudy, no sheen, no odour
BH107	Event 6 - September 2019	24/09/2019	10.754	Absent	18.9	6.85	4102	1.59	88	293	Grey-brown, slightly turbid, no sheen, no odour
BH107	Event 7 - October 2019	22/10/2019	10.755	Absent	20.0	7.08	9226	1.20	23.7	228.7	Grey, slightly turbid, no sheen, no odour
BH107	Event 8 - November 2019	07/11/2019	10.725	Absent	22.7	6.85	9870	1.96	75.9	280.9	Light grey, slightly turbid, no sheen, no odour
BH107	Event 9 - December 2019	12/12/2019	10.795	Absent	21.9	6.89	9387	1.56	7.3	212.3	Light brown, cloudy, no sheen, no odour
BH107	Event 11 - February 2020	20/02/2020	10.836	Absent	22.6	6.84	9375	1.46	32.7	237.7	Grey, slightly cloudy, no sheen, no odour
BH107	Event 13 - April 2020	23/04/2020	10.845	Absent	19.4	6.77	9183	1.18	10.1	215.1	Grey, slightly turbid, no sheen, no odour
BH107	Event 14 - May 2020	21/05/2020	11.182	Absent	18.5	6.77	9247	1.91	172.7	377.7	Turbid, no sheen, no odour
BH107	Event 16 - July 2020	30/07/2020	10.69	Absent	18.8	6.23	7605	0.33	79.1	284.1	Clear, no sheen, no odour
BH107	Event 17 - August 2020	11/08/2020	10.67	Absent	18.6	6.42	9110	1.61	93.1	298.1	Grey, turbid, no sheen, no odour
BH107	Event 18 - September 2020	10/09/2020	10.72	Absent	19.2	6.66	48	2.68	-25.8	179.2	Clear, no sheen, no odour, poor recharge, DO probe malfunction during purging
BH107	Event 19 - October 2020	09/10/2020	10.69	Absent	20.0	6.78	9596	1.24	51.1	256.1	Clear, no sheen, no odour, poor recharge
BH107	Event 21 - December 2020	08/12/2020	10.71	Absent	19.6	6.57	9963	11.15	-170.2	34.8	Clear, no sheen, no odour, poor recharge
BH107	Event 22 - January 2021	14/01/2021	10.710	Absent	22.2	6.70	9349	0.67	-100.1	104.9	Clear, no sheen, no odour, poor recharge
BH107	Event 23 - February 2021	11/02/2021	10.720	Absent	21.0	6.55	9620	0.60	-24.5	180.5	Slight orange tint to clear, poor recharge
BH107	Event 24 - March 2021	10/03/2021	10.770	Absent	19.6	6.80	9607	0.65	-113.2	91.8	Grey, cloudy, organic odour, no sheen
BH107	Event 25 - April 2021	07/04/2021	10.680	Absent	19.7	6.59	6653	0.69	-46.3	158.7	-
BH107	Event 26 - May 2021	03/05/2021	10.63	Absent	20.2	6.91	6651	5.19	125.4	330.4	Light grey colour, fairly clear, no odour, no sheen, slow recharge rate
BH107	Event 27 - June 2021	08/06/2021	9.31	Absent	18.5	6.60	7320	7.62	-53.7	151.3	Very dark, black/grey colour, high sedimet load, no odour or sheen

Well ID	Sampling Event	Date Measured	SWL (mbTOC)	LNAPL present	Temp (°C)	pH	Electrical Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Redox Potential (mV)	Corrected Redox Potential* (mV)	Comments (sheen, colour, turbidity, sediment, odour)
BH107	Event 28 - July 2021	07/07/2021	10.600	Absent	18.8	6.30	7496	6.13	56.7	261.7	Clear water, slight grey tinge, no odour, no sheen, low sediment load, slow purge rate
BH107	Event 29 - August 2021	13/08/2021	10.570	Absent	18.7	6.88	8092	0.72	15.3	220.3	Very dark grey/black water, no odour, no sheen, low sediment load
BH107	Event 30 - September 2021	01/09/2021	10.560	Absent	19.2	6.78	8070	1.30	-18.9	186.1	Very dark grey colour, high sediment load, poor recharge, no odour, no sheen
BH107	Event 31 - October 2021	15/10/2021	10.800	Absent	19.3	6.54	4654	1.37	-87	118	Black water. High sediment load, No odour/sheen. Good recharge
BH107	Event 32 - November 2021	08/11/2021	11.070	Absent	18.4	6.69	7411	0.44	-64.3	140.7	Dark grey. High sediment. No odour/sheen. Good recharge.
BH107	Event 33 - December 2021	08/12/2021	11.060	Absent	19.2	6.70	7582	0.44	-14.2	190.8	Clear, dark grey sediment. Silty. No odour/sheen. Good recharge
BH107	Event 34 - January 2022	13/01/2022	10.090	Absent	20.0	5.98	5555	12.53	25.4	230.4	Micro-purge issues. Grab sample taken.
BH107	Event 35 - February 2022	10/02/2022	11.450	Absent	20.2	6.62	6002	0.34	39.7	244.7	Dark grey. High turbidity. No odour/sheen
BH107	Event 36 - March 2022	18/03/2022	10.160	Absent	18.3	6.98	1549	1.13	-59	146	Black, no odour/sheen, Good recharge. Water became clear after 2L
BH107	Event 38 - May 2022	25/05/2022	9.57	Absent	19.1	7.36	4245	2.12	103.30	308.3	Brown, cloudy, no sheen, no odour, bailer sampled.
BH107	Event 39 - June 2022	27/06/2022	9.655	Absent	18.7	7.2	4524	4.83	105.50	310.5	Brown, cloudy, no sheen, no odour, bailer sampled.
BH107	Event 40 - July 2022	20/07/2022	9.64	Absent	19.1	6.97	4068	3.53	86.40	291.4	Grab sample taken, one set of parameters recorded
BH112	Event 4 - July 2019	18/07/2019	17.57	Absent	-	-	-	-	-	-	No data, grab sample collected
BH112	Event 5 - August 2019	20/08/2019	17.625	Absent	19.7	6.59	10985	1.39	67.6	272.6	Brown, turbid, poor recharge
BH112	Event 6 - September 2019	25/09/2019	17.585	Absent	20.4	6.72	11553	1.79	76.7	281.7	Grey-brown, turbid, no sheen, no odour
BH112	Event 7 - October 2019	22/10/2019	17.582	Absent	19.8	6.49	11726	0.92	64.6	269.6	Brown-grey, turbid, no sheen, no odour, poor recharge
BH112	Event 8 - November 2019	07/11/2019	17.580	Absent	22.3	6.60	12865	1.12	48	253	Light brown, cloudy, no sheen, no odour
BH112	Event 9 - December 2019	12/12/2019	17.58	Absent	20.4	6.33	11883	0.97	74.4	279.4	Grey, cloudy, slight sheen
BH112	Event 11 - February 2020	20/02/2020	17.590	Absent	21.1	6.46	12693	1.42	74	279	Brown, no sheen, no odour
BH112	Event 13 - April 2020	21/04/2020	17.601	Absent	20.0	6.49	12419	1.22	169.6	374.6	Grey-brown, turbid, slight organic sheen, no odour
BH112	Event 14 - May 2020	21/05/2020	17.580	Absent	-	-	-	-	-	-	No data, too much sediment, grab sample collected
BH112	Event 16 - July 2020	30/07/2020	17.550	Absent	18.9	6.20	11966	0.49	70.2	275.2	Brown, turbid, no sheen, no odour, poor recharge
BH112	Event 17 - August 2020	13/08/2020	17.590	Absent	18.9	6.26	12274	0.76	99.3	304.3	Grey, turbid, no sheen, no odour, poor recharge
BH112	Event 18 - September 2020	10/09/2020	17.590	Absent	18.9	6.44	38.1	2.01	42.1	247.1	Clear, no sheen, no odour, poor recharge, DO probe malfunction during purging
BH112	Event 19 - October 2020	09/10/2020	17.590	Absent	19.9	6.46	12521	1.45	85.9	290.9	Low sediment load, no sheen, no odour, poor recharge
BH112	Event 21 - December 2020	08/12/2020	17.580	Absent	19.7	6.25	12848	10.74	67.5	272.5	Clear, no sheen, no odour, poor recharge
BH112	Event 22 - January 2021	14/01/2021	17.580	Absent	22.1	6.54	12760	0.49	36.2	241.2	Slightly turbid brown, no sheen, no odour, poor recharge
BH112	Event 23 - February 2021	11/02/2021	17.800	Absent	21.7	6.52	13061	1.08	60.4	265.4	Turbid brown, no sheen, no odour, poor recharge
BH112	Event 24 - March 2021	10/03/2021	17.590	Absent	19.6	6.66	12724	0.54	17.1	222.1	Grey, some sediment, no sheen, no odour
BH112	Event 25 - April 2021	07/04/2021	17.050	Absent	19.9	6.77	4873	0.22	111.8	316.8	light grey tinge
BH112	Event 26 - May 2021	03/05/2021	17.390	Absent	18.0	6.58	8682	1.69	36.7	241.7	brown murky tinge, no odour, no sheen, low sediment load
BH112	Event 27 - June 2021	08/06/2021	17.500	Absent	18.8	6.57	7550	7.58	-17.6	187.4	light grey colour, no odour, no sheen, high sediment load, slow recharge, slow flow
BH112	Event 28 - July 2021	07/07/2021	17.560	Absent	19.3	7.10	8444	5.45	-2.5	202.5	very turbid, brown murky water, no odour, no sheen, slow purge rate, good recharge
BH112	Event 29 - August 2021	13/08/2021	17.590	Absent	18.7	6.52	8007	0.32	444	649	Dark grey/black colour, no odour, no sheen, low sediment load
BH112	Event 30 - September 2021	01/09/2021	17.600	Absent	19.4	6.67	9130	0.72	21	226	Very turbid, brown water, high sediment load, no odour, no sheen, poor recharge
BH112	Event 31 - October 2021	15/10/2021	17.590	Absent	19.3	6.67	9145	0.50	24	229	Very turbid brown/black water. High sediment load. No odour/sheen. Poor recharge
BH112	Event 32 - November 2021	08/11/2021	18.290	Absent	18.4	6.56	9513	0.57	-20.7	184.3	Silty brown colour, High sediment, No odour/sheen
BH112	Event 33 - December 2021	08/12/2021	18.650	Absent	19.4	6.31	9961	1.50	20.7	225.7	Dark sediment. Very silty. No odour/sheen. Poor recharge
BH112	Event 34 - January 2022	13/01/2022	19.090	Absent	19.8	6.55	9987	12.32	6.7	211.7	Light grey. No odour/sheen. Poor recharge
BH112	Event 35 - February 2022	10/02/2022	18.540	Absent	20.6	6.48	10728	1.78	72	277	Light brown. Moderate turbidity. No odour/sheen
BH112	Event 36 - March 2022	18/03/2022	16.090	Absent	18.6	7.00	4150	1.05	31	236	Grey, no odour/sheen, water became clear after 2.5L
BH112	Event 38 - May 2022	25/05/2022	15.235	Absent	19.8	7.1	3233	1.91	98.10	303.1	Brown, cloudy, some sediemnt, no sheen, no odour, bailer sampled
BH112	Event 39 - June 2022	27/06/2022	15.005	Absent	18.7	7.01	3190	5.88	104.30	309.3	Brown, cloudy, no sheen, no odour, bailer sampled.
BH112	Event 40 - July 2022	20/07/2022	13.97	Absent	19.4	6.89	3921	4.30	94.90	299.9	Grab sample taken, one set of parameters recorded. Pale yellow, no odour, no sheen
BH145	Event 3 - June 2019	13/06/2019	16.350	Absent	17.2	6.7	7307	1.23	165	370	Grey-brown, cloudy, no sheen, no odour, poor recharge
BH145	Event 4 - July 2019	17/07/2019	18.250	Absent	-	-	-	-	-	-	No data, grab sample collected
BH145	Event 5 - August 2019	21/08/2019	18.270	Absent	-	-	-	-	-	-	No data, grab sample collected
BH145	Event 6 - September 2019	26/09/2019	18.317	Absent	-	-	-	-	-	-	No data, grab sample collected
BH145	Event 7 - October 2019	23/10/2019	Not recorded	Absent	20.6	7.09	5334.4	2.94	129.5	334.5	Not recorded
BH145	Event 8 - November 2019	08/11/2019	18.587	Absent	-	-	-	-	-	-	Bailer lost, no sample or data collected
BH145	Event 9 - December 2019	12/12/2019	18.715	Absent	-	-	-	-	-	-	No data, grab sample collected
BH145	Event 14 - May 2020	21/05/2020	16.54	Absent	17.5	6.28	5045	1.15	203.4	408.4	Slightly turbid, no sheen, no odour
BH145	Event 16 - July 2020	30/07/2020	13.93	Absent	16.5	5.57	3145	0.26	179.1	384.1	Brown, turbid, no sheen, no odour, poor recharge

Well ID	Sampling Event	Date Measured	SWL (mbTOC)	LNAPL present	Temp (°C)	pH	Electrical Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Redox Potential (mV)	Corrected Redox Potential* (mV)	Comments (sheen, colour, turbidity, sediment, odour)
BH145	Event 17 - August 2020	13/08/2020	16.42	Absent	17.1	6.03	4669	1.26	65.7	270.7	Clear, no sheen, no odour, poor and insufficient recharge - grab sample taken
BH145	Event 18 - September 2020	09/09/2020	17.7	Absent	18.8	6.29	3802	0.11	-46.3	158.7	Brown, turbid, no sheen, no odour, poor recharge, DO probe malfunction
BH145	Event 19 - October 2020	08/10/2020	18.96	Absent	19.8	6.46	7948	1.38	80.9	285.9	Brown, turbid, high sediment load, no sheen, no odour, poor recharge
BH145	Event 20 - November 2020	11/11/2020	14.51	Absent	18.9	6.09	2913	0.33	-19.2	185.8	Brown, tubrid, no sheen, no odour, poor recharge
BH145	Event 21 - December 2020	09/12/2020	16.625	Absent	19.8	6.16	3612	0.59	-50.7	154.3	Turbid brown, no sheen, no odour, poor recharge
BH145	Event 22 - January 2021	12/01/2021	18.015	Absent	-	-	-	-	-	-	No data, grab sample collected
BH145	Event 23 - February 2021	09/02/2021	18.21	Absent	-	-	-	-	-	-	No data, grab sample collected
BH145	Event 24 - March 2021	10/03/2021	18.43	Absent	20.1	6.6	6075	0.81	59.3	264.3	Brown, cloudy, some sediemnt, no sheen, no odour
BH145	Event 25 - April 2021	07/04/2021	17.595	Absent	18.6	6.23	3740	0.69	3.7	208.7	Dark brown, turbid
BH145	Event 26 - May 2021	03/05/2021	19.85	Absent	-	-	-	-	-	-	Unable to purge, well was dry, no water coming up due to low SWL
BH145	Event 27 - June 2021	08/06/2021	19.49	Absent	-	-	-	-	-	-	Bailer used for grab sample, less than 1m of water available, very muddy. No data recorded. Half set of samples.
BH145	Event 28 - July 2021	07/07/2021	19.41	Absent	-	-	-	-	-	-	Bailer used for grab sample, less than 1m of water available. No data recorded
BH145	Event 29 - August 2021	13/08/2021	-	-	-	-	-	-	-	-	not sampled
BH145	Event 30 - September 2021	01/09/2021	19.17	Absent	-	-	-	-	-	-	not enough water to purge, took grab sample.
BH145	Event 31 - October 2021	15/10/2021	19.47	Absent	-	-	-	-	-	-	Bailer used for grab sample. No data recorded
BH145	Event 32 - November 2021	08/11/2021	19.32	Absent	-	-	-	-	-	-	Bailer used for grab sample. No data recorded
BH145	Event 33 - December 2021	08/12/2021	19.19	Absent	-	-	-	-	-	-	Bailer used for grab sample. No data recorded
BH145	Event 34 - January 2022	13/01/2022	19.1	Absent	-	-	-	-	-	-	Bailer used for grab sample. No data recorded
BH145	Event 35 - February 2022	10/02/2022	19.17	Absent	-	-	-	-	-	-	Bailer used for grab sample. No data recorded
BH145	Event 36 - March 2022	18/03/2022	18.63	Absent	-	-	-	-	-	-	Bailer used for grab sample. No data recorded
BH145	Event 38 - May 2022	25/05/2022	18.655	Absent	15.8	6.03	4587	0.62	125.60	330.6	Cloudy, no sheen, no odour, bailer sampled.
BH145	Event 39 - June 2022	27/06/2022	19.065	Absent	-	-	-	-	-	-	No data, grab sample collected
BH145	Event 40 - July 2022	20/07/2022	18.402	Absent	15.4	6.1	2978	4.90	101.80	306.8	Grab sample taken, one set of parameters recorded. Pale yellow, no odour, no sheen

*Corrected for standard hydrogen electrode (SHE) by adding 205 mV to YSI redox potential reading

Well ID	Sampling Event	Date Measured	SWL (mbTOC)	LNAPL present	Temp (°C)	pH	Electrical Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Redox Potential (mV)	Corrected Redox Potential* (mV)	Comments (sheen, colour, turbidity, sediment, odour)
BH104	Event 41 - August 2022	15/08/2022	10.800	Absent	18.6	6.11	21707	3.00	176.10	381.1	Slightly grey, slightly turbid, no odour/sheen
BH104	Event 42 - September 2022	19/09/2022	10.770	Absent	19.5	6.8	21616	1.20	148.00	353	Clear, no odour/sheen
BH104	Event 43 - October 2022	20/10/2022	10.480	Absent	18.9	6.5	20836	0.80	165.70	370.7	Clear, no sediment, no odour/sheen. Slight pale yellow tinge, no sediment, clear, no odour/sheen.
BH104	Event 44 - November 2022	16/11/2022	10.140	Absent	18.3	6.6	32098	0.52	152.10	357.1	Clear, no odour/sheen.
BH104R	Event 45 - December 2022	16/12/2022	8.310	Absent	18.6	6.98	6344	0.82	-73.70	131.3	Grey-brown, very cloudy, no sediment, no odour/sheen.
BH104R	Event 46 - January 2023	18/01/2023	8.618	Absent	19.40	6.74	5687	0.09	-74.90	130.1	Clear, no sediment, no odour/sheen.
BH104R	Event 47 - February 2023	08/02/2023	8.795	Absent	19.3	6.76	7700	0.75	-80.20	124.8	Grey, cloudy, no odour or sheen.
BH104R	Event 48 - March 2023	03/03/2023	9.300	Absent	19.5	6.79	6017	0.74	-30.10	174.9	Grey, cloudy, no odour or sheen.
BH104R	Event 49 - April 2023	04/04/2023	9.367	Absent	19.5	6.89	5049	0.13	19.50	224.5	Yellow tinge, cloudy, no odour/sheen.
BH104R	Event 50 - May 2023	02/05/2023	9.440	Absent	18.8	6.52	8072	3.10	-7.00	198	Mostly clear, no sediment, slight organic odour, no sheen. Good recharge.
BH104R	Event 51 - June 2023	07/06/2023	9.850	Absent	20.1	6.84	9508	5.20	32.20	237.2	Clear, no odour, no sediment, no sheen.
BH104R	Event 52 - July 2023	05/07/2023	10.330	Absent	18.9	6.80	8110	0.11	38.40	243.4	Clear, no odour, no sheen, no sediment.
BH104R	Event 53 - August 2023	09/08/2023	11.570	Absent	18.3	7.15	8154	9.39	10.40	215.4	Mostly clear, no sediment, no odour, no sheen. Good recharge.
BH104R	Event 54 - September 2023	05/09/2023	11.563	Absent	19.1	6.81	8350	2.81	-28.80	176.2	Light brown tinge, mostly clear, no odour or sheen.
BH104R	Event 55 - October 2023	06/10/2023	11.790	Absent	19.4	6.66	7707	0.00	-33.50	171.5	Clear, no odour or sheen.
BH104R	Event 56 - November 2023	08/11/2023	11.620	Absent	19.6	6.68	9152	0.12	7.00	212	Mostly clear, pale yellow tinge, no odour, no sheen, sediment.
BH104R	Event 57 - December 2023	06/12/2023	11.465	Absent	21.1	6.78	8611	0.08	-97.90	107.1	Clear, no odour, no sheen, no sediment. Great recharge.
BH104R	Event 58 - January 2024	19/01/2024	11.135	Absent	20.2	6.96	7518	0.03	-72.80	132.2	Clear, slight sulphide odour, no sheen, no sediment
BH104R	Event 59 - February 2024	13/02/2024	11.075	Absent	21.8	6.68	8312	0.25	-112.90	92.10	White, slightly cloudy, no odour, no sheen, no sediment
BH104R	Event 60 - March 2024	15/03/2024	11.050	Absent	19.5	6.56	7763	0.00	-102.40	102.60	Clear, no odour, no sheen, no sediment.
BH104R	Event 61 - April 2024	11/04/2024	10.940	Absent	21.6	6.82	8187	0.22	-30.80	174.20	Pale yellow tinge, slighty cloudy, no odour, no sheen, no sediment. Good recharge.
BH104R	Event 62 - May 2024	15/05/2024	11.05	Absent	19.9	6.77	7707	0.17	-120.20	84.80	Clear, no odour, no sheen, no sediment. Good recharge.
BH104R	Event 63 - June 2024	12/06/2024	11.020	Absent	19.2	6.74	7120	0.16	-64.80	140.20	Clear, no odour, no sheen, no sediment. Great recharge.
BH104R	Event 64 - July 2024	11/07/2024	11.180	Absent	18.1	6.76	7210	0.00	-84.70	120.30	Slight pale grey, somewhat cloudy, no sediment, hydrogen sulphide odour, no sheen.
BH104R	Event 65 - August 2024	06/08/2024	11.26	Absent	18.2	6.81	6863	0.35	-81.50	123.50	Clear, colourless,no sheen,no sediment, sulfuric odour. Good recharge.
BH104R	Event 66 - September 2024	12/09/2024	11.33	Absent	18.4	6.87	6865	0.05	-88.20	116.8	Clear, no sediment, slight sulfuric odour, no sheen
BH104R	Event 67 - October 2024	09/10/2024	11.235	Absent	18.5	6.93	7169	0.05	-142.10	62.9	Clear, no odour, no sediment, no sheen
BH104R	Event 68 - November 2024	07/11/2024	11.12	Absent	19.7	6.87	7078	2.43	-46.70	158.3	Water slightly cloudy, sulfuric odour, no sheen, yellow-grey tinge.
BH104R	Event 69 - December 2024	12/12/2024	11.004	Absent	19.5	6.93	7275	1.23	-58.10	146.9	Slightly cloudy, very pale yellow grey tinge, no sediment, slight sulfuric odour, no sheen. Good recharge.
BH104R	Event 70 - January 2025	23/01/2025	10.875	Absent	19.9	7.27	6776	4.75	88.40	293.40	Slightly cloudy, slight yellow-green colour, no odour, no sheen, no sediment.
BH104R	Event 71 - February 2025	18/02/2025	10.87	Absent	20.0	6.79	7346	0.15	-57.30	147.7	Clear, no sediment, no odour or sheen
BH104R	Event 72 - March 2025	11/03/2025	10.825	Absent	19.9	6.7	7327	0.00	-26.30	178.7	Clear, no odour, no sediment, no sheen
BH107	Event 41 - August 2022	15/08/2022	9.530	Absent	19.3	6.89	4428	4.40	106.40	311.4	Bailer used for grab sample. Clear, no odour/sheen
BH107	Event 42 - September 2022	19/09/2022	10.010	Absent	23.2	7.6	4643	4.59	76.10	281.1	pale yellow, no sediment, no odour/sheen
BH107	Event 43 - October 2022	20/10/2022	9.775	Absent	18.8	6.9	4780	0.94	96.00	301	Pale brown, cloudy, no odour/sheen. Clear, no odour/sheen
BH107	Event 44 - November 2022	16/11/2022	9.515	Absent	18.7	7.4	6707	0.98	45.30	250.3	Pale grey tinge, turbid, no sediment, no odour/sheen.
BH107R	Event 45 - December 2022	16/12/2022	6.870	Absent	18.1	7.37	2651	3.15	70.60	275.6	Brown, no sediment, no odour/sheen
BH107R	Event 46 - January 2023	18/01/2023	-	Absent	-	-	-	-	-	-	No access to sampling location for this round.
BH107R	Event 47 - February 2023	08/02/2023	7.025	Absent	19.3	7.19	3021	0.12	31.10	236.1	Clear, no odour/sheen.
BH107R	Event 48 - March 2023	03/03/2023	7.060	Absent	19.4	7.18	2824	0.12	37.80	242.8	Grey, cloudy, no odour or sheen.
BH107R	Event 49 - April 2023	04/04/2023	7.110	Absent	19.4	7.66	2542	0.24	36.90	241.9	Clear, no odour/sheen.
BH107R	Event 50 - May 2023	02/05/2023	7.150	Absent	18.8	6.83	3023	7.73	115.30	320.3	Clear, no sediment, no odour, no sheen.
BH107R	Event 51 - June 2023	07/06/2023	-	-	-	-	-	-	-	-	CPB determined no safe access across alignment from, southern side to northern side where BH107R is located.
BH107R	Event 52 - July 2023	05/07/2023	7.450	Absent	18.1	7.20	2568	1.42	440.10	645.1	Clear, no odour, no sheen, no sediment, poor recharge.
BH107R	Event 53 - August 2023	09/08/2023	7.620	Absent	18.7	7.41	3107	9.65	71.80	276.8	Clear, no odour, no sheen, no sediment.
BH107R	Event 54 - September 2023	05/09/2023	7.579	Absent	18.4	7.15	3144	4.96	60.60	265.6	Pale brown tinge, slightly turbid, no odour or sheen.
BH107R	Event 55 - October 2023	06/10/2023	7.698	Absent	18.9	7.31	3110	9.91	108.30	313.3	Pale brown tinge, slightly turbid, no odour or sheen.
BH107R	Event 56 - November 2023	08/11/2023	7.800	Absent	19.5	7.11	3438	3.63	101.90	306.9	Mostly clear, pale yellow tinge, no odour, no sheen, no sediment.
BH107R	Event 57 - December 2023	06/12/2023	7.810	Absent	20.6	7.06	3457	2.76	87.50	292.5	Clear, no odour, no sheen, no sediment, poor to no recharge.
BH107R	Event 58 - January 2024	19/01/2024	7.760	Absent	20.1	7.2	3373	0.32	81.40	286.4	Pale brown tinge, slightly cloudy, no odour or sheen. Poor recharge.
BH107R	Event 59 - February 2024	13/02/2024	7.730	Absent	21.6	6.97	3542	0.63	53.50	258.50	Clear, no odour, no sheen, no sediment
BH107R	Event 60 - March 2024	15/03/2024	7.795	Absent	19.6	6.87	3193	1.87	43.80	248.80	Pale brown, cloudy, no odour or sheen. Poor recharge.
BH107R	Event 61 - April 2024	11/04/2024	7.615	Absent	20.6	7.11	3608	0.94	106.90	311.90	Clear, very slightly cloudy, no odour, no sheen, no sediment. Poor to moderate recharge.
BH107R	Event 62 - May 2024	15/05/2024	7.77	Absent	19.7	6.97	3367	0.67	56.50	261.50	Clear, no sediment, no odour or sheen. moderate to poor recharge.
BH107R	Event 63 - June 2024	12/06/2024	7.700	Absent	18.8	6.98	3140	0.81	49.20	254.20	Clear, no odour, no sediment, no sheen.
BH107R	Event 64 - July 2024	11/07/2024	7.745	Absent	17.9	6.99	3193	0.84	37.10	242.10	Clear, no odour or sheen.
BH107R	Event 65 - August 2024	06/08/2024	7.73	Absent	18.1	7.14	3060	7.14	13.20	218.20	Faintly cloudy, colourless, odourless, no sheen, no sediment.
BH107R	Event 66 - September 2024	12/09/2024	7.66	Absent	18.8	7.07	3123	0.29	11.70	216.7	Clear, no colour, no odour, no sheen, no sediment
BH107R	Event 67 - October 2024	09/10/2024	7.53	Absent	18.2	7.18	3102	1.27	72.30	277.3	Clear, no sediment, no odour or sheen
BH107R	Event 68 - November 2024	07/11/2024	7.37	Absent	19.3	7.19	3001	5.31	59.60	264.6	Clear, no odour or sheen, no sediment
BH107R	Event 69 - December 2024	12/12/2024	7.295	Absent	20.6	7.56	3107	8.24	81.60	286.6	Clear no colour, no sediment, no sheen, no odour. Slow, no recharge.
BH107R	Event 70 - January 2025	23/01/2025	7.28	Absent	18.9	7.27	2955	4.14	77.80	282.80	Mostly clear, no sediment, no odour or sheen.
BH107R	Event 71 - February 2025	18/02/2025	7.315	Absent	20.1	6.95	3332	0.99	91.40	296.4	Clear, no sediment, no odour or sheen
BH107R	Event 72 - March 2025	11/03/2025	7.325	Absent	19.2	7.05	2999	4.75	114.30	319.3	Clear, no sediment, no odour or sheen

Well ID	Sampling Event	Date Measured	SWL (mbTOC)	LNAPL present	Temp (°C)	pH	Electrical Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Redox Potential (mV)	Corrected Redox Potential* (mV)	Comments (sheen, colour, turbidity, sediment, odour)
BH112	Event 41 - August 2022	15/08/2022	13.560	Absent	19.1	6.72	3226	4.34	109.80	314.8	Bailer used for grab sample. Slight grey tinge, no sediment, no odour/sheen
BH112	Event 42 - September 2022	19/09/2022	13.460	Absent	24.2	7.4	3629	4.56	68.60	273.6	Pale yellow, very cloudy, no sediment, no odour/sheen
BH112	Event 43 - October 2022	20/10/2022	13.300	Absent	18.6	7.0	3117	2.63	151.10	356.1	Dark brown, very cloudy, non-transparent, no odour/sheen. Able to purge groundwater as CPB haul road established
BH112	Event 44 - November 2022	16/11/2022	14.180	Absent	18.9	7.2	4722	1.17	81.80	286.8	Pale brown, very turbid, some sediment load, no odour/sheen. Pale brown tinge, mostly clear, no odour/sheen.
BH112R	Event 45 - December 2022	16/12/2022	-	-	-	-	-	-	-	-	No access to sampling location for this round.
BH112R	Event 46 - January 2023	18/01/2023	-	-	-	-	-	-	-	-	No access to sampling location for this round.
BH112R	Event 47 - February 2023	08/02/2023	-	-	-	-	-	-	-	-	No access to sampling location for this round.
BH112R	Event 48 - March 2023	03/03/2023	-	-	-	-	-	-	-	-	No access to sampling location for this round.
BH112R	Event 49 - April 2023	04/04/2023	-	-	-	-	-	-	-	-	No access to sampling location for this round.
BH112R	Event 50 - May 2023	02/05/2023	-	-	-	-	-	-	-	-	No access to sampling location for this round.
BH112R	Event 51 - June 2023	07/06/2023	Dry	Absent	-	-	-	-	-	-	Replacement well of replacement well BH112R. Well measured as Dry.
BH112R	Event 52 - July 2023	05/07/2023	12.000	Absent	-	-	-	-	-	-	Well not developed at this stage. Presence of water alerted to CPB and well to be developed.
BH112R	Event 53 - August 2023	09/08/2023	12.425	Absent	19.7	6.88	14408	8.38	113.00	318	Mostly clear, no odour, no sheen, no sediment. Poor recharge
BH112R	Event 54 - September 2023	05/09/2023	12.407	Absent	19.9	6.71	14971	0.31	55.10	260.1	Light brown, moderate turbidity, moderate sediment, no odour, no sheen
BH112R	Event 55 - October 2023	06/10/2023	12.700	Absent	18.8	6.89	13124	6.89	119.90	324.9	Pale brown tinge, slightly turbid, no odour or sheen.
BH112R	Event 56 - November 2023	08/11/2023	12.905	Absent	19.4	6.66	15954	0.08	58.30	263.3	Mostly clear, slightly cloudy, no odour, no sheen, no sediment.
BH112R	Event 57 - December 2023	06/12/2023	13.020	Absent	21.9	6.66	16111	0.24	69.50	274.5	Clear, no odour, no sheen, no sediment.
BH112R	Event 58 - January 2024	19/01/2024	13.045	Absent	21.1	6.79	14444	0.26	100.30	305.3	Clear, no odour, no sheen, no sediment.
BH112R	Event 59 - February 2024	13/02/2024	13.095	Absent	21.2	6.55	13913	0.42	74.10	279.10	Mostly clear, no odour, no sheen, no sediment
BH112R	Event 60 - March 2024	15/03/2024	13.141	Absent	22.1	6.37	15400	0.96	104.40	309.40	Clear, no odour, no sheen, no sediment. Good recharge.
BH112R	Event 61 - April 2024	11/04/2024	13.070	Absent	19.9	6.62	14890	0.57	121.40	326.40	Clear, no odour or sheen, no sediment load. Moderate recharge.
BH112R	Event 62 - May 2024	15/05/2024	13.07	Absent	20.5	6.55	14698	0.42	81.00	286.00	Clear, no odour, no sheen, no sediment. Moderate recharge.
BH112R	Event 63 - June 2024	12/06/2024	12.960	Absent	19.1	6.55	13336	0.36	73.70	278.70	Clear, no odour, no sediment, no sheen. Moderate recharge.
BH112R	Event 64 - July 2024	11/07/2024	13.025	Absent	19.2	6.51	14136	0.17	93.10	298.10	Clear, no sediment,no odour or sheen.
BH112R	Event 65 - August 2024	06/08/2024	13.065	Absent	19.0	6.56	13369	0.68	52.90	257.90	Clear, no sediment, no odour or sheen
BH112R	Event 66 - September 2024	12/09/2024	13.085	Absent	19.5	6.61	13518	0.18	62.20	267.2	Clear, no sediment, no odour or sheen
BH112R	Event 67 - October 2024	09/10/2024	13.115	Absent	19.1	6.69	14059	0.30	92.60	297.6	Clear, no sediment, no odour or sheen
BH112R	Event 68 - November 2024	06/11/2024	13.11	Absent	20.2	6.73	14629	4.07	69.10	274.1	Cloudy, no odour or sheen, no sediment
BH112R	Event 69 - December 2024	12/12/2024	13.077	Absent	20.4	7.06	14544	7.66	88.90	293.9	Mostly clear, no sediment, no odour or sheen.
BH112R	Event 70 - January 2025	23/01/2025	13.105	Absent	19.8	6.82	14126	4.90	111.60	316.6	Very cloudy, no odour, no sheen, no colour.
BH112R	Event 71 - February 2025	18/02/2025	13.123	Absent	21.1	6.48	14808	0.37	116.90	321.9	Clear, no sediment, no odour or sheen
BH112R	Event 72 - March 2025	11/03/2025	13.122	Absent	19.8	6.66	14396	4.78	128.40	333.4	Clear, no sediment, no odour, no sheen
BH144	Event 44 - November 2022	15/11/2022	16.560	Absent	20.2	6.2	2360	0.42	83.80	288.8	Pale brown, very turbid, no sediment, no odour/sheen.
BH145	Event 41 - August 2022	15/08/2022	18.660	Absent	-	-	-	-	-	-	Bailer used for grab sample. No data recorded. Brown, turbid, no odour/sheen
BH145	Event 42 - September 2022	20/09/2022	18.905	Absent	-	-	-	-	-	-	Bailer used due to low SWL. No parameters recorded due to preference of samples
BH145	Event 43 - October 2022	19/10/2022	18.470	Absent	19.1	6.2	4165	3.29	158.70	363.7	Low water level, one set parameters taken and samples collected.
BH145	Event 44 - November 2022	15/11/2022	18.615	Absent	20.9	6.3	6486	2.07	151.30	356.3	One set parameters recorded and grab sample due to low. amount of water available
BH145	Event 45 - December 2022	14/12/2022	18.980	Absent	-	-	-	-	-	-	No parameters recorded due to low standing water level. All samples collected.
BH145	Event 46 - January 2023	17/01/2023	19.200	Absent	-	-	-	-	-	-	Brown, turbid, no odour/sheen. No parameters recorded due to low amount of water available.
BH145	Event 47 - February 2023	07/02/2023	19.225	Absent	-	-	-	-	-	-	Brown, turbid, no odour/sheen. No parameters recorded due to low. water available.
BH145	Event 48 - March 2023	02/03/2023	19.300	Absent	-	-	-	-	-	-	Dark brown/grey, cloudy, high sediment, no odour/sheen. Low water level, grab samples taken, no parameters recorded due to lack of water available.
BH145R	Event 49 - April 2023	05/04/2023	11.920	Absent	18.6	7.54	3815	0.17	-152.60	52.4	Clear, no odour/sheen.
BH145R	Event 50 - May 2023	02/05/2023	12.030	Absent	18.9	6.61	10273	0.50	-120.00	85	Pale grey tinge, mostly clear, slight unidentified odour.
BH145R	Event 51 - June 2023	06/06/2023	11.980	Absent	18.3	6.93	12863	0.16	-143.00	62	Mostly clear, organic odour, no sediment, no sheen.
BH145R	Event 52 - July 2023	05/07/2023	11.810	Absent	18.5	6.40	12419	0.12	-83.90	121.1	Light grey tinge, mostly clear.
BH145R	Event 53 - August 2023	09/08/2023	11.906	Absent	19.1	6.78	13966	2.27	-79.70	125.3	Grab sample, one set of parameters collected as geocontrol, pump is faulty.
BH145R	Event 54 - September 2023	06/09/2023	11.777	Absent	18.3	6.71	14262	0.40	-72.20	132.8	Sightly brown, low turbidity, low sediment, no odour or sheen, great recharge
BH145R	Event 55 - October 2023	06/10/2023	11.760	Absent	19.3	6.65	14187	0.10	-92.80	112.2	Clear, no odour or sheen.
BH145R	Event 56 - November 2023	09/11/2023	11.650	Absent	19.7	6.58	18021	0.02	-84.00	121	Clear, no odour, no sheen, no sediment. Good recharge.
BH145R	Event 57 - December 2023	05/12/2023	11.525	Absent	19.6	6.6	16963	0.03	-93.80	111.2	Clear, slight sulfuric odour, no sheen, great recharge.
BH145R	Event 58 - January 2024	18/01/2024	11.260	Absent	19.8	6.75	16065	0.01	-80.70	124.3	Clear, no sediment, no odour or sheen, good recharge.
BH145R	Event 59 - February 2024	14/02/2024	11.300	Absent	20.4	6.51	17357	0.39	-85.10	119.90	Clear, no odour or sheen, no sediment, low turbidity
BH145R	Event 60 - March 2024	14/03/2024	11.270	Absent	19.7	6.29	17323	0.00	-107.80	97.20	Pale grey tinge, most clear, slight sulfuric odour, no sheen.
BH145R	Event 61 - April 2024	12/04/2024	11.215	Absent	20.1	6.67	13412	0.41	39.30	244.30	Clear, no sediment load, no odour or sheen. Good recharge
BH145R	Event 62 - May 2024	16/05/2024	11.275	Absent	19.4	6.56	13412	0.23	-72.10	132.90	Clear, no odour, no sheen, no sediment. Excellent recharge.
BH145R	Event 63 - June 2024	06/06/2024	11.180	Absent	18.0	6.49	15145	0.19	-62.00	143.00	Clear, no odour, no sheen, no sediment. Great recharge.
BH145R	Event 64 - July 2024	10/07/2024	11.140	Absent	20.5	6.62	16733	2.03	-41.70	163.30	Pale yellow grey, no sediment, very slight sulfuric odour, no sheen.
BH145R	Event 65 - August 2024	07/08/2024	11.22	Absent	18.6	6.93	15307	8.61	-44.90	160.10	Very pale grey, slightly cloudy, no odour, no sheen. Good recharge.
BH145R	Event 66 - September 2024	11/09/2024	11.22	Absent	19.0	6.58	15388	0.05	-74.30	130.7	Clear, colourless, slight sulfuric odour, no sheen
BH145R	Event 67 - October 2024	10/10/2024	11.205	Absent	19.4	6.67	16468	0.37	-72.70	132.3	Slightly cloudy with brownish yellow tinge, sulfuric odour, some very fine black coloured sediment, no sheen
BH145R	Event 68 - November 2024	07/11/2024	11.06	Absent	18.8	6.62	16372	2.62	-57.00	148	Mostly clear slight yellow tinge, sulphuric odour no sediment, no sheen. Good recharge.
BH145R	Event 69 - December 2024	11/12/2024	11.015	Absent	19.0	6.6	16409	0.72	-32.30	172.7	Mostly clear, whitish tinge, no sediment, no sheen, no odour.
BH145R	Event 70 - January 2025	17/01/2025	10.99	Absent	18.9	7.49	14722	10.06	55.70	260.70	Clear, no sediment, no odour or sheen.
BH145R	Event 71 - February 2025	19/02/2025	10.955	Absent	20.9	6.49	16788	0.31	-93.60	111.4	Mostly clear, white-grey colour, faint sulfuric odour, fine black sediment settled on bottom
BH145R	Event 72 - March 2025	12/03/2025	10.97	Absent	19.9	6.5	16852	2.69	-11.10	193.9	Clear, no sediment, no odour or sheen

*Corrected for standard hydrogen electrode (SHE) by adding 205 mV to YSI redox potential reading

Well ID	Sampling Event	Date Measured	SWL (mbTOC)	LNAPL present	Temp (°C)	pH	Electrical Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Redox Potential (mV)	Corrected Redox Potential* (mV)	Comments (sheen, colour, turbidity, sediment, odour)
BH104R	Event 67 - October 2024	09/10/2024	11.235	Absent	18.5	6.93	7169	0.05	-142.10	62.9	Clear, no odour, no sediment, no sheen
BH104R	Event 68 - November 2024	07/11/2024	11.12	Absent	19.7	6.87	7078	2.43	-46.70	158.3	Water slightly cloudy, sulfuric odour, no sheen, yellow-grey tinge.
BH104R	Event 69 - December 2024	12/12/2024	11.004	Absent	19.5	6.93	7275	1.23	-58.10	146.9	Slightly cloudy, very pale yellow grey tinge, no sediment, slight sulfuric odour, no sheen. Good recharge.
BH104R	Event 70 - January 2025	23/01/2025	10.875	Absent	19.9	7.27	6776	4.75	88.40	293.40	Slightly cloudy, slight yellow-green colour, no odour, no sheen, no sediment.
BH104R	Event 71 - February 2025	18/02/2025	10.87	Absent	20.0	6.79	7346	0.15	-57.30	147.7	Clear, no sediment, no odour or sheen
BH104R	Event 72 - March 2025	11/03/2025	10.825	Absent	19.9	6.7	7327	0.00	-26.30	178.7	Clear, no odour, no sediment, no sheen
BH107R	Event 67 - October 2024	09/10/2024	7.53	Absent	18.2	7.18	3102	1.27	72.30	277.3	Clear, no sediment, no odour or sheen
BH107R	Event 68 - November 2024	07/11/2024	7.37	Absent	19.3	7.19	3001	5.31	59.60	264.6	Clear, no odour or sheen, no sediment
BH107R	Event 69 - December 2024	12/12/2024	7.295	Absent	20.6	7.56	3107	8.24	81.60	286.6	Clear no colour, no sediment, no sheen, no odour. Slow, no recharge.
BH107R	Event 70 - January 2025	23/01/2025	7.28	Absent	18.9	7.27	2955	4.14	77.80	282.80	Mostly clear, no sediment, no odour or sheen.
BH107R	Event 71 - February 2025	18/02/2025	7.315	Absent	20.1	6.95	3332	0.99	91.40	296.4	Clear, no sediment, no odour or sheen
BH107R	Event 72 - March 2025	11/03/2025	7.325	Absent	19.2	7.05	2999	4.75	114.30	319.3	Clear, no sediment, no odour or sheen
BH112R	Event 67 - October 2024	09/10/2024	13.115	Absent	19.1	6.69	14059	0.30	92.60	297.6	Clear, no sediment, no odour or sheen
BH112R	Event 68 - November 2024	06/11/2024	13.11	Absent	20.2	6.73	14629	4.07	69.10	274.1	Cloudy, no odour or sheen, no sediment
BH112R	Event 69 - December 2024	12/12/2024	13.077	Absent	20.4	7.06	14544	7.66	88.90	293.9	Mostly clear, no sediment, no odour or sheen.
BH112R	Event 70 - January 2025	23/01/2025	13.105	Absent	19.8	6.82	14126	4.90	111.60	316.6	Very cloudy, no odour, no sheen, no colour.
BH112R	Event 71 - February 2025	18/02/2025	13.123	Absent	21.1	6.48	14808	0.37	116.90	321.9	Clear, no sediment, no odour or sheen
BH112R	Event 72 - March 2025	11/03/2025	13.122	Absent	19.8	6.66	14396	4.78	128.40	333.4	Clear, no sediment, no odour, no sheen
BH145R	Event 67 - October 2024	10/10/2024	11.205	Absent	19.4	6.67	16468	0.37	-72.70	132.3	Slightly cloudy with brownish yellow tinge, sulfuric odour, some very fine black coloured sediment, no sheen
BH145R	Event 68 - November 2024	07/11/2024	11.06	Absent	18.8	6.62	16372	2.62	-57.00	148	Mostly clear slight yellow tinge, sulphuric odour no sediment, no sheen. Good recharge.
BH145R	Event 69 - December 2024	11/12/2024	11.015	Absent	19.0	6.6	16409	0.72	-32.30	172.7	Mostly clear, whitish tinge, no sediment, no sheen, no odour.
BH145R	Event 70 - January 2025	17/01/2025	10.99	Absent	18.9	7.49	14722	10.06	55.70	260.70	Clear, no sediment, no odour or sheen.
BH145R	Event 71 - February 2025	19/02/2025	10.955	Absent	20.9	6.49	16788	0.31	-93.60	111.4	Mostly clear, white-grey colour, faint sulfuric odour, fine black sediment settled on bottom
BH145R	Event 72 - March 2025	12/03/2025	10.97	Absent	19.9	6.5	16852	2.69	-11.10	193.9	Clear, no sediment, no odour or sheen

*Corrected for standard hydrogen electrode (SHE) by adding 205 mV to YSI redox potential reading

Appendix B
Table B9
Heavy Metal Concentrations and Hardness-Modified Trigger Values (HMTV)

Well ID	Phase	Date	Hardness mg/L	Cadmium µg/L		Chromium µg/L		Lead µg/L		Nickel µg/L		Zinc µg/L	
ANZECC (2000) Freshwater Trigger Value				*0.2*	***HMTV***	*1.0*	***HMTV***	*3.4*	***HMTV***	*11*	***HMTV***	*8*	***HMTV***
BH104 / BH104R	Baseline	10/09/2020	1,550	<0.1	*6.7*	<1	*25.4*	<1	*510*	22	*315*	61	*229*
		9/10/2020	1,610	<0.1	*6.9*	<1	*26.2*	<1	*535*	31	*325*	25	*236*
		13/11/2020	2,020	<0.1	*8.5*	<1	*31.6*	<1	*713*	137	*394*	25	*286*
		8/12/2020	2,090	<0.1	*8.7*	2	*32.5*	<1	*745*	105	*405*	93	*295*
		14/01/2021	1,900	<0.1	*8.0*	<1	*30.0*	<1	*660*	175	*374*	19	*272*
		11/02/2021	2,110	<0.1	*8.8*	<1	*32.7*	<1	*754*	81	*409*	<5	*297*
		10/03/2021	2,190	<0.1	*9.1*	<1	*33.7*	<1	*790*	57	*422*	25	*307*
		7/04/2021	833	<0.1	*3.9*	<1	*15.3*	<1	*232*	40	*186*	8	*135*
		4/05/2021	1,490	<0.1	*6.5*	<1	*24.6*	<1	*485*	108	*304*	30	*221*
		8/06/2021	1,860	<0.1	*7.9*	<1	*29.5*	<1	*642*	81	*367*	62	*267*
		7/07/2021	1,860	<0.1	*7.9*	<1	*29.5*	<1	*642*	11	*367*	7	*267*
		13/08/2021	1,910	<0.1	*8.1*	<1	*30.1*	<1	*664*	57	*376*	92	*273*
		1/09/2021	1,590	<0.1	*6.8*	<1	*25.9*	<1	*526*	33	*321*	7	*234*
		15/10/2021	1,860	<0.1	*7.9*	2	*29.5*	<1	*642*	43	*367*	39	*267*
		8/11/2021	1,680	<0.1	*7.2*	<1	*27.1*	<1	*565*	35	*337*	19	*245*
		8/12/2021	1,400	<0.1	*6.1*	<1	*23.4*	<1	*448*	23	*288*	149	*210*
		13/01/2022	1,470	<0.1	*6.4*	<1	*24.3*	<1	*476*	35	*301*	11	*219*
		10/02/2022	637	<0.1	*3.0*	<1	*12.3*	<1	*165*	60	*148*	<5	*107*
		18/03/2022	645	<0.1	*3.1*	<1	*12.4*	<1	*167*	192	*149*	8	*109*
		25/05/2022	2,540	<0.1	*10.4*	<1	*38.1*	<1	*954*	3	*479*	8	*348*
		27/06/2022	3,730	<0.1	*14.6*	<1	*52.2*	<1	*1555*	24	*663*	8	*482*
		20/07/2022	3,540	0.3	*14.0*	2	*50.0*	<1	*1455*	11	*635*	11	*462*
	Construction	15/08/2022	3980	<0.1	*15.5*	<1	*55.0*	<1	*1688*	8	*701*	6	*510*
		19/09/2022	4140	<0.1	*16.1*	<1	*56.8*	<1	*1775*	71	*725*	16	*527*
		20/10/2022	4020	<0.1	*15.6*	<1	*55.5*	<1	*1710*	10	*707*	11	*514*
		16/11/2022	4320	<0.1	*16.7*	<1	*58.9*	<1	*1873*	8	*752*	7	*547*
		16/12/2022	823	<0.1	*3.8*	<1	*15.1*	<1	*228*	1	*184*	6	*134*
		18/01/2023	1180	<0.1	*5.3*	<1	*20.3*	<1	*360*	1	*249*	<5	*181*
		8/02/2023	1060	<0.1	*4.8*	<1	*18.6*	<1	*315*	<1	*228*	<5	*166*
		3/03/2023	1300	<0.1	*5.7*	<1	*22.0*	<1	*408*	1	*271*	67	*197*
		4/04/2023	1380	<0.1	*6.0*	<1	*23.1*	<1	*440*	14	*285*	8	*207*
		2/05/2023	1180	<0.1	*5.3*	<1	*20.3*	<1	*360*	4	*249*	36	*181*
		7/06/2023	1520	<0.1	*6.6*	<1	*25.0*	<1	*497*	3	*309*	7	*225*
		7/07/2023	1360	<0.1	*6.0*	<1	*22.8*	<1	*432*	3	*281*	<5	*205*
		9/08/2023	1570	<0.1	*6.8*	<1	*25.7*	<1	*518*	2	*318*	12	*231*
		5/09/2023	1190	<0.1	*5.3*	<1	*20.5*	<1	*364*	1	*251*	5	*183*
		6/10/2023	1370	<0.1	*6.0*	<1	*23.0*	<1	*436*	23	*283*	23	*206*
		8/11/2023	1100	<0.1	*4.9*	<1	*19.2*	<1	*330*	1	*235*	6	*171*
		6/12/2023	888	<0.1	*4.1*	<1	*16.1*	<1	*251*	<1	*196*	6	*142*
		19/01/2024	936	<0.1	*4.3*	<1	*16.8*	<1	*269*	<1	*205*	<5	*149*
		13/02/2024	882	<0.1	*4.1*	<1	*16.0*	<1	*249*	1	*195*	<5	*142*
		15/03/2024	920	<0.1	*4.2*	<1	*16.6*	<1	*263*	<1	*202*	<5	*147*
		11/04/2024	787	<0.1	*3.7*	<1	*14.6*	<1	*215*	<1	*177*	<5	*129*
		15/05/2024	809	<0.1	*3.8*	<1	*14.9*	<1	*223*	<1	*181*	<5	*132*
		12/06/2024	798	<0.1	*3.7*	<1	*14.7*	<1	*219*	<1	*179*	<5	*130*
		11/07/2024	742	<0.1	*3.5*	<1	*13.9*	<1	*200*	<1	*168*	8	*122*
		6/08/2024	779	<0.1	*3.6*	<1	*14.4*	<1	*213*	11	*175*	18	*127*
		12/09/2024	732	<0.1	*3.4*	<1	*13.7*	<1	*197*	1	*166*	<5	*121*
		9/10/2024	771	<0.1	*3.6*	<1	*14.3*	<1	*210*	<1	*174*	<5	*126*
		7/11/2024	815	<0.1	*3.8*	<1	*15.0*	<1	*225*	<1	*182*	<5	*132*
		12/12/2024	722	<0.1	*3.4*	<1	*13.6*	<1	*193*	1	*164*	<5	*119*
		23/01/2025	841	<0.1	*3.9*	<1	*15.4*	<1	*234*	2	*187*	7	*136*
		18/02/2025	704	<0.1	*3.3*	<1	*13.3*	<1	*187*	<1	*161*	<5	*117*
		11/03/2025	842	<0.1	*3.9*	<1	*15.4*	<1	*235*	1	*187*	6	*136*
BH107 / BH107R	Baseline	10/09/2020	1,650	<0.1	*7.1*	<1	*26.7*	2	*552*	23	*332*	85	*241*
		9/10/2020	1,530	0.1	*6.6*	<1	*25.1*	3	*501*	55	*311*	122	*226*
		8/12/2020	1,600	<0.1	*6.9*	<1	*26.1*	<1	*531*	109	*323*	34	*235*
		14/01/2021	1,500	<0.1	*6.5*	<1	*24.7*	<1	*489*	68	*306*	17	*222*
		11/02/2021	1,650	0.6	*7.1*	<1	*26.7*	3	*552*	90	*332*	168	*241*
		10/03/2021	1,570	0.2	*6.8*	<1	*25.7*	2	*518*	56	*318*	84	*231*
		7/04/2021	997	<0.1	*4.5*	<1	*17.7*	<1	*291*	41	*216*	17	*157*
		3/05/2021	926	<0.1	*4.2*	<1	*16.6*	<1	*265*	11	*203*	46	*148*
		8/06/2021	1280	<0.1	*5.6*	<1	*21.7*	<1	*400*	96	*267*	28	*194*
		7/07/2021	1230	<0.1	*5.5*	<1	*21.0*	<1	*380*	4	*258*	8	*188*
		13/08/2021	1400	<0.1	*6.1*	<1	*23.4*	<1	*448*	21	*288*	12	*210*
		1/09/2021	1260	<0.1	*5.6*	<1	*21.4*	<1	*392*	50	*264*	9	*192*
		15/10/2021	1290	<0.1	*5.7*	<1	*21.8*	<1	*404*	50	*269*	57	*196*
		8/11/2021	1180	<0.1	*5.3*	<1	*20.3*	<1	*360*	24	*249*	<5	*181*
		8/12/2021	1230	<0.1	*5.5*	<1	*21.0*	<1	*380*	9	*258*	679	*188*
		13/01/2022	376	<0.1	*1.9*	<1	*8.0*	<1	*84*	70	*94*	78	*69*
		10/02/2022	806	<0.1	*3.7*	<1	*14.9*	<1	*222*	73	*180*	5	*131*
		18/03/2022	131	<0.1	*0.7*	<1	*3.3*	<1	*22*	61	*39*	22	*28*
		25/05/2022	543	<0.1	*2.6*	<1	*10.7*	<1	*135*	1	*129*	6	*94*
		27/06/2022	569	<0.1	*2.7*	<1	*11.2*	<1	*143*	2	*134*	6	*98*

Appendix B
Table B9
Heavy Metal Concentrations and Hardness-Modified Trigger Values (HMTV)

Well ID	Phase	Date	Hardness mg/L	Cadmium µg/L		Chromium µg/L		Lead µg/L		Nickel µg/L		Zinc µg/L	
ANZECC (2000) Freshwater Trigger Value				*0.2*	***HMTV***	*1.0*	***HMTV***	*3.4*	***HMTV***	*11*	***HMTV***	*8*	***HMTV***
		20/07/2022	366	<0.1	*1.9*	<1	*7.8*	<1	*81*	<1	*92*	6	*67*
		8/06/2021	1,280	<0.1	*5.6*	<1	*21.7*	<1	*400*	96	*267*	28	*194*
		7/07/2021	1,230	<0.1	*5.5*	<1	*21.0*	<1	*380*	4	*258*	8	*188*
		13/08/2021	1,400	<0.1	*6.1*	<1	*23.4*	<1	*448*	21	*288*	12	*210*
		1/09/2021	1,260	<0.1	*5.6*	<1	*21.4*	<1	*392*	50	*264*	9	*192*
		15/10/2021	1,290	<0.1	*5.7*	<1	*21.8*	<1	*404*	50	*269*	57	*196*
		8/11/2021	1,180	<0.1	*5.3*	<1	*20.3*	<1	*360*	24	*249*	<5	*181*
		8/12/2021	1,230	<0.1	*5.5*	<1	*21.0*	<1	*380*	9	*258*	679	*188*
		13/01/2022	376	<0.1	*1.9*	<1	*8.0*	<1	*84*	70	*94*	78	*69*
		10/02/2022	806	<0.1	*3.7*	<1	*14.9*	<1	*222*	73	*180*	5	*131*
		18/03/2022	131	<0.1	*0.7*	<1	*3.3*	<1	*22*	61	*39*	22	*28*
		25/05/2022	543	<0.1	*2.6*	<1	*10.7*	<1	*135*	1	*129*	6	*94*
		27/06/2022	569	<0.1	*2.7*	<1	*11.2*	<1	*143*	2	*134*	6	*98*
		20/07/2022	366	<0.1	*1.9*	<1	*7.8*	<1	*81*	<1	*92*	6	*67*
	Construction	15/08/2022	516	<0.1	*2.5*	<1	*10.3*	<1	*126*	<1	*123*	7	*90*
		19/09/2022	485	<0.1	*2.4*	<1	*9.8*	<1	*117*	<1	*117*	6	*85*
		20/10/2022	575	<0.1	*2.8*	<1	*11.3*	<1	*145*	1	*135*	<5	*98*
		16/11/2022	555	<0.1	*2.7*	<1	*10.9*	<1	*138*	<1	*131*	<5	*96*
		16/12/2022	360	<0.1	*1.8*	<1	*7.7*	<1	*80*	2	*91*	12	*66*
		8/02/2023	380	<0.1	*1.9*	<1	*8.0*	<1	*85*	1	*95*	7	*69*
		3/03/2023	437	<0.1	*2.2*	<1	*9.0*	<1	*102*	2	*107*	125	*78*
		4/04/2023	427	<0.1	*2.1*	<1	*8.8*	<1	*99*	6	*105*	10	*76*
		2/05/2023	397	<0.1	*2.0*	<1	*8.3*	<1	*90*	10	*99*	26	*72*
		7/07/2023	447	<0.1	*2.2*	1	*9.2*	<1	*105*	2	*109*	12	*79*
		9/08/2023	470	<0.1	*2.3*	<1	*9.5*	<1	*112*	2	*114*	6	*83*
		5/09/2023	503	<0.1	*2.5*	<1	*10.1*	<1	*122*	2	*121*	9	*88*
		6/10/2023	508	<0.1	*2.5*	<1	*10.2*	<1	*124*	6	*122*	18	*89*
		8/11/2023	512	<0.1	*2.5*	<1	*10.2*	<1	*125*	5	*123*	18	*89*
		6/12/2023	511	<0.1	*2.5*	<1	*10.2*	<1	*125*	2	*122*	7	*89*
		19/01/2024	535	<0.1	*2.6*	<1	*10.6*	<1	*132*	1	*127*	6	*93*
		13/02/2024	515	<0.1	*2.5*	<1	*10.3*	<1	*126*	1	*123*	10	*90*
		15/03/2024	568	<0.1	*2.7*	<1	*11.2*	<1	*142*	2	*134*	11	*97*
		11/04/2024	536	<0.1	*2.6*	<1	*10.6*	<1	*132*	<1	*128*	6	*93*
		15/05/2024	547	<0.1	*2.6*	<1	*10.8*	<1	*136*	1	*130*	9	*94*
		12/06/2024	526	<0.1	*2.6*	<1	*10.5*	<1	*129*	1	*126*	8	*91*
		11/07/2024	507	<0.1	*2.5*	<1	*10.2*	<1	*123*	1	*122*	13	*88*
		6/08/2024	531	<0.1	*2.6*	<1	*10.6*	<1	*131*	10	*127*	17	*92*
		12/09/2024	522	<0.1	*2.5*	<1	*10.4*	<1	*128*	<1	*125*	7	*91*
		9/10/2024	507	<0.1	*2.5*	<1	*10.2*	<1	*123*	<1	*122*	<5	*88*
		7/11/2024	548	<0.1	*2.7*	<1	*10.8*	<1	*136*	<1	*130*	6	*95*
		12/12/2024	421	<0.1	*2.1*	<1	*8.7*	<1	*97*	3	*104*	10	*76*
		23/01/2025	514	<0.1	*2.5*	<1	*10.3*	<1	*125*	<1	*123*	<5	*90*
		18/02/2025	542	<0.1	*2.6*	<1	*10.7*	<1	*134*	1	*129*	8	*94*
		11/03/2025	467	<0.1	*2.3*	<1	*9.5*	<1	*111*	1	*113*	10	*83*
BH112 / BH112R	Baseline	10/09/2020	1,740	<0.1	*7.4*	<1	*27.9*	1	*590*	80	*347*	104	*252*
		9/10/2020	1,640	0.2	*7.0*	<1	*26.6*	3	*548*	62	*330*	146	*240*
		8/12/2020	1,700	<0.1	*7.3*	<1	*27.4*	<1	*573*	101	*340*	149	*247*
		14/01/2021	1,720	<0.1	*7.3*	<1	*27.7*	<1	*582*	120	*344*	35	*250*
		11/02/2021	1,700	<0.1	*7.3*	<1	*27.4*	<1	*573*	48	*340*	11	*247*
		10/03/2021	1,710	<0.1	*7.3*	<1	*27.5*	2	*577*	40	*342*	86	*249*
		7/04/2021	402	<0.1	*2.0*	<1	*8.4*	<1	*92*	36	*100*	9	*73*
		4/05/2021	792	<0.1	*3.7*	<1	*14.6*	<1	*217*	182	*178*	58	*129*
		8/06/2021	804	<0.1	*3.7*	<1	*14.8*	<1	*221*	56	*180*	34	*131*
		7/07/2021	825	<0.1	*3.8*	<1	*15.1*	<1	*229*	10	*184*	7	*134*
		13/08/2021	972	<0.1	*4.4*	<1	*17.3*	<1	*282*	43	*212*	29	*154*
		1/09/2021	957	<0.1	*4.4*	<1	*17.1*	<1	*276*	38	*209*	10	*152*
		15/10/2021	1,690	<0.1	*7.2*	3	*27.3*	4	*569*	71	*338*	118	*246*
		8/11/2021	1,180	<0.1	*5.3*	<1	*20.3*	<1	*360*	33	*249*	7	*181*
		8/12/2021	1,210	<0.1	*5.4*	<1	*20.7*	<1	*372*	50	*255*	655	*185*
		13/01/2022	1,180	<0.1	*5.3*	<1	*20.3*	<1	*360*	65	*249*	14	*181*
		10/02/2022	1,340	<0.1	*5.9*	<1	*22.5*	<1	*424*	141	*278*	13	*202*
		18/03/2022	364	<0.1	*1.8*	<1	*7.7*	<1	*81*	130	*92*	<5	*67*
		25/05/2022	286	<0.1	*1.5*	<1	*6.4*	<1	*60*	7	*75*	22	*54*
		27/06/2022	264	<0.1	*1.4*	<1	*5.9*	<1	*54*	<1	*70*	<5	*51*
		20/07/2022	251	<0.1	*1.3*	<1	*5.7*	<1	*50*	<1	*67*	5	*49*

Appendix B
Table B9
Heavy Metal Concentrations and Hardness-Modified Trigger Values (HMTV)

Well ID	Phase	Date	Hardness mg/L	Cadmium µg/L		Chromium µg/L		Lead µg/L		Nickel µg/L		Zinc µg/L	
ANZECC (2000) Freshwater Trigger Value				*0.2*	***HMTV***	*1.0*	***HMTV***	*3.4*	***HMTV***	*11*	***HMTV***	*8*	***HMTV***
	Construction	15/08/2022	261	<0.1	*1.4*	<1	*5.9*	<1	*53*	<1	*69*	<5	*50*
		19/09/2022	268	<0.1	*1.4*	<1	*6.0*	<1	*55*	<1	*71*	<5	*51*
		20/10/2022	283	<0.1	*1.5*	<1	*6.3*	<1	*59*	5	*74*	49	*54*
		16/11/2022	260	<0.1	*1.4*	<1	*5.9*	<1	*53*	1	*69*	<5	*50*
		9/08/2023	2630	<0.1	*10.7*	<1	*39.2*	<1	*997*	18	*493*	8	*359*
		5/09/2023	2360	<0.1	*9.7*	<1	*35.9*	<1	*869*	47	*450*	19	*327*
		6/10/2023	2290	<0.1	*9.5*	<1	*35.0*	<1	*837*	16	*438*	48	*319*
		8/11/2023	2100	<0.1	*8.8*	<1	*32.6*	<1	*749*	9	*407*	12	*296*
		6/12/2023	2270	<0.1	*9.4*	<1	*34.7*	<1	*827*	8	*435*	16	*316*
		19/01/2024	2460	<0.1	*10.1*	<1	*37.1*	<1	*916*	7	*466*	13	*339*
		13/02/2024	1930	<0.1	*8.1*	<1	*30.4*	<1	*673*	7	*379*	14	*276*
		15/03/2024	2330	<0.1	*9.6*	<1	*35.5*	<1	*855*	6	*445*	17	*323*
		11/04/2024	2,130	<0.1	*8.9*	<1	*33.0*	<1	*763*	6	*412*	9	*300*
		15/05/2024	2,220	<0.1	*9.2*	<1	*34.1*	<1	*804*	6	*427*	15	*310*
		12/06/2024	2,110	<0.1	*8.8*	<1	*32.7*	<1	*754*	5	*409*	34	*297*
		11/07/2024	2,130	<0.1	*8.9*	<1	*33.0*	<1	*763*	5	*412*	13	*300*
		6/08/2024	2,300	<0.1	*9.5*	<1	*35.1*	1	*841*	48	*440*	33	*320*
		12/09/2024	2,220	<0.1	*9.2*	<1	*34.1*	<1	*804*	5	*427*	13	*310*
		9/10/2024	2,320	<0.1	*9.6*	<1	*35.4*	<1	*851*	4	*443*	10	*322*
		6/11/2024	2,430	<0.1	*10.0*	<1	*36.7*	<1	*902*	4	*461*	17	*335*
		12/12/2024	2,230	<0.1	*9.3*	<1	*34.2*	<1	*809*	30	*428*	19	*312*
		23/01/2025	2,340	<0.1	*9.7*	<1	*35.6*	<1	*860*	5	*446*	13	*325*
		18/02/2025	2,330	<0.1	*9.6*	<1	*35.5*	<1	*855*	4	*445*	11	*323*
		11/03/2025	2,190	<0.1	*9.1*	<1	*33.7*	<1	*790*	6	*422*	5	*307*
BH145	Baseline	9/09/2020	223	0.1	*1.2*	<1	*5.2*	2	*43*	129	*61*	2620	*44*
		8/10/2020	264	<0.1	*1.4*	<1	*5.9*	<1	*54*	20	*70*	643	*51*
		11/11/2020	65	<0.1	*0.4*	<1	*1.9*	<1	*9*	43	*21*	10700	*15*
		9/12/2020	65	<0.1	*0.4*	<1	*1.9*	<1	*9*	82	*21*	1330	*15*
		12/01/2021	88	<0.1	*0.5*	4	*2.4*	14	*13*	11	*27*	1030	*20*
		9/02/2021	80	<0.1	*0.5*	<1	*2.2*	<1	*12*	8	*25*	1620	*18*
		10/03/2021	119	<0.1	*0.7*	<1	*3.1*	<1	*20*	68	*35*	297	*26*
		7/04/2021	65	<0.1	*0.4*	<1	*1.9*	<1	*9*	13	*21*	1380	*15*
		1/09/2021	211	0.4	*1.1*	<1	*5.0*	<1	*40*	46	*58*	694	*42*
		15/10/2021	86	<0.1	*0.5*	<1	*2.4*	<1	*13*	<1	*27*	<5	*20*
		8/11/2021	234	0.2	*1.2*	<1	*5.4*	<1	*46*	28	*63*	556	*46*
		8/12/2021	228	0.5	*1.2*	<1	*5.3*	<1	*45*	14	*62*	568	*45*
		13/01/2022	154	<0.1	*0.9*	<1	*3.8*	<1	*27*	8	*44*	824	*32*
		10/02/2022	131	0.1	*0.7*	<1	*3.3*	<1	*22*	6	*39*	498	*28*
		18/03/2022	149	0.1	*0.8*	<1	*3.7*	<1	*26*	6	*43*	567	*31*
		25/05/2022	106	<0.1	*0.6*	<1	*2.8*	<1	*17*	4	*32*	210	*23*
		27/06/2022	113	<0.1	*0.7*	<1	*3.0*	<1	*18*	2	*34*	142	*25*
		20/07/2022	48	<0.1	*0.3*	<1	*1.5*	<1	*6*	3	*16*	138	*12*
	Construction	15/08/2022	60	<0.1	*0.4*	<1	*1.8*	<1	*8*	3	*20*	102	*14*
		19/09/2022	97	<0.1	*0.6*	<1	*2.6*	<1	*15*	2	*30*	75	*22*
		20/10/2022	215	<0.1	*1.2*	<1	*5.0*	<1	*41*	3	*59*	101	*43*
		15/11/2022	70	<0.1	*0.4*	<1	*2.0*	<1	*10*	2	*23*	68	*16*
		14/12/2022	94	<0.1	*0.6*	<1	*2.6*	<1	*15*	2	*29*	72	*21*
		7/02/2023	118	<0.1	*0.7*	<1	*3.1*	<1	*19*	3	*35*	61	*26*
BH145R	Construction	5/04/2023	974	<0.1	*4.4*	<1	*17.4*	<1	*282*	26	*212*	<5	*154*
		2/05/2023	1170	<0.1	*5.2*	<1	*20.2*	<1	*357*	5	*248*	6	*180*
		6/06/2023	1580	<0.1	*6.8*	<1	*25.8*	<1	*522*	2	*320*	<5	*232*
		7/07/2023	1830	<0.1	*7.8*	<1	*29.1*	<1	*629*	1	*362*	<5	*263*
		9/08/2023	2380	<0.1	*9.8*	<1	*36.1*	<1	*879*	<1	*453*	<5	*329*
		6/09/2023	2090	<0.1	*8.7*	<1	*32.5*	<1	*745*	25	*405*	6	*295*
		6/10/2023	2510	<0.1	*10.3*	<1	*37.7*	<1	*940*	22	*474*	23	*345*
		9/11/2023	2500	<0.1	*10.2*	<1	*37.6*	<1	*935*	<1	*472*	5	*343*
		5/12/2023	2610	<0.1	*10.6*	<1	*38.9*	<1	*988*	<1	*490*	<5	*356*
		19/01/2024	2890	<0.1	*11.7*	<1	*42.3*	<1	*1124*	1	*534*	<5	*388*
		14/02/2024	2460	<0.1	*10.1*	<1	*37.1*	<1	*916*	1	*466*	<5	*339*
		14/03/2024	2920	<0.1	*11.8*	<1	*42.7*	<1	*1139*	<1	*539*	<5	*392*
		12/04/2024	1,900	<0.1	*8.0*	<1	*30.0*	<1	*660*	2	*374*	<5	*272*
		16/05/2024	2,590	<0.1	*10.6*	<1	*38.7*	<1	*978*	<1	*487*	8	*354*
		6/06/2024	2,750	<0.1	*11.2*	<1	*40.6*	<1	*1056*	<1	*512*	<5	*372*
		10/07/2024	1,400	<0.1	*6.1*	<1	*23.4*	<1	*448*	1	*288*	8	*210*
		7/08/2024	2,830	<0.1	*11.4*	<1	*41.6*	<1	*1095*	24	*525*	15	*382*
		11/09/2024	2,690	<0.1	*10.9*	<1	*39.9*	<1	*1026*	1	*502*	7	*365*
		9/10/2024	2,800	<0.1	*11.3*	<1	*41.3*	<1	*1080*	<1	*520*	8	*378*
		7/11/2024	2,490	<0.1	*10.2*	<1	*37.5*	<1	*930*	<1	*471*	10	*342*
		11/12/2024	2,680	<0.1	*10.9*	<1	*39.8*	<1	*1022*	19	*501*	19	*364*
		17/01/2025	2,440	<0.1	*10.0*	<1	*36.8*	<1	*907*	2	*463*	9	*336*
		19/02/2025	2,880	<0.1	*11.6*	<1	*42.2*	<1	*1119*	<1	*533*	7	*387*
		12/03/2025	2,600	<0.1	*10.6*	<1	*38.8*	<1	*983*	1	*488*	17	*355*

Note:

Heavy metal concentrations equal to or exceeds HMTV

Package	Well ID	Sampling Event	Sampled	Date monitored	SWL (mbTOC)	Data logger present?	Data logger recorded?	Comments
West	BH104R	Event 67 - October 2024	Yes	9/10/2024	11.235	Yes	Yes	
West	BH104R	Event 68 - November 2024	Yes	7/11/2024	11.12	Yes	Yes	Monthly monitoring event
West	BH104R	Event 69 - December 2024	Yes	12/12/2024	11.004	Yes	Yes	
West	BH104R	Event 70 - January 2025	Yes	23/01/2025	10.875	Yes	Yes	Monthly monitoring event
West	BH104R	Event 71 - February 2025	Yes	18/02/2025	10.87	Yes	Yes	
West	BH104R	Event 72 - March 2025	Yes	11/03/2025	10.825	Yes	Yes	Monthly monitoring event
West	BH107R	Event 67 - October 2024	Yes	9/10/2024	7.53	Yes	Yes	
West	BH107R	Event 68 - November 2024	Yes	7/11/2024	7.37	Yes	Yes	Monthly monitoring event
West	BH107R	Event 69 - December 2024	Yes	12/12/2024	7.295	Yes	Yes	
West	BH107R	Event 70 - January 2025	Yes	23/01/2025	7.28	Yes	Yes	Monthly monitoring event
West	BH107R	Event 71 - February 2025	Yes	18/02/2025	7.315	Yes	Yes	
West	BH107R	Event 72 - March 2025	Yes	11/03/2025	7.325	Yes	Yes	Monthly monitoring event
West	BH112R	Event 67 - October 2024	Yes	9/10/2024	13.115	Yes	Yes	
West	BH112R	Event 68 - November 2024	Yes	6/11/2024	13.11	Yes	Yes	Monthly monitoring event
West	BH112R	Event 69 - December 2024	Yes	12/12/2024	13.077	Yes	Yes	
West	BH112R	Event 70 - January 2025	Yes	23/01/2025	13.105	Yes	Yes	Monthly monitoring event
West	BH112R	Event 71 - February 2025	Yes	18/02/2025	13.123	Yes	Yes	
West	BH112R	Event 72 - March 2025	Yes	11/03/2025	13.122	Yes	Yes	Monthly monitoring event
Central	BH145R	Event 67 - October 2024	Yes	10/10/2024	11.205	Yes	Yes	
Central	BH145R	Event 68 - November 2024	Yes	7/11/2024	11.06	Yes	Yes	Monthly monitoring event
Central	BH145R	Event 69 - December 2024	Yes	11/12/2024	11.015	Yes	Yes	
Central	BH145R	Event 70 - January 2025	Yes	17/01/2025	10.99	Yes	Yes	Monthly monitoring event
Central	BH145R	Event 71 - February 2025	Yes	19/02/2025	10.955	Yes	Yes	
Central	BH145R	Event 72 - March 2025	Yes	12/03/2025	10.97	Yes	Yes	Monthly monitoring event
East	BH175	Event 67 - October 2024	Yes	10/10/2024	4.36	Yes	Yes	
East	BH175	Event 69 - December 2024	Yes	11/12/2024	4.395	Yes	Yes	
East	BH175	Event 71 - February 2025	Yes	19/02/2025	3.805	Yes	Yes	

Appendix C

Field Parameter Graphs

Groundwater Quality Parameter Graphs

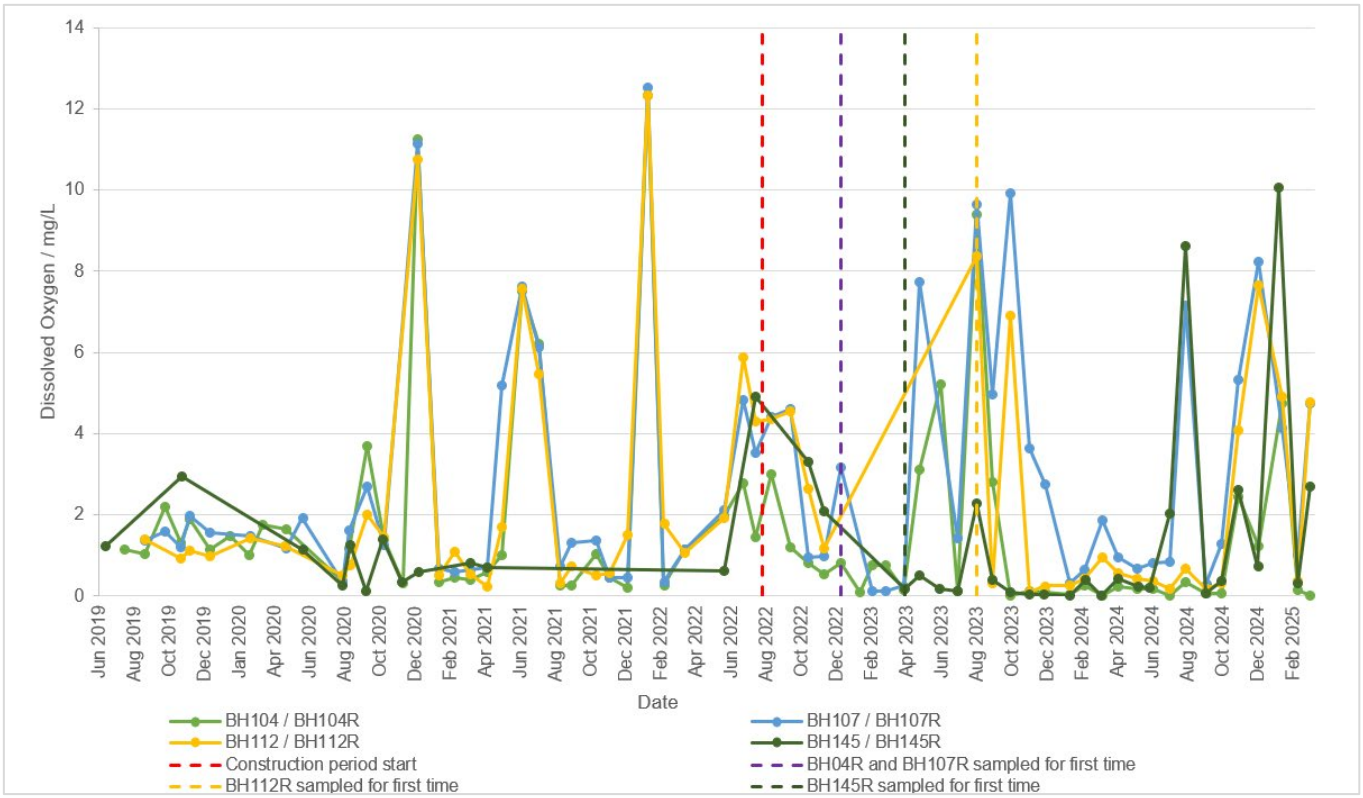


Figure 1 ***Dissolved oxygen in groundwater wells over time***

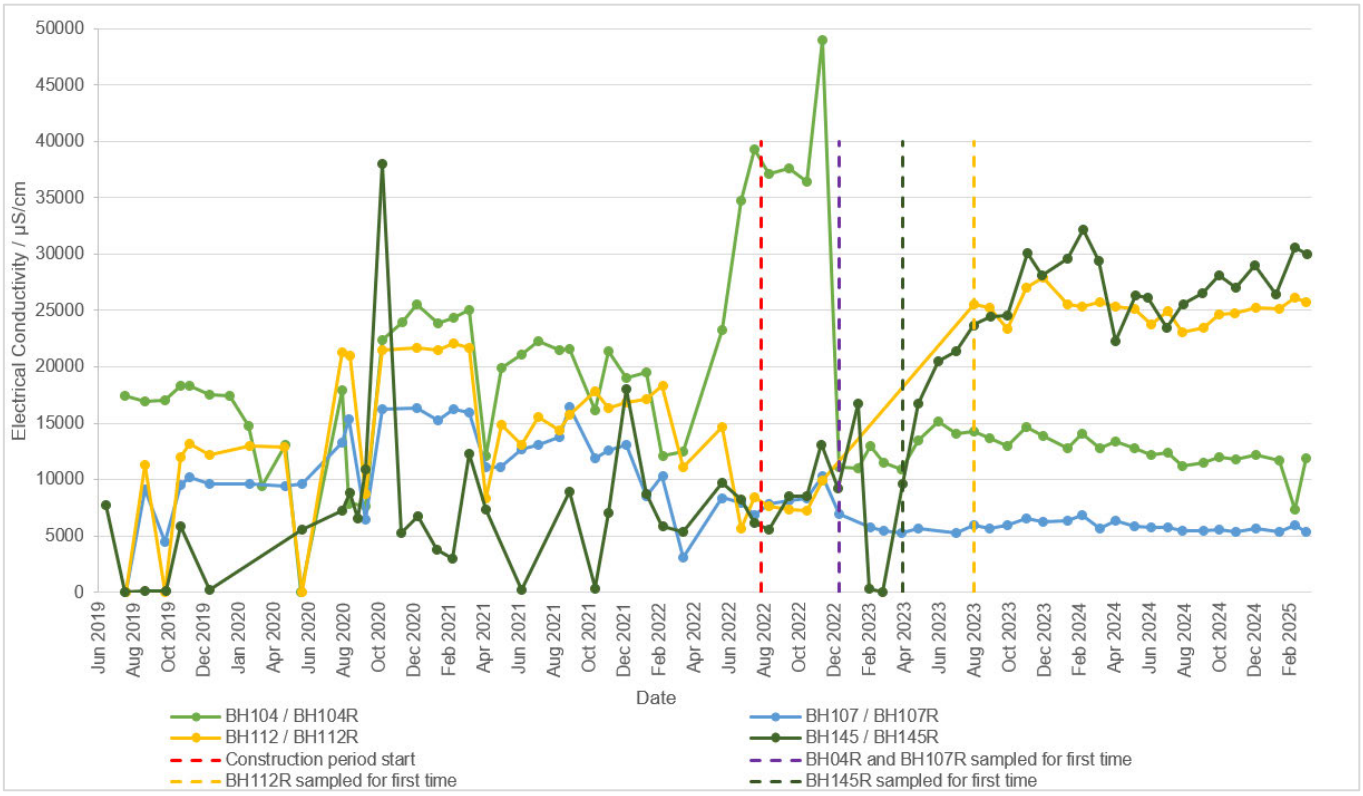


Figure 2 ***Electrical conductivity in groundwater wells over time***

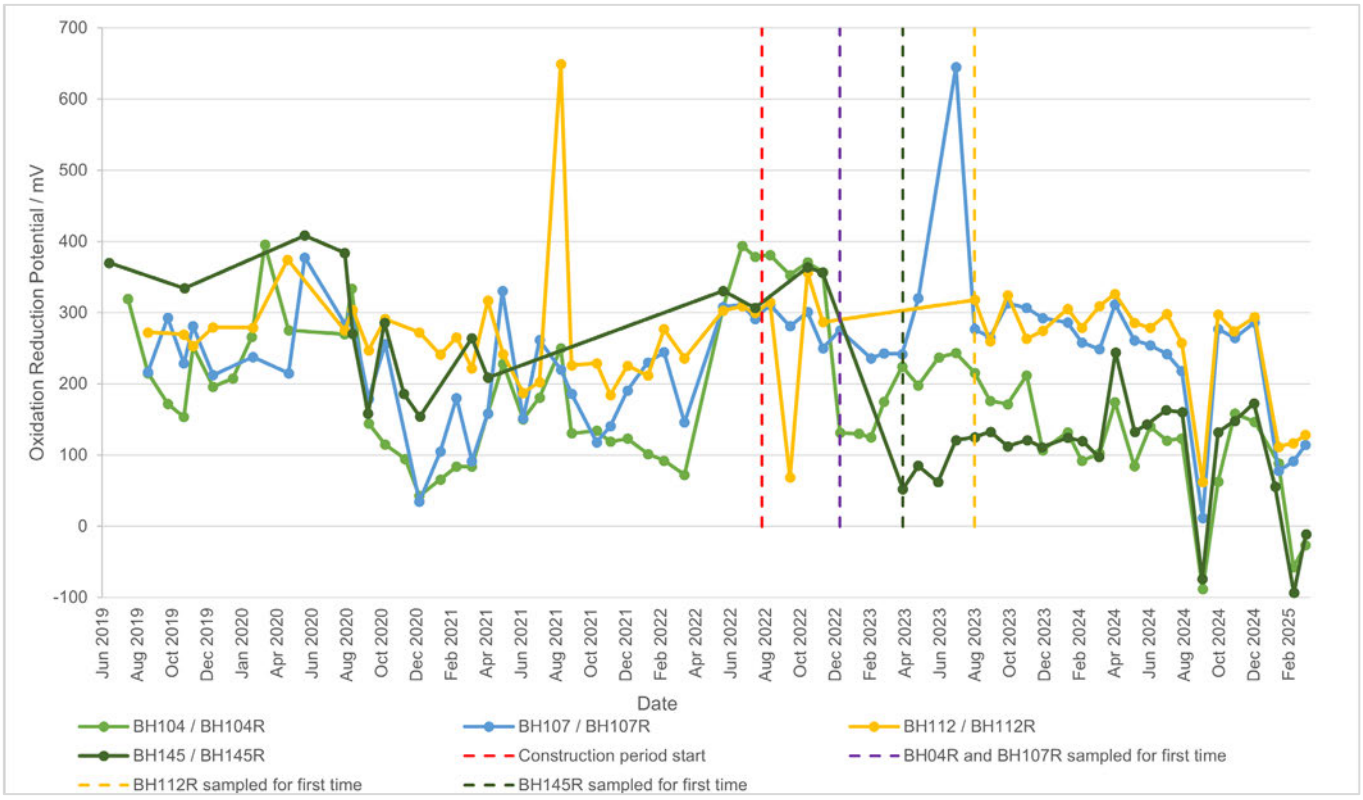


Figure 3 ***Redox in groundwater wells over time***

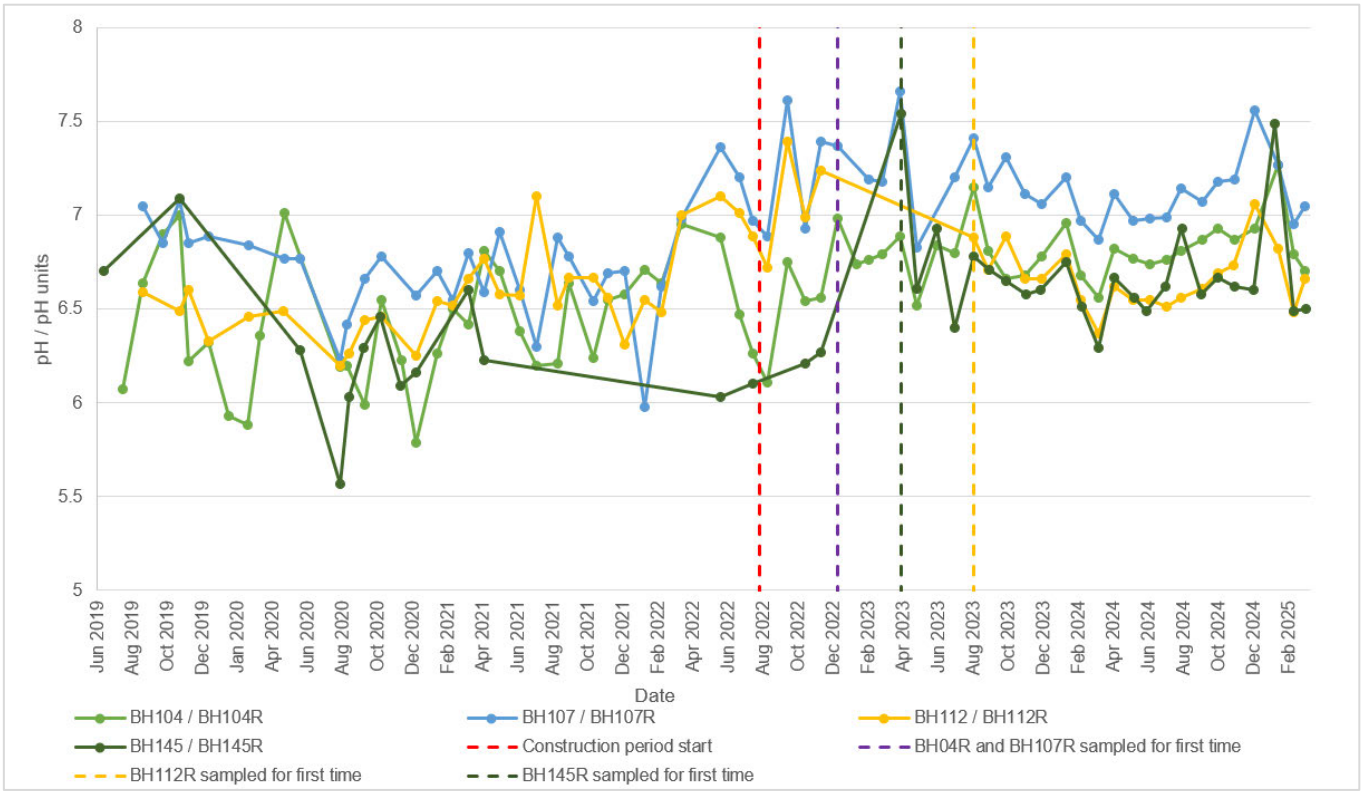


Figure 4 ***pH in groundwater wells over time***

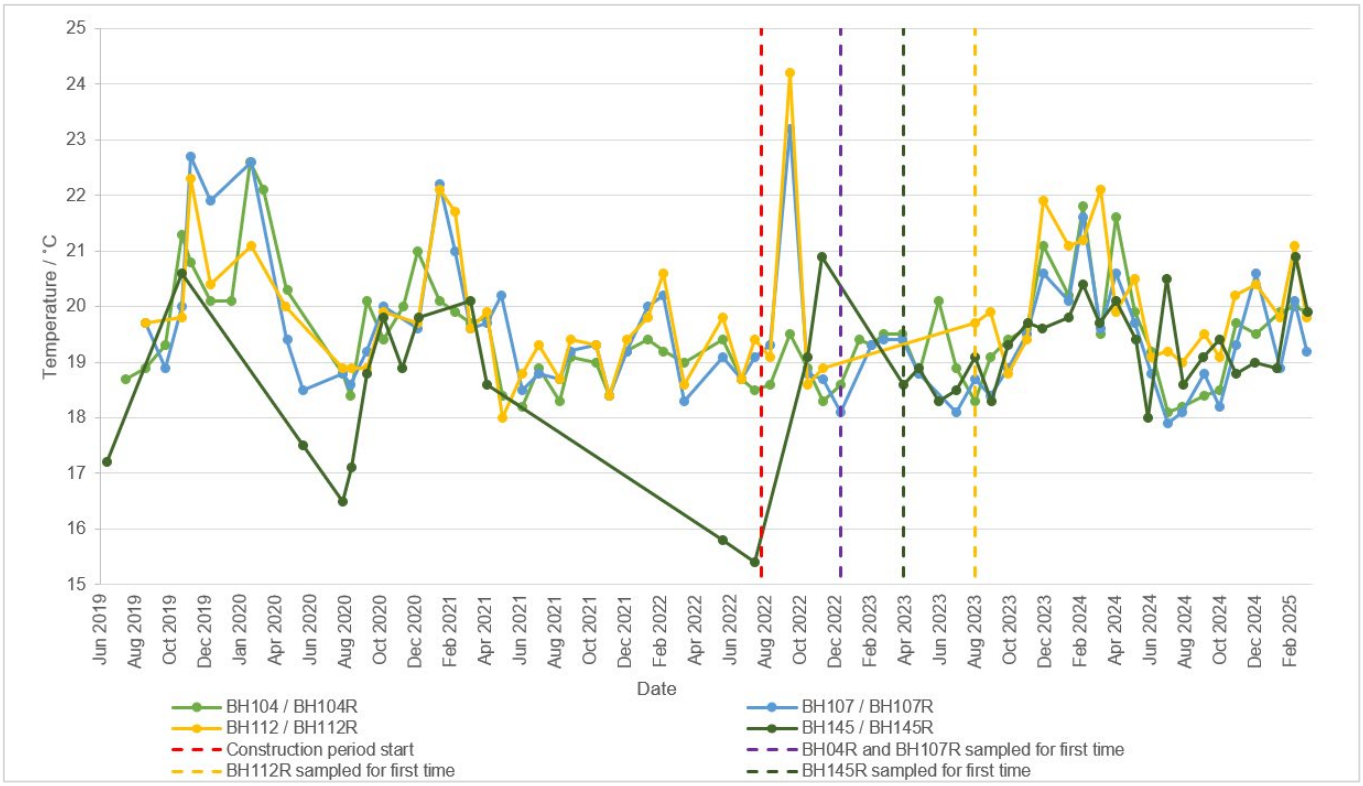


Figure 5 ***Temperature in groundwater wells over time***

Appendix D

Boxplot Graphs

Boxplot graphs for selected analytes

pH

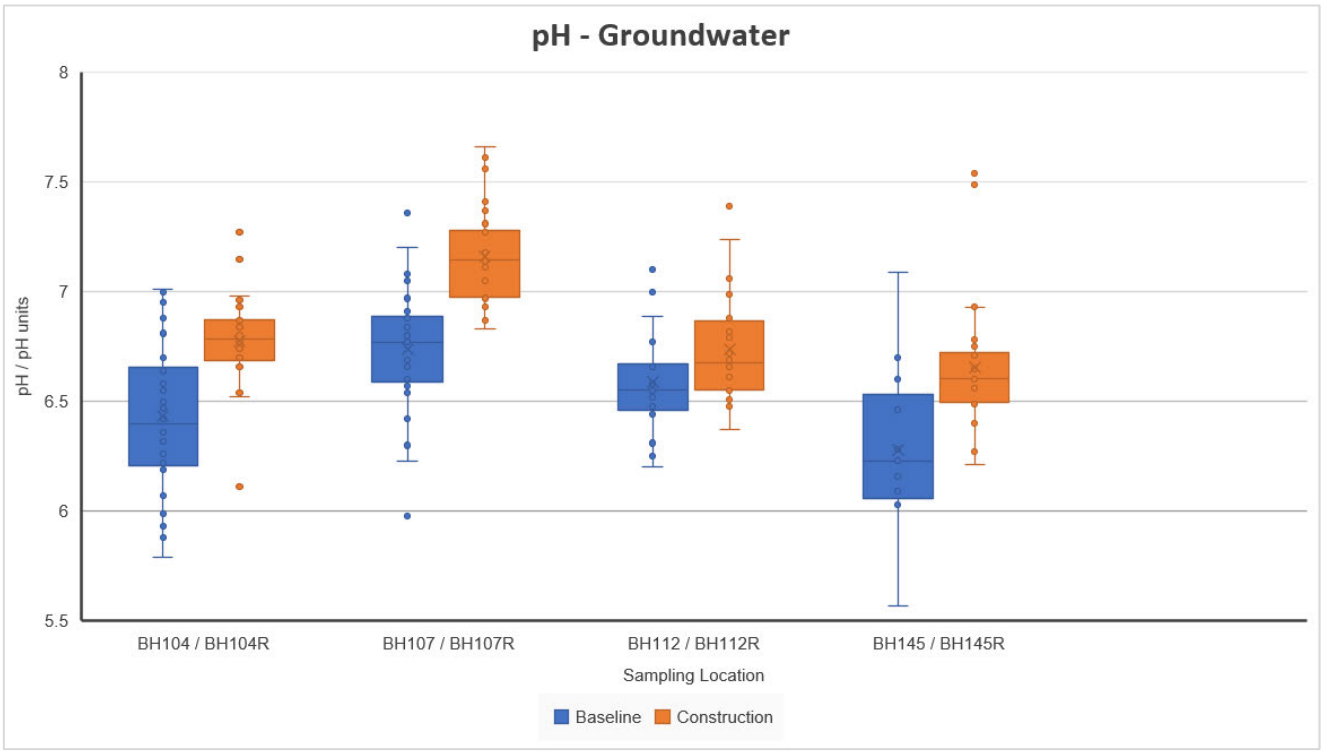


Figure 1 *Summary of field recorded pH for the baseline and construction phases to March 2025*

Electrical Conductivity

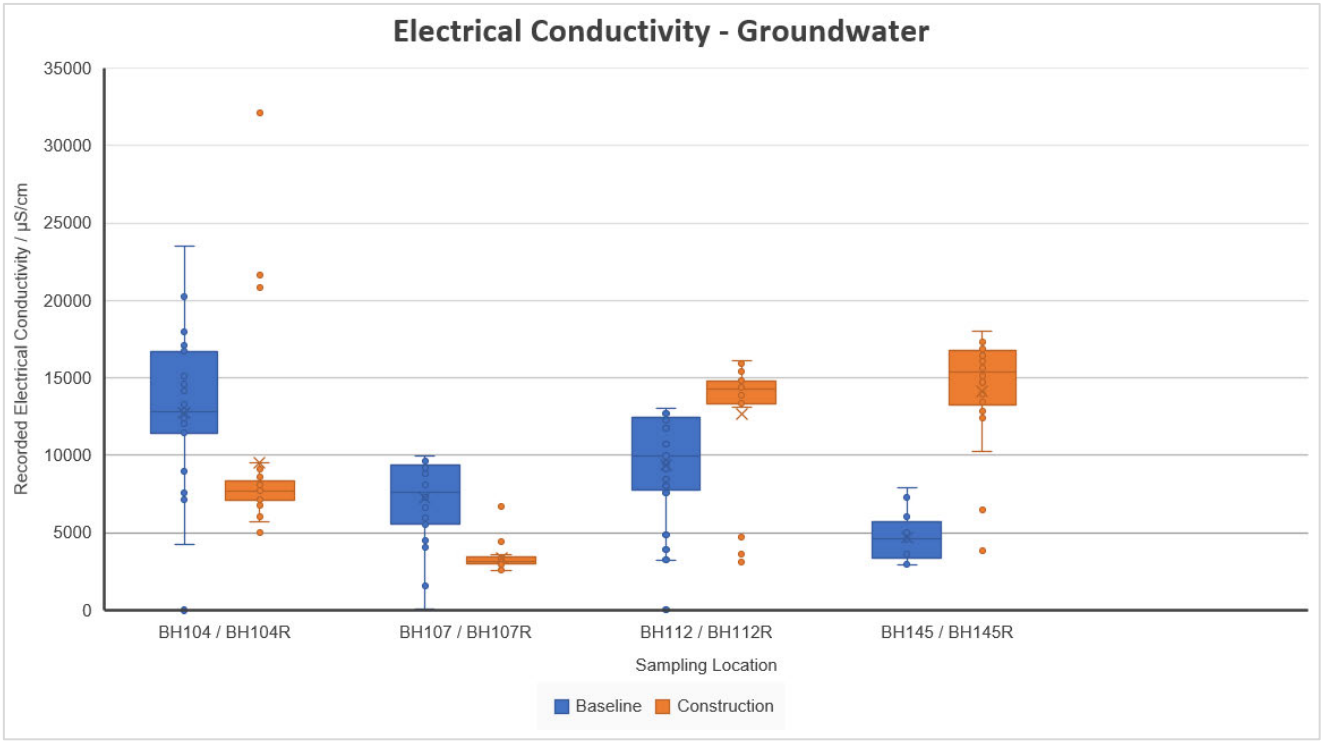
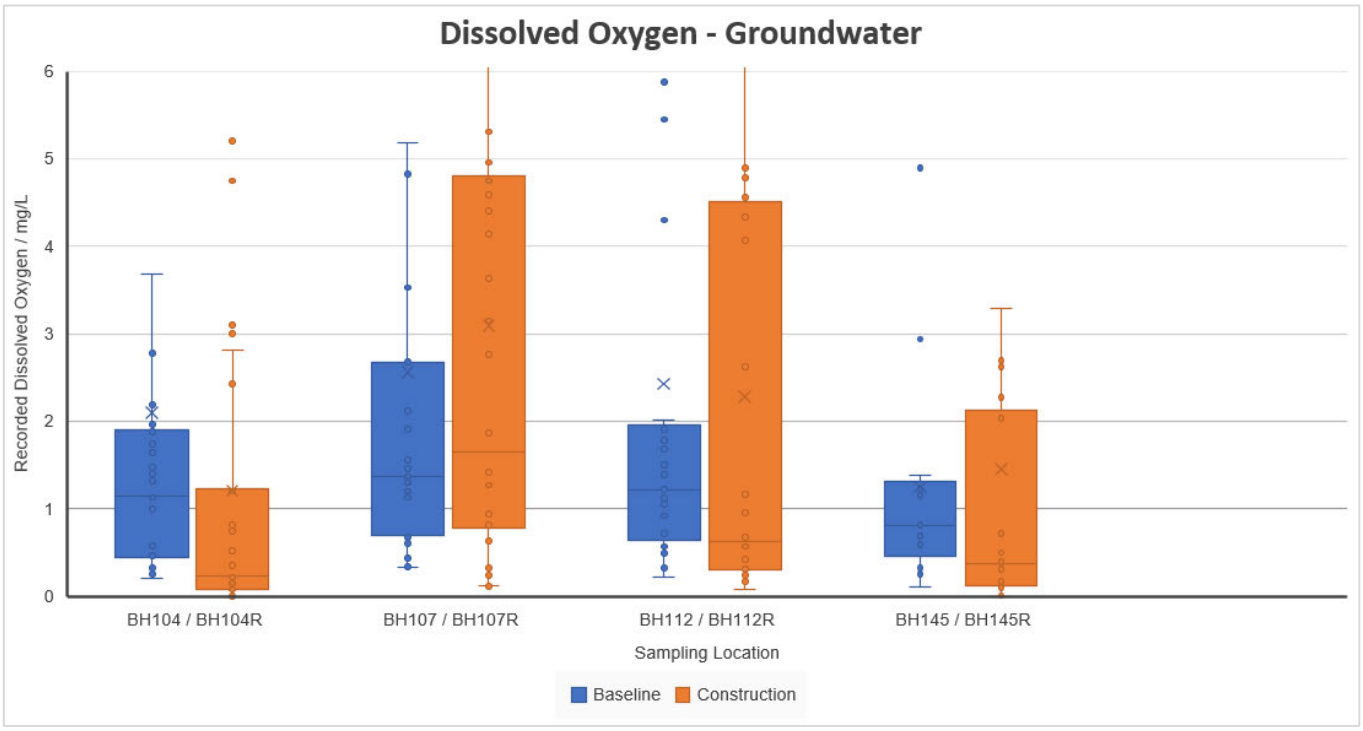


Figure 2 *Summary of field recorded electrical conductivity for the baseline and construction phases to March 2025*

Dissolved Oxygen



Note: Some outliers have been hidden

Figure 3 *Summary of field recorded dissolved oxygen for the baseline and construction phases to March 2025*

Total Dissolved Solids

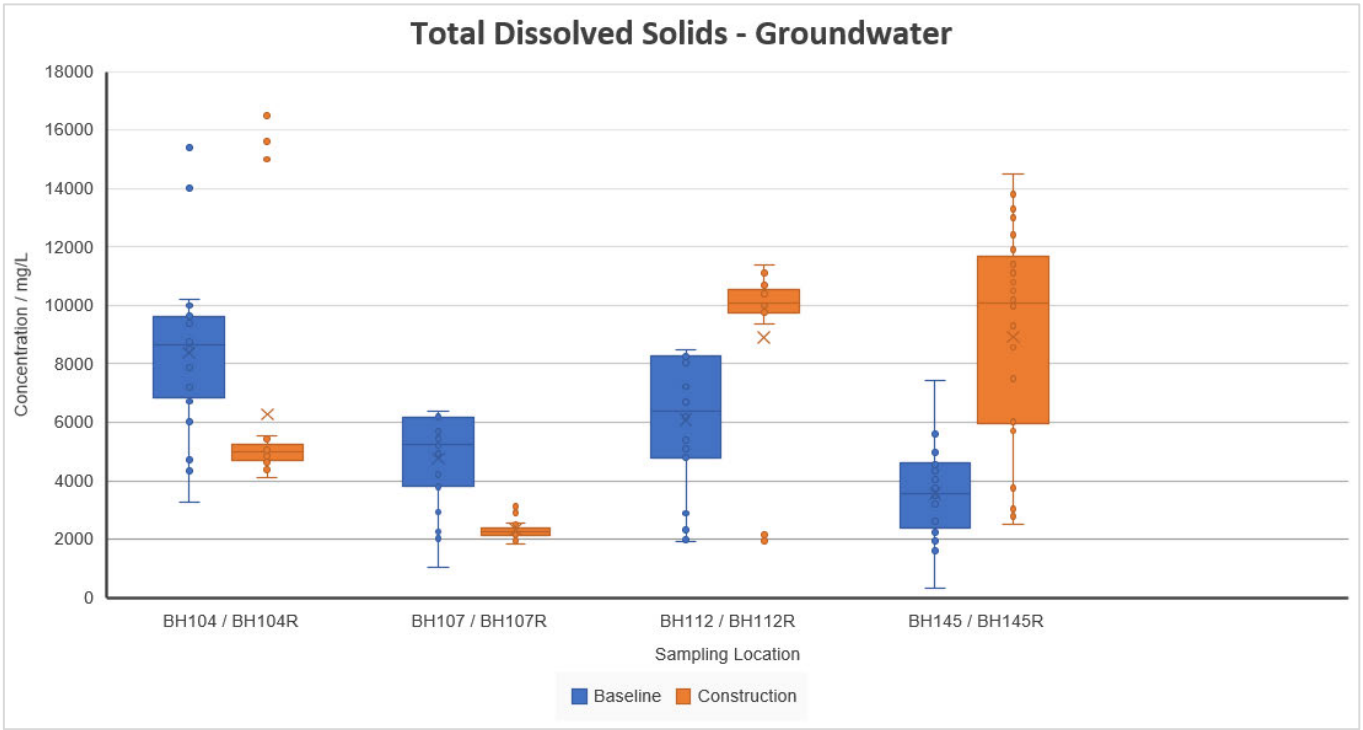
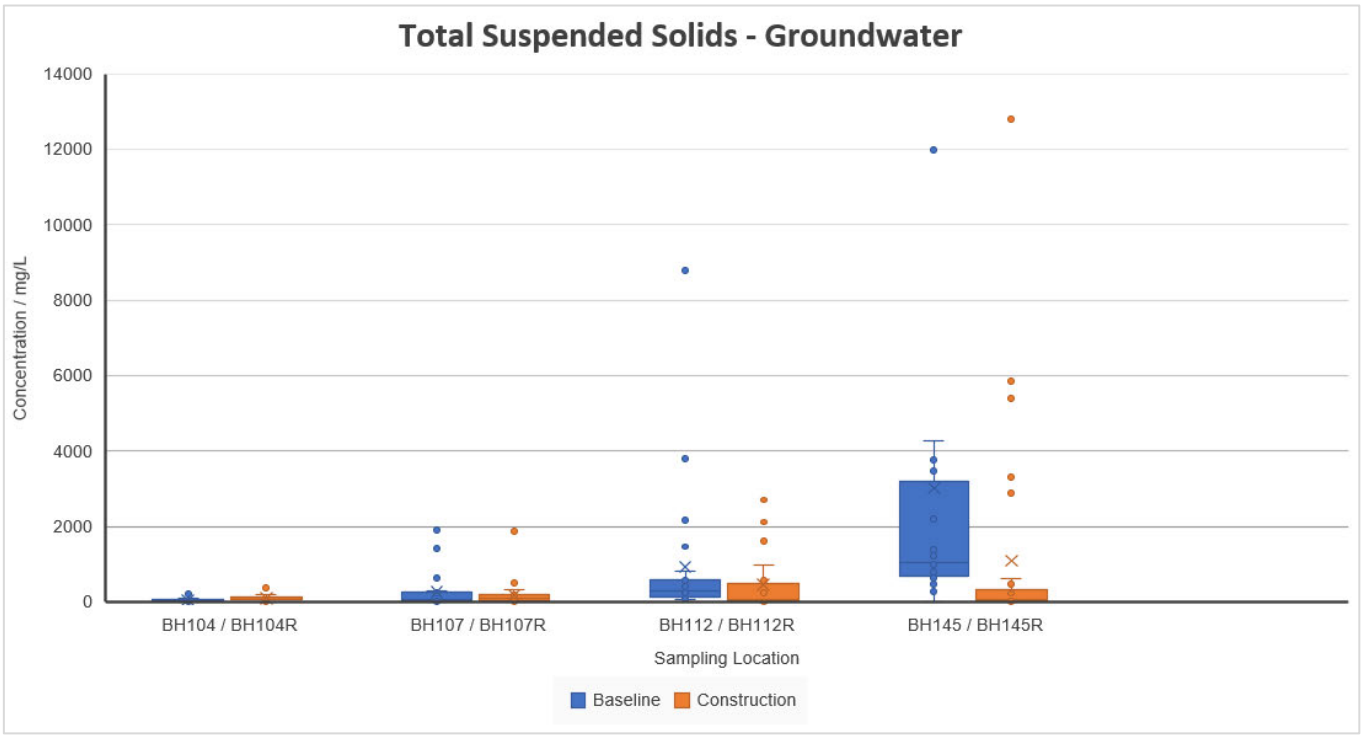


Figure 4 *Summary of total dissolved solids concentrations for the baseline and construction phases to March 2025*

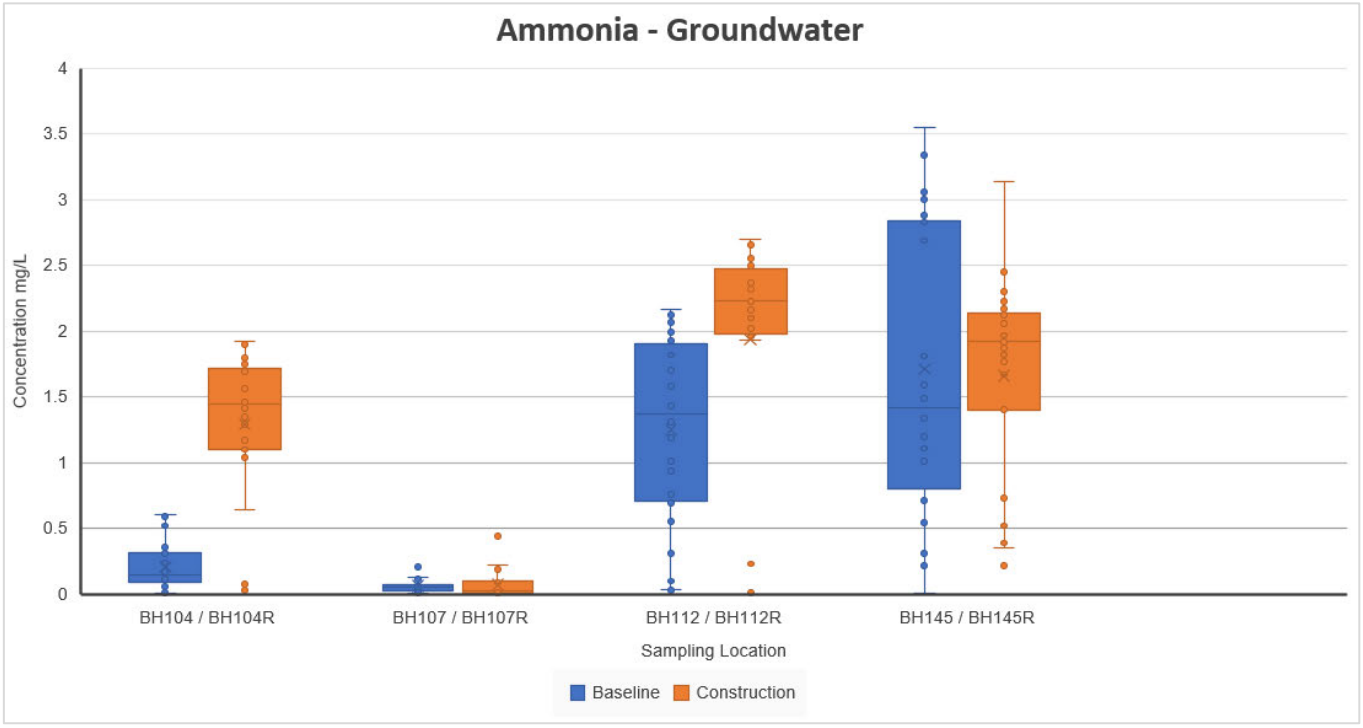
Total Suspended Solids



Note: Some outliers have been hidden

Figure 5 ***Summary of total suspended solids concentrations for the baseline and construction phases to March 2025***

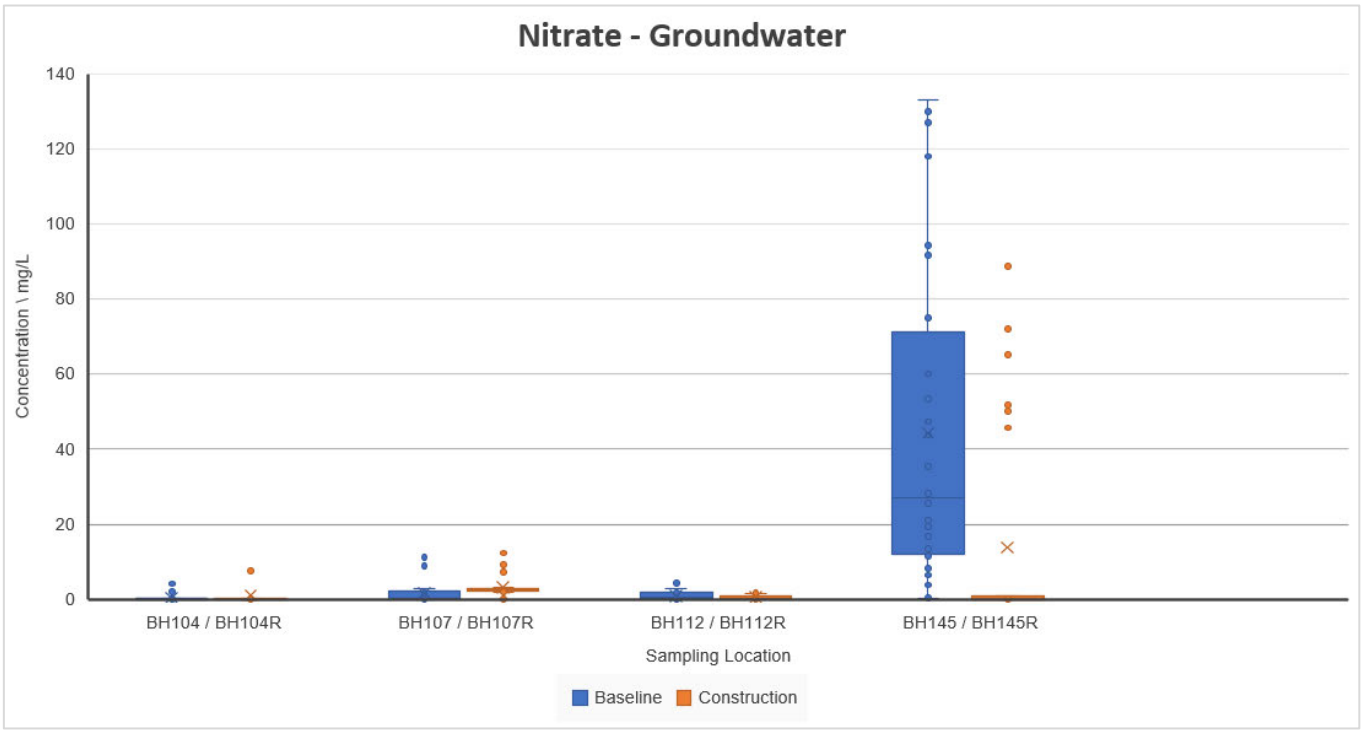
Ammonia



Note: Some outliers have been hidden

Figure 6 ***Summary of ammonia concentrations for the baseline and construction phases to March 2025***

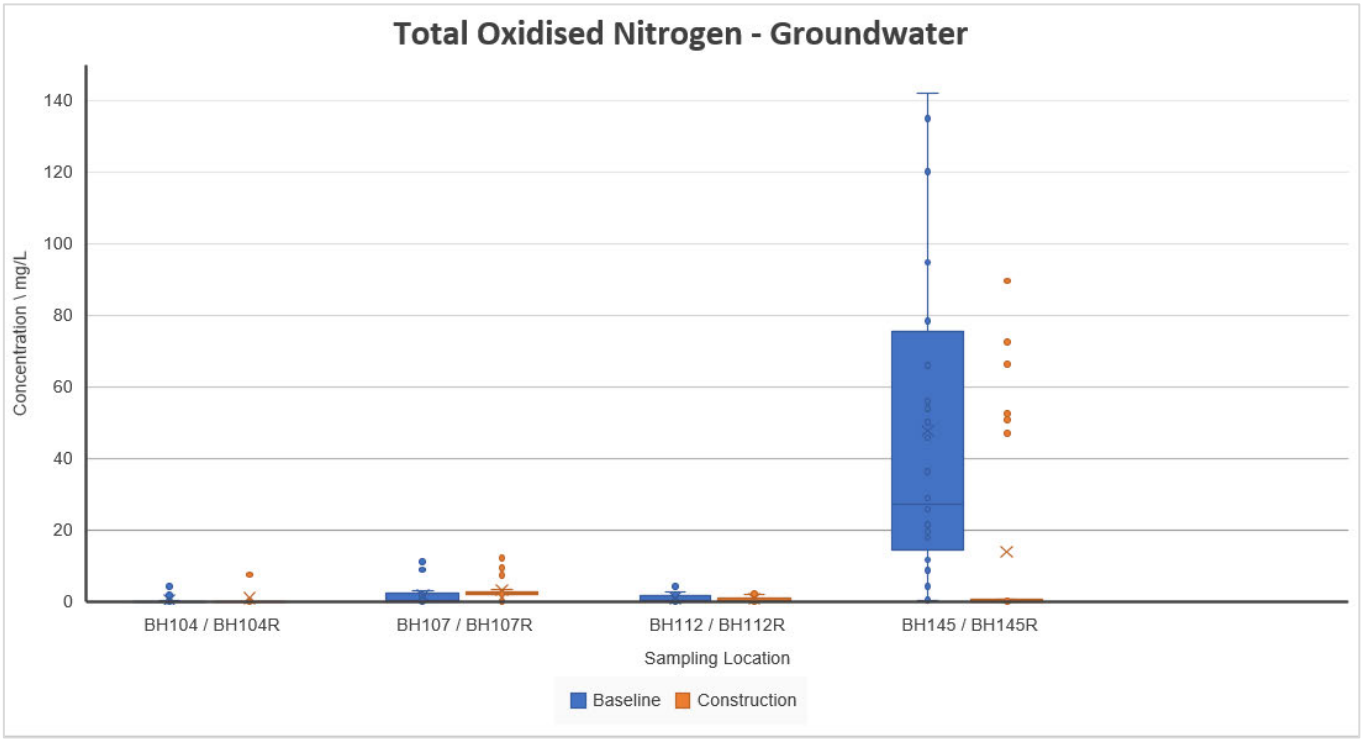
Nitrate



Note: Some outliers have been hidden

Figure 7 Summary of nitrate concentrations for the baseline and construction phases to March 2025

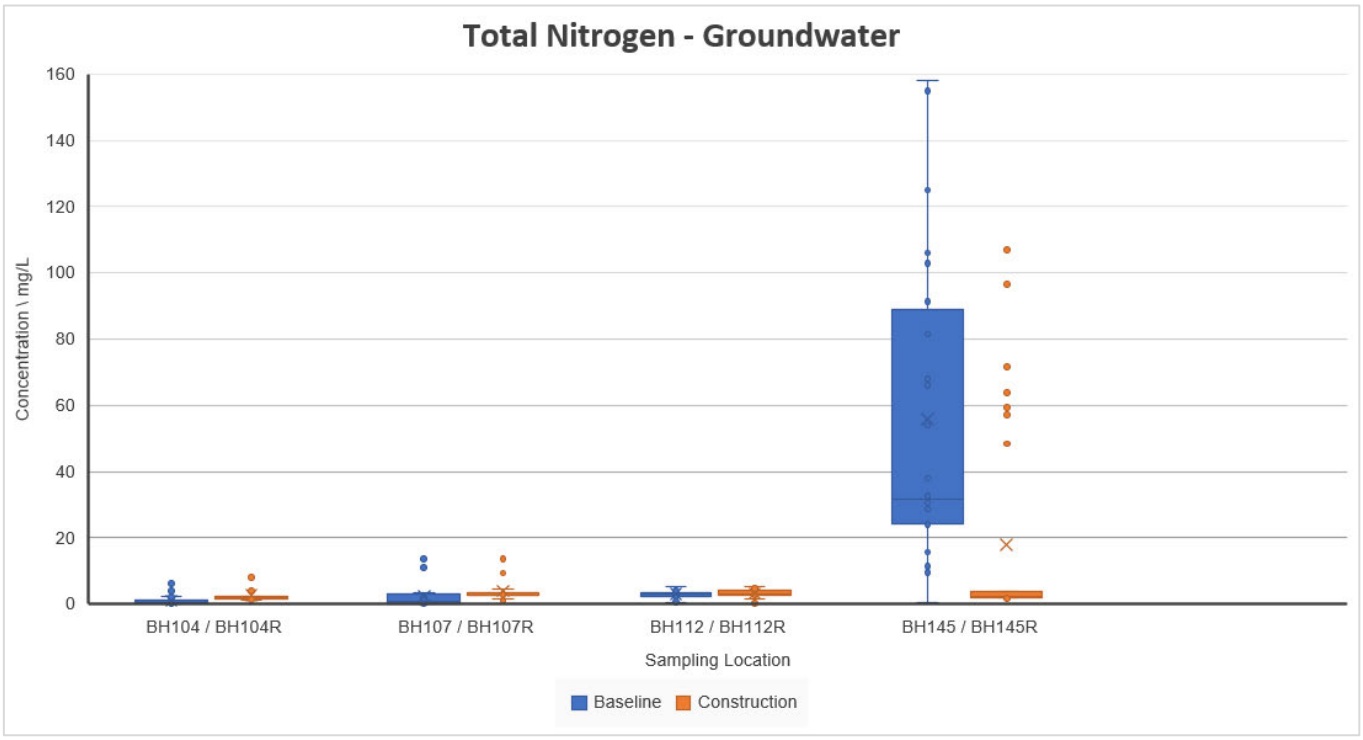
Total Oxidised Nitrogen



Note: Some outliers have been hidden

Figure 8 Summary of total oxidised nitrogen concentrations for the baseline and construction phases to March 2025

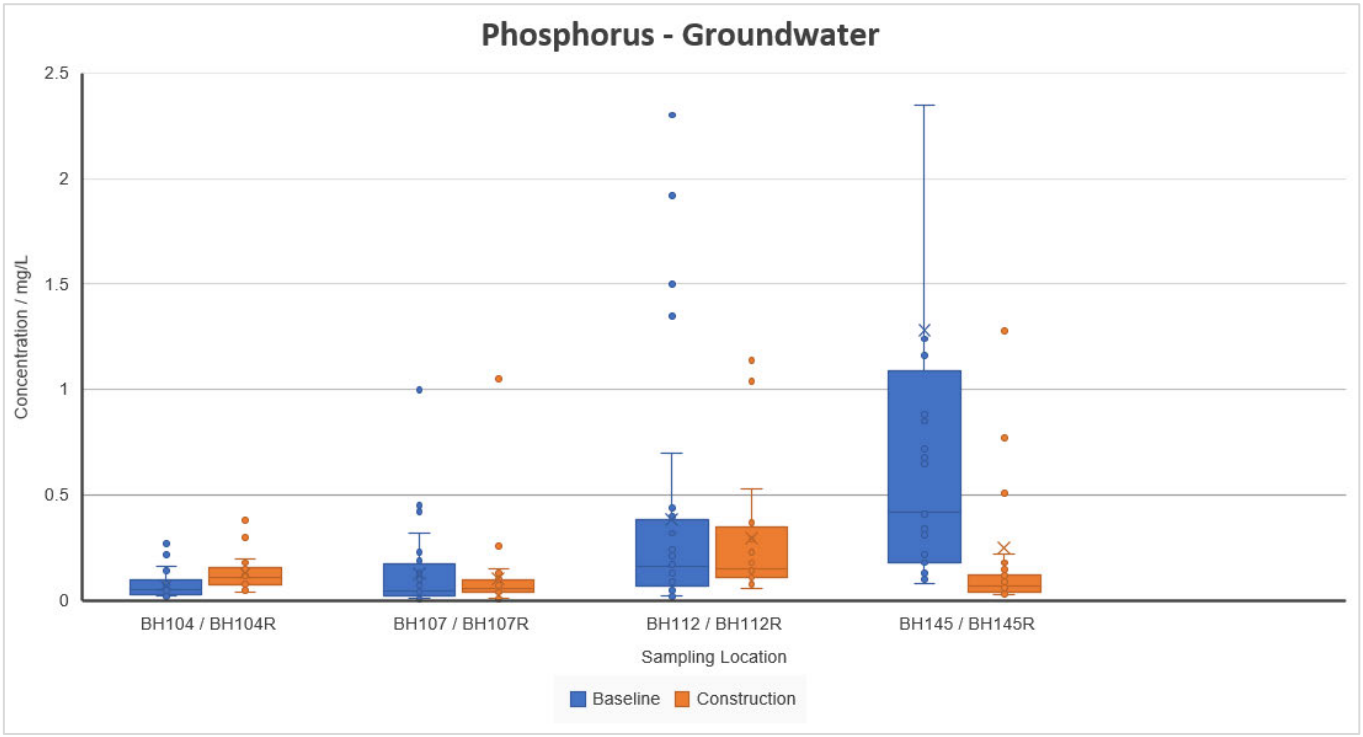
Total Nitrogen



Note: Some outliers have been hidden

Figure 9 ***Summary of total nitrogen concentrations for the baseline and construction phases to March 2025***

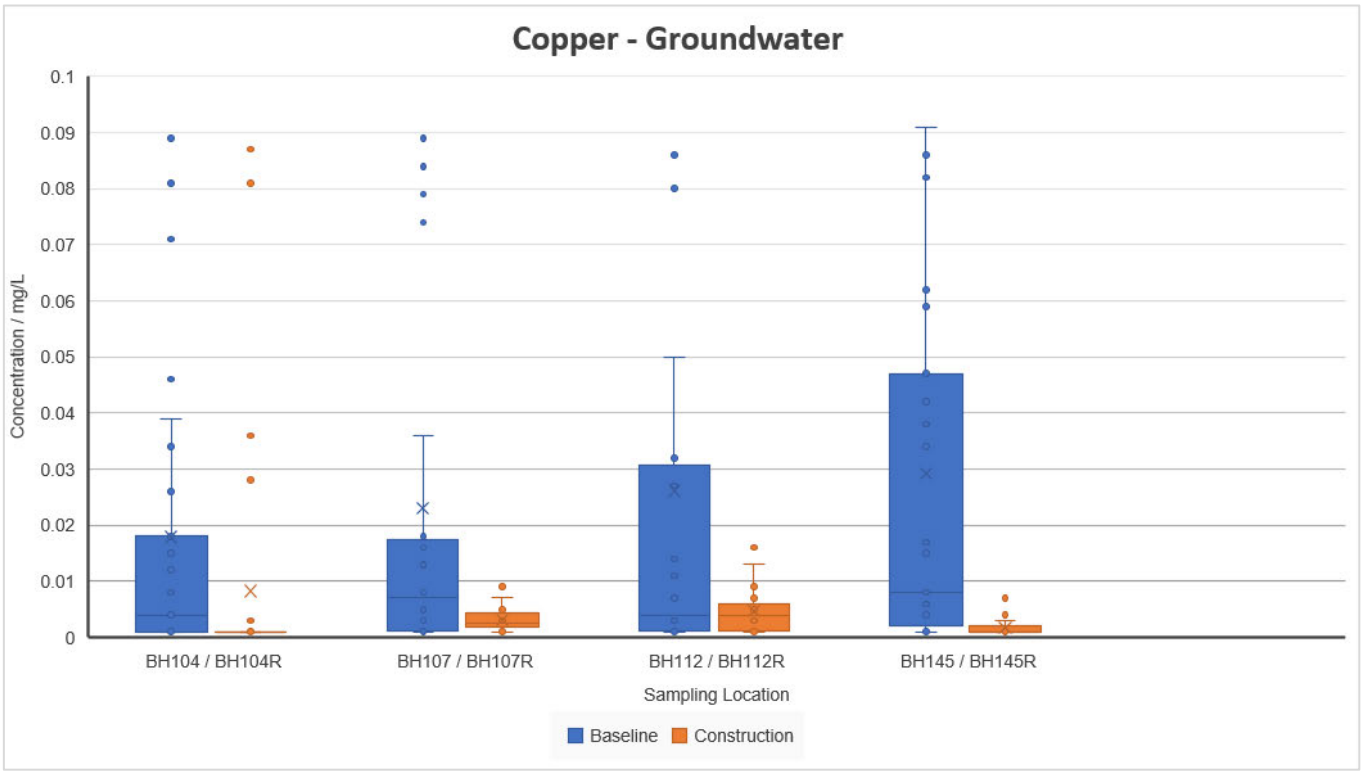
Phosphorus



Note: Some outliers have been hidden

Figure 10 ***Summary of phosphorus concentrations for the baseline and construction phases to March 2025***

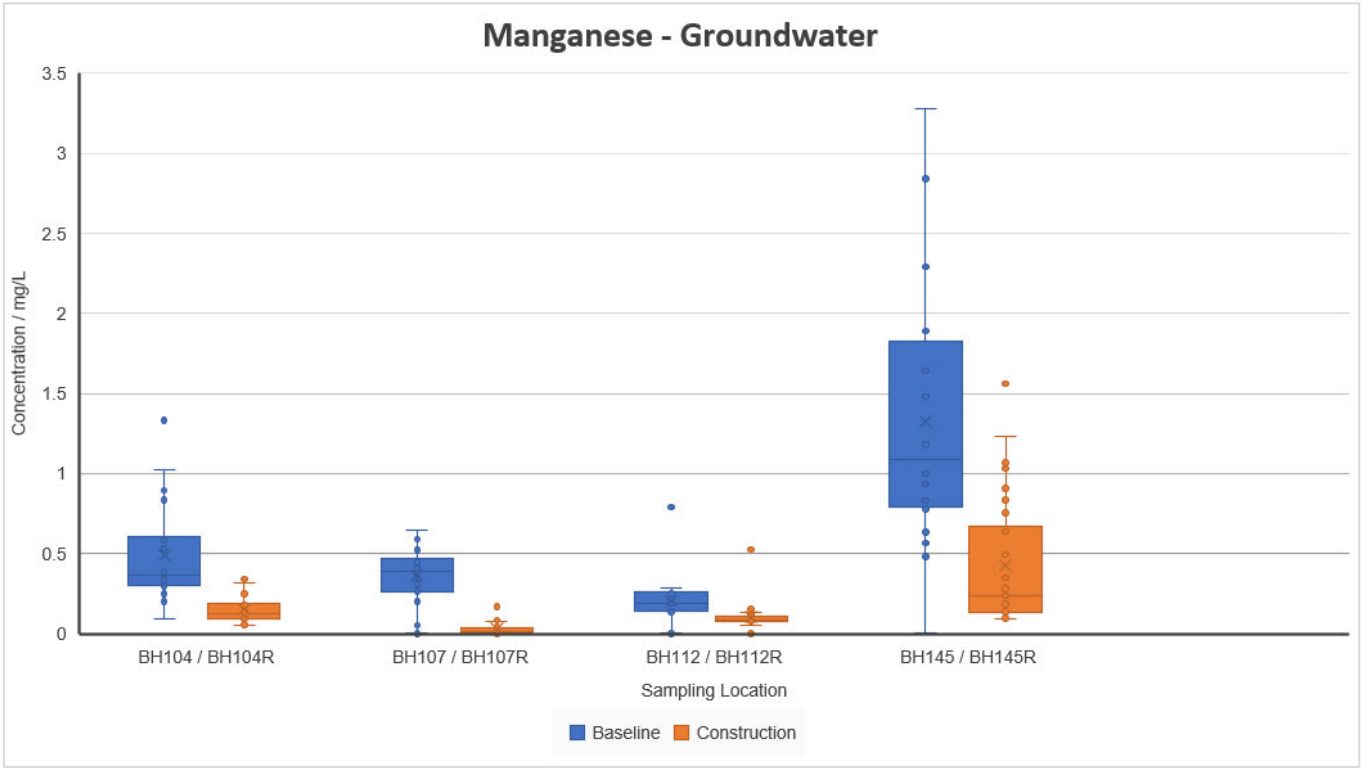
Copper



Note: Some outliers have been hidden

Figure 11 Summary of copper concentrations for the baseline and construction phases to March 2025

Manganese



Note: Some outliers have been hidden

Figure 12 Summary of manganese concentrations for the baseline and construction phases to March 2025

Appendix E

Calibration certificates

Oil / Water Interface Meter

Instrument Geotech Interface Meter (30M)
Serial No. 3910

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
Connectors	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: Miriam Poyitt

Calibration date: 1/10/2024

Next calibration due: 30/11/2024

Multi Parameter Water Meter

Instrument **YSI Pro DSS**
Serial No. **21K104040**

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH/ORP	✓	
	2. Turbidity	✓	
	3. Conductivity	✓	
	4. D.O	✓	
	5. Temp	✓	
	6. Depth	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. SPC (µS/cm)		2760		424499	2763
2. Temp (C)		19.8		MultiTherm	19.4
3. pH 4		4.00		422643	3.96
4. pH 7		7.00		419529	7.02
6. DO (%)		0.0%		412773	-0.4%
7.Turbidity (NTU)		100.00		426945	100.04
ORP (mV)		234.44		420151/420152	234.2

Calibrated by: **Christopher Nicdao**

Calibration date: **02/10/2024**

Next calibration due: **01/11/2024**

Oil / Water Interface Meter

Instrument Geotech Interface Meter (30M)
Serial No. 4441

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
Tape Check	Cleaned	✓	
Connectors	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: Samuel Tanner

Calibration date: 31/10/2024

Next calibration due: 30/12/2024

Multi Parameter Water Meter

Instrument YSI Pro DSS
Serial No. 21K101478

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH/ORP	✓	
	2. Turbidity	✓	
	3. Conductivity	✓	
	4. D.O	✓	
	5. Temp	✓	
	6. Depth	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00 (pH)		pH 7.00		426181	6.97
2. pH 4.00 (pH)		pH 4.00		429462	4.02
3. ORP (mV)		227.4		420151/426087	227.6
4. EC (uS/cm)		2760		429463	2762
5. D.O		0%		412773	-0.3%
6. Temp (°C)		23.0		MultiTherm	22.8
7. Turbidity (NTU)		100NTU		430123	98.86

Calibrated by: Samuel Tanner

Calibration date: 4/11/2024

Next calibration due: 4/12/2024

28/11/24

Oil / Water Interface Meter

Instrument Geotech Interface Meter (60m)
Serial No. 3961

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors			
Tape Check	Cleaned	✓	
Connectors	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: **Miriam Poyitt**

Calibration date: **28-Nov-24**

Next calibration due: **27-Jan-25**

Multi Parameter Water Meter

Instrument YSI Pro DSS
Serial No. 21K101477

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. Turbidity	✓	
	3. Conductivity	✓	
	4. D.O	✓	
	5. Temp	✓	
	6. Depth	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.00		426181	6.99
2. pH 4.00		pH 4.00		429462	4.00
3. ORP		227.84		426086/426087	227.8
4. EC		2760mS		433489	2760
5. D.O		0.0%		412773	-0.2%
6. Temp		22.8		MultiTherm	22.2
&. Turbidity		100NTU		434381	100.07

Calibrated by: **Samuel Tanner**

Calibration date: **6/12/2024**

Next calibration due: **5/01/2025**

Multi Parameter Water Meter

Instrument YSI Pro DSS
Serial No. 21K101474

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH/ORP	✓	
	2. Turbidity	✓	
	3. Conductivity	✓	
	4. D.O	✓	
	5. Temp	✓	
	6. Depth	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH7		426181	7.04
2. pH 4.00		pH4		429462	4.03
3.ORP (mV)		226.6		435258/426086	225.64
4. SPC (uS/cm)		2760		433489	2763
5. D.O		0.0%		412773	-0.3%
6. Temp (^{o}C)		23.8		MultiTherm	23.6
7. Turbidity (NTU)		100		434381	94.74

Calibrated by: **Miriam Poyitt**

Calibration date: **7/01/2025**

Next calibration due: **6/02/2025**

Oil / Water Interface Meter

Instrument Geotech Interface Meter (30M)
Serial No. 4019

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
Connectors	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: Chris Nicdao

Calibration date: 9/01/2025

Next calibration due: 8/02/2025

Multi Parameter Water Meter

Instrument **YSI Pro DSS**
Serial No. **21K101474**

airmet

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH/ORP	✓	
	2. Turbidity	✓	
	3. Conductivity	✓	
	4. D.O	✓	
	5. Temp	✓	
	6. Depth	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH7		426181	7.01
2. pH 4.00		pH4		429462	4.01
3.ORP (mV)		228.28		A426086/B435258	230.3
4. SPC (uS/cm)		2760		433489	2752
5. D.O		0.0%		412773	-0.1%
6. Temp (°C)		22.6		MultiTherm	22.4
7. Turbidity (NTU)		100		434381	99.42

Calibrated by: **Miriam Poyitt**

Calibration date: **21/01/2025**

Next calibration due: **20/02/2025**

Multi Parameter Water Meter

Instrument YSI Pro DSS
Serial No. 21K104033

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH/ORP	✓	
	2. Turbidity	✓	
	3. Conductivity	✓	
	4. D.O	✓	
	5. Temp	✓	
	6. Depth	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00	pH 7.00		426181	7.03
2. pH 4.00	pH 4.00		429462	3.99
3. mV	230.92		A426086/B435258	230.5
4. EC	2760 µS/cm		433489	2754
6. D.O	0.0%		412773	-0.1%
7. Temp	21.4		MultiTherm	21.1
8. Turbidity	100 NTU		434381	100.05

Calibrated by: Miriam Poyitt

Calibration date: 17/01/2025

Next calibration due: 16/02/2025

Multi Parameter Water Meter

Instrument YSI Pro DSS
Serial No. 21K104033

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH/ORP	✓	
	2. Turbidity	✓	
	3. Conductivity	✓	
	4. D.O	✓	
	5. Temp	✓	
	6. Depth	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00	pH 7.00		426181	7.03
2. pH 4.00	pH 4.00		429462	3.99
3. mV	230.92		A426086/B435258	230.5
4. EC	2760 µS/cm		433489	2754
6. D.O	0.0%		412773	-0.1%
7. Temp	21.4		MultiTherm	21.1
8. Turbidity	100 NTU		434381	100.05

Calibrated by: Miriam Poyitt

Calibration date: 17/01/2025

Next calibration due: 16/02/2025

Oil / Water Interface Meter

Instrument Geotech Interface Meter (60M)
Serial No. 3911

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity above 7.9v	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	3	
Connectors	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Tested by: **Alex Buist**

Test date: **10/12/2024**

Next Test due: **9/01/2025**

Oil / Water Interface Meter

Instrument Geotech Interface Meter (60m)
Serial No. 3954

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
Tape Check	Cleaned	✓	
Connectors	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: Miriam Poyitt

Calibration date: 17/12/2024

Next calibration due: 15/02/2025

Multi Parameter Water Meter

Instrument YSI Pro DSS
Serial No. 21K101479

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. Turbidity	✓	
	3. Conductivity	✓	
	4. D.O	✓	
	5. Temp	✓	
	6. Depth	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
pH 7.00		7.00		426181	6.96
pH 4.00		4.00		429462	3.99
ORP (mV)		227.84		A426086/B435258	229.9
EC (uS/cm)		2760		436693	2759
D.O. (%)		0.0%		412773	0.2%
Temp (°C)		22.8		MultiTherm	22.6
Turbidity (NTU)		100		436042	100.60

Calibrated by: Chris Nicdao

Calibration date: 14/02/2025

Next calibration due: 16/03/2025

Oil / Water Interface Meter

Instrument Geotech Interface Meter (60m)
Serial No. 3954

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
Tape Check	Cleaned	✓	
Connectors	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: **Athonis Popotas**

Calibration date: **12/02/2024**

Next calibration due: **12/04/2024**

Oil / Water Interface Meter

Instrument Geotech Interface Meter (30M)
Serial No. 4019

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
Connectors	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: **Nausheen Mazari**

Calibration date: **4/03/2025**

Next calibration due: **3/04/2025**

Multi Parameter Water Meter

Instrument YSI Pro DSS
Serial No. 21B104421

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH/ORP	✓	
	2. Conductivity	✓	
	3. D.O	✓	
	4. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
pH 4.00 (pH)		pH 4.00		429462	3.96
pH 7.00 (pH)		pH 4.00		433551	7.00
ORP (mV)		225.86		A426086/B435258	227.0
EC (uS/cm)		2760		436693	2749
D.O. (%)		0%		412773	0.0%
Temp (°C)		23.7		MultiTherm	23.6
Turbidity (NTU)		100 NTU		436042	98.21

Calibrated by: **Miriam Poyitt**

Calibration date: **4/03/2025**

Next calibration due: **4/04/2025**

Appendix F

Quality assurance / Quality control program and assessment

Data Quality Objectives (DQOs)

The Data Quality Objectives (DQOs) are based on guidance presented in:

– NEPC (2013) National Environment Protection (Assessment of Site Contamination) Amended Measure (NEPM) No. 1 – Schedule B2, Guideline on Site Characterisation.

The DQO process will be applied to the on-going monitoring to ensure that data collection activities are appropriate and achieve the project objectives. The DQO process involves seven steps as follows:

– Step 1: State the Problem
– Step 2: Identify the decision/goal of the study
– Step 3: Identify the information inputs
– Step 4: Define the boundaries of the Study
– Step 5: Develop the analytical approach
– Step 6: Specify performance or acceptance criteria
– Step 7: Develop the plan for obtaining data

An overview of the DQOs for the works are presented in the following steps.

Step 1: State the problem

The M12 Motorway (the project) is located between the M7 Motorway at Cecil Hills, and The Northern Road at Luddenham in Western Sydney, covering approximately 16 km. The intention of the project is to provide direct access between the Western Sydney International Airport at Badgerys Creek and Sydney's motorway network.

As part of the project approval conditions, TfNSW are required to prepare and implement a groundwater monitoring program for the M12 Motorway development to be undertaken during baseline, construction and post construction.

Step 2: Identify the decision/goal of the study

The key goal of the baseline monitoring program is to collect background monitoring data to identify baseline conditions in at least the first 12 months "pre-construction", prior to commencement of construction of the M12 Motorway.

The baseline data would support the development of a groundwater monitoring program and management plans for construction and operation of the project. The baseline data may also inform the design of construction and operational groundwater quality controls.

Step 3: Identify the information inputs

The following inputs are required for the decision:

Existing data obtained from previous Jacobs reports: Surface water and hydrology assessment report (JAJV, 2018a), Contamination factual report (JAJV, 2018b) and groundwater assessment report (2018c).

– Sampling and gauging of four groundwater well locations (BH104/BH104R, BH107/BH107R, BH112/BH112R and BH145/BH145R) along the proposed project alignment.
– Analysis of groundwater samples for the following analytes:
    - Dissolved heavy metals (arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel and zinc)
    - Total recoverable hydrocarbons (TRH)
    - Benzene, toluene, ethylbenzene, xylene and naphthalene (BTEXN)
    - Nutrients (including ammonia, nitrate, nitrite, total nitrogen, total phosphorus)
    - Total dissolved solids (TDS)
    - Total suspended solids (TSS)
    - Major anions and cations (chloride, sulfate, sodium, potassium, magnesium, calcium, carbonate and bicarbonate)
    - Total hardness as CaCO3.

– Comparison of data with relevant public health and environmental water quality criteria to identify baseline conditions prior to commencement of the construction of the project.
– Confirmation that data generated by sampling and analysis are of a suitable quality to allow reliable comparison to baseline data as per the assessment of the data quality indicators (DQIs) (further discussed below).
– Baseline 20th and/or 80th percentiles to be calculated and compared to the construction monitoring period to ensure that the construction of the motorway is not impacted on the groundwater.

Step 4: Define the boundaries of the study

The spatial and temporal boundaries of the study area are as follows:

– The lateral boundary of the project is defined as the extent of the groundwater monitoring locations as shown in Figure 1, Appendix A.
– The vertical boundary of the project is defined as the depth of the maximum groundwater well, approximately 72.15m AHD (BH112)
– The temporal boundary of the project is defined as the previous baseline monitoring periods (April 2019 to July 2022) and the construction monitoring period (August 2022 to March 2025).

Step 5: Develop the analytical approach

The degree of impact by contaminants and the associated decisions will be assessed with reference to assessment criteria, as discussed in Section 4.2. Acceptable relative percentage difference (RPD) limits for chemicals of potential concern (CoPC) detected in Quality Assurance and Quality Control (QA/QC) samples such as field duplicates, rinsate blanks, trip blanks and trip spikes and matrix spikes and matrix spike duplicates are identified in the following sections. The decision rules to be applied are as follows:

– Monitoring data will be compared against relevant public health and environmental water quality guidelines to make this assessment.
– If the data has been collected in a manner from which it is possible to establish completeness, comparability, representativeness, precision and accuracy, the data will be considered suitable for the purposes of this assessment.
– If baseline data, either within or exceeding adopted assessment criteria, is considered suitable for interpretation, baseline conditions are able to be determined and support the development of a groundwater monitoring program during the construction and future operation of the project.
– If changes in groundwater conditions are observed between monitoring events during the construction and/or operational phases and previous baseline periods that cannot be plausibly explained by natural environmental fluctuations, and the concentrations of contaminants of potential concern have become elevated to levels in exceedance of the adopted public health and environmental water quality criteria, then further assessment may be required to evaluate the need for additional investigation and / or remediation / management activities.

Step 6: Specify performance or acceptance criteria

Data generated during this groundwater monitoring program must be appropriate to allow decisions to be made with confidence. Specific limits have been adopted in accordance with the appropriate guidance from the AS4482.1, which includes appropriate indicators of data quality (DQIs used to assess QA/QC, and GHD's Standard Field Operating Procedures). The pre-determined DQIs established for the project are discussed below.

If any of the DQIs are not met, further investigation will be necessary to determine whether the non-conformance will significantly affect the usefulness of the data.

Step 7: Develop the plan for obtaining data

This step involves identifying the most resource effective sampling and analysis design which is required to satisfy the DQOs. The sampling and analysis plan which was developed to meet this objective is provided in Section 3.

Data quality indicators

Data generated during this investigation must be appropriate to allow decisions to be made with confidence. Specific limits for this investigation have been adopted in accordance with guidance from the AS4482.1 which

includes appropriate indicators of data quality ((DQIs) used to assess QA/QC, and GHD's Standard Field Operating Procedures).

To assess the usability of the data prior to making decisions, the data was assessed against pre-determined DQIs. The DQIs including precision, accuracy, representativeness, comparability and completeness, were reviewed at the completion of the investigation works to assess for the presence of decision errors.

The pre-determined DQIs established for the investigation are discussed below and shown in Table F1.

– Precision - measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the RPD of duplicate samples.
– Accuracy - measures the bias in a measurement system. The accuracy of the laboratory data that are generated during this investigation is a measure of the closeness of the analytical results obtained by a method to the 'true' (or standard) value. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards.
– Representativeness - expresses the degree to which sample data accurately and precisely represent a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples on a representative basis across the site, and by using an adequate number of sample locations to characterise the site to the required accuracy.
– Comparability - expresses the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples; ensuring analysing laboratories use consistent analysis techniques and reporting methods.
– Completeness - is defined as the percentage of measurements made which are judged to be valid measurements.

Table F1 – Summary of quality assurance / quality control criteria – all media

Data quality indicator	Frequency	Data quality acceptance criteria
Precision		
Blind and split duplicates	1 / 10 samples (combined)	<30-50% RPD
Transport spike	1 per batch	70-130% recovery
Transport blank	1 per batch	<LOR
Accuracy		
Surrogate spikes Laboratory control samples Matrix spikes	All organic samples 1 per lab batch 1 per lab batch	70-130% <LOR 70-130%
Rinsate blanks (for non-dedicated equipment)	1 per lab event	<LOR
Representativeness		
Sampling appropriate for media and analytes	All samples	-
Samples extracted and analysed within holding times	All samples	Organics (14 days) Inorganics (6 months)
Comparability		
Consistent field conditions, sampling staff and laboratory analysis	All samples	All samples
Standard operating procedures for sample collection & handling	All samples	All samples

Data quality indicator	Frequency	Data quality acceptance criteria
Standard analytical methods used for all analyses	All samples	All samples
Completeness		
Sample description and COCs completed and appropriate	All Samples	All Samples
Appropriate documentation	All Samples	All Samples
Satisfactory frequency and result for QA/QC samples	All QA/QC samples	-
Data from critical samples is considered valid	-	Critical samples valid

If any of the DQIs are not met, further investigation will be necessary to determine whether the non-conformance will significantly affect the usefulness of the data.

Field QA/QC

An evaluation of the field and laboratory data quality was undertaken in accordance with the NEPM – Schedule B2, Assessment of data quality.

Each monitoring round, one blind duplicate and one split duplicate was collected from two different sampling locations where possible and analysed as part of the project quality control program. Blind duplicate samples were analysed as an intra-laboratory duplicate at the primary laboratory (ALS Environmental). Split duplicates were analysed as inter-laboratory duplicates at the secondary laboratory (Eurofins). The duplicate samples and trip blanks are used by GHD to assess reliability of analytical results, with one of each generally collected during each monitoring event.

Six intra-laboratory duplicate samples were collected during the current monitoring period and include the following:

– GWDUP1/BH104R – 10 October 2024
– GWDUP1/BH112R – 6 November 2024
– GWDUP1/BH145R – 11 December 2024
– GWDUP1/BH145R – 17 January 2025
– GWDUP1/BH104R – 18 February 2025
– GWDUP1/BH104R – 11 March 2025

Six inter-laboratory duplicate samples were collected during the current monitoring period and include the following:

– GWDUP2/BH107R – 10 October 2024
– GWDUP2/BH104R – 6 November 2024
– GWDUP2/BH104R – 12 December 2024
– GWDUP2/BH145R – 17 January 2025
– GWDUP2/BH104R – 18 February 2025
– GWDUP2/BH104R – 11 March 2025

Twenty-four primary samples were collected during the October 2024 to March 2025 monitoring period. It was considered that the number of duplicates collected was adequate (12/24 samples = 50%). Trip blank and trip spike samples were collected during all monitoring rounds.

Relative percentage difference calculations

Relative percentage difference (RPD) calculations are used to assess how closely primary and inter/intra duplicate sample results match. RPDs are a quantitative measure of the accuracy of the analytical results and are calculated

in accordance with the procedure described in *AS 4482.1 – 2005 (Standards Australia 2005). According to AS 4482.1 – 2005*, typical RPDs are expected to range between 30% and 50%; however, this may be higher for organics and for low concentrations of analytes. GHD has adopted the following:

- 200% for concentrations within 1 to 10 times the analyte LOR
- 50% for concentrations within 10 to 30 times the analyte LOR
- 30% for concentrations greater than 30 times the analyte LOR

Where a result is below the laboratory LOR for one of the paired samples, the concentration assigned to that sample is the LOR. Where both results are reported below laboratory LOR the RPD is not calculated.

There were no RPD exceedances reported for M12 groundwater sampling during the current monitoring period.

RPD results are presented in Table F2, Appendix F.

Trip blanks

Trip blank samples provide an indication of cross contamination from volatile substances during field sampling and / or during transport. Trip blanks were collected and analysed at a rate of one per sample batch submitted to the laboratory.

The six trip blank samples were free of contaminants, reporting concentrations below the laboratory detection limits.

Trip blank results are provided in Table F3, Appendix F.

Rinsate blank

Rinsate blank samples were free of contaminants, reporting concentrations below laboratory detection limits.

Rinsate results are provided in Table F3, Appendix F.

Trip spike samples

Trip spike samples are samples prepared by the primary laboratory and “spiked” with a known concentration of volatile compound (BTEXN) to provide an indication of variation in volatile parameters concentrations during transport and handling. Trip spikes were collected and analysed at a rate of one per sample batch submitted to the laboratory. Acceptance criteria for trip spike recovery are between 70 – 130%.

Trip spike samples were prepared, transported with samples, and analysed for BTEX for the six monitoring events. The trip spike recovery results are provided in Table F3, Appendix F.

The recovery of BTEXN were within the acceptable range of 70 to 130%.

Laboratory QA/QC

The NATA certified laboratories utilised for this assessment (ALS Environmental and Eurofins) undertook their own quality assurance and quality control procedures for sample analysis. GHD has reviewed the internal laboratory control data provided within the laboratory reports (refer to Appendix H). It is noted comments have been provided by the laboratory where a failure result was reported in laboratory QA/QC procedures.

Laboratory holding time

Samples were extracted and analysed within the required holding time for chemical analysis, with the exception of one sample from the November 2024 event, GWRB1 (lab report: ES2436306). The laboratory holding times are provided within laboratory reports in Appendix H.

As the majority of reporting holding times were consistent and acceptable across the current monitoring period (including for the November 2024 monitoring event), the rinsate blank sample holding time breach was not considered to have an impact on the outcome of the investigation, or interpretation of this round of data.

Matrix spikes

Most matrix spike recovery results were reported within the laboratory limits (70% - 130%), except for the March 2025 event for chloride, where the recovery was equal to the upper data quality objective (130%).

It should be noted there were additional outliers as some matrix spike recoveries were unable to be determined. This was because the background level was greater than or equal to four times the spike level. This occurred in the following events:

– January 2025 event for sulfate and chloride.
– February 2025 event for reactive phosphorus.
– December 2024 and March 2025 events for sulfate.
– October 2024 event for nitrite + nitrate.
– November 2024 event for nitrite + nitrate, total Kjeldahl nitrogen, total phosphorus and reactive phosphorus.

As the majority of reported matrix spike recoveries were within laboratory limits during the monitoring period, the matrix spike outliers are not considered to have any impact on the outcome of the investigation, or interpretation of this round of data.

Laboratory control samples, surrogate spikes

All laboratory control samples (LCS) and surrogate spike recoveries were within laboratory limits (70%-130% for LCS and 50%-150% for surrogate recoveries).

Laboratory duplicate samples

All laboratory duplicate samples were reported within the laboratory limits (result < 10 times LOR: no limit; result between 10- and 20-times LOR: 0% – 50%; result > 20 times LOR: 0%-20%).

Frequency of quality control samples

A sufficient frequency of quality control samples was reported by the laboratory during the monitoring period except for some analytes outlined for the respective event, as follows:

– October 2024 event for TRH (laboratory duplicate and matrix spike).
– November 2024 event for TRH, dissolved mercury and dissolved metals (laboratory duplicates and matrix spikes).
– December 2024 event for TRH (laboratory duplicates) and phosphorus (laboratory control samples).
– January 2025 event for TRH (laboratory duplicates and matrix spikes) and total phosphorus (laboratory control samples).
– February 2025 event for TRH (laboratory duplicates and matrix spikes).
– March 2025 event for TRH and PAH/phenols (laboratory duplicates and matrix spikes).

As quality control samples were collected for the remainder of analytes and samples during the monitoring period, it is considered that any reduced rate of collection of laboratory duplicates and matrix spikes did not have a material impact on the outcome of the investigation, or interpretation of this round of data.

QA/QC assessment outcome

The review of the QA/QC program and data indicates that the groundwater analytical data are of an acceptable quality upon which to draw meaningful conclusions regarding impacts to groundwater at the site.

	Location Code	BH104R	BH104R		BH107R	BH107R		BH112R	BH112R	
	Date	09 Oct 2024	10 Oct 2024		09 Oct 2024	10 Oct 2024		06 Nov 2024	06 Nov 2024	
	Field ID	BH104R	GWDUP1		BH107R	GWDUP2		BH112R	GWDUP1	
	Matrix Type	Water	Water		Water	Water		Water	Water	
	Sample Type	Normal	Field_D		Normal	Interlab_D		Normal	Field_D	
	Lab Report Number	ES2433147	ES2433147	RPD	ES2433147	1148295	RPD	ES2436306	ES2436306	RPD
Chemistry Name	**Unit**	**EQL**								
Metals										
Arsenic (filtered)	mg/L	0.001	0.003	0.003	0	<0.001	<0.001	-	0.002	0.003	40
Cadmium (filtered)	mg/L	0.0001	<0.0001	<0.0001	-	<0.0001	<0.0002	-	<0.0001	<0.0001	-
Chromium (III+VI) (filtered)	mg/L	0.001	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-
Copper (filtered)	mg/L	0.001	<0.001	<0.001	-	<0.001	0.002	67	0.004	0.005	22
Lead (filtered)	mg/L	0.001	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-
Mercury (filtered)	mg/L	0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-
Nickel (filtered)	mg/L	0.001	<0.001	<0.001	-	<0.001	<0.001	-	0.004	0.004	0
Zinc (filtered)	mg/L	0.005	<0.005	<0.005	-	<0.005	0.007	33	0.017	0.016	6

	Location Code	BH145R	BH145R		BH145R	BH145R		BH104R	BH104R	
	Date	17 Jan 2025	17 Jan 2025		17 Jan 2025	17 Jan 2025		18 Feb 2025	18 Feb 2025	
	Field ID	BH145R	GWDUP1		BH145R	GWDUP2		BH104R	GWDUP1	
	Matrix Type	Water	Water		Water	Water		Water	Water	
	Sample Type	Normal	Field_D		Normal	Interlab_D		Normal	Field_D	
	Lab Report Number	ES2501188	ES2501188	RPD	ES2501188	1178885	RPD	ES2504804	ES2504804	RPD
Chemistry Name	**Unit**	**EQL**								
Metals										
Arsenic (filtered)	mg/L	0.001	0.003	0.003	0	0.003	0.004	29	0.002	0.003	40
Cadmium (filtered)	mg/L	0.0001	<0.0001	<0.0001	-	<0.0001	<0.0002	-	<0.0001	0.0001	0
Chromium (III+VI) (filtered)	mg/L	0.001	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-
Copper (filtered)	mg/L	0.001	0.004	0.004	0	0.004	0.005	22	<0.001	0.001	0
Lead (filtered)	mg/L	0.001	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-
Mercury (filtered)	mg/L	0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-
Nickel (filtered)	mg/L	0.001	0.002	0.003	40	0.002	0.003	40	<0.001	0.001	0
Zinc (filtered)	mg/L	0.005	0.009	0.016	56	0.009	0.011	20	<0.005	<0.005	-

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**

****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 200 (1 - 10 x EQL); 50 (10 - 30 x EQL); 30 (> 30 x EQL))**

*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

	Location Code	BH104R	BH104R		BH145R	BH145R		BH104R	BH104R	
	Date	07 Nov 2024	06 Nov 2024		11 Dec 2024	11 Dec 2024		12 Dec 2024	12 Dec 2024	
	Field ID	BH104R	GWDUP2		BH145R	GWDUP1		BH104R	GWDUP2	
	Matrix Type	Water	Water		Water	Water		Water	Water	
	Sample Type	Normal	Interlab_D		Normal	Field_D		Normal	Interlab_D	
	Lab Report Number	ES2436306	1158219	RPD	ES2440696	ES2440696	RPD	ES2440696	1171608	RPD
Chemistry Name	**Unit**	**EQL**								
Metals										
Arsenic (filtered)	mg/L	0.001	0.004	0.003	29	0.001	<0.001	0	0.003	0.002	40
Cadmium (filtered)	mg/L	0.0001	<0.0001	<0.0002	-	<0.0001	<0.0001	-	<0.0001	<0.0002	-
Chromium (III+VI) (filtered)	mg/L	0.001	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-
Copper (filtered)	mg/L	0.001	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-
Lead (filtered)	mg/L	0.001	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-
Mercury (filtered)	mg/L	0.0001	<0.0001	<0.0001	-	<0.0001	-	-	<0.0001	<0.0001	-
Nickel (filtered)	mg/L	0.001	<0.001	<0.001	-	0.019	0.017	11	0.001	<0.001	0
Zinc (filtered)	mg/L	0.005	<0.005	<0.005	-	0.019	0.014	30	<0.005	<0.005	-

	Location Code	BH104R	BH104R		BH104R	BH104R		BH104R	BH104R	
	Date	18 Feb 2025	18 Feb 2025		11 Mar 2025	11 Mar 2025		11 Mar 2025	11 Mar 2025	
	Field ID	BH104R	GWDUP2		BH104R	GWDUP1		BH104R	GWDUP2	
	Matrix Type	Water	Water		Water	Water		Water	Water	
	Sample Type	Normal	Interlab_D		Normal	Field_D		Normal	Interlab_D	
	Lab Report Number	ES2504804	1190687	RPD	ES2507162	ES2507162	RPD	ES2507162	1197874	RPD
Chemistry Name	**Unit**	**EQL**								
Metals										
Arsenic (filtered)	mg/L	0.001	0.002	0.002	0	0.002	0.002	0	0.002	0.002	0
Cadmium (filtered)	mg/L	0.0001	<0.0001	<0.0002	-	<0.0001	<0.0001	-	<0.0001	<0.0002	-
Chromium (III+VI) (filtered)	mg/L	0.001	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-
Copper (filtered)	mg/L	0.001	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-
Lead (filtered)	mg/L	0.001	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-
Mercury (filtered)	mg/L	0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-
Nickel (filtered)	mg/L	0.001	<0.001	<0.001	-	0.001	<0.001	0	0.001	<0.001	0
Zinc (filtered)	mg/L	0.005	<0.005	0.006	18	0.006	<0.005	18	0.006	<0.005	18

***RPDs have only been considered where a concentrat**

****Elevated RPDs are highlighted as per QAQC Profile s 30 (> 30 x EQL))**

*****Interlab Duplicates are matched on a per compound in the primary laboratory**

	Sample Type		Trip_B							Rinsate						
	Date		10 Oct 2024	04 Nov 2024	09 Dec 2024	13 Jan 2025	20 Jan 2025	18 Feb 2025	07 Mar 2025	10 Oct 2024	06 Nov 2024	11 Dec 2024	17 Jan 2025	23 Jan 2025	19 Feb 2025	12 Mar 2025
	Field ID		Trip Blank	Trip blank	Trip Blank	Trip Blank	Trip Blank	Trip blank	Trip blank	GWRB1	GWRB1	GWRB1	GWRB1	GWRB2	GWRB1	GWRB2
	Matrix Type		Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
	Lab Report Number		ES2433147	ES2436306	ES2440696	ES2501188	ES2501516	ES2504804	ES2507162	ES2433147	ES2436306	ES2440696	ES2501188	ES2501516	ES2504804	ES2507162
Chemistry Name	**Unit**	**EQL**														
Metals																
Arsenic	mg/L	0.001	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic (filtered)	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	mg/L	0.0001	-	-	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cadmium (filtered)	mg/L	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium (III+VI)	mg/L	0.001	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (III+VI) (filtered)	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	mg/L	0.001	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper (filtered)	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/L	0.001	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Lead (filtered)	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	mg/L	0.0001	-	-	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Mercury (filtered)	mg/L	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	mg/L	0.001	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel (filtered)	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	mg/L	0.005	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc (filtered)	mg/L	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BTEXN																
Benzene	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-	-
	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	-	-	-	-	-	-
	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	-	-	-	-	-	-
	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylene (o)	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	-	-	-	-	-	-
	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylene (m & p)	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	-	-	-	-	-	-
	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylene Total	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	-	-	-	-	-	-
	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene (BTEXN suite)	mg/L	0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	-	-	-	-	-
	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRH - NEPM 2013																
F1 (C6-C10 minus BTEX)	mg/L	0.02	<0.02	-	<0.02	<0.02	<0.02	-	<0.02	-	-	-	-	-	-	-
C6-C10 Fraction	mg/L	0.02	<0.02	-	<0.02	<0.02	<0.02	-	<0.02	-	-	-	-	-	-	-
TRH - NEPM 1999																
C6-C9 Fraction	mg/L	0.02	<0.02	-	<0.02	<0.02	<0.02	-	<0.02	-	-	-	-	-	-	-

***Trip blank and rinsate blank concentrations greater than the LOR have been highlighted**

****Acceptable trip spike recoveries are in the range of 70 to 130 %**

	Sample Type	Trip_S						
	Date	15 Oct 2024	12 Nov 2024	20 Dec 2024	24 Jan 2025	31 Jan 2025	22 Feb 2025	14 Mar 2025
	Field ID	Trip Spike	Trip Spike	Trip Spike	Trip Spike	Trip Spike	Trip Spike	Trip Spike
	Matrix Type	Water	Water	Water	Water	Water	Water	Water
	Lab Report Number	ES2433147	ES2436306	ES2440696	ES2501188	ES2501516	ES2504804	ES2507162
Chemistry Name	**Unit**	**EQL**						
Metals								
Arsenic	mg/L	0.001	-	-	-	-	-	-	-
Arsenic (filtered)	mg/L	0.001	-	-	-	-	-	-	-
Cadmium	mg/L	0.0001	-	-	-	-	-	-	-
Cadmium (filtered)	mg/L	0.0001	-	-	-	-	-	-	-
Chromium (III+VI)	mg/L	0.001	-	-	-	-	-	-	-
Chromium (III+VI) (filtered)	mg/L	0.001	-	-	-	-	-	-	-
Copper	mg/L	0.001	-	-	-	-	-	-	-
Copper (filtered)	mg/L	0.001	-	-	-	-	-	-	-
Lead	mg/L	0.001	-	-	-	-	-	-	-
Lead (filtered)	mg/L	0.001	-	-	-	-	-	-	-
Mercury	mg/L	0.0001	-	-	-	-	-	-	-
Mercury (filtered)	mg/L	0.0001	-	-	-	-	-	-	-
Nickel	mg/L	0.001	-	-	-	-	-	-	-
Nickel (filtered)	mg/L	0.001	-	-	-	-	-	-	-
Zinc	mg/L	0.005	-	-	-	-	-	-	-
Zinc (filtered)	mg/L	0.005	-	-	-	-	-	-	-
BTEXN									
	mg/L	0.001	-	-	-	-	-	-	-
Benzene	%	-	85	105	75	75	75	90	80
	mg/L	0.002	-	-	-	-	-	-	-
Toluene	%	-	90	105	80	75	75	90	85
	mg/L	0.002	-	-	-	-	-	-	-
Ethylbenzene	%	-	85	105	75	70	75	90	85
	mg/L	0.002	-	-	-	-	-	-	-
Xylene (o)	%	-	95	100	80	80	90	100	90
	mg/L	0.002	-	-	-	-	-	-	-
Xylene (m & p)	%	-	95	95	80	75	85	110	90
	mg/L	0.002	-	-	-	-	-	-	-
Xylene Total	%	-	95	97.5	80	77.5	87.5	105	90
	mg/L	0.002	-	-	-	-	-	-	-
Naphthalene (BTEXN suite)	%	-	110	125	110	100	100	110	100
TRH - NEPM 2013									
F1 (C6-C10 minus BTEX)	mg/L	0.02	-	-	-	-	-	-	-
C6-C10 Fraction	mg/L	0.02	-	-	-	-	-	-	-
TRH - NEPM 1999									
C6-C9 Fraction	mg/L	0.02	-	-	-	-	-	-	-

***Trip blank and rinsate blank concentrations greater than the LOR have been highlighted**

****Acceptable trip spike recoveries are in the range of 70 to 130 %**

Appendix G

Field sheets

Purging and Sampling Record

Well ID: BH104R

Job Information		*Sampling Information*		*Monitoring Well Information*				
Client:	TfNSW	**Purge Method:**	Low flow	**SWL:**	11.235 m bTOC	**Time SWL Measured:**	08:31 AM	
Project:	M12	**Sample Method:**	Micropurge	**Well Depth:**	18.110 m bTOC	**Logic Check:**	Yes	
Proj. No.:	12554717	**Sample Depth:**	17 m bTOC	**NAPL Check:**	Absent	**Well Cap Secure?**	Yes	
Site:	M12 West	**WQuality Meter Type:**	YSI	**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	Stick Up	
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	Yes	**Screened Interval From:**	to	m bTOC		
Date:	09/10/2024	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	50 mm	**Stick Up:**	m	
Round:	October 2024	**Field Filtered?**	Yes					

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
08:47	0.5	18.2	6.99	7002.0	1.60	12.0	11.425	Slightly cloudy, slight sulfuric odour, no sediment, no sheen
08:51	1.0	18.3	6.96	7015.0	0.46	-43.7	11.480	Flow rate slowed
08:59	2.0	18.4	6.95	7058.0	0.21	-98.3	11.635	Clear, slight sulfuric odour, no sediment, no sheen
09:02	2.5	18.5	6.95	7075.0	0.19	-101.4	11.630	
09:07	3.0	18.2	6.96	7064.0	0.19	-108.7	11.640	Clear, no odour, no sediment, no sheen
09:11	3.5	18.3	6.95	7106.0	0.16	-119.4	11.635	
09:13	4.0	18.5	6.95	7198.0	0.14	-129.5	11.675	
09:17	4.5	18.5	6.96	7178.0	0.08	-134.5	11.690	
09:23	5.0	18.5	6.96	7152.0	0.07	-138.5	11.725	
09:26	5.5	18.6	6.96	7168.0	0.06	-140.3	11.750	
09:29	6.0	18.5	6.93	7169.0	0.05	-142.1	11.770	Clear, no odour, no sediment, no sheen
								Parameters stable, samples collected.

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Comment: **Duplicate samples collected, bottles used, access, condition of headworks etc**

GWDUP1, ALS metals

Purge Volumes			
Casing Int. Dia (mm)	**50**	**100**	**150**
Vol (L/m of casing)	**2.0**	**7.9**	**17.7**

Purging and Sampling Record

Well ID: BH107R

Job Information		*Sampling Information*		*Monitoring Well Information*				
Client:	TfNSW	**Purge Method:**	Low flow	**SWL:**	7.530 m bTOC	**Time SWL Measured:**	10:15 AM	
Project:	M12	**Sample Method:**	Micropurge	**Well Depth:**	14.490 m bTOC	**Logic Check:**	Yes	
Proj. No.:	12554717	**Sample Depth:**	13.5 m bTOC	**NAPL Check:**	Absent	**Well Cap Secure?**	Yes	
Site:	M12 West	**WQuality Meter Type:**	YSI	**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	Stick Up	
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	Yes	**Screened Interval From:**	to	m bTOC		
Date:	09/10/2024	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	50 mm	**Stick Up:**	m	
Round:	October 2024	**Field Filtered?**	Yes					

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
10:23	0.5	18.4	7.20	3264.0	1.28	66.5	7.760	No odour, no sheen, no sediment, clear
10:28	1.0	18.4	7.18	3224.0	1.70	62.5	8.045	
10:31	1.5	18.4	7.20	3212.0	3.41	66.3	8.400	
10:34	2.0	18.5	7.21	3201.0	3.93	69.5	8.600	
10:37	2.5	18.5	7.24	3179.0	5.42	75.1	8.785	
10:40	3.0	18.5	7.22	3167.0	4.36	77.2	8.970	
10:43	3.5	18.4	7.20	3147.0	3.03	78.0	9.140	
10:47	4.0	18.3	7.18	3136.0	1.63	76.6	9.353	
10:50	4.5	18.3	7.18	3129.0	0.96	74.3	9.580	
10:54	5.0	18.3	7.17	3116.0	1.00	72.7	9.820	
10:58	5.5	18.2	7.18	3102.0	1.27	72.3	10.105	No odour, no sheen, no sediment, clear
	6.0							Parameters stable and samples collected

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Comment: **Duplicate samples collected, bottles used, access, condition of headworks etc**

GWDUP2, Eurofins metals

Purge Volumes			
Casing Int. Dia (mm)	**50**	**100**	**150**
Vol (L/m of casing)	**2.0**	**7.9**	**17.7**

Purging and Sampling Record

Well ID: BH112R

Job Information		*Sampling Information*		*Monitoring Well Information*				
Client:	TfNSW	**Purge Method:**	Low flow	**SWL:**	13.115 m bTOC	**Time SWL Measured:**	11:45 AM	
Project:	M12	**Sample Method:**	Micropurge	**Well Depth:**	21.435 m bTOC	**Logic Check:**	Yes	
Proj. No.:	12554717	**Sample Depth:**	19 m bTOC	**NAPL Check:**	Absent	**Well Cap Secure?**	Yes	
Site:	M12 West	**WQuality Meter Type:**	YSI	**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	Stick Up	
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	Yes	**Screened Interval From:**	to	m bTOC		
Date:	09/10/2024	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	50 mm	**Stick Up:**	m	
Round:	October 2024	**Field Filtered?**	Yes					

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
12:00	0.5	18.9	6.69	13993.0	0.56	101.8	13.285	Clear, no sediment, no odour or sheen
12:04	1.0	19.0	6.69	14044.0	0.39	101.3	13.380	
12:08	1.5	19.1	6.69	14059.0	0.34	99.5	13.635	
12:09	2.0	19.1	6.69	14067.0	0.34	98.3	13.725	
12:12	2.5	19.1	6.69	14061.0	0.33	97.0	13.855	
12:14	3.0	19.1	6.69	14060.0	0.32	95.7	13.975	
12:17	3.5	19.1	6.69	14059.0	0.32	95.1	14.030	
12:18	4.0	19.0	6.69	14046.0	0.32	94.1	14.120	
12:20	4.5	19.1	6.69	14060.0	0.31	93.3	14.250	
12:23	5.0	19.1	6.69	14059.0	0.30	92.6	14.340	Clear, no sediment, no odour or sheen
								Parameters stable, samples taken
.								

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Comment: **Duplicate samples collected, bottles used, access, condition of headworks etc**

Purge Volumes			
Casing Int. Dia (mm)	**50**	**100**	**150**
Vol (L/m of casing)	**2.0**	**7.9**	**17.7**

Purging and Sampling Record

Well ID: BH145R

Job Information		Sampling Information		Monitoring Well Information			
Client:	TfNSW	**Purge Method:**	Low flow	**SWL:**	11.205 m bTOC	**Time SWL Measured:**	11:56 AM
Project:	M12	**Sample Method:**	Micropurge	**Well Depth:**	19.935 m bTOC	**Logic Check:**	Yes
Proj. No.:	12554717	**Sample Depth:**	18 m bTOC	**NAPL Check:**	Absent	**Well Cap Secure?**	Yes
Site:	M12 West	**WQuality Meter Type:**	YSI	**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	Stick Up
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	Yes	**Screened Interval From:**	to	m bTOC	
Date:	10/10/2024	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	50 mm	**Stick Up:**	m
Round:	October 2024	**Field Filtered?**	Yes				

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
12:11	0.5	19.8	6.64	16873.0	1.61	-87.6	11.230	Slightly cloudy with brownish yellow tinge,sulfuric odour,no sediment, no sheen
12:15	1.0	19.6	6.65	15673.0	0.69	-101.2	11.235	
12:18	1.5	19.5	6.66	16710.0	0.42	-102.6	11.240	
12:21	2.0	19.6	6.66	16679.0	0.39	-100.5	11.245	Slightly cloudy with brownish yellow tinge, sulfuric odour, some very fine black coloured sediment, no sheen
12:24	2.5	19.3	6.67	16561.0	0.37	-96.8	11.255	
12:27	3.0	19.3	6.67	16566.0	0.36	-95.3	11.255	
12:31	3.5	19.4	6.67	16490.0	0.39	-87.7	11.265	
12:33	4.0	19.3	6.67	16486.0	0.38	-81.9	11.275	
12:37	4.5	19.4	6.67	16458.0	0.37	-74.8	11.275	
12:40	5.0	19.4	6.67	16468.0	0.37	-72.7	11.280	Slightly cloudy with brownish yellow tinge, sulfuric odour, some very fine black c
								Parameters stable, samples collected

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Comment: **Duplicate samples collected, bottles used, access, condition of headworks etc**

Purge Volumes

Casing Int. Dia (mm)	50	100	150
Vol (L/m of casing)	2.0	7.9	17.7

Groundwater Gauging Record

Client: TfNSW
Project: M12 Motorway
Job No.: 12554717
Location: Western Sydney, Sydney, NSW

WL Meter Type: Int.Fce
Date: 09/10/2024 & 10/10/2024
Sampler: **L. Saunders & N. Hugo**

Well ID	Date	Time	Accessible?	SWL (mbTOC)	BOC (mbTOC)	Data logger present?	Data logger brand type	Data logger downloaded?	Comment
BH104R*	9/10/2024	8:31	Yes	11.235	18.110	Yes	HOBO	Yes	
BH107R*	9/10/2024	10:15	Yes	7.530	14.490	Yes	Solinst	Yes	
BH112R*	9/10/2024	11:45	Yes	13.115	21.435	Yes	Solinst	Yes	
BH145R*	10/10/2024	11:56	Yes	11.205	19.935	Yes	HOBO	Yes	
BH170									Not located to date
BH175	10/10/2024	11:28	Yes	4.360	18.060	Yes	Solinst	Yes	

* BH104, BH107 and BH112 destroyed November 2022 and replacement wells BH104R, BH107R and BH112R are now gauged
* BH145 is no longer in use as of April 2023 and replacement well BH145R is now gauged.

Purging and Sampling Record

Well ID: BH104R

Job Information		*Sampling Information*		*Monitoring Well Information*			
Client:	TfNSW	**Purge Method:**	Low flow	**SWL:**	11.120 m bTOC	**Time SWL Measured:**	10:10 AM
Project:	M12	**Sample Method:**	Micropurge	**Well Depth:**	18.145 m bTOC	**Logic Check:**	Yes
Proj. No.:	12554717	**Sample Depth:**	17 m bTOC	**NAPL Check:**	Absent	**Well Cap Secure?**	Yes
Site:	M12 West	**WQuality Meter Type:**	YSI	**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	Stick Up
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	Yes	**Screened Interval From:**	to m bTOC		
Date:	07/11/2024	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	50 mm	**Stick Up:**	m
Round:	November 2024	**Field Filtered?**	Yes				

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
10:32	0.5	20.2	6.79	7461.0	1.16	-48.5	11.320	Metallic and slightly sulfuric odour, clear, no sediment, no sheen, no colour
10:34	1.0	20.3	6.79	7428.0	0.75	-54.7	11.465	
10:37	1.5	20.2	6.79	7389.0	0.43	-64.2	11.485	Good recharge
11:13	2.5	20.6	6.87	6388.0	2.91	-4.7	11.460	Pump stopped (10:40 am), suspected pump or cable issue. Pump was oily when taken out of case. Pulled micropurge to 14 mbtoc. Pump still not working. Switched to bailer method. Sample depth 14 mbtoc (10:55 am). Water cloudy, yellow-grey tinge, metallic odour, no sheen
11:17	3.5	20.3	6.85	6446.0	2.57	-13.4	11.625	Water cloudy, yellow-grey tinge, no odour, no sheen
11:18	4.5	20.0	6.93	7071.0	4.24	-23.1	11.675	
11:21	5.5	19.8	6.94	6905.0	3.43	-47.0	11.815	
11:24	6.5	19.7	6.97	7338.0	4.64	-51.2	11.915	Water slightly cloudy, sulfuric odour, no sheen, yellow-grey tinge
11:27	7.5	19.8	6.95	7112.0	2.88	-43.5	11.990	
11:31	8.5	20.0	6.91	6928.0	2.50	-41.1	12.045	Water slightly cloudy, no odour, no sheen, yellow-grey tinge
11:35	9.5	19.7	6.87	7078.0	2.43	-46.7	12.115	Water slightly cloudy, sulfuric odour, no sheen, yellow-grey tinge
								Some parameters stable, sampled due to time constraints.
								Hobo logger did not sink properly, string had to be put into the well. Similar sensation felt with the bailer at approximately 10 mbtoc

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Comment: **Duplicate samples collected, bottles used, access, condition of headworks etc**

GWDUP2, Eurofins metals

Purge Volumes			
Casing Int. Dia (mm)	**50**	**100**	**150**
Vol (L/m of casing)	**2.0**	**7.9**	**17.7**

Purging and Sampling Record

Well ID: BH107R

Job Information		*Sampling Information*		*Monitoring Well Information*			
Client:	TfNSW	**Purge Method:**	Purge	**SWL:**	7.370 m bTOC	**Time SWL Measured:**	12:09 PM
Project:	M12	**Sample Method:**	Bailer	**Well Depth:**	14.495 m bTOC	**Logic Check:**	Yes
Proj. No.:	12554717	**Sample Depth:**	10 m bTOC	**NAPL Check:**	Absent	**Well Cap Secure?**	Yes
Site:	M12 West	**WQuality Meter Type:**	YSI	**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	Stick Up
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	No	**Screened Interval From:**	to m bTOC		
Date:	07/11/2024	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	50 mm	**Stick Up:**	m
Round:	November 2024	**Field Filtered?**	Yes				

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
12:14	1.0	20.1	7.19	3139.0	4.75	64.1	7.775	Clear, no odour or sheen, no sediment
12:17	2.0	19.2	7.17	3042.0	4.75	63.7	8.160	
12:20	3.0	19.2	7.17	3033.0	4.97	62.5	8.570	
12:24	4.0	19.2	7.20	3025.0	5.51	56.9	8.910	
12:27	5.0	19.3	7.19	3001.0	5.31	59.6	9.175	Clear, no odour or sheen, no sediment
								Parameters stable (except DO), samples collected due to time constraints

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Comment: **Duplicate samples collected, bottles used, access, condition of headworks etc**

Purge Volumes			
Casing Int. Dia (mm)	**50**	**100**	**150**
Vol (L/m of casing)	**2.0**	**7.9**	**17.7**

Purging and Sampling Record

Well ID: BH112R

Job Information		*Sampling Information*		*Monitoring Well Information*			
Client:	TfNSW	**Purge Method:**	Purge	**SWL:**	13.110 m bTOC	**Time SWL Measured:**	11:05 AM
Project:	M12	**Sample Method:**	Bailer	**Well Depth:**	21.120 m bTOC	**Logic Check:**	Yes
Proj. No.:	12554717	**Sample Depth:**	13 to 15 m bTOC	**NAPL Check:**	Absent	**Well Cap Secure?**	Yes
Site:	M12 West	**WQuality Meter Type:**	YSI	**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	Stick Up
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	No	**Screened Interval From:**	to m bTOC		
Date:	06/11/2024	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	50 mm	**Stick Up:**	m
Round:	November 2024	**Field Filtered?**	Yes				

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
11:25	2.0	25.6	6.85	16415.0	4.52	90.0	13.830	Clear, no odour or sheen no sediment
11:31	4.0	21.7	6.76	15093.0	4.56	78.8	14.030	Slightly cloudy, no odour or sheen, no sediment
11:38	6.0	21.0	6.70	14818.0	3.79	78.1	14.480	
11:42	8.0	20.2	6.73	14607.0	4.40	76.1	14.880	Cloudy, no odour or sheen, no sediment
11:47	10.0	20.2	6.73	14629.0	4.07	69.1	15.265	Cloudy, no odour or sheen, no sediment
								Some parameters stable, samples collected due to time constraints

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Comment: **Duplicate samples collected, bottles used, access, condition of headworks etc**

GWDUP1, ALS metals

Purge Volumes

Casing Int. Dia (mm)	50	100	150
Vol (L/m of casing)	2.0	7.9	17.7

Purging and Sampling Record

Well ID: BH145R

Job Information		*Sampling Information*		*Monitoring Well Information*			
Client:	TfNSW	**Purge Method:**	Purge	**SWL:**	11.060 m bTOC	**Time SWL Measured:**	01:38 PM
Project:	M12	**Sample Method:**	Bailer	**Well Depth:**	19.960 m bTOC	**Logic Check:**	
Proj. No.:	12554717	**Sample Depth:**	12 m bTOC	**NAPL Check:**	Absent	**Well Cap Secure?**	
Site:	M12 West	**WQuality Meter Type:**		**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	Stick Up
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	Yes	**Screened Interval From:**	to m bTOC		
Date:	07/11/2024	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	50 mm	**Stick Up:**	m
Round:	November 2024	**Field Filtered?**	Yes				

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
13:44	1.0	20.2	6.74	10049.0	3.92	-21.2	11.100	Mostly clear slight yellow tinge, sulphuric odour no sediment, no sheen.
13:47	2.0	19.2	6.75	9322.0	3.63	-49.0	11.120	
13:49	3.0	18.9	6.74	10641.0	3.38	-52.5	11.135	
13:52	4.0	18.8	6.70	12790.0	3.71	-46.8	11.160	
13:55	5.0	18.8	6.75	11676.0	3.35	-55.2	11.175	
13:57	6.0	18.8	6.72	15435.0	3.44	-51.9	11.190	Good recharge.
14:00	7.0	19.0	6.72	14235.0	2.91	-58.3	11.200	
14:03	8.0	18.8	6.62	16372.0	2.62	-57.0	11.205	Mostly clear slight yellow tinge, sulphuric odour no sediment, no sheen.
								Parameters mostly stable, sampled due to time constraints.

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Comment: **Duplicate samples collected, bottles used, access, condition of headworks etc**

Purge Volumes

Casing Int. Dia (mm)	50	100	150
Vol (L/m of casing)	2.0	7.9	17.7

Purging and Sampling Record

Well ID: BH104R

Job Information		Sampling Information		Monitoring Well Information				
Client:	TfNSW	**Purge Method:**	Low flow	**SWL:**	11.004 m bTOC	**Time SWL Measured:**	08:01 AM	
Project:	M12	**Sample Method:**	Micropurge	**Well Depth:**	18.111 m bTOC	**Logic Check:**	Yes	
Proj. No.:	12554717	**Sample Depth:**	15 m bTOC	**NAPL Check:**	Absent	**Well Cap Secure?**	Yes	
Site:	M12 West	**WQuality Meter Type:**	YSI Pro DSS	**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	Stick Up	
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	Yes	**Screened Interval From:**	to m bTOC			
Date:	12/12/2024	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	50 mm	**Stick Up:**	0.8 m	
Round:	December 2024	**Field Filtered?**	Yes					

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
09:00	1.0	19.8	7.36	7081.0	9.02	104.3	11.298	Cloudy, pale yellow grey tinge, no sediment, no odour or sheen
09:05	2.0	19.5	7.28	6996.0	8.72	96.7	11.465	
09:10	3.0	19.5	7.07	7068.0	5.54	15.6	11.566	Slightly cloudy, very pale yellow grey tinge, no sediment, slight sulfuric odour, no sheen
09:14	4.0	19.5	7.02	7115.0	4.11	-13.6	11.654	Good recharge
09:18	5.0	19.5	6.99	7154.0	3.10	-24.7	11.740	
09:22	6.0	19.4	6.96	7196.0	2.45	-33.3	11.797	
09:27	7.0	19.4	6.95	7242.0	1.88	-43.8	11.845	
09:31	8.0	19.5	6.93	7252.0	1.49	-52.3	11.870	
09:35	9.0	19.5	6.93	7275.0	1.23	-58.1	11.892	Slightly cloudy, very pale yellow grey tinge, no sediment, slight sulfuric odour, no sheen
								Majority of parameters stable and samples collected due to time constraints

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Comment: **Duplicate samples collected, bottles used, access, condition of headworks etc**

GWDUP2, Eurofins metals

Purge Volumes			
Casing Int. Dia (mm)	**50**	**100**	**150**
Vol (L/m of casing)	**2.0**	**7.9**	**17.7**

Purging and Sampling Record

Well ID: BH107R

Job Information		Sampling Information		Monitoring Well Information				
Client:	TfNSW	**Purge Method:**	Low flow	**SWL:**	7.295 m bTOC	**Time SWL Measured:**	10:03 AM	
Project:	M12	**Sample Method:**	Micropurge	**Well Depth:**	14.491 m bTOC	**Logic Check:**	Yes	
Proj. No.:	12554717	**Sample Depth:**	11 m bTOC	**NAPL Check:**	Absent	**Well Cap Secure?**	Yes	
Site:	M12 West	**WQuality Meter Type:**	YSI Pro DSS	**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	Stick Up	
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	Yes	**Screened Interval From:**	to m bTOC			
Date:	12/12/2024	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	50 mm	**Stick Up:**	0.91 m	
Round:	December 2024	**Field Filtered?**	No					

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
10:26	1.0	19.9	7.31	3130.0	3.01	42.7	7.350	Clear no colour, no sediment, no sheen, no odour
10:29	2.0	19.5	7.23	3092.0	4.34	57.1	8.070	Micropurge bubbling, adjusted discharge
10:36	3.0	19.6	7.48	3060.0	8.43	70.7	8.690	Issues with micropurge, adjusted discharge and fill times
10:41	4.0	19.8	7.20	3094.0	3.69	72.4	9.240	
10:48	5.0	19.3	7.29	2988.0	6.87	71.4	9.635	Micropurge bubbling, adjusted discharge. Likely increasing DO
10:53	6.0	20.3	7.49	3014.0	8.63	74.8	10.095	Slow/no recharge
10:59	7.0	20.6	7.48	3043.0	8.76	78.4	10.395	
11:06	8.0	20.7	7.55	3097.0	8.64	81.2	10.800	
11:08	8.5	20.6	7.56	3107.0	8.24	81.6		Clear no colour, no sediment, no sheen,no odour
								Majority of parameters stable, sampled due to time constraints

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Comment: **Duplicate samples collected, bottles used, access, condition of headworks etc**

Purge Volumes			
Casing Int. Dia (mm)	**50**	**100**	**150**
Vol (L/m of casing)	**2.0**	**7.9**	**17.7**

Purging and Sampling Record

Well ID: BH112R

Job Information		Sampling Information		Monitoring Well Information				
Client:	TfNSW	**Purge Method:**	Low flow	**SWL:**	13.077 m bTOC	**Time SWL Measured:**	12:00 PM	
Project:	M12	**Sample Method:**	Micropurge	**Well Depth:**	21.095 m bTOC	**Logic Check:**	Yes	
Proj. No.:	12554717	**Sample Depth:**	18 m bTOC	**NAPL Check:**	Absent	**Well Cap Secure?**	Yes	
Site:	M12 West	**WQuality Meter Type:**	YSI Pro DSS	**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	Stick Up	
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	Yes	**Screened Interval From:**	to m bTOC			
Date:	12/12/2024	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	50 mm	**Stick Up:**	0.85 m	
Round:	December 2024	**Field Filtered?**	Yes					

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
12:15	1.0	20.8	6.88	14575.0	3.89	82.0	13.200	Mostly clear, no sediment, no odour or sheen
12:20	2.0	20.6	7.03	14495.0	7.62	80.4	13.358	Bladder and pump issues, bubbles coming up. Likely increasing DO
12:23	3.0	20.3	7.04	14558.0	7.84	83.3	13.645	
12:27	4.0	20.4	7.05	14575.0	7.63	86.4	13.890	
12:30	5.0	20.4	7.06	14544.0	7.66	88.9	14.140	Mostly clear, no sediment, no odour or sheen
								Parameters stable, samples collected

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Comment: **Duplicate samples collected, bottles used, access, condition of headworks etc**

Purge Volumes

Casing Int. Dia (mm)	50	100	150
Vol (L/m of casing)	2.0	7.9	17.7

Purging and Sampling Record

Well ID: BH145R

Job Information		Sampling Information		Monitoring Well Information				
Client:	TfNSW	**Purge Method:**	Low flow	**SWL:**	11.015 m bTOC	**Time SWL Measured:**	01:56 PM	
Project:	M12	**Sample Method:**	Micropurge	**Well Depth:**	19.945 m bTOC	**Logic Check:**	Yes	
Proj. No.:	12554717	**Sample Depth:**	15 m bTOC	**NAPL Check:**	Absent	**Well Cap Secure?**	Yes	
Site:	M12 Central	**WQuality Meter Type:**	YSI Pro DSS	**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	Gatic	
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	Yes	**Screened Interval From:**	to	m bTOC		
Date:	11/12/2024	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	50 mm	**Stick Up:**	m	
Round:	November 2024	**Field Filtered?**	Yes					

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
14:15	0.5	20.3	6.78	16677.0	2.44	25.4	11.065	Mostly clear, whitish tinge, no sediment, no sheen, no odour
14:17	1.0	19.8	6.67	16545.0	1.50	5.4	11.060	
14:19	1.5	19.6	6.63	16499.0	1.15	-6.7	11.085	
14:21	2.0	19.4	6.62	16453.0	1.06	-12.8	11.105	
14:23	2.5	19.2	6.61	16472.0	0.95	-18.2	11.095	
14:25	3.0	19.3	6.60	16475.0	0.89	-20.1	11.105	
14:27	3.5	19.2	6.60	16480.0	0.81	-23.8	11.120	
14:28	4.0	19.2	6.60	16481.0	0.77	-26.1	11.125	
14:30	4.5	19.1	6.60	16483.0	0.75	-28.8	11.120	
14:32	5.0	19.0	6.60	16409.0	0.72	-32.3	11.120	Mostly clear, whitish tinge, no sediment, no sheen, no odour
								Parameters stable, sampled

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Comment: **Duplicate samples collected, bottles used, access, condition of headworks etc**

ALS Metals, GWDUP1

Purge Volumes			
Casing Int. Dia (mm)	**50**	**100**	**150**
Vol (L/m of casing)	**2.0**	**7.9**	**17.7**

Groundwater Gauging Record

Client: TfNSW
Project: M12 Motorway
Job No.: 12554717
Location: Western Sydney, Sydney, NSW

WL Meter Type: Int.Fce
Date: 11-12/12/2024
Sampler: **L. Saunders / N. Hugo**

Well ID	Date	Time	Accessible?	SWL (mbTOC)	BOC (mbTOC)	Data logger present?	Data logger brand type	Data logger downloaded?	Comment
BH104R*	12/12/2024	8:01	Yes	11.004	18.111	Yes	HOBO	Yes	
BH107R*	12/12/2024	10:03	Yes	7.295	14.491	Yes	Solinst	Yes	
BH112R*	12/12/2024	12:00	Yes	13.077	21.095	Yes	Solinst	Yes	
BH145R*	11/12/2024	13:56	Yes	11.015	19.945	Yes	HOBO	Yes	Includes barometric logger
BH170									Not located to date
BH175	11/12/2024	11:49	Yes	4.395	18.125	Yes	Solinst	Yes	
BH219									Destroyed

* BH104, BH107 and BH112 destroyed November 2022 and replacement wells BH104R, BH107R and BH112R are now gauged
* BH145 is no longer in use as of April 2023 and replacement well BH145R is now gauged.

Purging and Sampling Record

Well ID: BH104R

Job Information		Sampling Information		Monitoring Well Information				
Client:	TfNSW	**Purge Method:**	Low flow	**SWL:**	10.875 m bTOC	**Time SWL Measured:**	12:41 PM	
Project:	M12	**Sample Method:**	Bailer	**Well Depth:**	18.130 m bTOC	**Logic Check:**	Yes	
Proj. No.:	12554717	**Sample Depth:**	16 m bTOC	**NAPL Check:**	Absent	**Well Cap Secure?**	Yes	
Site:	M12 West	**WQuality Meter Type:**	YSI Pro DSS	**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	Stick Up	
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	Yes	**Screened Interval From:**	to m bTOC			
Date:	23/01/2025	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	50 mm	**Stick Up:**	m	
Round:	January 2025	**Field Filtered?**	Yes					

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
12:47	1.0	20.0	7.29	6660.0	5.56	96.8	11.110	Slightly cloudy, slight yellow-green colour, no odour, no sheen, no sediment
12:50	2.0	19.6	7.28	6678.0	4.03	103.2	11.265	Good recharge
12:52	3.0	19.7	7.35	6713.0	5.76	98.8	11.350	
12:55	4.0	19.7	7.27	6751.0	5.03	95.4	11.480	
12:58	5.0	19.8	7.31	6823.0	4.51	91.9	11.590	
13:01	6.0	19.9	7.27	6776.0	4.75	88.4	11.675	Slightly cloudy, slight yellow-green colour, no odour, no sheen, no sediment
								Parameters mostly stable, sampled due to time constraints

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc

Purge Volumes

Casing Int. Dia (mm)	50	100	150
Vol (L/m of casing)	2.0	7.9	17.7

Purging and Sampling Record

Well ID: BH107R

Job Information		*Sampling Information*		*Monitoring Well Information*				
Client:	TfNSW	**Purge Method:**	No purge	**SWL:**	7.280 m bTOC	**Time SWL Measured:**	11:57 AM
Project:	M12	**Sample Method:**	Bailer	**Well Depth:**	14.500 m bTOC	**Logic Check:**	Yes
Proj. No.:	12554717	**Sample Depth:**	12 m bTOC	**NAPL Check:**	Absent	**Well Cap Secure?**	Yes
Site:	M12 West	**WQuality Meter Type:**	YSI Pro DSS	**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	Stick Up
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	No	**Screened Interval From:**	to m bTOC		
Date:	23/01/2025	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	50 mm	**Stick Up:**	m
Round:	January 2025	**Field Filtered?**	Yes				

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
12:02	1.0	19.7	7.40	3179.0	4.91	83.8	7.624	Clear, no sediment, no odour or sheen
12:06	2.0	19.2	7.34	3021.0	4.65	81.2	8.136	
12:08	3.0	19.0	7.32	2892.0	4.68	79.9	8.596	Low to moderate recharge
12:10	4.0	18.9	7.28	3011.0	4.08	79.5	8.973	Mostly clear, no sediment, no odour or sheen
12:12	5.0	18.9	7.29	2912.0	4.34	78.8	9.333	
12:14	6.0	18.9	7.27	2955.0	4.14	77.8	9.688	Mostly clear, no sediment, no odour or sheen
								Parameters mostly stable, sampled due to time constraints

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Comment: **Duplicate samples collected, bottles used, access, condition of headworks etc**

Purge Volumes

Casing Int. Dia (mm)	50	100	150
Vol (L/m of casing)	2.0	7.9	17.7

Purging and Sampling Record

Well ID: BH112R

Job Information		*Sampling Information*		*Monitoring Well Information*				
Client:	TfNSW	**Purge Method:**	No purge	**SWL:**	13.105 m bTOC	**Time SWL Measured:**	11:08 AM	
Project:	M12	**Sample Method:**	Bailer	**Well Depth:**	21.145 m bTOC	**Logic Check:**	Yes	
Proj. No.:	12554717	**Sample Depth:**	18 m bTOC	**NAPL Check:**	Absent	**Well Cap Secure?**	Yes	
Site:	M12 West	**WQuality Meter Type:**	YSI Pro DSS	**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	Stick Up	
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	No	**Screened Interval From:**	to m bTOC			
Date:	23/01/2025	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	50 mm	**Stick Up:**	m	
Round:	January 2025	**Field Filtered?**	Yes					

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
11:10	1.0	20.5	6.70	14235.0	3.83	102.2	13.350	Slightly cloudy, no odour, no sheen, no colour
11:13	2.0	20.1	6.81	14223.0	4.35	96.8	13.530	
11:17	3.0	19.8	6.80	14058.0	4.13	117.4	13.735	Moderate recharge
11:20	4.0	19.8	6.86	14163.0	5.59	116.2	13.940	
11:22	5.0	19.7	6.80	14080.0	5.32	110.1	14.155	Very cloudy, no odour, no sheen, no colour
11:27	5.5	19.9	6.81	14171.0	4.64	118.8	-	
11:29	6.0	19.8	6.82	14126.0	4.90	111.6	14.665	Parameters mostly stable, sampled due to time constraints
								Very cloudy, no odour, no sheen, no colour

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Comment: **Duplicate samples collected, bottles used, access, condition of headworks etc**

Purge Volumes			
Casing Int. Dia (mm)	**50**	**100**	**150**
Vol (L/m of casing)	**2.0**	**7.9**	**17.7**

Purging and Sampling Record

Well ID: BH145R

Job Information		*Sampling Information*		*Monitoring Well Information*				
Client:	TfNSW	**Purge Method:**	Low flow	**SWL:**	10.990 m bTOC	**Time SWL Measured:**	01:20 PM
Project:	M12	**Sample Method:**	Micropurge	**Well Depth:**	19.960 m bTOC	**Logic Check:**	Yes
Proj. No.:	12554717	**Sample Depth:**	17 m bTOC	**NAPL Check:**	Absent	**Well Cap Secure?**	Yes
Site:	M12 Central	**WQuality Meter Type:**	YSI Pro DSS	**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	Stick Up
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	Yes	**Screened Interval From:**	to m bTOC		
Date:	17/01/2025	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	50 mm	**Stick Up:**	m
Round:	January 2025	**Field Filtered?**	Yes				

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
13:45	1.0	19.1	6.68	15723.0	3.04	-8.0	10.980	Clear, very slight pale yellow tinge, trace settled fine black sediment, no odour or sheen
13:49	2.0	19.1	6.89	15608.0	6.25	-16.8	11.010	Clear, trace settled fine black sediment, no odour or sheen
13:54	3.0	19.1	6.98	15506.0	7.20	-21.9	10.960	Clear, no sediment, no odour or sheen
13:58	4.0	19.0	7.07	15374.0	8.00	-21.6	10.990	Great recharge
14:03	5.0	18.9	7.21	15213.0	9.15	-15.2	11.020	
14:07	6.0	18.9	7.30	15056.0	9.55	-3.6	11.040	
14:11	7.0	18.9	7.36	14938.0	9.75	12.2	10.890	
14:16	8.0	18.9	7.40	14903.0	10.10	27.6	11.065	
14:19	9.0	18.9	7.44	14855.0	10.15	35.6	11.080	
14:23	10.0	18.9	7.47	14793.0	10.42	47.7	11.110	
14:27	11.0	18.9	7.49	14722.0	10.06	55.7	11.125	Clear, no sediment, no odour or sheen
								Majority of parameters stable, samples collected due to time constraints

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Comment: **Duplicate samples collected, bottles used, access, condition of headworks etc**

GWDUP1, ALS metals. GWDUP2, Eurofins metals

Purge Volumes			
Casing Int. Dia (mm)	**50**	**100**	**150**
Vol (L/m of casing)	**2.0**	**7.9**	**17.7**

Purging and Sampling Record

Well ID: BH104R

Job Information		Sampling Information		Monitoring Well Information			
Client:	TfNSW	**Purge Method:**	Low flow	**SWL:**	10.870 m bTOC	**Time SWL Measured:**	08:14 AM
Project:	M12	**Sample Method:**	Micropurge	**Well Depth:**	18.145 m bTOC	**Logic Check:**	Yes
Proj. No.:	12554717	**Sample Depth:**	15.5 m bTOC	**NAPL Check:**	Absent	**Well Cap Secure?**	Yes
Site:	M12 West	**WQuality Meter Type:**	YSI	**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	Stick Up
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	Yes	**Screened Interval From:**	to m bTOC		
Date:	18/02/2025	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	mm	**Stick Up:**	m
Round:	February 2025	**Field Filtered?**	Yes				

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
08:35	0.5	19.6	6.88	7216.0	0.95	80.5	11.001	Slightly cloudy, slight pale yellow tinge, no sediment, slight sulfuric odour
08:38	1.0	19.7	6.83	7231.0	0.64	66.1	11.077	no sheen
08:43	1.5	19.6	6.79	7243.0	0.48	32.7	11.118	Slightly cloudy, no sediment, no odour or sheen
08:46	2.0	19.7	6.79	7250.0	0.35	0.9	11.160	Clear, no sediment, no odour or sheen
08:50	2.5	19.7	6.81	7279.0	0.28	-17.5	11.190	Moderate recharge
08:55	3.0	19.7	6.82	7277.0	0.40	-28.0	11.215	
08:59	3.5	19.9	6.84	7272.0	0.43	-38.4	11.210	Great recharge
09:03	4.0	19.8	6.84	7285.0	0.37	-42.6	11.240	
09:07	4.5	19.9	6.83	7315.0	0.31	-48.0	11.243	
09:10	5.0	19.8	6.83	7293.0	0.28	-49.2	11.250	
09:15	5.5	20.0	6.82	7325.0	0.24	-51.6	11.265	
09:19	6.0	20.2	6.80	7355.0	0.20	-55.1	11.270	
09:23	6.5	20.0	6.79	7346.0	0.15	-57.3	11.276	Clear, no sediment, no odour or sheen
								Majority of parameters stable, samples collected

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Purge Volumes			
Casing Int. Dia (mm)	**50**	**100**	**150**
Vol (L/m of casing)	**2.0**	**7.9**	**17.7**

Comment:

Sample Summary

Samples collected?	Yes	Duplicate collected?	Yes	Duplicate 1 ID:	GWDUP1 (ALS metals)
#Primary sample containers	6	Duplicate analysis:	Metals	Duplicate 2 ID:	GWDUP2 (Eurofins metals)

Purging and Sampling Record

Well ID: BH107R

Job Information		Sampling Information		Monitoring Well Information				
Client:	TfNSW	**Purge Method:**	Low flow	**SWL:**	7.315 m bTOC	**Time SWL Measured:**	10:20 AM
Project:	M12	**Sample Method:**	Micropurge	**Well Depth:**	14.490 m bTOC	**Logic Check:**	Yes
Proj. No.:	12554717	**Sample Depth:**	13 m bTOC	**NAPL Check:**		**Well Cap Secure?**	Yes
Site:	M12 West	**WQuality Meter Type:**	YSI	**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	Yes	**Screened Interval From:**	to m bTOC		
Date:	18/02/2025	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	mm	**Stick Up:**	m
Round:	February 2025	**Field Filtered?**	Yes				

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
10:31	0.5	21.6	6.99	3757.0	2.37	113.6	7.400	Clear, no colour, no odour, no sheen
10:35	1.0	20.9	6.96	3655.0	1.03	102.4	4.620	
10:40	1.5	20.6	6.97	3525.0	2.88	98.7	7.855	
10:43	2.0	20.5	6.96	3446.0	1.32	95.8	8.095	
10:47	2.5	20.1	6.95	3386.0	1.09	94.6	8.335	
10:51	3.0	20.1	6.95	3365.0	0.99	92.3	8.625	
10:55	3.5	20.2	6.95	3355.0	0.99	91.6	8.790	
10:59	4.0	20.1	6.95	3332.0	0.99	91.4	9.015	Clear, no sediment, no odour or sheen
								Parameters stable, sampled

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Purge Volumes			
Casing Int. Dia (mm)	**50**	**100**	**150**
Vol (L/m of casing)	**2.0**	**7.9**	**17.7**

Comment:

Sample Summary

Samples collected?	Yes	Duplicate collected?	No	Duplicate 1 ID:	
#Primary sample containers	6	Duplicate analysis:		Duplicate 2 ID:	

Purging and Sampling Record

Well ID: BH112R

Job Information		*Sampling Information*		*Monitoring Well Information*			
Client:	TfNSW	**Purge Method:**	Low flow	**SWL:**	13.123 m bTOC	**Time SWL Measured:**	11:36 AM
Project:	M12	**Sample Method:**	Micropurge	**Well Depth:**	21.120 m bTOC	**Logic Check:**	Yes
Proj. No.:	12554717	**Sample Depth:**	19 m bTOC	**NAPL Check:**	Absent	**Well Cap Secure?**	Yes
Site:	M12 West	**WQuality Meter Type:**	YSI	**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	Stick Up
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	Yes	**Screened Interval From:**	to m bTOC		
Date:	18/02/2025	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	mm	**Stick Up:**	m
Round:	February 2025	**Field Filtered?**	Yes				

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
12:03	0.5	21.4	6.49	15100.0	1.45	166.2	13.315	Clear, no sediment, no odour or sheen
12:07	1.0	21.3	6.48	15035.0	0.85	153.5	13.420	
12:11	1.5	21.2	6.48	15006.0	0.60	142.6	13.560	
12:15	2.0	21.1	6.48	14958.0	0.52	136.2	13.685	Low to moderate recharge
12:18	2.5	21.1	6.48	14932.0	0.47	131.4	13.790	
12:22	3.0	21.1	6.48	14872.0	0.43	127.0	13.925	
12:26	3.5	21.1	6.48	14851.0	0.40	123.2	14.055	
12:31	4.0	21.2	6.48	14815.0	0.38	119.5	14.180	
12:34	4.5	21.1	6.48	14808.0	0.37	116.9	14.315	Clear, no sediment, no odour or sheen
								Parameters stable, samples collected

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Purge Volumes			
Casing Int. Dia (mm)	**50**	**100**	**150**
Vol (L/m of casing)	**2.0**	**7.9**	**17.7**

Comment:

Sample Summary

Samples collected?	Yes	Duplicate collected?	No	Duplicate 1 ID:	
#Primary sample containers	6	Duplicate analysis:		Duplicate 2 ID:	

Purging and Sampling Record

Well ID: BH145R

Job Information		Sampling Information		Monitoring Well Information			
Client:	TfNSW	**Purge Method:**	Low flow	**SWL:**	10.955 m bTOC	**Time SWL Measured:**	12:43 PM
Project:	M12	**Sample Method:**	Micropurge	**Well Depth:**	19.975 m bTOC	**Logic Check:**	Yes
Proj. No.:	12554717	**Sample Depth:**	19 m bTOC	**NAPL Check:**	Absent	**Well Cap Secure?**	Yes
Site:	M12 West	**WQuality Meter Type:**	YSI	**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	Gatic
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	Yes	**Screened Interval From:**	to m bTOC		
Date:	19/02/2025	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	50 mm	**Stick Up:**	m
Round:	February 2025	**Field Filtered?**	Yes				

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
13:06	0.5	21.2	6.48	17377.0	2.21	-94.2	10.975	Cloudy, dark grey colour sulfuric odour, no sediment.
13:10	1.0	20.3	6.45	17100.0	1.15	-106.1	10.985	
13:14	1.5	20.0	6.46	16967.0	0.71	-111.7	10.985	Cloudy, grey colour sulfuric odour, fine black sediment settled on bottom
13:18	2.0	20.0	6.49	16854.0	0.52	-115.4	10.990	
13:22	2.5	20.4	6.49	16939.0	0.46	-114.4	10.990	
13:26	3.0	20.8	6.50	17036.0	0.42	-112.8	10.995	
13:31	3.5	20.6	6.50	16909.0	0.38	-109.9	11.005	Cloudy, white-grey colour,sulfuric odour, fine black sediment settled on bottom
13:34	4.0	20.6	6.49	16881.0	0.39	-106.0	11.010	Mostly cloudy, white-grey colour,sulfuric odour, fine black sediment on bottom
13:38	4.5	20.5	6.49	16782.0	0.35	-103.1	11.030	Slightly cloudy, white-grey colour, faint sulfuric odour, with fine black sediment
13:44	5.0	20.8	6.49	16820.0	0.33	-96.7	11.015	settled on bottom
13:48	5.5	20.9	6.49	16788.0	0.31	-93.6	11.025	Mostly clear, white-grey colour, faint sulfuric odour, fine black sediment
								settled on bottom
								Parameters mostly stable, sampled due to time constraints
								(Hot day, temperature not stable)

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Purge Volumes			
Casing Int. Dia (mm)	**50**	**100**	**150**
Vol (L/m of casing)	**2.0**	**7.9**	**17.7**

Comment:

Sample Summary

Samples collected?	Yes	Duplicate collected?	No	Duplicate 1 ID:	
#Primary sample containers	6	Duplicate analysis:		Duplicate 2 ID:	

Groundwater Gauging Record

Client: TfNSW
Project: M12 Motorway
Job No.: 12554717
Location: Western Sydney, Sydney, NSW

WL Meter Type: Int.Fce
Date: 18-19/02/2025
Sampler: L. Saunders / N. Hugo

Well ID	Date	Time	Accessible?	SWL (mbTOC)	BOC (mbTOC)	Data logger present?	Data logger brand type	Data logger downloaded?	Comment
BH104R*	18/02/2025	8:14	Yes	10.870	18.145	Yes	HOBO	Yes	
BH107R*	18/02/2025	10:20	Yes	7.315	14.490	Yes	Solinst	Yes	
BH112R*	18/02/2025	11:36	Yes	13.123	21.120	Yes	Solinst	Yes	
BH145R*	19/02/2025	12:43	Yes	10.955	19.975	Yes	HOBO	Yes	Includes barometric logger
BH170									Not located to date
BH175	19/02/2025	12:10	Yes	3.805	18.100	Yes	Solinst	Yes	
BH219									Destroyed

* BH104, BH107 and BH112 destroyed November 2022 and replacement wells BH104R, BH107R and BH112R are now gauged
* BH145 is no longer in use as of April 2023 and replacement well BH145R is now gauged.

Purging and Sampling Record

Well ID: BH104R

Job Information		Sampling Information		Monitoring Well Information				
Client:	TfNSW	**Purge Method:**	Low flow	**SWL:**	10.825 m bTOC	**Time SWL Measured:**	07:38 AM
Project:	M12	**Sample Method:**	Micropurge	**Well Depth:**	18.145 m bTOC	**Logic Check:**	Yes
Proj. No.:	12554717	**Sample Depth:**	13 m bTOC	**NAPL Check:**	Absent	**Well Cap Secure?**	Yes
Site:	M12 West	**WQuality Meter Type:**	YSI	**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	Stick Up
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	Yes	**Screened Interval From:**	to m bTOC		
Date:	11/03/2025	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	50 mm	**Stick Up:**	m
Round:	March 2025	**Field Filtered?**	Yes				

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
08:11	0.5	20.0	6.73	7384.0	0.89	101.1	11.055	Clear, no odour, no sediment, no sheen
08:16	1.0	20.0	6.70	7379.0	0.60	103.9	11.167	
08:19	1.5	20.1	6.70	7391.0	0.33	104.3	11.214	
08:22	2.0	20.0	6.69	7385.0	0.24	102.9	11.255	
08:26	2.5	20.0	6.69	7384.0	0.16	102.1	11.275	
08:29	3.0	20.0	6.69	7389.0	0.12	100.1	11.333	
08:32	3.5	20.0	6.69	7385.0	0.09	90.1	11.350	
08:35	4.0	20.0	6.69	7374.0	0.07	50.0	11.375	
08:38	4.5	20.0	6.69	7361.0	0.07	14.0	11.375	Great recharge
08:41	5.0	20.1	6.69	7364.0	0.05	3.2	11.385	
08:44	5.5	20.1	6.70	7369.0	0.03	-9.4	11.385	
08:48	6.0	20.0	6.70	7365.0	0.02	-17.6	11.398	
08:51	6.5	20.0	6.70	7344.0	0.01	-21.8	11.395	
08:53	7.0	19.9	6.70	7327.0	0.00	-26.3	11.415	Clear, no odour, no sediment, no sheen
	7.5							Parameters mostly stable, sampled due to time constraints

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Purge Volumes			
Casing Int. Dia (mm)	**50**	**100**	**150**
Vol (L/m of casing)	**2.0**	**7.9**	**17.7**

Comment:

Sample Summary

Samples collected?	Yes	Duplicate collected?	Yes	Duplicate 1 ID:	GWDUP1
#Primary sample containers	6	Duplicate analysis:		Duplicate 2 ID:	GWDUP2

Purging and Sampling Record

Well ID: BH107R

Job Information		Sampling Information		Monitoring Well Information				
Client:	TfNSW	**Purge Method:**	Purge	**SWL:**	7.325 m bTOC	**Time SWL Measured:**	09:54 AM
Project:	M12	**Sample Method:**	Bailer	**Well Depth:**	14.506 m bTOC	**Logic Check:**	Yes
Proj. No.:	12554717	**Sample Depth:**	11 m bTOC	**NAPL Check:**	Absent	**Well Cap Secure?**	Yes
Site:	M12 West	**WQuality Meter Type:**	YSI	**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	Stick Up
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	Yes	**Screened Interval From:**	to m bTOC		
Date:	11/03/2025	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	mm	**Stick Up:**	m
Round:	March 2025	**Field Filtered?**	Yes				

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
10:10	1.0	19.6	7.05	3138.0	3.35	113.4	7.660	Clear, no sediment, no odour or sheen
10:15	2.0	19.3	7.05	2982.0	4.78	111.5	7.960	
10:17	3.0	19.3	7.10	2993.0	5.56	110.7	8.354	
10:20	4.0	19.3	7.06	3033.0	4.68	113.7	8.740	
10:23	5.0	19.2	7.05	2999.0	4.75	114.3	9.085	Clear, no sediment, no odour or sheen
								Parameters mostly stable, sampled due to time constraints

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Purge Volumes

Casing Int. Dia (mm)	50	100	150
Vol (L/m of casing)	2.0	7.9	17.7

Comment:

Sample Summary

Samples collected? Yes — Duplicate collected? No — Duplicate 1 ID:

#Primary sample containers 6 — Duplicate analysis: — Duplicate 2 ID:

Purging and Sampling Record

Well ID: BH112R

Job Information		Sampling Information		Monitoring Well Information			
Client:	TfNSW	**Purge Method:**	Purge	**SWL:**	13.122 m bTOC	**Time SWL Measured:**	11:02 AM
Project:	M12	**Sample Method:**	Bailer	**Well Depth:**	21.105 m bTOC	**Logic Check:**	Yes
Proj. No.:	12554717	**Sample Depth:**	17 m bTOC	**NAPL Check:**	Absent	**Well Cap Secure?**	Yes
Site:	M12 West	**WQuality Meter Type:**	YSI	**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	Stick Up
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	Yes	**Screened Interval From:**	to m bTOC		
Date:	11/03/2025	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	mm	**Stick Up:**	m
Round:	March 2025	**Field Filtered?**	Yes				

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
11:10	1.0	20.1	6.65	14313.0	4.93	145.0	13.360	Clear, no sediment, no odour, no sheen
10:13	2.0	20.0	6.65	14479.0	4.27	140.2	13.585	
10:14	3.0	20.0	6.66	1433.0	4.69	137.6	13.785	
10:18	4.0	19.9	6.63	14323.0	4.89	135.6	14.195	
10:21	5.0	19.8	6.65	14444.0	4.47	133.8	14.395	
11:24	6.0	19.8	6.63	14407.0	3.40	132.9	14.600	
11:26	7.0	19.8	6.66	14396.0	4.78	128.4	14.815	Clear, no sediment, no odour, no sheen
								Parameters mostly stable, sampled due to time constraints

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Purge Volumes			
Casing Int. Dia (mm)	**50**	**100**	**150**
Vol (L/m of casing)	**2.0**	**7.9**	**17.7**

Comment:

Sample Summary

Samples collected? Yes — Duplicate collected? No — Duplicate 1 ID:

#Primary sample containers 6 — Duplicate analysis: — Duplicate 2 ID:

Purging and Sampling Record

Well ID: BH145R

Job Information		Sampling Information		Monitoring Well Information				
Client:	TfNSW	**Purge Method:**	Low flow	**SWL:**	10.970 m bTOC	**Time SWL Measured:**	11:07 AM	
Project:	M12	**Sample Method:**	Micropurge	**Well Depth:**	19.955 m bTOC	**Logic Check:**	Yes	
Proj. No.:	12554717	**Sample Depth:**	17 m bTOC	**NAPL Check:**	Absent	**Well Cap Secure?**	Yes	
Site:	M12 West	**WQuality Meter Type:**	YSI	**NAPL Depth:**	m bTOC	**Gatic or Stick Up?**	Gatic	
Sampler:	L. Saunders/ N. Hugo	**Flow Cell Used?**	Yes	**Screened Interval From:**	to m bTOC			
Date:	12/03/2025	**WLevel Meter Type:**	Interface Probe	**Well Diameter:**	50 mm	**Stick Up:**	m	
Round:	March 2025	**Field Filtered?**	Yes					

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µs/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m bTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		*+/- 0.2 °C*	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*	
11:31	0.5	20.3	6.40	17263.0	1.48	-55.5	10.998	Clear, no sediment, slight sulphuric odour, no sheen
11:34	1.0	20.1	6.39	17180.0	0.90	-57.5	11.020	Good recharge
11:38	1.5	20.0	6.41	17091.0	0.93	-51.1	11.020	Great recharge
11:43	2.0	20.0	6.44	17040.0	1.25	-40.6	11.025	
11:46	2.5	20.0	6.45	16974.0	1.50	-33.6	11.025	Clear, no sediment, no odour or sheen
11:50	3.0	20.0	6.47	16967.0	1.81	-27.2	11.030	
11:54	3.5	20.0	6.48	16914.0	2.07	-21.9	11.030	
11:58	4.0	20.0	6.49	16903.0	2.27	-17.1	11.035	
12:02	4.5	20.0	6.50	16892.0	2.47	-13.7	11.040	
12:05	5.0	19.9	6.50	16852.0	2.69	-11.1	11.043	Clear, no sediment, no odour or sheen
								Parameters mostly stable, sampled due to time constraints

Field QA Checks:	
Air bubbles in vials or violent reactions?	No
Decontamination as per GHD procedure?	Yes
Was sampling equipment pre-cleaned?	Yes
COC updated?	Yes

Purge Volumes			
Casing Int. Dia (mm)	**50**	**100**	**150**
Vol (L/m of casing)	**2.0**	**7.9**	**17.7**

Comment:

Sample Summary

Samples collected? Yes — Duplicate collected? No — Duplicate 1 ID:

#Primary sample containers 6 — Duplicate analysis: — Duplicate 2 ID:

Groundwater Gauging Record

Client: TfNSW
Project: M12 Motorway
Job No.: 12554717
Location: Western Sydney, Sydney, NSW

WL Meter Type: Int.Fce
Date: 11/03/2025
Sampler: **N Hugo & L Saunders**

Well ID	Date	Time	Accessible?	SWL (mbTOC)	BOC (mbTOC)	Data logger present?	Data logger brand type	Data logger downloaded?	Comment
BH104R*	11/03/2025	7:38	Yes	10.825	18.145	Yes	Hobo	Yes	
BH107R*	11/03/2025	9:54	Yes	7.325	14.506	Yes	Solinist	Yes	
BH112R*	11/03/2025	11:02	Yes	13.122	21.105	Yes	Solinist	Yes	
BH145R*	12/03/2025	11:07	Yes	10.970	19.955	Yes	Hobo	Yes	
BH170									Not located to date
BH175									Not monitored this month
BH219									Destroyed

* BH104, BH107 and BH112 destroyed November 2022 and replacement wells BH104R, BH107R and BH112R are now gauged
* BH145 is no longer in use as of April 2023 and replacement well BH145R is now gauged.

Appendix H

Laboratory reports

HT

CHAIN OF CUSTODY

ALS Laboratory: please tick →

BRISBANE 32 Shand Street Stafford QLD 4053 PH: 07 3243 7222 E: EnviroSales@alsglobal.com
TOWNSVILLE 14-15 Desma Court Garbutt QLD 4814 PH: 07 4796 0600 E: townsville@alsglobal.com
PERTH 10 Hod Way Malaga WA 6090 PH: 08 9209 7655 E: samplereceipt.perth@alsglobal.com
LAUNCESTON 38 Kings Meadows Road Launceston NSW 2250 PH: 03 6407 6309 E: launceston@alsglobal.com

CLIENT: GHD Pty Ltd	TURNAROUND REQUIREME ☐ Standard TAT (List due date): STANDARD TAT		FOR LABORATORY USE ONLY (Circle)
OFFICE: Sydney	(Standard TAT may be longer for some tests e.g. Ultra Trace ☐ Non Standard or urgent TAT (List due date):		Custody Seal Intact? Yes No N/A
PROJECT: M12 Groundwater	ALS QUOTE NO.: SY/022/21 V5	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: 12554717		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Henry Luo	CONTACT PH: Henry Luo 0414 980 992	OF: 1 2 3 4 5 6 7	Other comments:

SAMPLER: Lia Saunders, Nica Hugo	SAMPLER MOBILE: 0488 301 344	RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): ESDAT	Nica Hugo			
Email Reports to: emily.smith@ghd.com; lia.saunders@ghd.com; henry.luo@ghd.com; nica.hugo@ghd.com; ghdlabreports@ghd.com		DATE/TIME: 10/10/2024 @ 15:00	DATE/TIME:	DATE/TIME:	DATE/TIME: 10/10/24 1500

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: ANALYSIS OF NITRITE 48 HRS HOLDING TIME REQUIRED. PLEASE DO NOT LOG ALL SAMPLES RECEIVED IN ONE WORKORDER. LOG AS TWO SEPARATE WORKORDERS AS PER THE TWO COCs PROVIDED.

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).												
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	Comments	TOTAL CONTAINERS	W-02 (dissolved & metals)	EG020F (dissolved Fe, Mn)	W-04 (BTEXN)	MT-06A (TN, NO2, NO3, NH3, TP, soluble Reactive P)	NT-01D & 02 (major cations & anions, Hardness)	EA015H (TDS)	EA025H (TSS)	EP073A (SIM) (Phenols – Standard level (16 analytes))	W-02T (S total metals)	BTEXN		
1	BH104R	9/10/2024	Water		6	X	X	X	X	X	X	X					
2	BH107R	9/10/2024	Water		6	X	X	X	X	X	X	X					
3	BH112R	9/10/2024	Water		6	X	X	X	X	X	X	X					
4	BH145R	10/09/2024	Water		6	X	X	X	X	X	X	X					
5	GWDUP1	9/10/2024	Water		1	X											
Euro	GWDUP2	9/10/2024	Water	PLEASE FORWARD TO EUROFINS WITH ATTACHED COC	1												
6	GWRB1	9/10/2024	Water		1									X			
7	Trip spike	9/10/2024	Water		1										X		
8	Trip blank	9/10/2024	Water		1										X		

Environmental Division
Sydney
Work Order Reference
ES2433147

Telephone : +61-2-8784 8555

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2433147**

Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Contact	: Samiksha Sathish
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: henry.luo@ghd.com	E-mail	: samiksha.sathish@alsglobal.com
Telephone	: +61 02 9239 7100	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 9239 7199	Facsimile	: +61-2-8784 8500
Project	: 12554717	Page	: 1 of 3
Order number	: 12554717	Quote number	: ES2021GHDSER0026 (SY/322/21_V5)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: Lia Saunders, NICA HUGO		

Dates

Date Samples Received	: 10-Oct-2024 15:00	Issue Date	: 10-Oct-2024
Client Requested Due Date	: 16-Oct-2024	Scheduled Reporting Date	: **16-Oct-2024**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 7	Temperature	: 9.0, 11.3, 8.6'C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 8 / 8

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Sample GWDUP2 has been forwarded to Eurofins.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Sydney, NATA accreditation no. 825, site no. 10911.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA015H Total Dissolved Solids - Standard Level	WATER - EA025H Suspended Solids - Standard Level	WATER - EG020F Dissolved Metals by ICP/MS	WATER - NT-01D & 02 Major Cations & Anions (Ca, Mg, Na, K, Cl, SO4,	WATER - NT-08A Total Nitrogen + NO2 + NO3 + NH3 + Total P +	WATER - W-02 8 Metals	WATER - W-04 TRH/BTEXN
ES2433147-001	09-Oct-2024 00:00	BH104R	✓	✓	✓	✓	✓	✓	✓
ES2433147-002	09-Oct-2024 00:00	BH107R	✓	✓	✓	✓	✓	✓	✓
ES2433147-003	09-Oct-2024 00:00	BH112R	✓	✓	✓	✓	✓	✓	✓
ES2433147-004	09-Oct-2024 00:00	BH145R	✓	✓	✓	✓	✓	✓	✓
ES2433147-005	10-Oct-2024 00:00	GWDUP1						✓	

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP080 BTEXN	WATER - W-02T 8 metals (Total)	WATER - W-18 TRH(C6 - C9)/BTEXN
ES2433147-006	10-Oct-2024 00:00	GWRB1		✓	
ES2433147-007	10-Oct-2024 00:00	Trip Spike	✓		
ES2433147-008	10-Oct-2024 00:00	Trip Blank			✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

Accounts Payable Australia

- A4 - AU Tax Invoice (INV)	Email	accountspayableAU@ghd.com

EMILY SMITH

- *AU Certificate of Analysis - NATA (COA)	Email	emily.smith@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	emily.smith@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	emily.smith@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	emily.smith@ghd.com
- Chain of Custody (CoC) (COC)	Email	emily.smith@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	emily.smith@ghd.com
- EDI Format - XTab (XTAB)	Email	emily.smith@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	emily.smith@ghd.com

GHD LAB REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	ghdlabreports@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ghdlabreports@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ghdlabreports@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ghdlabreports@ghd.com
- Chain of Custody (CoC) (COC)	Email	ghdlabreports@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	ghdlabreports@ghd.com
- EDI Format - XTab (XTAB)	Email	ghdlabreports@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	ghdlabreports@ghd.com

HENRY LUO

- *AU Certificate of Analysis - NATA (COA)	Email	henry.luo@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	henry.luo@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	henry.luo@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	henry.luo@ghd.com
- Chain of Custody (CoC) (COC)	Email	henry.luo@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	henry.luo@ghd.com
- EDI Format - XTab (XTAB)	Email	henry.luo@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	henry.luo@ghd.com

Lia Saunders

- *AU Certificate of Analysis - NATA (COA)	Email	Lia.Saunders@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	Lia.Saunders@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	Lia.Saunders@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	Lia.Saunders@ghd.com
- Chain of Custody (CoC) (COC)	Email	Lia.Saunders@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	Lia.Saunders@ghd.com
- EDI Format - XTab (XTAB)	Email	Lia.Saunders@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	Lia.Saunders@ghd.com

NICA HUGO

- *AU Certificate of Analysis - NATA (COA)	Email	nica.hugo@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	nica.hugo@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	nica.hugo@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	nica.hugo@ghd.com
- Chain of Custody (CoC) (COC)	Email	nica.hugo@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	nica.hugo@ghd.com
- EDI Format - XTab (XTAB)	Email	nica.hugo@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	nica.hugo@ghd.com

CERTIFICATE OF ANALYSIS

Work Order	: **ES2433147**	Page	: 1 of 7
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Contact	: Samiksha Sathish
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9239 7100	Telephone	: +61-2-8784 8555
Project	: 12554717	Date Samples Received	: 10-Oct-2024 15:00
Order number	: 12554717	Date Analysis Commenced	: 11-Oct-2024
C-O-C number	: ----	Issue Date	: 16-Oct-2024 16:10
Sampler	: Lia Saunders, NICA HUGO		
Site	: ----		
Quote number	: SY/322/21_V5		
No. of samples received	: 8		
No. of samples analysed	: 8		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- It has been noted that Ammonia is greater than TKN, however this difference is within the limits of experimental variation.
- EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEXN compounds spiked at 20 ug/L.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH104R	BH107R	BH112R	BH145R	GWDUP1
				Sampling date / time	09-Oct-2024 00:00	09-Oct-2024 00:00	09-Oct-2024 00:00	09-Oct-2024 00:00	10-Oct-2024 00:00
Compound	CAS Number	LOR	Unit		ES2433147-001	ES2433147-002	ES2433147-003	ES2433147-004	ES2433147-005
					Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		**4680**	**2140**	**10200**	**11400**	----
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		**18**	**20**	**20**	**66**	----
EA065: Total Hardness as CaCO3									
Total Hardness as CaCO3	----	1	mg/L		**771**	**507**	**2320**	**2800**	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**1100**	**1540**	**1340**	**1070**	----
Total Alkalinity as CaCO3	----	1	mg/L		**1100**	**1540**	**1340**	**1070**	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**215**	**184**	**1510**	**337**	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**2470**	**327**	**4670**	**6430**	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**119**	**38**	**245**	**231**	----
Magnesium	7439-95-4	1	mg/L		**115**	**100**	**416**	**540**	----
Sodium	7440-23-5	1	mg/L		**1600**	**745**	**3040**	**3260**	----
Potassium	7440-09-7	1	mg/L		**17**	**15**	**42**	**18**	----
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		**0.003**	<0.001	**0.002**	**0.002**	**0.003**
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L		<0.001	<0.001	**0.004**	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L		<0.005	<0.005	**0.010**	**0.008**	<0.005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH104R	BH107R	BH112R	BH145R	GWDUP1
				Sampling date / time	09-Oct-2024 00:00	09-Oct-2024 00:00	09-Oct-2024 00:00	09-Oct-2024 00:00	10-Oct-2024 00:00
Compound	CAS Number	LOR	Unit		ES2433147-001	ES2433147-002	ES2433147-003	ES2433147-004	ES2433147-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Manganese	7439-96-5	0.001	mg/L		**0.082**	<0.001	**0.076**	**0.109**	----
Iron	7439-89-6	0.05	mg/L		**1.44**	<0.05	<0.05	**3.14**	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**1.92**	**0.04**	**2.37**	**2.25**	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	**0.03**	<0.01	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		<0.01	**2.43**	**0.35**	<0.01	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	**2.43**	**0.38**	<0.01	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**1.9**	**0.4**	**2.3**	**2.2**	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**1.9**	**2.8**	**2.7**	**2.2**	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**0.08**	**0.03**	**0.06**	**0.04**	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	**0.03**	<0.01	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**96.1**	**43.8**	**190**	**210**	----
ø Total Cations	----	0.01	meq/L		**85.4**	**42.9**	**180**	**198**	----
ø Ionic Balance	----	0.01	%		**5.89**	**1.05**	**2.75**	**2.83**	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH104R	BH107R	BH112R	BH145R	GWDUP1
				Sampling date / time	09-Oct-2024 00:00	09-Oct-2024 00:00	09-Oct-2024 00:00	09-Oct-2024 00:00	10-Oct-2024 00:00
Compound	CAS Number	LOR	Unit		ES2433147-001	ES2433147-002	ES2433147-003	ES2433147-004	ES2433147-005
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	----
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	<100	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	<100	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	----
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	----
^ Total Xylenes	----	2	µg/L		<2	<2	<2	<2	----
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	----
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**90.3**	**100**	**93.1**	**90.9**	----
Toluene-D8	2037-26-5	2	%		**102**	**121**	**103**	**107**	----
4-Bromofluorobenzene	460-00-4	2	%		**128**	**133**	**121**	**126**	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	GWRB1	Trip Spike	Trip Blank	----	----
			Sampling date / time	10-Oct-2024 00:00	10-Oct-2024 00:00	10-Oct-2024 00:00	----	----
Compound	CAS Number	LOR	Unit	ES2433147-006	ES2433147-007	ES2433147-008	--------	--------
				Result	Result	Result	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	----	----	<20	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	----	----	<20	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	----	----	<20	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	----	**17**	<1	----	----
Toluene	108-88-3	2	µg/L	----	**18**	<2	----	----
Ethylbenzene	100-41-4	2	µg/L	----	**17**	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	----	**19**	<2	----	----
ortho-Xylene	95-47-6	2	µg/L	----	**19**	<2	----	----
^ Total Xylenes	----	2	µg/L	----	**38**	<2	----	----
^ Sum of BTEX	----	1	µg/L	----	**90**	<1	----	----
Naphthalene	91-20-3	5	µg/L	----	**22**	<5	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	----	**92.0**	**92.8**	----	----
Toluene-D8	2037-26-5	2	%	----	**101**	**104**	----	----
4-Bromofluorobenzene	460-00-4	2	%	----	**115**	**124**	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72	143
Toluene-D8	2037-26-5	75	131
4-Bromofluorobenzene	460-00-4	73	137

QUALITY CONTROL REPORT

Work Order	: **ES2433147**	Page	: 1 of 12
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Contact	: Samiksha Sathish
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9239 7100	Telephone	: +61-2-8784 8555
Project	: 12554717	Date Samples Received	: 10-Oct-2024
Order number	: 12554717	Date Analysis Commenced	: 11-Oct-2024
C-O-C number	: ----	Issue Date	: 16-Oct-2024
Sampler	: Lia Saunders, NICA HUGO		
Site	: ----		
Quote number	: SY/322/21_V5		
No. of samples received	: 8		
No. of samples analysed	: 8		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
= Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 6119122)									
ES2432895-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	8200	8160	0.5	0% - 20%
ES2433144-010	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1490	1510	1.0	0% - 20%
EW2404616-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	382	381	0.0	0% - 20%
EW2404671-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	72	65	9.5	No Limit
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 6119123)									
ES2432895-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	13	13	0.0	No Limit
ES2433144-010	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	6	9	44.1	No Limit
EW2404616-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
EW2404671-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 6117317)									
EN2412529-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	31	36	16.1	0% - 20%
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	103	101	1.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	134	138	2.8	0% - 20%
EN2412662-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	267	271	1.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	267	271	1.5	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 6113832)									
ES2433051-013	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	25	25	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 6113831)									
ES2432979-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	338	332	2.0	0% - 20%

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED045G: Chloride by Discrete Analyser (QC Lot: 6113831) - continued									
ES2432979-010	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	146	150	3.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 6116537)									
EN2412465-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	30	29	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	3	3	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	22	21	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
ES2433122-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	386	393	1.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	249	252	1.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	259	261	0.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	1	1	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 6116542)									
EW2404639-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	2	2	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	2	2	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	15	15	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
ES2433147-003	BH112R	ED093F: Calcium	7440-70-2	1	mg/L	245	246	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	416	423	1.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	3040	3080	1.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	42	42	0.0	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6116538)									
ES2432912-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.006	0.006	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
ES2433122-004	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0002	0.0003	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.417	0.415	0.4	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6116538) - continued									
ES2433122-004	Anonymous	EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6116543)									
EW2404639-003	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0012	0.0012	0.0	0% - 50%
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	1.35	1.36	0.1	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.014	0.013	0.0	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.225	0.226	0.0	0% - 20%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	1.21	1.19	2.0	0% - 20%
ES2433147-003	BH112R	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.076	0.078	3.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.004	0.005	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.010	0.012	14.2	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6116551)									
ES2433147-005	GWDUP1	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.079	0.081	1.6	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	1.48	1.45	1.9	0% - 20%
EW2404631-009	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.045	0.044	0.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6116551) - continued									
EW2404631-009	Anonymous	EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.007	0.007	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.17	0.13	25.3	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 6116494)									
ES2433144-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.008	0.010	25.5	No Limit
ES2433144-011	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.004	0.003	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.005	0.005	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.012	0.010	17.1	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 6116539)									
ES2432912-002	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	0.0016	0.0016	0.0	0% - 50%
ES2433122-002	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 6116541)									
EW2404639-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2433147-003	BH112R	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 6116552)									
EW2404631-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EW2404631-009	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6114950)									
ES2433144-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2433144-011	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 6116298)									
ES2432909-013	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.01	0.01	0.0	No Limit
ES2432909-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.03	0.02	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 6113833)									
ES2433051-013	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.01	0.01	0.0	No Limit
ES2433144-010	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 6116299)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 6116299) - continued									
ES2432909-013	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.01	0.0	No Limit
ES2432909-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 6116300)									
ES2433147-002	BH107R	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	2.43	2.40	1.1	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 6116296)									
ES2432912-007	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.1	<0.1	0.0	No Limit
ES2433149-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.1	0.2	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 6116297)									
ES2432912-007	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.01	0.02	59.6	No Limit
ES2433149-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.01	0.02	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 6113834)									
ES2433144-010	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.01	0.01	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6114986)									
ES2432976-011	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2433152-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6114986)									
ES2432976-011	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2433152-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 6114986)									
ES2432976-011	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2433152-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 6119122)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	97.6	87.0	109
				<10	293 mg/L	106	75.2	126
				<10	2410 mg/L	99.1	83.0	124
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 6119123)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	101	83.0	129
				<5	1000 mg/L	98.1	82.0	110
				<5	879 mg/L	105	83.0	118
ED037P: Alkalinity by PC Titrator (QCLot: 6117317)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	101	81.0	115
				----	50 mg/L	103	80.0	128
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6113832)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.9	82.0	122
				<1	500 mg/L	100	82.0	122
ED045G: Chloride by Discrete Analyser (QCLot: 6113831)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	107	80.9	127
				<1	1000 mg/L	106	80.9	127
ED093F: Dissolved Major Cations (QCLot: 6116537)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	80.0	114
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	90.0	116
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	82.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	101	85.0	113
ED093F: Dissolved Major Cations (QCLot: 6116542)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	80.0	114
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	90.0	116
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	82.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	100	85.0	113
EG020F: Dissolved Metals by ICP-MS (QCLot: 6116538)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	95.6	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	91.2	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	92.0	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	93.2	81.0	111

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 6116538) - continued								
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	92.0	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	91.2	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	91.6	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	92.7	81.0	117
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	98.7	82.0	112
EG020F: Dissolved Metals by ICP-MS (QCLot: 6116543)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	95.6	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	92.7	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	93.4	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	93.4	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	91.6	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	90.8	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	92.2	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	92.5	81.0	117
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	101	82.0	112
EG020F: Dissolved Metals by ICP-MS (QCLot: 6116551)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	96.8	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	88.0	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	91.3	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	95.9	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	90.0	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	88.4	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	94.6	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	95.9	81.0	117
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	112	82.0	112
EG020T: Total Metals by ICP-MS (QCLot: 6116494)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	98.7	82.0	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	91.8	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	91.3	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	96.0	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	94.3	85.0	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	95.6	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	94.4	79.0	117
EG035F: Dissolved Mercury by FIMS (QCLot: 6116539)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG035F: Dissolved Mercury by FIMS (QCLot: 6116539) - continued								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	101	83.0	105
EG035F: Dissolved Mercury by FIMS (QCLot: 6116541)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	105	83.0	105
EG035F: Dissolved Mercury by FIMS (QCLot: 6116552)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	95.3	83.0	105
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6114950)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	99.4	77.0	111
EK055G: Ammonia as N by Discrete Analyser (QCLot: 6116298)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	101	90.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6113833)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	91.9	82.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6116299)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	102	91.0	113
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6116300)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	100	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 6116296)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	91.0	69.0	123
				<0.1	1 mg/L	103	70.0	123
				<0.1	5 mg/L	93.0	70.0	123
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6116297)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	93.6	71.3	126
				<0.01	0.442 mg/L	96.7	71.3	126
				<0.01	1 mg/L	96.4	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6113834)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	97.2	85.0	117
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6113631)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	80.7	53.7	97.0
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	79.5	63.3	107
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	70.9	58.3	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6114986)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	84.1	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6113631)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	77.3	53.9	95.5
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	77.7	57.8	110

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6113631) - continued								
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	54.3	50.5	115
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6114986)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	85.9	75.0	127
EP080: BTEXN (QCLot: 6114986)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	92.4	68.3	119
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	97.7	73.5	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	91.8	73.8	122
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	100	73.0	122
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	106	76.4	123
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	103	75.5	124

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6113832)							
ES2433051-013	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	115	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 6113831)							
ES2432979-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	100	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 6116538)							
ES2432912-002	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	90.5	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	90.2	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	95.4	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	97.7	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	74.9	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	95.3	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	90.6	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	92.9	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 6116543)							
ES2433147-004	BH145R	EG020A-F: Arsenic	7440-38-2	1 mg/L	113	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	97.5	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	97.2	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	113	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 6116543) - continued							
ES2433147-004	BH145R	EG020A-F: Lead	7439-92-1	1 mg/L	100	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	95.7	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	102	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	101	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 6116551)							
ES2433149-001	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	89.5	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	86.4	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	92.8	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	98.8	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	90.6	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	96.5	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	98.3	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	93.5	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 6116494)							
ES2433144-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	109	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	100	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	96.6	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	114	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	105	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	104	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	105	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 6116539)							
ES2432912-001	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	126	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 6116541)							
ES2433147-002	BH107R	EG035F: Mercury	7439-97-6	0.01 mg/L	112	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 6116552)							
ES2433147-005	GWDUP1	EG035F: Mercury	7439-97-6	0.01 mg/L	86.0	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6114950)							
ES2433144-001	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	90.5	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 6116298)							
ES2432909-001	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	111	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6113833)							
ES2433051-013	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	113	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6116299)							
ES2432909-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	116	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6116300)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6116300) - continued							
ES2433147-002	BH107R	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	# Not Determined	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 6116296)							
ES2432912-007	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	91.6	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6116297)							
ES2432912-007	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	96.0	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6113834)							
ES2433144-010	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	117	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6114986)							
ES2432976-011	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	104	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6114986)							
ES2432976-011	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	105	70.0	130
EP080: BTEXN (QCLot: 6114986)							
ES2432976-011	Anonymous	EP080: Benzene	71-43-2	25 µg/L	92.4	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	102	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	105	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	114	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	107	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	107	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2433147**	Page	: 1 of 9
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Telephone	: +61-2-8784 8555
Project	: 12554717	Date Samples Received	: 10-Oct-2024
Site	: ----	Issue Date	: 16-Oct-2024
Sampler	: Lia Saunders, NICA HUGO	No. of samples received	: 8
Order number	: 12554717	No. of samples analysed	: 8

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Ar	ES2433147--002	BH107R	**Nitrite + Nitrate as N**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)						
TRH - Semivolatile Fraction	EP071	0	18	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
TRH - Semivolatile Fraction	EP071	0	18	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container* / Client Sample ID(s)		*Sample Date*	*Extraction / Preparation*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Clear Plastic Bottle - Natural (EA015H)								
BH104R,	BH107R,	**09-Oct-2024**	**----**	----	**----**	**15-Oct-2024**	16-Oct-2024	✓
BH112R,	BH145R							
EA025: Total Suspended Solids dried at 104 ± 2°C								
Clear Plastic Bottle - Natural (EA025H)								
BH104R,	BH107R,	**09-Oct-2024**	**----**	----	**----**	**15-Oct-2024**	16-Oct-2024	✓
BH112R,	BH145R							
EA065: Total Hardness as CaCO3								
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)								
BH104R,	BH107R,	**09-Oct-2024**	**----**	----	**----**	**14-Oct-2024**	06-Nov-2024	✓
BH112R,	BH145R							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
BH104R, BH107R, BH112R, BH145R	**09-Oct-2024**	**----**	----	----	**14-Oct-2024**	23-Oct-2024	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
BH104R, BH107R, BH112R, BH145R	**09-Oct-2024**	**----**	----	----	**11-Oct-2024**	06-Nov-2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
BH104R, BH107R, BH112R, BH145R	**09-Oct-2024**	**----**	----	----	**11-Oct-2024**	06-Nov-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
BH104R, BH107R, BH112R, BH145R	**09-Oct-2024**	**----**	----	----	**14-Oct-2024**	06-Nov-2024	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
BH104R, BH107R, BH112R, BH145R	**09-Oct-2024**	**----**	----	----	**14-Oct-2024**	07-Apr-2025	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
GWDUP1	**10-Oct-2024**	**----**	----	----	**14-Oct-2024**	08-Apr-2025	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)							
GWRB1	**10-Oct-2024**	**14-Oct-2024**	08-Apr-2025	✓	**14-Oct-2024**	08-Apr-2025	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)							
BH104R, BH107R, BH112R, BH145R	**09-Oct-2024**	**----**	----	----	**14-Oct-2024**	06-Nov-2024	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)							
GWDUP1	**10-Oct-2024**	**----**	----	----	**15-Oct-2024**	07-Nov-2024	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
GWRB1	**10-Oct-2024**	**----**	----	----	**12-Oct-2024**	07-Nov-2024	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
BH104R, BH107R, BH112R, BH145R	**09-Oct-2024**	**----**	----	----	**14-Oct-2024**	06-Nov-2024	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
BH104R, BH107R, BH112R, BH145R	**09-Oct-2024**	**----**	----	----	**11-Oct-2024**	11-Oct-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
BH104R, BH107R, BH112R, BH145R	**09-Oct-2024**	**----**	----	**----**	**14-Oct-2024**	06-Nov-2024	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
BH104R, BH107R, BH112R, BH145R	**09-Oct-2024**	**14-Oct-2024**	06-Nov-2024	✓	**14-Oct-2024**	06-Nov-2024	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
BH104R, BH107R, BH112R, BH145R	**09-Oct-2024**	**14-Oct-2024**	06-Nov-2024	✓	**14-Oct-2024**	06-Nov-2024	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
BH104R, BH107R, BH112R, BH145R	**09-Oct-2024**	**----**	----	**----**	**11-Oct-2024**	11-Oct-2024	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
BH104R, BH107R, BH112R, BH145R	**09-Oct-2024**	**11-Oct-2024**	16-Oct-2024	✓	**15-Oct-2024**	20-Nov-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
BH104R, BH107R, BH112R, BH145R	**09-Oct-2024**	**15-Oct-2024**	23-Oct-2024	✓	**15-Oct-2024**	23-Oct-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
Trip Blank	**10-Oct-2024**	**15-Oct-2024**	24-Oct-2024	✓	**15-Oct-2024**	24-Oct-2024	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071)							
BH104R, BH107R, BH112R, BH145R	**09-Oct-2024**	**11-Oct-2024**	16-Oct-2024	✓	**15-Oct-2024**	20-Nov-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
BH104R, BH107R, BH112R, BH145R	**09-Oct-2024**	**15-Oct-2024**	23-Oct-2024	✓	**15-Oct-2024**	23-Oct-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
Trip Blank	**10-Oct-2024**	**15-Oct-2024**	24-Oct-2024	✓	**15-Oct-2024**	24-Oct-2024	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080)							
BH104R, BH107R, BH112R, BH145R	**09-Oct-2024**	**15-Oct-2024**	23-Oct-2024	✓	**15-Oct-2024**	23-Oct-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
Trip Spike, Trip Blank	**10-Oct-2024**	**15-Oct-2024**	24-Oct-2024	✓	**15-Oct-2024**	24-Oct-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	6	43	**13.95**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	6	46	**13.04**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	34	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	3	24	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	18	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	3	43	**6.98**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	3	46	**6.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	5	**40.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	5	40	**12.50**	**12.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	5	40	**12.50**	**12.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	13	**23.08**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	3	16	**18.75**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Control Samples (LCS) - Continued							
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	3	43	**6.98**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	3	46	**6.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	3	43	**6.98**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	3	46	**6.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	18	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).

Analytical Methods	Method	Matrix	Method Descriptions
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030E. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.

HT

CHAIN OF CUSTODY

ALS Laboratory: please tick →

Environmental Division Sydney
Work Order Reference
ES2436306

Telephone : +61-2-8784 8555

CLIENT: GHD Pty Ltd	TURNAROUND REQUIREME (Standard TAT may be longer for some tests e.g., Ultra Trace) ☐ Standard TAT (List due date): STANDARD TAT ☐ Non Standard or urgent TAT (List due date):		FOR LABORATORY USE (Custody Seal Intact? Free ice / frozen ice bricks pres Random Sample Temperature Other comment:
OFFICE: Sydney			
PROJECT: M12 Groundwater	ALS QUOTE NO.: SY/322/21 V5	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	
ORDER NUMBER: 12554717			
PROJECT MANAGER: Henry Luo	CONTACT PH: Henry Luo 0414 890 002		
SAMPLER: Lia Saunders, Nica Hugo	SAMPLER MOBILE: 0468 301 344	RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): ESDAT	Nica Hugo		
Email Reports to: emily.smith@ghd.com; lia.saunders@ghd.com, henry.luo@ghd.com, nica.hugo@ghd.com, ghdlabreports@ghd.com		DATE/TIME: 10/10/2024 @ 15:00	DATE/TIME: 7/11/24 1600	DATE/TIME:
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:		ANALYSIS OF NITRITE 48 HRS HOLDING TIME REQUIRED. PLEASE DO NOT LOG ALL SAMPLES RECI TWO SEPARATE WORKORDERS AS PER THE TWO COCs PROVIDED		

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).											
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	Comments	TOTAL CONTAINERS	W-02 (dissolved 8 metals)	EG020F (dissolved Fe, Mn)	W-04 (TRH/BTEXN)	NT-06A (TN, NO2, NO3, NH3, TP, soluble Reactive P)	NT-01D & 02 (major cations & anions, Hardness)	EA015H (TDS)	EA025H (TSS)	EP075A (SIM) (Phenols - Standard level (15 analytes))	W-021 (6 total metals)	BTEXN		
1	BH104R	7/11/2024	Water		6	X	X	X	X	X	X	X					
2	BH107R	7/11/2024	Water		6	X	X	X	X	X	X	X					
3	BH112R	6/11/2024	Water		6	X	X	X	X	X	X	X					
4	BH145R	7/11/2024	Water		6	X	X	X	X	X	X	X					
5	GWDUP1	6/11/2024	Water		1	X											
~~5~~	GWDUP2	7/11/2024	Water	PLEASE FORWARD TO EUROFINS WITH ATTACHED COC	1												
6	GWRB1	6/10/2024	Water		1									X			
7	Trip spike	4/11/2024	Water		1										X		
8	Trip blank	4/11/2024	Water		1										X		

Subcon / Forward Lab / Split WO: Eurofins

Lab / Analysis:

Organised By / Date:

Relinquished By / Date:

Conhote / Courier:

WO No:

Attached By PO / Internal Sheet:

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2436306**

Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Contact	: Samiksha Sathish
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: henry.luo@ghd.com	E-mail	: samiksha.sathish@alsglobal.com
Telephone	: +61 02 9239 7100	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 9239 7199	Facsimile	: +61-2-8784 8500
Project	: 12554717	Page	: 1 of 3
Order number	: 12554717	Quote number	: ES2021GHDSER0026 (SY/322/21_V5)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: Lia Saunders, NICA HUGO		

Dates

Date Samples Received	: 07-Nov-2024 16:00	Issue Date	: 07-Nov-2024
Client Requested Due Date	: 14-Nov-2024	Scheduled Reporting Date	: **14-Nov-2024**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 6	Temperature	: 8.4, 7.6, 10.0'c
Receipt Detail	: HARD ESKY	No. of samples received / analysed	: 8 / 8

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample 'GWDUP2' being forwarded to Eurofins.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Sydney, NATA accreditation no. 825, site no. 10911.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA015H Total Dissolved Solids - Standard Level	WATER - EA025H Suspended Solids - Standard Level	WATER - EG020F Dissolved Metals by ICP/MS	WATER - NT-01D & 02 Major Cations & Anions (Ca, Mg, Na, K, Cl, SO4,	WATER - NT-08A Total Nitrogen + NO2 + NO3 + NH3 + Total P +	WATER - W-02 8 Metals	WATER - W-04 TRH/BTEXN
ES2436306-001	07-Nov-2024 00:00	BH104R	✓	✓	✓	✓	✓	✓	✓
ES2436306-002	07-Nov-2024 00:00	BH107R	✓	✓	✓	✓	✓	✓	✓
ES2436306-003	06-Nov-2024 00:00	BH112R	✓	✓	✓	✓	✓	✓	✓
ES2436306-004	07-Nov-2024 00:00	BH145R	✓	✓	✓	✓	✓	✓	✓
ES2436306-005	06-Nov-2024 00:00	GWDUP1						✓	

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP080 BTEXN	WATER - W-02T 8 metals (Total)
ES2436306-006	06-Oct-2024 00:00	GWRB1		✓
ES2436306-007	04-Nov-2024 00:00	Trip spike	✓	
ES2436306-008	04-Nov-2024 00:00	Trip blank	✓	

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **WATER** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received Date	Samples Received Evaluation	Instructions Received Date	Instructions Received Evaluation
EG035T: Total Mercury by FIMS							
GWRB1	Clear Plastic Bottle - Nitric Acid;	----	03-Nov-2024	07-Nov-2024	✘	----	----

Requested Deliverables

Accounts Payable Australia

- A4 - AU Tax Invoice (INV)	Email	accountspayableAU@ghd.com

EMILY SMITH

- *AU Certificate of Analysis - NATA (COA)	Email	emily.smith@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	emily.smith@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	emily.smith@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	emily.smith@ghd.com
- Chain of Custody (CoC) (COC)	Email	emily.smith@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	emily.smith@ghd.com
- EDI Format - XTab (XTAB)	Email	emily.smith@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	emily.smith@ghd.com

GHD LAB REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	ghdlabreports@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ghdlabreports@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ghdlabreports@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ghdlabreports@ghd.com
- Chain of Custody (CoC) (COC)	Email	ghdlabreports@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	ghdlabreports@ghd.com
- EDI Format - XTab (XTAB)	Email	ghdlabreports@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	ghdlabreports@ghd.com

HENRY LUO

- *AU Certificate of Analysis - NATA (COA)	Email	henry.luo@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	henry.luo@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	henry.luo@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	henry.luo@ghd.com
- Chain of Custody (CoC) (COC)	Email	henry.luo@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	henry.luo@ghd.com
- EDI Format - XTab (XTAB)	Email	henry.luo@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	henry.luo@ghd.com

Lia Saunders

- *AU Certificate of Analysis - NATA (COA)	Email	Lia.Saunders@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	Lia.Saunders@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	Lia.Saunders@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	Lia.Saunders@ghd.com
- Chain of Custody (CoC) (COC)	Email	Lia.Saunders@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	Lia.Saunders@ghd.com
- EDI Format - XTab (XTAB)	Email	Lia.Saunders@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	Lia.Saunders@ghd.com

NICA HUGO

- *AU Certificate of Analysis - NATA (COA)	Email	nica.hugo@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	nica.hugo@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	nica.hugo@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	nica.hugo@ghd.com
- Chain of Custody (CoC) (COC)	Email	nica.hugo@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	nica.hugo@ghd.com
- EDI Format - XTab (XTAB)	Email	nica.hugo@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	nica.hugo@ghd.com

CERTIFICATE OF ANALYSIS

Work Order	: **ES2436306**	Page	: 1 of 7
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Contact	: Samiksha Sathish
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9239 7100	Telephone	: +61-2-8784 8555
Project	: 12554717	Date Samples Received	: 07-Nov-2024 16:00
Order number	: 12554717	Date Analysis Commenced	: 07-Nov-2024
C-O-C number	: ----	Issue Date	: 14-Nov-2024 19:29
Sampler	: Lia Saunders, NICA HUGO		
Site	: ----		
Quote number	: SY/322/21_V5		
No. of samples received	: 8		
No. of samples analysed	: 8		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEXN compounds spiked at 20 ug/L.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	BH104R	BH107R	BH112R	BH145R	GWDUP1
				Sampling date / time	07-Nov-2024 00:00	07-Nov-2024 00:00	06-Nov-2024 00:00	07-Nov-2024 00:00	06-Nov-2024 00:00
Compound	CAS Number	LOR	Unit		ES2436306-001	ES2436306-002	ES2436306-003	ES2436306-004	ES2436306-005
					Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		**4390**	**1930**	**9750**	**10200**	**----**
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		**82**	**145**	**84**	**234**	**----**
EA065: Total Hardness as CaCO3									
Total Hardness as CaCO3	----	1	mg/L		**815**	**548**	**2430**	**2490**	**----**
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	**----**
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	**----**
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**1130**	**1490**	**1340**	**1080**	**----**
Total Alkalinity as CaCO3	----	1	mg/L		**1130**	**1490**	**1340**	**1080**	**----**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**189**	**170**	**1660**	**337**	**----**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**1750**	**248**	**4230**	**5310**	**----**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**112**	**38**	**256**	**202**	**----**
Magnesium	7439-95-4	1	mg/L		**130**	**110**	**434**	**483**	**----**
Sodium	7440-23-5	1	mg/L		**1590**	**688**	**3140**	**2970**	**----**
Potassium	7440-09-7	1	mg/L		**17**	**14**	**45**	**18**	**----**
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		**0.004**	<0.001	**0.002**	**0.004**	**0.003**
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L		<0.001	<0.001	**0.004**	<0.001	**0.005**
Nickel	7440-02-0	0.001	mg/L		<0.001	<0.001	**0.004**	<0.001	**0.004**
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L		<0.005	**0.006**	**0.017**	**0.010**	**0.016**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	BH104R	BH107R	BH112R	BH145R	GWDUP1
				Sampling date / time	07-Nov-2024 00:00	07-Nov-2024 00:00	06-Nov-2024 00:00	07-Nov-2024 00:00	06-Nov-2024 00:00
Compound	CAS Number	LOR	Unit		ES2436306-001	ES2436306-002	ES2436306-003	ES2436306-004	ES2436306-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Manganese	7439-96-5	0.001	mg/L		**0.092**	<0.001	**0.084**	**0.116**	----
Iron	7439-89-6	0.05	mg/L		**1.28**	<0.05	<0.05	**2.34**	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**1.56**	<0.01	**2.10**	**1.43**	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	**0.32**	<0.01	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.06**	**2.77**	**0.16**	**0.06**	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.06**	**2.77**	**0.48**	**0.06**	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**2.0**	**0.7**	**2.4**	**2.0**	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**2.1**	**3.5**	**2.9**	**2.1**	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**0.13**	**0.07**	**0.14**	**0.15**	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.01**	**0.01**	**0.03**	<0.01	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**75.9**	**40.3**	**181**	**178**	----
ø Total Cations	----	0.01	meq/L		**85.9**	**41.2**	**186**	**179**	----
ø Ionic Balance	----	0.01	%		**6.18**	**1.14**	**1.52**	**0.31**	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	BH104R	BH107R	BH112R	BH145R	GWDUP1
				Sampling date / time	07-Nov-2024 00:00	07-Nov-2024 00:00	06-Nov-2024 00:00	07-Nov-2024 00:00	06-Nov-2024 00:00
Compound	CAS Number	LOR	Unit		ES2436306-001	ES2436306-002	ES2436306-003	ES2436306-004	ES2436306-005
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	----
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	<100	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	<100	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	----
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	----
^ Total Xylenes	----	2	µg/L		<2	<2	<2	<2	----
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	----
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**92.2**	**95.5**	**113**	**103**	----
Toluene-D8	2037-26-5	2	%		**96.5**	**104**	**121**	**122**	----
4-Bromofluorobenzene	460-00-4	2	%		**106**	**105**	**127**	**108**	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	GWRB1	Trip spike	Trip blank	----	----
				Sampling date / time	06-Nov-2024 00:00	04-Nov-2024 00:00	04-Nov-2024 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2436306-006	ES2436306-007	ES2436306-008	--------	--------
					Result	Result	Result	----	----
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		----	**21**	<1	----	----
Toluene	108-88-3	2	µg/L		----	**21**	<2	----	----
Ethylbenzene	100-41-4	2	µg/L		----	**21**	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		----	**19**	<2	----	----
ortho-Xylene	95-47-6	2	µg/L		----	**20**	<2	----	----
^ **Total Xylenes**	----	2	µg/L		----	**39**	<2	----	----
^ **Sum of BTEX**	----	1	µg/L		----	**102**	<1	----	----
Naphthalene	91-20-3	5	µg/L		----	**25**	<5	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		----	**112**	**105**	----	----
Toluene-D8	2037-26-5	2	%		----	**116**	**102**	----	----
4-Bromofluorobenzene	460-00-4	2	%		----	**117**	**107**	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72	143
Toluene-D8	2037-26-5	75	131
4-Bromofluorobenzene	460-00-4	73	137

QUALITY CONTROL REPORT

Work Order	: **ES2436306**	Page	: 1 of 14
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Contact	: Samiksha Sathish
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9239 7100	Telephone	: +61-2-8784 8555
Project	: 12554717	Date Samples Received	: 07-Nov-2024
Order number	: 12554717	Date Analysis Commenced	: 07-Nov-2024
C-O-C number	: ----	Issue Date	: 14-Nov-2024
Sampler	: Lia Saunders, NICA HUGO		
Site	: ----		
Quote number	: SY/322/21_V5		
No. of samples received	: 8		
No. of samples analysed	: 8		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
= Indicates failed QC
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 6182514)									
ES2436127-002	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	634	631	0.4	0% - 20%
ES2436208-002	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	19	17	9.8	No Limit
ES2436234-002	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	399	390	2.2	0% - 20%
ES2436236-003	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	509	502	1.5	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 6182523)									
EN2414436-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	9480	9520	0.5	0% - 20%
ES2436257-002	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1060	1120	5.2	0% - 20%
ES2436300-006	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	230	226	1.5	0% - 20%
ES2436306-004	BH145R	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	10200	10500	2.5	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 6182513)									
ES2436127-002	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	17	12	37.9	No Limit
ES2436208-002	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	3890	4290	9.8	0% - 20%
ES2436234-002	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	17	16	0.0	No Limit
ES2436236-003	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	9	5	50.0	No Limit
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 6182524)									
EN2414436-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	46	46	0.0	No Limit
ES2436257-002	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ES2436300-006	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ES2436306-004	BH145R	EA025H: Suspended Solids (SS)	----	5	mg/L	234	250	6.2	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 6175681)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 6175681) - continued									
EN2414333-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	142	143	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	142	143	0.0	0% - 20%
EN2414354-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	1160	1160	0.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	1160	1160	0.4	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 6173566)									
ES2436079-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3	3	0.0	No Limit
ES2436218-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1	6	138	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 6176254)									
ES2436484-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1 (10)*	mg/L	372	390	4.8	0% - 20%
ES2436217-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1 (10)*	mg/L	<10	<10	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 6173567)									
ES2436079-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	35	35	0.0	0% - 20%
ES2436218-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	9	9	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 6176255)									
ES2436484-001	Anonymous	ED045G: Chloride	16887-00-6	1 (10)*	mg/L	33	37	11.1	No Limit
ES2436217-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	45	45	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 6180361)									
ES2436285-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	1240	1190	4.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	329	333	1.2	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1870	1880	0.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	62	62	0.0	0% - 20%
ES2436285-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	1260	1310	3.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1530	1560	1.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	2350	2290	2.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	11	11	0.0	0% - 50%
ED093F: Dissolved Major Cations (QC Lot: 6180364)									
ES2436306-004	BH145R	ED093F: Calcium	7440-70-2	1	mg/L	202	201	0.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	483	470	2.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	2970	2940	1.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	18	17	0.0	0% - 50%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6180359)									
ES2436285-003	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6180359) - continued									
ES2436285-003	Anonymous	EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.014	0.015	0.0	0% - 50%
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.018	0.018	0.0	0% - 50%
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.006	0.006	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.058	0.056	3.4	0% - 50%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
ES2436285-011	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.366	0.369	0.6	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.076	0.074	1.9	0% - 50%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.64	0.63	1.8	0% - 50%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6180365)									
ES2436306-004	BH145R	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.004	0.003	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.116	0.116	0.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.010	0.009	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	2.34	2.33	0.5	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6180546)									
ES2436290-011	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.010	0.009	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.013	0.014	0.0	0% - 50%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.041	0.040	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.06	0.06	0.0	No Limit
EW2405129-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6180546) - continued									
EW2405129-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.176	0.176	0.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.005	0.007	24.4	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.73	0.72	2.2	0% - 50%
EG020T: Total Metals by ICP-MS (QC Lot: 6175779)									
ES2436247-003	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
ES2436300-006	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.003	0.001	63.6	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 6180362)									
ES2436285-004	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2436285-010	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 6180544)									
ES2435518-033	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2436306-005	GWDUP1	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6174378)									
EN2414136-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001 (0.0010)*	mg/L	<0.0010	<0.0010	0.0	No Limit
ES2436055-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 6183656)									
ES2436300-004	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.08	0.10	21.2	No Limit
ES2436300-013	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.09	0.03	97.6	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 6173569)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 6173569) - continued									
ES2436234-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2436300-011	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 6176256)									
ES2436484-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2436217-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.02	0.02	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 6183655)									
ES2436261-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	2.23	2.26	1.6	0% - 20%
ES2436300-008	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	2.82	2.68	5.2	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 6183659)									
ES2436261-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.4	1.4	0.0	0% - 50%
ES2436300-009	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.9	0.9	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 6183660)									
ES2436261-002	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.15	0.15	0.0	0% - 50%
ES2436300-009	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.75	0.72	4.2	0% - 20%
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 6173570)									
ES2436300-011	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 6176257)									
ES2436484-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01 (0.10)*	mg/L	<0.10	<0.10	0.0	No Limit
ES2436217-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	7.43	7.13	4.0	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6175902)									
ES2436169-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2436306-001	BH104R	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6175902)									
ES2436169-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2436306-001	BH104R	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 6175902)									
ES2436169-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2436306-001	BH104R	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080: BTEXN (QC Lot: 6175902) - continued									
ES2436306-001	BH104R	EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 6182514)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	93.6	87.0	109
				<10	293 mg/L	103	75.2	126
				<10	2410 mg/L	100	83.0	124
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 6182523)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	92.0	87.0	109
				<10	293 mg/L	107	75.2	126
				<10	2410 mg/L	96.3	83.0	124
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 6182513)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	98.0	83.0	129
				<5	1000 mg/L	99.2	82.0	110
				<5	879 mg/L	114	83.0	118
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 6182524)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	95.7	83.0	129
				<5	1000 mg/L	97.0	82.0	110
				<5	879 mg/L	98.0	83.0	118
ED037P: Alkalinity by PC Titrator (QCLot: 6175681)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	102	81.0	115
				----	50 mg/L	108	80.0	128
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6173566)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.6	82.0	122
				<1	500 mg/L	104	82.0	122
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6176254)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	105	82.0	122
				<1	500 mg/L	103	82.0	122
ED045G: Chloride by Discrete Analyser (QCLot: 6173567)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	101	80.9	127
				<1	1000 mg/L	98.8	80.9	127
ED045G: Chloride by Discrete Analyser (QCLot: 6176255)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	97.7	80.9	127
				<1	1000 mg/L	95.4	80.9	127
ED093F: Dissolved Major Cations (QCLot: 6180361)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED093F: Dissolved Major Cations (QCLot: 6180361) - continued								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	80.0	114
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	107	90.0	116
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	103	82.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	106	85.0	113
ED093F: Dissolved Major Cations (QCLot: 6180364)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	80.0	114
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	109	90.0	116
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	107	82.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	108	85.0	113
EG020F: Dissolved Metals by ICP-MS (QCLot: 6180359)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	92.0	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.6	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.6	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	90.6	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	94.1	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	96.9	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	88.4	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	92.0	81.0	117
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	100	82.0	112
EG020F: Dissolved Metals by ICP-MS (QCLot: 6180365)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	98.2	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	100.0	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	94.2	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	96.3	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	95.5	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	93.5	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	93.4	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	95.7	81.0	117
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	93.4	82.0	112
EG020F: Dissolved Metals by ICP-MS (QCLot: 6180546)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	94.6	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	95.8	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	96.9	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	91.2	81.0	111

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 6180546) - continued								
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	94.6	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	95.5	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	92.1	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	91.9	81.0	117
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	97.4	82.0	112
EG020T: Total Metals by ICP-MS (QCLot: 6175779)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	95.4	82.0	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	97.2	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	98.8	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	100	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	96.0	85.0	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	95.0	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	97.2	79.0	117
EG035F: Dissolved Mercury by FIMS (QCLot: 6180362)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	89.5	83.0	105
EG035F: Dissolved Mercury by FIMS (QCLot: 6180363)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	93.3	83.0	105
EG035F: Dissolved Mercury by FIMS (QCLot: 6180544)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	95.1	83.0	105
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6174378)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	97.2	77.0	111
EK055G: Ammonia as N by Discrete Analyser (QCLot: 6183656)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	104	90.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6173569)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	108	82.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6176256)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	102	82.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6183655)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	108	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 6183659)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	90.8	69.0	123
				<0.1	1 mg/L	103	70.0	123
				<0.1	5 mg/L	99.1	70.0	123
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6183660)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6183660) - continued								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	98.0	71.3	126
				<0.01	0.442 mg/L	104	71.3	126
				<0.01	1 mg/L	104	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6173570)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	95.6	85.0	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6176257)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	96.5	85.0	117
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6174135)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	55.0	53.7	97.0
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	81.9	63.3	107
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	61.3	58.3	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6175902)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	93.8	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6174135)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	60.6	53.9	95.5
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	78.1	57.8	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	105	50.5	115
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6175902)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	86.0	75.0	127
EP080: BTEXN (QCLot: 6175902)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	104	68.3	119
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	104	73.5	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	104	73.8	122
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	105	73.0	122
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	110	76.4	123
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	122	75.5	124

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6173566)							
ES2436079-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	119	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6176254)							
ES2436217-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	200 mg/L	123	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 6173567)							
ES2436079-002	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	107	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 6176255)							
ES2436217-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	97.0	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 6180359)							
ES2436285-002	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	111	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	108	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	101	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	105	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	106	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	99.9	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	104	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	104	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 6180546)							
ES2436306-005	GWDUP1	EG020A-F: Arsenic	7440-38-2	1 mg/L	99.0	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	88.4	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	83.5	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	87.7	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	91.0	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	81.6	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	88.9	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	88.0	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 6175779)							
ES2436247-005	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	98.8	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	104	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	104	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	101	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	108	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	102	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	101	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 6180362)							
ES2436285-001	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	90.4	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 6180363)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG035F: Dissolved Mercury by FIMS (QCLot: 6180363) - continued							
ES2436306-004	BH145R	EG035F: Mercury	7439-97-6	0.01 mg/L	90.4	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 6180544)							
ES2435518-032	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	101	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6174378)							
EN2414391-001	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	89.9	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 6183656)							
ES2436300-004	Anonymous	EK055G: Ammonia as N	7664-41-7	0.5 mg/L	96.8	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6173569)							
ES2436300-011	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	127	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6176256)							
ES2436217-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	111	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6183655)							
ES2436261-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	# Not Determined	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 6183659)							
ES2436261-003	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	# Not Determined	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6183660)							
ES2436261-003	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	# Not Determined	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6173570)							
ES2436300-011	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	119	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6176257)							
ES2436217-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	# Not Determined	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6175902)							
ES2436169-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	110	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6175902)							
ES2436169-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	103	70.0	130
EP080: BTEXN (QCLot: 6175902)							
ES2436169-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	107	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	113	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	117	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080: BTEXN (QCLot: 6175902) - continued							
ES2436169-001	Anonymous	EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	118	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	121	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	105	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2436306**	Page	: 1 of 11
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Telephone	: +61-2-8784 8555
Project	: 12554717	Date Samples Received	: 07-Nov-2024
Site	: ----	Issue Date	: 14-Nov-2024
Sampler	: Lia Saunders, NICA HUGO	No. of samples received	: 8
Order number	: 12554717	No. of samples analysed	: 8

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Ar	ES2436261--002	Anonymous	**Nitrite + Nitrate as N**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser	ES2436261--003	Anonymous	**Total Kjeldahl Nitrogen as N**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK067G: Total Phosphorus as P by Discrete Analyser	ES2436261--003	Anonymous	**Total Phosphorus as P**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK071G: Reactive Phosphorus as P by discrete analyse	ES2436217--001	Anonymous	**Reactive Phosphorus as P**	14265-44-2	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)						
Dissolved Mercury by FIMS	EG035F	4	41	9.76	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	19	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	41	4.88	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	19	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / Client Sample ID(s)	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA015: Total Dissolved Solids dried at 180 ± 5 °C							
Clear Plastic Bottle - Natural (EA015H)							
BH112R	**06-Nov-2024**	**----**	----	----	**12-Nov-2024**	13-Nov-2024	✓
Clear Plastic Bottle - Natural (EA015H)							
BH104R, BH107R, BH145R	**07-Nov-2024**	**----**	----	----	**12-Nov-2024**	14-Nov-2024	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H)							
BH112R	**06-Nov-2024**	**----**	----	----	**12-Nov-2024**	13-Nov-2024	✓
Clear Plastic Bottle - Natural (EA025H)							
BH104R, BH107R, BH145R	**07-Nov-2024**	**----**	----	----	**12-Nov-2024**	14-Nov-2024	✓
EA065: Total Hardness as CaCO3							
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
BH112R	**06-Nov-2024**	**----**	----	----	**11-Nov-2024**	04-Dec-2024	✓
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
BH104R, BH107R, BH145R	**07-Nov-2024**	**----**	----	----	**11-Nov-2024**	05-Dec-2024	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
BH112R	**06-Nov-2024**	**----**	----	----	**08-Nov-2024**	20-Nov-2024	✓
Clear Plastic Bottle - Natural (ED037-P)							
BH104R, BH107R, BH145R	**07-Nov-2024**	**----**	----	----	**08-Nov-2024**	21-Nov-2024	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
BH112R	**06-Nov-2024**	**----**	----	----	**08-Nov-2024**	04-Dec-2024	✓
Clear Plastic Bottle - Natural (ED041G)							
BH104R, BH107R, BH145R	**07-Nov-2024**	**----**	----	----	**08-Nov-2024**	05-Dec-2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
BH112R	**06-Nov-2024**	**----**	----	----	**08-Nov-2024**	04-Dec-2024	✓
Clear Plastic Bottle - Natural (ED045G)							
BH104R, BH107R, BH145R	**07-Nov-2024**	**----**	----	----	**08-Nov-2024**	05-Dec-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
BH112R	**06-Nov-2024**	**----**	----	----	**11-Nov-2024**	04-Dec-2024	✓
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
BH104R, BH107R, BH145R	**07-Nov-2024**	**----**	----	----	**11-Nov-2024**	05-Dec-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
BH112R	**06-Nov-2024**	**----**	----	----	**11-Nov-2024**	05-May-2025	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
GWDUP1	**06-Nov-2024**	**----**	----	----	**12-Nov-2024**	05-May-2025	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
BH104R, BH107R, BH145R	**07-Nov-2024**	**----**	----	----	**11-Nov-2024**	06-May-2025	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)							
GWRB1	**06-Nov-2024**	**08-Nov-2024**	05-May-2025	✓	**08-Nov-2024**	05-May-2025	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)							
BH112R, GWDUP1	**06-Nov-2024**	**----**	----	----	**13-Nov-2024**	04-Dec-2024	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)							
BH104R, BH107R, BH145R	**07-Nov-2024**	**----**	----	----	**13-Nov-2024**	05-Dec-2024	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
GWRB1	**06-Nov-2024**	**----**	----	----	**11-Nov-2024**	04-Dec-2024	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
BH112R	**06-Nov-2024**	**----**	----	----	**13-Nov-2024**	04-Dec-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
BH104R, BH107R, BH145R	**07-Nov-2024**	**----**	----	----	**13-Nov-2024**	05-Dec-2024	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
BH112R	**06-Nov-2024**	**----**	----	----	**08-Nov-2024**	08-Nov-2024	✓
Clear Plastic Bottle - Natural (EK057G)							
BH104R, BH107R, BH145R	**07-Nov-2024**	**----**	----	----	**08-Nov-2024**	09-Nov-2024	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
BH112R	**06-Nov-2024**	**----**	----	----	**13-Nov-2024**	04-Dec-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
BH104R, BH107R, BH145R	**07-Nov-2024**	**----**	----	----	**13-Nov-2024**	05-Dec-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) BH112R	**06-Nov-2024**	**13-Nov-2024**	04-Dec-2024	✓	**13-Nov-2024**	04-Dec-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK061G) BH104R, BH107R, BH145R	**07-Nov-2024**	**13-Nov-2024**	05-Dec-2024	✓	**13-Nov-2024**	05-Dec-2024	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) BH112R	**06-Nov-2024**	**13-Nov-2024**	04-Dec-2024	✓	**13-Nov-2024**	04-Dec-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK067G) BH104R, BH107R, BH145R	**07-Nov-2024**	**13-Nov-2024**	05-Dec-2024	✓	**13-Nov-2024**	05-Dec-2024	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) BH112R	**06-Nov-2024**	**----**	----	----	**08-Nov-2024**	08-Nov-2024	✓
Clear Plastic Bottle - Natural (EK071G) BH104R, BH107R, BH145R	**07-Nov-2024**	**----**	----	----	**08-Nov-2024**	09-Nov-2024	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) BH112R	**06-Nov-2024**	**08-Nov-2024**	13-Nov-2024	✓	**11-Nov-2024**	18-Dec-2024	✓
Amber Glass Bottle - Unpreserved (EP071) BH104R, BH107R, BH145R	**07-Nov-2024**	**08-Nov-2024**	14-Nov-2024	✓	**11-Nov-2024**	18-Dec-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) BH112R	**06-Nov-2024**	**11-Nov-2024**	20-Nov-2024	✓	**11-Nov-2024**	20-Nov-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) BH104R, BH107R	**07-Nov-2024**	**11-Nov-2024**	21-Nov-2024	✓	**11-Nov-2024**	21-Nov-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) BH145R	**07-Nov-2024**	**11-Nov-2024**	21-Nov-2024	✓	**12-Nov-2024**	21-Nov-2024	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) BH112R	**06-Nov-2024**	**08-Nov-2024**	13-Nov-2024	✓	**11-Nov-2024**	18-Dec-2024	✓
Amber Glass Bottle - Unpreserved (EP071) BH104R, BH107R, BH145R	**07-Nov-2024**	**08-Nov-2024**	14-Nov-2024	✓	**11-Nov-2024**	18-Dec-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) BH112R	**06-Nov-2024**	**11-Nov-2024**	20-Nov-2024	✓	**11-Nov-2024**	20-Nov-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) BH104R, BH107R	**07-Nov-2024**	**11-Nov-2024**	21-Nov-2024	✓	**11-Nov-2024**	21-Nov-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) BH145R	**07-Nov-2024**	**11-Nov-2024**	21-Nov-2024	✓	**12-Nov-2024**	21-Nov-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) Trip blank	**04-Nov-2024**	**11-Nov-2024**	18-Nov-2024	✓	**11-Nov-2024**	18-Nov-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) Trip spike	**04-Nov-2024**	**11-Nov-2024**	18-Nov-2024	✓	**12-Nov-2024**	18-Nov-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) BH112R	**06-Nov-2024**	**11-Nov-2024**	20-Nov-2024	✓	**11-Nov-2024**	20-Nov-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) BH104R, BH107R	**07-Nov-2024**	**11-Nov-2024**	21-Nov-2024	✓	**11-Nov-2024**	21-Nov-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) BH145R	**07-Nov-2024**	**11-Nov-2024**	21-Nov-2024	✓	**12-Nov-2024**	21-Nov-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	32	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	4	41	**9.76**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	5	41	**12.20**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	21	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	3	21	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	28	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	8	78	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	8	78	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	19	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	32	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	3	41	**7.32**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	3	41	**7.32**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	28	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	10	78	**12.82**	**12.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	10	78	**12.82**	**12.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	20	**15.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	3	20	**15.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Control Samples (LCS) - Continued							
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	3	41	**7.32**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	3	41	**7.32**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	28	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	4	78	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	4	78	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	3	41	**7.32**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	41	**4.88**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	28	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	19	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).

Analytical Methods	Method	Matrix	Method Descriptions
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030E. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.

CHAIN OF CUSTODY

COC#: 76760 ALS Laboratory: ES Sydney Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME: 12/12/24 1846

CLIENT: GHDSER - GHD PTY LTD

PROJECT: 12554717 M12 Groundwater

SITE: M12 Groundwater

ORDER NO: 12554717

PROJECT MANAGER: Lia Saunders
PRIMARY SAMPLER: Lia Saunders

CONTACT PH:
QUOTE NO: SY/322/21_V6

SAMPLER MOBILE:
/ ES2021GHDSER0026

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Groundwater Analysis GROUNDWATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	BH104R		12/12/2024 09:41 AM	WATER	ALS: 6 Non ALS: 0	No	Partial 7/10		
002	BH112R		12/12/2024 09:33 AM	WATER	ALS: 6 Non ALS: 0	No	Partial 7/10		
003	BH107R		12/12/2024 09:31 AM	WATER	ALS: 6 Non ALS: 0	No	Partial 7/10		
004	BH145R		11/12/2024 02:36 PM	WATER	ALS: 6 Non ALS: 0	No	Partial 7/10		
005	GWRB1		11/12/2024 02:17 PM	WATER	ALS: 1 Non ALS: 0	No	Partial 1/10		
006	GWDUP1		11/12/2024 02:38 PM	WATER	ALS: 1 Non ALS: 0	No	Partial 1/10		

HT

Environmental Division
Sydney
Work Order Reference
ES2440696



Telephone : +61-2-8784 8555

CHAIN OF CUSTODY

COC#: 76760 ALS Laboratory: ES Sydney Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME: 12/12/24 1846

CLIENT: GHDSER - GHD PTY LTD

PROJECT: 12554717 M12 Groundwater

SITE: M12 Groundwater

ORDER NO: 12554717

PROJECT MANAGER: Lia Saunders
PRIMARY SAMPLER: Lia Saunders

CONTACT PH:
QUOTE NO: SY/322/21_V6

SAMPLER MOBILE:
/ ES2021GHDSER0026

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	BH104R	Groundwater Analysis GROUNDWATER	WATER	- W-02 8 Metals - W-04 TRH/BTEXN - EA025H Suspended Solids - Standard Level - EA015H Total Dissolved Solids - Standard Level - EG020F Dissolved Metals by ICP/MS - NT-08A Total Nitrogen + NO2 + NO3 + NH3 + Total P + Reactive P - NT-01D & 02 Major Cations & Anions (Ca, Mg, Na, K, Cl, SO4, Alkalinity) + Hardness
002	BH112R	Groundwater Analysis GROUNDWATER	WATER	- W-02 8 Metals - W-04 TRH/BTEXN - EA025H Suspended Solids - Standard Level - EA015H Total Dissolved Solids - Standard Level - EG020F Dissolved Metals by ICP/MS - NT-08A Total Nitrogen + NO2 + NO3 + NH3 + Total P + Reactive P - NT-01D & 02 Major Cations & Anions (Ca, Mg, Na, K, Cl, SO4, Alkalinity) + Hardness
003	BH107R	Groundwater Analysis GROUNDWATER	WATER	- W-02 8 Metals - W-04 TRH/BTEXN - EA025H Suspended Solids - Standard Level - EA015H Total Dissolved Solids - Standard Level - EG020F Dissolved Metals by ICP/MS - NT-08A Total Nitrogen + NO2 + NO3 + NH3 + Total P + Reactive P - NT-01D & 02 Major Cations & Anions (Ca, Mg, Na, K, Cl, SO4, Alkalinity) + Hardness
004	BH145R	Groundwater Analysis GROUNDWATER	WATER	- W-02 8 Metals - W-04 TRH/BTEXN - EA025H Suspended Solids - Standard Level - EA015H Total Dissolved Solids - Standard Level - EG020F Dissolved Metals by ICP/MS - NT-08A Total Nitrogen + NO2 + NO3 + NH3 + Total P + Reactive P - NT-01D & 02 Major Cations & Anions (Ca, Mg, Na, K, Cl, SO4, Alkalinity) + Hardness
005	GWRS1	Groundwater Analysis GROUNDWATER	WATER	- W-02T 8 metals (Total)
006	GWDUP1	Groundwater Analysis GROUNDWATER	WATER	- EG020F Dissolved Metals by ICP/MS

CHAIN OF CUSTODY

COC#: 76760 *ALS Laboratory:* ES Sydney Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: GHDSER - GHD PTY LTD

PROJECT: 12554717 M12 Groundwater

SITE: M12 Groundwater

ORDER NO: 12554717

PROJECT MANAGER: Lia Saunders
PRIMARY SAMPLER: Lia Saunders

CONTACT PH:
QUOTE NO: SY/322/21_V6

SAMPLER MOBILE:
/ ES2021GHDSER0026

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	BH104R	Amber VOC Vial - Sulfuric Acid	40 mL	00160724029638	Purple	No	
001	BH104R	Amber VOC Vial - Sulfuric Acid	40 mL	00160724029649	Purple	No	
001	BH104R	Clear Plastic Bottle - Sulfuric Acid	60 mL	00100624160885	Purple	No	
001	BH104R	Amber Glass Bottle - Unpreserved	100 mL	00400423013993	Orange	No	
001	BH104R	Clear Plastic Bottle - Natural	500 mL	00070523015836	Green	No	
001	BH104R	Clear Plastic Bottle - Nitric Acid; Filtered	60 mL	00120824054810	Red	No	
002	BH112R	Amber Glass Bottle - Unpreserved	100 mL	00400423042576	Orange	No	
002	BH112R	Amber VOC Vial - Sulfuric Acid	40 mL	00160324052748	Purple	No	
002	BH112R	Amber VOC Vial - Sulfuric Acid	40 mL	00160324052759	Purple	No	
002	BH112R	Clear Plastic Bottle - Sulfuric Acid	60 mL	00101023011536	Purple	No	
002	BH112R	Clear Plastic Bottle - Nitric Acid; Filtered	60 mL	00120822106154	Red	Yes	
002	BH112R	Clear Plastic Bottle - Natural	500 mL	00070623016154	Green	No	
003	BH107R	Amber VOC Vial - Sulfuric Acid	40 mL	00161223078336	Purple	No	
003	BH107R	Amber VOC Vial - Sulfuric Acid	40 mL	00161223078343	Purple	No	
003	BH107R	Amber Glass Bottle - Unpreserved	100 mL	00400723043540	Orange	No	
003	BH107R	Clear Plastic Bottle - Sulfuric Acid	60 mL	00101123047738	Purple	No	
003	BH107R	Clear Plastic Bottle - Nitric Acid; Filtered	60 mL	00120822029415	Red	Yes	
003	BH107R	Clear Plastic Bottle - Natural	500 mL	00070623090220	Green	No	
004	BH145R	Clear Plastic Bottle - Natural	500 mL	00070623185191	Green	No	
004	BH145R	Amber Glass Bottle - Unpreserved	100 mL	00400723118555	Orange	No	
004	BH145R	Amber VOC Vial - Sulfuric Acid	40 mL	00161223050856	Purple	No	
004	BH145R	Amber VOC Vial - Sulfuric Acid	40 mL	00161223050840	Purple	No	
004	BH145R	Clear Plastic Bottle - Sulfuric Acid	60 mL	00101123009150	Purple	No	
004	BH145R	Clear Plastic Bottle - Nitric Acid; Filtered	60 mL	00120822087169	Red	Yes	
005	GWRB1	Clear Plastic Bottle - Nitric Acid; Unfiltered	60 mL	00120822029543	Red	No	Total metals
006	GWDUP1	Clear Plastic Bottle - Nitric Acid; Filtered	60 mL	00122111003519	Red	Yes	

CHAIN OF CUSTODY

COC#: 76760 *ALS Laboratory:* ES Sydney Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: GHDSER - GHD PTY LTD

PROJECT: 12554717 M12 Groundwater

SITE: M12 Groundwater

ORDER NO: 12554717

PROJECT MANAGER: Lia Saunders
PRIMARY SAMPLER: Lia Saunders

CONTACT PH:
QUOTE NO: SY/322/21_V6

SAMPLER MOBILE:
/ ES2021GHDSER0026

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	

Other comments:

Total Bottle Count: ALS: 26, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **ES2440696**		
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Lia Saunders	Contact	: Samiksha Sathish
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: Lia.Saunders@ghd.com	E-mail	: samiksha.sathish@alsglobal.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 12554717 M12 Groundwater	Page	: 1 of 2
Order number	: 12554717	Quote number	: ES2021GHDSER0026 (SY/322/21_V6)
C-O-C number	: 76760	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: M12 Groundwater		
Sampler	: Lia Saunders		

Dates

Date Samples Received	: 12-Dec-2024 18:46	Issue Date	: 13-Dec-2024
Client Requested Due Date	: 20-Dec-2024	Scheduled Reporting Date	: **20-Dec-2024**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 12.5°C, 16.7°C, 18.4°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 8 / 8

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Sydney, NATA accreditation no. 825, site no. 10911.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA015H Total Dissolved Solids - Standard Level	WATER - EA025H Suspended Solids - Standard Level	WATER - EG020F Dissolved Metals by ICP/MS	WATER - NT-01D & 02 Major Cations & Anions (Ca, Mg, Na, K, Cl, SO4,	WATER - NT-08A Total Nitrogen + NO2 + NO3 + NH3 + Total P +	WATER - W-02 8 Metals	WATER - W-04 TRH/BTEXN
ES2440696-001	12-Dec-2024 09:41	BH104R	✓	✓	✓	✓	✓	✓	✓
ES2440696-002	12-Dec-2024 09:33	BH112R	✓	✓	✓	✓	✓	✓	✓
ES2440696-003	12-Dec-2024 09:31	BH107R	✓	✓	✓	✓	✓	✓	✓
ES2440696-004	11-Dec-2024 14:36	BH145R	✓	✓	✓	✓	✓	✓	✓
ES2440696-006	11-Dec-2024 14:38	GWDUP1			✓				

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP080 BTEXN	WATER - W-02T 8 metals (Total)	WATER - W-18 TRH(C6 - C9)/BTEXN
ES2440696-005	11-Dec-2024 14:17	GWRB1		✓	
ES2440696-007	09-Dec-2024 00:00	Trip Blank			✓
ES2440696-008	09-Dec-2024 00:00	Trip Spike	✓		

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

Accounts Payable Australia

- A4 - AU Tax Invoice (INV)	Email	accountspayableAU@ghd.com

Lia Saunders

- *AU Certificate of Analysis - NATA (COA)	Email	Lia.Saunders@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	Lia.Saunders@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	Lia.Saunders@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	Lia.Saunders@ghd.com
- Chain of Custody (CoC) (COC)	Email	Lia.Saunders@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	Lia.Saunders@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	Lia.Saunders@ghd.com

CERTIFICATE OF ANALYSIS

Work Order	: **ES2440696**	Page	: 1 of 8
Amendment	: **1**		
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Lia Saunders	Contact	: Samiksha Sathish
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 12554717 M12 Groundwater	Date Samples Received	: 12-Dec-2024 18:46
Order number	: 12554717	Date Analysis Commenced	: 13-Dec-2024
C-O-C number	: 76760	Issue Date	: 26-Mar-2025 16:06
Sampler	: Lia Saunders		
Site	: M12 Groundwater		
Quote number	: SY/322/21_V6		
No. of samples received	: 8		
No. of samples analysed	: 8		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Amendment (26/03/2025): This report has been amended and re-released to allow the reporting of additional analytical data, specifically additional dissolved metals (EG020F) for sample 006, GWDUP1
- EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEXN compounds spiked at 20 ug/L.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	BH104R	BH112R	BH107R	BH145R	GWDUP1
				Sampling date / time	12-Dec-2024 09:41	12-Dec-2024 09:33	12-Dec-2024 09:31	11-Dec-2024 14:36	11-Dec-2024 14:38
Compound	CAS Number	LOR	Unit		ES2440696-001	ES2440696-002	ES2440696-003	ES2440696-004	ES2440696-006
					Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		**4620**	**10400**	**2130**	**12400**	----
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		**66**	<5	**49**	**10**	----
EA065: Total Hardness as CaCO3									
Total Hardness as CaCO3	----	1	mg/L		**722**	**2230**	**421**	**2680**	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	**43**	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**1070**	**1250**	**1420**	**1020**	----
Total Alkalinity as CaCO3	----	1	mg/L		**1070**	**1250**	**1460**	**1020**	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**252**	**1560**	**468**	**357**	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**1920**	**4390**	**328**	**5610**	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**116**	**255**	**40**	**235**	----
Magnesium	7439-95-4	1	mg/L		**105**	**388**	**78**	**508**	----
Sodium	7440-23-5	1	mg/L		**1500**	**2790**	**739**	**2960**	----
Potassium	7440-09-7	1	mg/L		**16**	**41**	**14**	**17**	----
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		**0.003**	**0.002**	<0.001	**0.001**	<0.001
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L		<0.001	**0.004**	**0.003**	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L		**0.001**	**0.030**	**0.003**	**0.019**	**0.017**
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L		<0.005	**0.019**	**0.010**	**0.019**	**0.014**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	BH104R	BH112R	BH107R	BH145R	GWDUP1
				Sampling date / time	12-Dec-2024 09:41	12-Dec-2024 09:33	12-Dec-2024 09:31	11-Dec-2024 14:36	11-Dec-2024 14:38
Compound	CAS Number	LOR	Unit		ES2440696-001	ES2440696-002	ES2440696-003	ES2440696-004	ES2440696-006
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Manganese	7439-96-5	0.001	mg/L		**0.075**	**0.082**	**0.023**	**0.095**	**0.092**
Iron	7439-89-6	0.05	mg/L		**1.15**	<0.05	<0.05	**2.60**	**2.82**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**1.75**	**2.02**	**0.05**	**2.06**	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	**0.05**	<0.01	<0.01	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.02**	**0.42**	**2.26**	**0.01**	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.02**	**0.47**	**2.26**	**0.01**	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**2.0**	**2.3**	**0.4**	**2.3**	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**2.0**	**2.8**	**2.7**	**2.3**	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**0.07**	**0.10**	**0.03**	**0.04**	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	**0.03**	<0.01	<0.01	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**80.8**	**181**	**48.2**	**186**	----
ø Total Cations	----	0.01	meq/L		**80.1**	**167**	**40.9**	**183**	----
ø Ionic Balance	----	0.01	%		**0.44**	**4.08**	**8.14**	**0.90**	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	BH104R	BH112R	BH107R	BH145R	GWDUP1
				Sampling date / time	12-Dec-2024 09:41	12-Dec-2024 09:33	12-Dec-2024 09:31	11-Dec-2024 14:36	11-Dec-2024 14:38
Compound	CAS Number	LOR	Unit		ES2440696-001	ES2440696-002	ES2440696-003	ES2440696-004	ES2440696-006
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	----
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	<100	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	<100	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	----
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	----
^ Total Xylenes	----	2	µg/L		<2	<2	<2	<2	----
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	----
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**117**	**87.3**	**84.7**	**96.1**	----
Toluene-D8	2037-26-5	2	%		**123**	**103**	**103**	**111**	----
4-Bromofluorobenzene	460-00-4	2	%		**125**	**99.6**	**99.6**	**104**	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	GWRB1	----	----	----	----
				Sampling date / time	11-Dec-2024 14:17	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2440696-005	--------	--------	--------	--------
					Result	----	----	----	----
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Trip Blank	Trip Spike	----	----	----
				Sampling date / time	09-Dec-2024 00:00	09-Dec-2024 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2440696-007	ES2440696-008	--------	--------	--------
					Result	Result	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	**15**	----	----	----
Toluene	108-88-3	2	µg/L		<2	**16**	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	**15**	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	**16**	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	**16**	----	----	----
^ **Total Xylenes**	----	2	µg/L		<2	**32**	----	----	----
^ **Sum of BTEX**	----	1	µg/L		<1	**78**	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	**22**	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**94.4**	**89.0**	----	----	----
Toluene-D8	2037-26-5	2	%		**109**	**108**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**105**	**104**	----	----	----

Surrogate Control Limits

Sub-Matrix: GROUNDWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72	143
Toluene-D8	2037-26-5	75	131
4-Bromofluorobenzene	460-00-4	73	137

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72	143
Toluene-D8	2037-26-5	75	131
4-Bromofluorobenzene	460-00-4	73	137

QUALITY CONTROL REPORT

Work Order	: **ES2440696**	Page	: 1 of 12
Amendment	: **1**		
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Lia Saunders	Contact	: Samiksha Sathish
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 12554717 M12 Groundwater	Date Samples Received	: 12-Dec-2024
Order number	: 12554717	Date Analysis Commenced	: 13-Dec-2024
C-O-C number	: 76760	Issue Date	: 26-Mar-2025
Sampler	: Lia Saunders		
Site	: M12 Groundwater		
Quote number	: SY/322/21_V6		
No. of samples received	: 8		
No. of samples analysed	: 8		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
= Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 6266621)									
EN2416505-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	3710	3700	0.4	0% - 20%
EN2416507-009	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	597	624	4.3	0% - 20%
ES2440659-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	786	770	2.0	0% - 20%
ES2440770-011	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	250	256	2.6	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 6266652)									
ES2440696-001	BH104R	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	4620	4840	4.7	0% - 20%
ES2440935-004	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	9850	9990	1.4	0% - 20%
ES2440935-014	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	710	746	4.8	0% - 20%
ES2440954-004	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	94	80	15.3	No Limit
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 6266622)									
EN2416505-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
EN2416507-009	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	44	44	2.3	No Limit
ES2440659-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ES2440770-011	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	62	50	20.6	0% - 50%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 6266653)									
ES2440696-001	BH104R	EA025H: Suspended Solids (SS)	----	5	mg/L	66	55	18.1	0% - 50%
ES2440935-004	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ES2440935-014	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ES2440954-004	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 6258466)									
ES2440362-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 6258466) - continued									
ES2440362-002	Anonymous	ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	3	3	0.0	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	3	3	0.0	No Limit
ME2401941-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	135	137	1.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	135	137	1.5	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 6258608)									
ES2440630-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	202	202	0.0	0% - 20%
ES2440630-010	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	468	464	1.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 6259499)									
EW2405788-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	147	146	0.9	0% - 20%
ES2440668-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	612	614	0.2	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 6258611)									
ES2440630-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	520	523	0.6	0% - 20%
ES2440630-010	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	172	166	3.6	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 6259498)									
EW2405788-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1140	1150	1.3	0% - 20%
ES2440668-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	470	468	0.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 6264220)									
ES2440791-006	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	17	17	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	82	82	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1330	1300	2.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	1	1	0.0	No Limit
ES2440658-007	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6264221)									
ES2440791-006	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.063	0.062	0.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.014	0.014	0.0	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.076	0.076	0.0	0% - 50%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	9.74	9.52	2.3	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6264221) - continued									
ES2440658-007	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6264661)									
EB2443462-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.027	0.028	0.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.10	0.10	0.0	No Limit
ES2440108-013	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0005	0.0005	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.003	0.004	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.137	0.140	2.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.011	0.012	0.0	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	1.88	1.90	1.1	0% - 20%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.15	0.15	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 6264626)									
ED2400263-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.008	0.008	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
ES2440663-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 6264626) - continued									
ES2440663-001	Anonymous	EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.005	0.006	18.4	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.006	0.007	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.010	0.011	0.0	0% - 50%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.003	0.004	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.008	0.010	27.2	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 6264222)									
ES2440465-004	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2440728-002	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6261761)									
ES2440665-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2440770-005	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 6263663)									
ES2440696-001	BH104R	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	1.75	1.75	0.0	0% - 20%
ES2440770-006	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.01	0.03	80.1	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 6258610)									
ES2440630-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2440630-010	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 6259496)									
ES2440770-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2440668-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 6263664)									
ES2440696-001	BH104R	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.02	0.0	No Limit
ES2440770-006	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	<0.01	0.0	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 6263660)									
ES2440696-001	BH104R	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.0	2.0	0.0	0% - 20%
ES2440770-007	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.9	0.9	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 6263659)									
ES2440696-001	BH104R	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.07	0.07	0.0	No Limit
ES2440770-007	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.06	0.04	32.6	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 6258609)									
ES2440630-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2440630-010	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 6259497)									
ES2440770-002	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2440668-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6263894)									
EN2416515-001	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6268695)									
ES2440342-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2440696-004	BH145R	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6263894)									
EN2416515-001	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6268695)									
ES2440342-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2440696-004	BH145R	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 6268695)									
ES2440342-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2440696-004	BH145R	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 6266621)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	101	87.0	109
				<10	293 mg/L	102	75.2	126
				<10	2380 mg/L	105	83.0	124
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 6266652)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	99.8	87.0	109
				<10	293 mg/L	100	75.2	126
				<10	2380 mg/L	108	83.0	124
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 6266622)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	103	83.0	129
				<5	1000 mg/L	99.1	82.0	110
				<5	828 mg/L	90.3	83.0	118
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 6266653)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	96.0	83.0	129
				<5	1000 mg/L	99.5	82.0	110
				<5	828 mg/L	89.2	83.0	118
ED037P: Alkalinity by PC Titrator (QCLot: 6258466)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	96.5	81.0	115
				----	50 mg/L	94.0	80.0	128
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6258608)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	105	82.0	122
				<1	500 mg/L	97.1	82.0	122
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6259499)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	90.3	82.0	122
				<1	500 mg/L	92.6	82.0	122
ED045G: Chloride by Discrete Analyser (QCLot: 6258611)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	97.4	80.9	127
				<1	1000 mg/L	94.5	80.9	127
ED045G: Chloride by Discrete Analyser (QCLot: 6259498)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	95.5	80.9	127
				<1	1000 mg/L	95.1	80.9	127
ED093F: Dissolved Major Cations (QCLot: 6264220)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
ED093F: Dissolved Major Cations (QCLot: 6264220) - continued								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	97.4	80.0	114
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	90.0	116
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	97.4	82.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.7	85.0	113
EG020F: Dissolved Metals by ICP-MS (QCLot: 6264221)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	90.9	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	86.3	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	89.5	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	95.8	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	90.7	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	91.5	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	86.9	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	91.3	81.0	117
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	89.0	82.0	112
EG020F: Dissolved Metals by ICP-MS (QCLot: 6264661)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	92.2	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	88.9	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	91.1	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	93.0	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	92.4	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	90.9	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	91.0	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	95.1	81.0	117
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	92.8	82.0	112
EG020T: Total Metals by ICP-MS (QCLot: 6264626)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	100	82.0	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	97.3	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.4	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	99.1	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	97.0	85.0	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	100	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	100	79.0	117
EG035F: Dissolved Mercury by FIMS (QCLot: 6264222)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	88.2	83.0	105

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6261761)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	99.3	77.0	111
EK055G: Ammonia as N by Discrete Analyser (QCLot: 6263663)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	100	90.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6258610)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	99.0	82.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6259496)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	96.5	82.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6263664)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	96.6	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 6263660)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	97.7	69.0	123
				<0.1	2.5 mg/L	101	70.0	123
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6263659)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	101	71.3	126
				<0.01	0.5 mg/L	105	71.3	126
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6258609)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	106	85.0	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6259497)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	96.9	85.0	117
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6263000)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	88.6	53.7	97.0
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	105	63.3	107
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	98.6	58.3	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6263894)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	74.9	53.7	97.0
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	84.6	63.3	107
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	100	58.3	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6268695)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	98.9	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6263000)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	90.6	53.9	95.5
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	80.0	57.8	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	66.7	50.5	115
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6263894)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6263894) - continued								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	81.6	53.9	95.5
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	91.6	57.8	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	87.5	50.5	115
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6268695)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	100	75.0	127
EP080: BTEXN (QCLot: 6268695)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	91.7	68.3	119
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	104	73.5	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	99.1	73.8	122
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	108	73.0	122
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	104	76.4	123
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	117	75.5	124

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6258608)							
ES2440630-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6259499)							
ES2440668-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 6258611)							
ES2440630-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	89.3	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 6259498)							
ES2440668-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	99.4	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 6264221)							
ES2440465-002	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	96.8	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	94.1	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	90.2	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	100	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG020F: Dissolved Metals by ICP-MS (QCLot: 6264221) - continued							
ES2440465-002	Anonymous	EG020A-F: Lead	7439-92-1	1 mg/L	102	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	97.8	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	91.9	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	99.1	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 6264661)							
EB2443462-002	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	113	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	114	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	117	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	122	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	121	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	120	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	115	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	118	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 6264626)							
ED2400263-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	102	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	98.5	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	99.9	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	104	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	93.1	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	101	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	102	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 6264222)							
ES2440465-001	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	94.9	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6261761)							
ES2440665-002	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	108	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 6263663)							
ES2440696-001	BH104R	EK055G: Ammonia as N	7664-41-7	1 mg/L	111	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6258610)							
ES2440630-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	105	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6259496)							
ES2440668-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	102	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6263664)							
ES2440696-001	BH104R	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	105	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 6263660)							
ES2440696-002	BH112R	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	100	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6263659)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6263659) - continued							
ES2440696-002	BH112R	EK067G: Total Phosphorus as P	----	1 mg/L	106	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6258609)							
ES2440630-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	110	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6259497)							
ES2440668-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	100	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6263894)							
EN2416515-002	Anonymous	EP071: C10 - C14 Fraction	----	200 µg/L	98.1	70.0	130
		EP071: C15 - C28 Fraction	----	250 µg/L	122	71.0	130
		EP071: C29 - C36 Fraction	----	200 µg/L	99.4	67.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6268695)							
ES2440342-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	103	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6263894)							
EN2416515-002	Anonymous	EP071: >C10 - C16 Fraction	----	250 µg/L	99.2	70.0	130
		EP071: >C16 - C34 Fraction	----	350 µg/L	101	75.0	130
		EP071: >C34 - C40 Fraction	----	150 µg/L	104	67.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6268695)							
ES2440342-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	101	70.0	130
EP080: BTEXN (QCLot: 6268695)							
ES2440342-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	97.6	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	110	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	113	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	119	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	118	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	117	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2440696**	Page	: 1 of 10
Amendment	: **1**		
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Lia Saunders	Telephone	: +61-2-8784 8555
Project	: 12554717 M12 Groundwater	Date Samples Received	: 12-Dec-2024
Site	: M12 Groundwater	Issue Date	: 26-Mar-2025
Sampler	: Lia Saunders	No. of samples received	: 8
Order number	: 12554717	No. of samples analysed	: 8

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES2440630--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES2440668--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)						
TRH - Semivolatile Fraction	EP071	1	19	5.26	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / Client Sample ID(s)	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EA015: Total Dissolved Solids dried at 180 ± 5 °C							
Clear Plastic Bottle - Natural (EA015H)							
BH145R	**11-Dec-2024**	**----**	----	**----**	**17-Dec-2024**	18-Dec-2024	✓
Clear Plastic Bottle - Natural (EA015H)							
BH104R, BH112R, BH107R	**12-Dec-2024**	**----**	----	**----**	**17-Dec-2024**	19-Dec-2024	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H)							
BH145R	**11-Dec-2024**	**----**	----	**----**	**17-Dec-2024**	18-Dec-2024	✓
Clear Plastic Bottle - Natural (EA025H)							
BH104R, BH112R, BH107R	**12-Dec-2024**	**----**	----	**----**	**17-Dec-2024**	19-Dec-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA065: Total Hardness as CaCO3							
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
BH145R	**11-Dec-2024**	**----**	----	**----**	**17-Dec-2024**	08-Jan-2025	✓
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
BH104R, BH112R, BH107R	**12-Dec-2024**	**----**	----	**----**	**17-Dec-2024**	09-Jan-2025	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
BH145R	**11-Dec-2024**	**----**	----	**----**	**13-Dec-2024**	25-Dec-2024	✓
Clear Plastic Bottle - Natural (ED037-P)							
BH104R, BH112R, BH107R	**12-Dec-2024**	**----**	----	**----**	**13-Dec-2024**	26-Dec-2024	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
BH145R	**11-Dec-2024**	**----**	----	**----**	**13-Dec-2024**	08-Jan-2025	✓
Clear Plastic Bottle - Natural (ED041G)							
BH104R, BH112R, BH107R	**12-Dec-2024**	**----**	----	**----**	**14-Dec-2024**	09-Jan-2025	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
BH145R	**11-Dec-2024**	**----**	----	**----**	**13-Dec-2024**	08-Jan-2025	✓
Clear Plastic Bottle - Natural (ED045G)							
BH104R, BH112R, BH107R	**12-Dec-2024**	**----**	----	**----**	**14-Dec-2024**	09-Jan-2025	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
BH145R	**11-Dec-2024**	**----**	----	**----**	**17-Dec-2024**	08-Jan-2025	✓
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
BH104R, BH112R, BH107R	**12-Dec-2024**	**----**	----	**----**	**17-Dec-2024**	09-Jan-2025	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
BH145R, GWDUP1	**11-Dec-2024**	**----**	----	**----**	**17-Dec-2024**	09-Jun-2025	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
BH104R, BH112R, BH107R	**12-Dec-2024**	**----**	----	**----**	**17-Dec-2024**	10-Jun-2025	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)							
GWRB1	**11-Dec-2024**	**17-Dec-2024**	09-Jun-2025	✓	**17-Dec-2024**	09-Jun-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)							
BH145R	**11-Dec-2024**	**----**	----	----	**17-Dec-2024**	08-Jan-2025	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)							
BH104R, BH112R, BH107R	**12-Dec-2024**	**----**	----	----	**17-Dec-2024**	09-Jan-2025	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
GWRB1	**11-Dec-2024**	**----**	----	----	**18-Dec-2024**	08-Jan-2025	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
BH145R	**11-Dec-2024**	**----**	----	----	**16-Dec-2024**	08-Jan-2025	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
BH104R, BH112R, BH107R	**12-Dec-2024**	**----**	----	----	**16-Dec-2024**	09-Jan-2025	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
BH145R	**11-Dec-2024**	**----**	----	----	**13-Dec-2024**	13-Dec-2024	✓
Clear Plastic Bottle - Natural (EK057G)							
BH104R, BH112R, BH107R	**12-Dec-2024**	**----**	----	----	**14-Dec-2024**	14-Dec-2024	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
BH145R	**11-Dec-2024**	**----**	----	----	**16-Dec-2024**	08-Jan-2025	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
BH104R, BH112R, BH107R	**12-Dec-2024**	**----**	----	----	**16-Dec-2024**	09-Jan-2025	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
BH145R	**11-Dec-2024**	**16-Dec-2024**	08-Jan-2025	✓	**16-Dec-2024**	08-Jan-2025	✓
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
BH104R, BH112R, BH107R	**12-Dec-2024**	**16-Dec-2024**	09-Jan-2025	✓	**16-Dec-2024**	09-Jan-2025	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
BH145R	**11-Dec-2024**	**16-Dec-2024**	08-Jan-2025	✓	**16-Dec-2024**	08-Jan-2025	✓
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
BH104R, BH112R, BH107R	**12-Dec-2024**	**16-Dec-2024**	09-Jan-2025	✓	**16-Dec-2024**	09-Jan-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) BH145R	**11-Dec-2024**	**----**	----	**----**	**13-Dec-2024**	13-Dec-2024	✓
Clear Plastic Bottle - Natural (EK071G) BH104R, BH112R, BH107R	**12-Dec-2024**	**----**	----	**----**	**14-Dec-2024**	14-Dec-2024	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) BH145R	**11-Dec-2024**	**17-Dec-2024**	18-Dec-2024	✓	**20-Dec-2024**	26-Jan-2025	✓
Amber Glass Bottle - Unpreserved (EP071) BH104R, BH112R, BH107R	**12-Dec-2024**	**17-Dec-2024**	19-Dec-2024	✓	**18-Dec-2024**	26-Jan-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080) Trip Blank	**09-Dec-2024**	**19-Dec-2024**	23-Dec-2024	✓	**20-Dec-2024**	23-Dec-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) BH145R	**11-Dec-2024**	**19-Dec-2024**	25-Dec-2024	✓	**20-Dec-2024**	25-Dec-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) BH104R, BH112R, BH107R	**12-Dec-2024**	**19-Dec-2024**	26-Dec-2024	✓	**20-Dec-2024**	26-Dec-2024	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) BH145R	**11-Dec-2024**	**17-Dec-2024**	18-Dec-2024	✓	**20-Dec-2024**	26-Jan-2025	✓
Amber Glass Bottle - Unpreserved (EP071) BH104R, BH112R, BH107R	**12-Dec-2024**	**17-Dec-2024**	19-Dec-2024	✓	**18-Dec-2024**	26-Jan-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080) Trip Blank	**09-Dec-2024**	**19-Dec-2024**	23-Dec-2024	✓	**20-Dec-2024**	23-Dec-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) BH145R	**11-Dec-2024**	**19-Dec-2024**	25-Dec-2024	✓	**20-Dec-2024**	25-Dec-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) BH104R, BH112R, BH107R	**12-Dec-2024**	**19-Dec-2024**	26-Dec-2024	✓	**20-Dec-2024**	26-Dec-2024	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) Trip Blank, Trip Spike	**09-Dec-2024**	**19-Dec-2024**	23-Dec-2024	✓	**20-Dec-2024**	23-Dec-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) BH145R	**11-Dec-2024**	**19-Dec-2024**	25-Dec-2024	✓	**20-Dec-2024**	25-Dec-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) BH104R, BH112R, BH107R	**12-Dec-2024**	**19-Dec-2024**	26-Dec-2024	✓	**20-Dec-2024**	26-Dec-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	4	34	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	4	32	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	8	80	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	8	80	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	10	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	19	**5.26**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	10	80	**12.50**	**12.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	10	80	**12.50**	**12.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	20	**15.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	19	**10.53**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Control Samples (LCS) - Continued							
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	4	80	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	4	80	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	19	**10.53**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).

Analytical Methods	Method	Matrix	Method Descriptions
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030E. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.

HT

UPDATED COC

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: GHD Pty Ltd	TURNAROUND REQUIREME ☐ Standard TAT (List due date): STANDARD TAT	FOR LABORATORY USE ONLY (Circle)	
OFFICE: Sydney	(Standard TAT may be longer for some tests e.g., Ultra Trace ☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact?	Yes No N/A
PROJECT: M12 Groundwater	ALS QUOTE NO.: SYS22/21 V5	Free ice / frozen ice bricks present upon receipt?	Yes No N/A
ORDER NUMBER: 12554717		Random Sample Temperature on Receipt:	°C
PROJECT MANAGER: Henry Luo	CONTACT PH: Henry Luo 0414 060 002	Other comment:	

COC SEQUENCE NUMBER (Circle): COC: 1 2 3 4 5 6 7; OF: 1 2 3 4 5 6 7

SAMPLER: Lia Saunders, Nica Hugo	SAMPLER MOBILE: 0411 213 734	RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): ESDAT	Lia Saunders			
Email Reports to: emily.smith@ghd.com; lia.saunders@ghd.com, henry.luo@ghd.com, nica.hugo@ghd.com, ghdlabreports@ghd.com		DATE/TIME: 17/01/2025 at 18:00	DATE/TIME:	DATE/TIME:	DATE/TIME: 17/1/25 1815

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: ANALYSIS OF NITRITE 48 HRS HOLDING TIME REQUIRED. PLEASE DO NOT LOG ALL SAMPLES RECEIVED IN ONE WORKORDER. LOG AS TWO SEPARATE WORKORDERS AS PER THE TWO COCs PROVIDED.

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).											
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	Comments	TOTAL CONTAINERS	W-02 (dissolved & metals)	EG020F (dissolved Fe, Mn)	W-94 (TRHBTEX/N)	NT-08A (TN, NO2, NO3, NH3, TP soluble Reactive P)	NT 050 & 07 (major cations & anions, Hardness)	EA015H (TDS)	EA025H (TSS)	EP075A (SIM) (Phenols – Standard level (15 analytes))	W-02T (6 total metals)	BTEXN		
4	BH145R	17/01/2025	Water		6	X	X	X	X	X	X	X					
5	GWDUP1	17/01/2025	Water		1	X											
–	GWDUP2	17/01/2025	Water	PLEASE FORWARD TO EUROFINS WITH ATTACHED COC	1												
6	GWRB1	17/01/2025	Water		1									X			
7	Trip spike	17/01/2025	Water		1										X		
8	Trip blank	17/01/2025	Water		1										X		

Subcontracted Lab / Split WO

Lab / Analysis: GWDUP2 EUROFINS

Organised By / Date:

Received By / Date:

Courier:

WO #: ES2501188

Attached By PO / Internal Sheet:

Environmental Division Sydney
Work Order Reference
ES2501188

Telephone : +61-2-8784 8555

ES2501188

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: GHD Pty Ltd	TURNAROUND REQUIREME: ☐ Standard TAT (List due date): STANDARD TAT	FOR LABORATORY USE ONLY (Circle)	
OFFICE: Sydney	(Standard TAT may be longer for some tests e.g., Ultra Trace) ☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact?	Yes No N/A
PROJECT: M12 Groundwater	ALS QUOTE NO.: SY/322/21 V5	Free ice / frozen ice bricks present upon receipt?	Yes No N/A
ORDER NUMBER: 12584717	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt	°C
PROJECT MANAGER: Henry Luo	CONTACT PH: Henry Luo 0414 090 602 OF: 1 2 3 4 5 6 7	Other comment	

SAMPLER: Lia Saunders, Nica Hugo; SAMPLER MOBILE: 0411 213 724	RELINQUISHED BY: Lia Saunders	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? (YES / NO); EDD FORMAT (or default): ESDAT	DATE/TIME: 17/01/2025	DATE/TIME:	DATE/TIME:	DATE/TIME:
Email Reports to: emily.smith@ghd.com; lia.saunders@ghd.com henry.luo@ghd.com; nica.hugo@ghd.com, ghdlabreports@ghd.com				

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: ANALYSIS OF NITRITE 48 HRS HOLDING TIME REQUIRED. PLEASE DO NOT LOG ALL SAMPLES RECEIVED IN ONE WORKORDER. LOG AS TWO SEPARATE WORKORDERS AS PER THE TWO COCs PROVIDED.

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).												
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	Comments	TOTAL CONTAINERS	W-602 (dissolved 8 metals)	EG020F (dissolved Fe, Mn)	W-604 (TRHB (EXN)	NT-08A (TN, 4O2, NO3, NH3, TP, Soluble Reactive P)	NT-01D & 02 (major cations & anions, Hardness)	EA015H (TDS)	EA025H (TSS)	EP075A (SIM) Phenols - Standard Level (15 analytes)	W-627 (8 total metals)	EP075N		
	BH104R	17/01/2025	Water		6	X	X	X	X	X	X	X					
	BH107R	17/01/2025	Water		6	X	X	X	X	X	X	X					
	BH112R	17/01/2025	Water		6	X	X	X	X	X	X	X					
	BH145R	17/01/2025	Water		6	X	X	X	X	X	X	X					
	GWDUP1	17/01/2025	Water		1	X											
	GWDUP2	17/01/2025	Water	PLEASE FORWARD TO EUROFINS WITH ATTACHED COC	1												
	GWRB1	17/01/2025	Water		1									X			
	Trip spike	17/01/2025	Water		1										X		
	Trip blank	17/01/2025	Water		1										X		

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **ES2501188**		
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Contact	: Samiksha Sathish
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: henry.luo@ghd.com	E-mail	: samiksha.sathish@alsglobal.com
Telephone	: +61 02 9239 7100	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 9239 7199	Facsimile	: +61-2-8784 8500
Project	: 12554717	Page	: 1 of 3
Order number	: ----	Quote number	: ES2021GHDSER0026 (SY/322/21_V6)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: Lia Saunders, Nica Hugo		

Dates

Date Samples Received	: 17-Jan-2025 12:57	Issue Date	: 18-Jan-2025
Client Requested Due Date	: 24-Jan-2025	Scheduled Reporting Date	: **24-Jan-2025**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 7	Temperature	: 6.7°C, 3.5°C & 4.8°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 5 / 5

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Sample ID GWDUP2 to be forwarded to Eurofins as per COC
- The sampling date listed on the COC is 17/01/25, however the vial was dated 13/01/25 for sample 7 & 8.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Sydney, NATA accreditation no. 825, site no. 10911.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA015H Total Dissolved Solids - Standard Level	WATER - EA025H Suspended Solids - Standard Level	WATER - EG020F Dissolved Metals by ICP/MS	WATER - NT-01D & 02 Major Cations & Anions (Ca, Mg, Na, K, Cl, SO4,	WATER - NT-08A Total Nitrogen + NO2 + NO3 + NH3 + Total P +	WATER - W-02 8 Metals	WATER - W-04 TRH/BTEXN
ES2501188-004	17-Jan-2025 00:00	BH145R	✓	✓	✓	✓	✓	✓	✓
ES2501188-005	17-Jan-2025 00:00	GWDUP1						✓	

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP080 BTEXN	WATER - W-02T 8 metals (Total)	WATER - W-18 TRH(C6 - C9)/BTEXN
ES2501188-006	17-Jan-2025 00:00	GWRB1		✓	
ES2501188-007	13-Jan-2025 00:00	Trip Spike	✓		
ES2501188-008	13-Jan-2025 00:00	Trip Blank			✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

Accounts Payable Australia

- A4 - AU Tax Invoice (INV)	Email	accountspayableAU@ghd.com

EMILY SMITH

- *AU Certificate of Analysis - NATA (COA)	Email	emily.smith@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	emily.smith@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	emily.smith@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	emily.smith@ghd.com
- Chain of Custody (CoC) (COC)	Email	emily.smith@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	emily.smith@ghd.com
- EDI Format - XTab (XTAB)	Email	emily.smith@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	emily.smith@ghd.com

GHD LAB REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	ghdlabreports@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ghdlabreports@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ghdlabreports@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ghdlabreports@ghd.com
- Chain of Custody (CoC) (COC)	Email	ghdlabreports@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	ghdlabreports@ghd.com
- EDI Format - XTab (XTAB)	Email	ghdlabreports@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	ghdlabreports@ghd.com

HENRY LUO

- *AU Certificate of Analysis - NATA (COA)	Email	henry.luo@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	henry.luo@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	henry.luo@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	henry.luo@ghd.com
- Chain of Custody (CoC) (COC)	Email	henry.luo@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	henry.luo@ghd.com
- EDI Format - XTab (XTAB)	Email	henry.luo@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	henry.luo@ghd.com

Lia Saunders

- *AU Certificate of Analysis - NATA (COA)	Email	Lia.Saunders@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	Lia.Saunders@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	Lia.Saunders@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	Lia.Saunders@ghd.com
- Chain of Custody (CoC) (COC)	Email	Lia.Saunders@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	Lia.Saunders@ghd.com
- EDI Format - XTab (XTAB)	Email	Lia.Saunders@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	Lia.Saunders@ghd.com

NICA HUGO

- *AU Certificate of Analysis - NATA (COA)	Email	nica.hugo@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	nica.hugo@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	nica.hugo@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	nica.hugo@ghd.com
- Chain of Custody (CoC) (COC)	Email	nica.hugo@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	nica.hugo@ghd.com
- EDI Format - XTab (XTAB)	Email	nica.hugo@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	nica.hugo@ghd.com

CERTIFICATE OF ANALYSIS

Work Order	: **ES2501188**	Page	: 1 of 7
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Contact	: Samiksha Sathish
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9239 7100	Telephone	: +61-2-8784 8555
Project	: 12554717	Date Samples Received	: 17-Jan-2025 12:57
Order number	: ----	Date Analysis Commenced	: 18-Jan-2025
C-O-C number	: ----	Issue Date	: 24-Jan-2025 17:37
Sampler	: Lia Saunders, Nica Hugo		
Site	: ----		
Quote number	: SY/322/21_V6		
No. of samples received	: 5		
No. of samples analysed	: 5		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEXN compounds spiked at 20 ug/L.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: **WATER**
(Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	BH145R	GWDUP1	GWRB1	Trip Spike	Trip Blank
				Sampling date / time	17-Jan-2025 00:00	17-Jan-2025 00:00	17-Jan-2025 00:00	13-Jan-2025 00:00	13-Jan-2025 00:00
					ES2501188-004	ES2501188-005	ES2501188-006	ES2501188-007	ES2501188-008
					Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		**11600**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		<5	----	----	----	----
EA065: Total Hardness as CaCO3									
Total Hardness as CaCO3	----	1	mg/L		**2440**	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**558**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**558**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**371**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**5480**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**185**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**481**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**2900**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**15**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		**0.003**	**0.003**	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L		**0.004**	**0.004**	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.002**	**0.003**	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.009**	**0.016**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH145R	GWDUP1	GWRB1	Trip Spike	Trip Blank
				Sampling date / time	17-Jan-2025 00:00	17-Jan-2025 00:00	17-Jan-2025 00:00	13-Jan-2025 00:00	13-Jan-2025 00:00
Compound	CAS Number	LOR	Unit		ES2501188-004	ES2501188-005	ES2501188-006	ES2501188-007	ES2501188-008
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Manganese	7439-96-5	0.001	mg/L		**0.102**	----	----	----	----
Iron	7439-89-6	0.05	mg/L		<0.05	----	----	----	----
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		----	----	<0.001	----	----
Cadmium	7440-43-9	0.0001	mg/L		----	----	<0.0001	----	----
Chromium	7440-47-3	0.001	mg/L		----	----	<0.001	----	----
Copper	7440-50-8	0.001	mg/L		----	----	<0.001	----	----
Nickel	7440-02-0	0.001	mg/L		----	----	<0.001	----	----
Lead	7439-92-1	0.001	mg/L		----	----	<0.001	----	----
Zinc	7440-66-6	0.005	mg/L		----	----	<0.005	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	----	<0.0001	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**1.96**	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.04**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.04**	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**2.0**	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**2.0**	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**0.04**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH145R	GWDUP1	GWRB1	Trip Spike	Trip Blank
				Sampling date / time	17-Jan-2025 00:00	17-Jan-2025 00:00	17-Jan-2025 00:00	13-Jan-2025 00:00	13-Jan-2025 00:00
Compound	CAS Number	LOR	Unit		ES2501188-004	ES2501188-005	ES2501188-006	ES2501188-007	ES2501188-008
					Result	Result	Result	Result	Result
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		173	----	----	----	----
ø Total Cations	----	0.01	meq/L		175	----	----	----	----
ø Ionic Balance	----	0.01	%		0.54	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	----	----	----	<20
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	----	----	----	<20
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	15	<1
Toluene	108-88-3	2	µg/L		<2	----	----	15	<2
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	14	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	15	<2
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	16	<2
^ Total Xylenes	----	2	µg/L		<2	----	----	31	<2

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH145R	GWDUP1	GWRB1	Trip Spike	Trip Blank
				Sampling date / time	17-Jan-2025 00:00	17-Jan-2025 00:00	17-Jan-2025 00:00	13-Jan-2025 00:00	13-Jan-2025 00:00
Compound	CAS Number	LOR	Unit		ES2501188-004	ES2501188-005	ES2501188-006	ES2501188-007	ES2501188-008
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
^ **Sum of BTEX**	----	1	µg/L		<1	----	----	**75**	<1
Naphthalene	91-20-3	5	µg/L		<5	----	----	**20**	<5
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**99.1**	----	----	**99.5**	**113**
Toluene-D8	2037-26-5	2	%		**107**	----	----	**102**	**77.1**
4-Bromofluorobenzene	460-00-4	2	%		**104**	----	----	**108**	**75.5**

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72	143
Toluene-D8	2037-26-5	75	131
4-Bromofluorobenzene	460-00-4	73	137

QUALITY CONTROL REPORT

Work Order	: **ES2501188**	Page	: 1 of 11
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Contact	: Samiksha Sathish
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9239 7100	Telephone	: +61-2-8784 8555
Project	: 12554717	Date Samples Received	: 17-Jan-2025
Order number	: ----	Date Analysis Commenced	: 18-Jan-2025
C-O-C number	: ----	Issue Date	: 24-Jan-2025
Sampler	: Lia Saunders, Nica Hugo		
Site	: ----		
Quote number	: SY/322/21_V6		
No. of samples received	: 5		
No. of samples analysed	: 5		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
= Indicates failed QC
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 6327535)									
EN2500960-016	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1520	1500	1.3	0% - 20%
ES2501192-005	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	576	584	1.4	0% - 20%
ES2501271-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	728	755	3.6	0% - 20%
ES2501478-006	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	413	426	3.2	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 6327534)									
EN2500960-016	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	54	54	0.0	0% - 50%
ES2501192-005	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	14	12	7.7	No Limit
ES2501271-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ES2501478-006	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 6322936)									
ES2501157-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	559	556	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	559	556	0.6	0% - 20%
ES2501256-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	36	35	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	36	35	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 6319574)									
ED2500073-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1 (10)*	mg/L	<10	<10	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 6319574) - continued									
ES2501188-004	BH145R	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	371	374	0.8	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 6319573)									
ED2500073-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1	1	0.0	No Limit
ES2501188-004	BH145R	ED045G: Chloride	16887-00-6	1	mg/L	5480	5400	1.5	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 6328238)									
EN2500862-008	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	94	96	2.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	111	114	3.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	510	521	2.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	17	18	0.0	0% - 50%
ES2501185-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	14	14	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	11	11	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	103	100	3.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	6	6	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6328240)									
EN2500862-008	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.009	0.010	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.030	0.032	5.8	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
ES2501185-003	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.177	0.171	3.3	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	2.71	2.65	2.2	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6331185)									
EN2500844-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.009	0.008	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6331185) - continued									
EN2500844-002	Anonymous	EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.008	0.007	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.001	0.002	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
ES2500880-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.012	0.011	0.0	0% - 50%
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.12	0.12	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 6327452)									
ED2500070-004	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
ES2501447-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.968	0.963	0.5	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.086	0.086	0.0	0% - 50%
EG035F: Dissolved Mercury by FIMS (QC Lot: 6328239)									
ES2500687-012	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2501155-002	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 6331184)									
EN2500844-003	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2500880-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6327450)									
ED2500071-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.1 µg/L	<0.0001	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6327450) - continued									
ES2501371-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 6328622)									
ES2501087-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	1.74	1.78	1.9	0% - 20%
ES2501155-004	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 6319572)									
ED2500073-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2501188-004	BH145R	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 6328623)									
ES2501087-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.04	0.04	0.0	No Limit
ES2501155-004	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 6328626)									
ES2501087-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1 (5.0)*	mg/L	37.1	36.1	2.7	No Limit
ES2501188-004	BH145R	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.0	1.9	0.0	0% - 50%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 6328627)									
ES2501087-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01 (0.50)*	mg/L	2.28	2.60	13.1	No Limit
ES2501188-004	BH145R	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.04	0.06	26.9	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 6319575)									
ES2501192-006	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2501188-004	BH145R	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6321986)									
ES2501188-004	BH145R	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2501321-010	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6321986)									
ES2501188-004	BH145R	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2501321-010	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 6321986)									
ES2501188-004	BH145R	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2501321-010	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080: BTEXN (QC Lot: 6321986) - continued									
ES2501321-010	Anonymous	EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 6327535)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	102	87.0	109
				<10	293 mg/L	96.2	75.2	126
				<10	2380 mg/L	106	83.0	124
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 6327534)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	102	83.0	129
				<5	1000 mg/L	99.4	82.0	110
				<5	828 mg/L	103	83.0	118
ED037P: Alkalinity by PC Titrator (QCLot: 6322936)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	95.7	81.0	115
				----	50 mg/L	95.2	80.0	128
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6319574)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	103	82.0	122
				<1	500 mg/L	108	82.0	122
ED045G: Chloride by Discrete Analyser (QCLot: 6319573)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	103	80.9	127
				<1	1000 mg/L	92.0	80.9	127
ED093F: Dissolved Major Cations (QCLot: 6328238)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	96.7	80.0	114
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	100	90.0	116
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	97.0	82.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	89.5	85.0	113
EG020F: Dissolved Metals by ICP-MS (QCLot: 6328240)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	90.9	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	89.2	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	89.4	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	88.2	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	86.9	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	83.7	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	85.6	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	87.8	81.0	117
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	85.4	82.0	112

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 6331185)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	91.0	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	89.1	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	92.7	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	90.9	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	91.8	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	93.7	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	86.6	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	90.0	81.0	117
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	91.1	82.0	112
EG020T: Total Metals by ICP-MS (QCLot: 6327452)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	89.7	82.0	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	88.2	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	93.4	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	89.7	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	89.7	85.0	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	88.4	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	90.7	79.0	117
EG035F: Dissolved Mercury by FIMS (QCLot: 6328239)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	91.4	83.0	105
EG035F: Dissolved Mercury by FIMS (QCLot: 6331184)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	86.3	83.0	105
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6327450)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	100	77.0	111
EK055G: Ammonia as N by Discrete Analyser (QCLot: 6328622)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	106	90.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6319572)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	99.0	82.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6328623)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	108	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 6328626)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	94.1	69.0	123
				<0.1	2.5 mg/L	97.5	70.0	123
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6328627)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6328627) - continued								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	98.0	71.3	126
				<0.01	0.5 mg/L	102	71.3	126
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6319575)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	96.3	85.0	117
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6320481)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	83.4	53.7	97.0
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	82.5	63.3	107
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	75.3	58.3	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6321986)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	104	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6320481)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	63.8	53.9	95.5
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	92.6	57.8	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	69.3	50.5	115
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6321986)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	98.8	75.0	127
EP080: BTEXN (QCLot: 6321986)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	109	68.3	119
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	115	73.5	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	116	73.8	122
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	116	73.0	122
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	114	76.4	123
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	111	75.5	124

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6319574)							
ED2500073-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	109	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 6319573)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED045G: Chloride by Discrete Analyser (QCLot: 6319573) - continued							
ED2500073-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	116	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 6328240)							
EN2500862-009	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	96.9	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	91.4	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	92.3	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	92.3	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	95.3	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	87.6	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	91.8	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	94.1	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 6331185)							
EN2500844-001	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	94.7	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	91.7	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	95.3	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	78.5	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	103	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	96.1	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	91.5	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	95.1	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 6327452)							
ED2500071-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	94.4	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	90.2	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	94.0	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	94.3	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	99.3	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	91.5	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	94.0	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 6328239)							
ES2500687-007	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	90.6	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 6331184)							
EN2500684-007	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	88.2	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6327450)							
ED2500070-004	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	77.9	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 6328622)							
ES2501087-001	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	100	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6319572)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6319572) - continued							
ED2500073-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	108	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6328623)							
ES2501087-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	87.7	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 6328626)							
ES2501118-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	96.5	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6328627)							
ES2501118-001	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	95.8	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6319575)							
ES2501192-006	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	107	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6321986)							
ES2501188-004	BH145R	EP080: C6 - C9 Fraction	----	325 µg/L	79.5	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6321986)							
ES2501188-004	BH145R	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	79.2	70.0	130
EP080: BTEXN (QCLot: 6321986)							
ES2501188-004	BH145R	EP080: Benzene	71-43-2	25 µg/L	80.6	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	76.2	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	79.5	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	81.0	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	88.7	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	87.6	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2501188**	Page	: 1 of 9
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Telephone	: +61-2-8784 8555
Project	: 12554717	Date Samples Received	: 17-Jan-2025
Site	: ----	Issue Date	: 24-Jan-2025
Sampler	: Lia Saunders, Nica Hugo	No. of samples received	: 5
Order number	: ----	No. of samples analysed	: 5

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, where applicable to the methodology, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)						
TRH - Semivolatile Fraction	EP071	0	8	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)						
Total Phosphorus as P By Discrete Analyser	EK067G	2	18	11.11	15.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
TRH - Semivolatile Fraction	EP071	0	8	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container* / Client Sample ID(s)	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA015: Total Dissolved Solids dried at 180 ± 5 °C							
Clear Plastic Bottle - Natural (EA015H)							
BH145R	**17-Jan-2025**	**----**	----	----	**22-Jan-2025**	24-Jan-2025	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H)							
BH145R	**17-Jan-2025**	**----**	----	----	**22-Jan-2025**	24-Jan-2025	✓
EA065: Total Hardness as CaCO3							
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
BH145R	**17-Jan-2025**	**----**	----	----	**22-Jan-2025**	14-Feb-2025	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
BH145R	**17-Jan-2025**	**----**	----	----	**21-Jan-2025**	31-Jan-2025	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
BH145R	**17-Jan-2025**	**----**	----	----	**18-Jan-2025**	14-Feb-2025	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
BH145R	**17-Jan-2025**	**----**	----	----	**18-Jan-2025**	14-Feb-2025	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
BH145R	**17-Jan-2025**	**----**	----	----	**22-Jan-2025**	14-Feb-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
BH145R	**17-Jan-2025**	**----**	----	----	**22-Jan-2025**	16-Jul-2025	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
GWDUP1	**17-Jan-2025**	**----**	----	----	**24-Jan-2025**	16-Jul-2025	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)							
GWRB1	**17-Jan-2025**	**22-Jan-2025**	16-Jul-2025	✓	**22-Jan-2025**	16-Jul-2025	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)							
BH145R, GWDUP1	**17-Jan-2025**	**----**	----	----	**24-Jan-2025**	14-Feb-2025	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
GWRB1	**17-Jan-2025**	**----**	----	----	**23-Jan-2025**	14-Feb-2025	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
BH145R	**17-Jan-2025**	**----**	----	----	**23-Jan-2025**	14-Feb-2025	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
BH145R	**17-Jan-2025**	**----**	----	----	**18-Jan-2025**	19-Jan-2025	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
BH145R	**17-Jan-2025**	**----**	----	----	**23-Jan-2025**	14-Feb-2025	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
BH145R	**17-Jan-2025**	**23-Jan-2025**	14-Feb-2025	✓	**23-Jan-2025**	14-Feb-2025	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
BH145R	**17-Jan-2025**	**23-Jan-2025**	14-Feb-2025	✓	**23-Jan-2025**	14-Feb-2025	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
BH145R	**17-Jan-2025**	**----**	----	----	**18-Jan-2025**	19-Jan-2025	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
BH145R	**17-Jan-2025**	**21-Jan-2025**	24-Jan-2025	✓	**23-Jan-2025**	02-Mar-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
Trip Blank	**13-Jan-2025**	**23-Jan-2025**	27-Jan-2025	✓	**24-Jan-2025**	27-Jan-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
BH145R	**17-Jan-2025**	**23-Jan-2025**	31-Jan-2025	✓	**24-Jan-2025**	31-Jan-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071)							
BH145R	**17-Jan-2025**	**21-Jan-2025**	24-Jan-2025	✓	**23-Jan-2025**	02-Mar-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
Trip Blank	**13-Jan-2025**	**23-Jan-2025**	27-Jan-2025	✓	**24-Jan-2025**	27-Jan-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
BH145R	**17-Jan-2025**	**23-Jan-2025**	31-Jan-2025	✓	**24-Jan-2025**	31-Jan-2025	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080)							
Trip Spike, Trip Blank	**13-Jan-2025**	**23-Jan-2025**	27-Jan-2025	✓	**24-Jan-2025**	27-Jan-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
BH145R	**17-Jan-2025**	**23-Jan-2025**	31-Jan-2025	✓	**24-Jan-2025**	31-Jan-2025	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	8	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	8	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	5	40	**12.50**	**12.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	5	40	**12.50**	**12.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	19	**15.79**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	18	**11.11**	**15.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Control Samples (LCS) - Continued							
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	8	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).

Analytical Methods	Method	Matrix	Method Descriptions
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030E. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.

Lab / Received Lab / Split WO
Date / Time Rec'd:
Organised By / Date: Eurofins
Relinquished By / Date: GWDUP2
Courier / Courier:
WO No:
Attach by / Transferred Client:

HT

Environmental Division
Sydney
Work Order Reference
ES2501516

Telephone : – 61-2-8784 8555

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: GHD Pty Ltd	TURNAROUND REQUIREME ☐ Standard TAT (List due date): STANDARD TAT	FOR LABORATORY US	
OFFICE: Sydney	(Standard TAT may be longer for some tests e.g. Ultra Trace ☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact?	
PROJECT: M12 Groundwater	ALS QUOTE NO.: BY/322/21 V5	COC SEQUENCE NUMBER (Circle)	
ORDER NUMBER: 12554717		COC: 1 2 3 4 5 6 7	Free ice / frozen ice bricks
PROJECT MANAGER: Henry Luo	CONTACT PH: Henry Luo 0413 390 002	OF: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
			Other comment:

SAMPLER: Lia Saunders, Nica Hugo	SAMPLER MOBILE: 0411 213 724	RELINQUISHED BY: Lia Saunders	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): ESDAT	DATE/TIME: 23/01/2025 at 18:00	DATE/TIME: 23/1/25 1913
Email Reports to: emily.smith@ghd.com; lia.saunders@ghd.com; henry.luo@ghd.com; nica.hugo@ghd.com; ghdlabreports@ghd.com		RELINQUISHED BY:	RECEIVED BY:
		DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: ANALYSIS OF NITRITE 48 HRS HOLDING TIME REQUIRED. PLEASE DO NOT LOG ALL SAMPLES RECEIVED IN ONE WORKORDER. LOG AS TWO SEPARATE WORKORDERS AS PER THE TWO COCs PROVIDED.

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).												
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	Comments	TOTAL CONTAINERS	W-02 (dissolved 6 metals)	ES6207 (dissolved e.g. NH3)	W-04 (TRH/BTEXN)	NT-08A (TN, NO2, NO3, NH3, TP, soluble Reactive P)	NT-07D & 32 (major cations & anions, Hardness)	EA015H (TDS)	EA025H (TSS)	EP075A (SIM) (Phenols - Standard level (15 analytes))	W-02Y (6 total metals)	BTEXN		
	1 BH1104R BH104R	23/01/2025	Water		6	X	X	X	X	X	X	X					
	2 BH107R	23/01/2025	Water		6	X	X	X	X	X	X	X					
	3 BH112R	23/01/2025	Water		6	X	X	X	X	X	X	X					
	4 GWDUP1 S1	23/01/2025	Water		1	X											
	GWDUP2	23/01/2025	Water	PLEASE FORWARD TO EUROFINS WITH ATTACHED COC	1												
	5 GWRB1 GWRB2	23/01/2025	Water		1									X			
	6 Trip spike 20	23/01/2025	Water		1										X		
	7 Trip blank 20	23/01/2025	Water		1										X		

Environmental Division
Sydney
Work Order Reference
ES2501516

Telephone : +61-2-8784 8555

UPDATED COC

CHAIN OF CUSTODY

ALS Laboratory: please tick →

STANDARD TAT

CLIENT: GHD Pty Ltd	TURNAROUND REQUIREME (Standard TAT may be longer for some tests e.g. Ultra Trace) ☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	FOR LABORATORY USE ON: Custody Seal Intact? Yes / No / N/A; Free ice / frozen ice bricks present upon receipt? Yes / No; Random Sample Temperature on Receipt: °C; Other comment:
OFFICE: Sydney	ALS QUOTE NO.: SY/322/21 V5	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7
PROJECT: M12 Groundwater		
ORDER NUMBER: 12554717	CONTACT PH: Henry Luo 0414 080 902	
PROJECT MANAGER: Henry Luo	SAMPLER MOBILE: 0411 213 724	RELINQUISHED BY: Lia Saunders; DATE/TIME: 23/01/2025 at 19:00
SAMPLER: Lia Saunders, Nica Hugo	EDD FORMAT (or default): ESDAT	RECEIVED BY: DATE/TIME:
COC emailed to ALS? (YES / NO)		RELINQUISHED BY: DATE/TIME:
Email Reports to: emily.smith@ghd.com; lia.saunders@ghd.com; henry.luo@ghd.com, nica.hugo@ghd.com; ghdlabreports@ghd.com		RECEIVED BY: Wanida; DATE/TIME: 050226 1200

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: ANALYSIS OF NITRITE 48 HRS HOLDING TIME REQUIRED. PLEASE DO NOT LOG ALL SAMPLES RECEIVED IN ONE WORKORDER. LOG AS TWO SEPARATE WORKORDERS AS PER THE TWO COCs PROVIDED.

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)
Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)				CONTAINER INFORMATION	ANALYSIS REQUIRED											
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	Comments	TOTAL CONTAINERS	W-02 (dissolved 8 metals)	EG020F (dissolved Fe, Mn)	W-04 (TRH/BTEXN)	NT-06A (TP, NO2, NO3, NH3, TP, Soluble Reactive P)	NT-01D & 02 (major cations & anions, Hardness)	EA016H (TDS)	EA025H (TSS)	EP075A (SIM) (Phenols – Standard level) (15 analytes))	W-02T (8 total metals)	BTEXN		
					5	X	X	X	X	X	X	X					
1	BH1104R	23-01-25	Water		6	X	X	X	X	X	X	X					
2	BH107R	23-01-25	Water		6	X	X	X	X	X	X	X		X			
3	BH112R	23-01-25	Water		1										X		
4	GWRB2	23-01-25	Water		1										X		
5	Trip spike	23-01-25	Water		1												
6	Trip blank																

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2501516**

Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Contact	: Samiksha Sathish
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: henry.luo@ghd.com	E-mail	: samiksha.sathish@alsglobal.com
Telephone	: +61 02 9239 7100	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 9239 7199	Facsimile	: +61-2-8784 8500
Project	: 12554717	Page	: 1 of 3
Order number	: 12554717	Quote number	: ES2021GHDSER0026 (SY/322/21_V6)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: Lia Saunders, Nica Hugo		

Dates

Date Samples Received	: 23-Jan-2025 19:13	Issue Date	: 23-Jan-2025
Client Requested Due Date	: 31-Jan-2025	Scheduled Reporting Date	: **31-Jan-2025**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 7	Temperature	: 0.8'C, 1.2'C, 0.4'C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Sample GWDUP2 forwarded to Eurofins for analysis
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Sydney, NATA accreditation no. 825, site no. 10911.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- Sample GWDUP1 was not received.
- Sample 5 ID on the COC is GWRB1, received as GWRB2. Please confirm which ID is correct.
- Sample GWDUP2 was not received.
- Sample 1 received as BH104R .

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA015H Total Dissolved Solids - Standard Level	WATER - EA025H Suspended Solids - Standard Level	WATER - EG020F Dissolved Metals by ICP/MS	WATER - NT-01D & 02 Major Cations & Anions (Ca, Mg, Na, K, Cl, SO4,	WATER - NT-08A Total Nitrogen + NO2 + NO3 + NH3 + Total P +	WATER - W-02 8 Metals	WATER - W-04 TRH/BTEXN
ES2501516-001	23-Jan-2025 00:00	BH104R	✓	✓	✓	✓	✓	✓	✓
ES2501516-002	23-Jan-2025 00:00	BH107R	✓	✓	✓	✓	✓	✓	✓
ES2501516-003	23-Jan-2025 00:00	BH112R	✓	✓	✓	✓	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP080 BTEXN	WATER - W-02T 8 metals (Total)	WATER - W-18 TRH(C6 - C9)/BTEXN
ES2501516-005	23-Jan-2025 00:00	GWRB2		✓	
ES2501516-006	20-Jan-2025 00:00	Trip Spike	✓		
ES2501516-007	20-Jan-2025 00:00	Trip Blank			✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

Accounts Payable Australia

- A4 - AU Tax Invoice (INV)	Email	accountspayableAU@ghd.com

EMILY SMITH

- *AU Certificate of Analysis - NATA (COA)	Email	emily.smith@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	emily.smith@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	emily.smith@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	emily.smith@ghd.com
- Chain of Custody (CoC) (COC)	Email	emily.smith@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	emily.smith@ghd.com
- EDI Format - XTab (XTAB)	Email	emily.smith@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	emily.smith@ghd.com

GHD LAB REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	ghdlabreports@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ghdlabreports@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ghdlabreports@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ghdlabreports@ghd.com
- Chain of Custody (CoC) (COC)	Email	ghdlabreports@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	ghdlabreports@ghd.com
- EDI Format - XTab (XTAB)	Email	ghdlabreports@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	ghdlabreports@ghd.com

HENRY LUO

- *AU Certificate of Analysis - NATA (COA)	Email	henry.luo@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	henry.luo@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	henry.luo@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	henry.luo@ghd.com
- Chain of Custody (CoC) (COC)	Email	henry.luo@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	henry.luo@ghd.com
- EDI Format - XTab (XTAB)	Email	henry.luo@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	henry.luo@ghd.com

Lia Saunders

- *AU Certificate of Analysis - NATA (COA)	Email	Lia.Saunders@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	Lia.Saunders@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	Lia.Saunders@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	Lia.Saunders@ghd.com
- Chain of Custody (CoC) (COC)	Email	Lia.Saunders@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	Lia.Saunders@ghd.com
- EDI Format - XTab (XTAB)	Email	Lia.Saunders@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	Lia.Saunders@ghd.com

NICA HUGO

- *AU Certificate of Analysis - NATA (COA)	Email	nica.hugo@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	nica.hugo@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	nica.hugo@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	nica.hugo@ghd.com
- Chain of Custody (CoC) (COC)	Email	nica.hugo@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	nica.hugo@ghd.com
- EDI Format - XTab (XTAB)	Email	nica.hugo@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	nica.hugo@ghd.com

SAM SATHISH

- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	samiksha.sathish@alsglobal.com

CERTIFICATE OF ANALYSIS

Work Order	: **ES2501516**	Page	: 1 of 8
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Contact	: Samiksha Sathish
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9239 7100	Telephone	: +61-2-8784 8555
Project	: 12554717	Date Samples Received	: 23-Jan-2025 19:13
Order number	: 12554717	Date Analysis Commenced	: 24-Jan-2025
C-O-C number	: ----	Issue Date	: 31-Jan-2025 17:51
Sampler	: Lia Saunders, Nica Hugo		
Site	: ----		
Quote number	: SY/322/21_V6		
No. of samples received	: 6		
No. of samples analysed	: 6		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEXN compounds spiked at 20 ug/L.
- Sample GWDUP1 was not received.
- Sample 5 ID on the COC is GWRB1, received as GWRB2. Please confirm which ID is correct.
- Sample GWDUP2 was not received.
- Sample 1 received as BH104R .
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH104R	BH107R	BH112R	GWRB2	Trip Spike
				Sampling date / time	23-Jan-2025 00:00	23-Jan-2025 00:00	23-Jan-2025 00:00	23-Jan-2025 00:00	20-Jan-2025 00:00
Compound	CAS Number	LOR	Unit		ES2501516-001	ES2501516-002	ES2501516-003	ES2501516-005	ES2501516-006
					Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		**4640**	**2260**	**10600**	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		**130**	**30**	**241**	----	----
EA065: Total Hardness as CaCO3									
Total Hardness as CaCO3	----	1	mg/L		**841**	**514**	**2340**	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**1060**	**1440**	**1280**	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**1060**	**1440**	**1280**	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**204**	**204**	**1790**	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**1660**	**258**	**3930**	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**111**	**36**	**252**	----	----
Magnesium	7439-95-4	1	mg/L		**137**	**103**	**416**	----	----
Sodium	7440-23-5	1	mg/L		**1510**	**691**	**3020**	----	----
Potassium	7440-09-7	1	mg/L		**16**	**14**	**42**	----	----
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		**0.001**	<0.001	**0.001**	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Copper	7440-50-8	0.001	mg/L		**0.001**	**0.001**	<0.001	----	----
Nickel	7440-02-0	0.001	mg/L		**0.002**	<0.001	**0.005**	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Zinc	7440-66-6	0.005	mg/L		**0.007**	<0.005	**0.013**	----	----

Analytical Results

Sub-Matrix: **WATER**
(Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	BH104R	BH107R	BH112R	GWRB2	Trip Spike
				Sampling date / time	23-Jan-2025 00:00	23-Jan-2025 00:00	23-Jan-2025 00:00	23-Jan-2025 00:00	20-Jan-2025 00:00
					ES2501516-001	ES2501516-002	ES2501516-003	ES2501516-005	ES2501516-006
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Manganese	7439-96-5	0.001	mg/L		**0.051**	<0.001	**0.081**	----	----
Iron	7439-89-6	0.05	mg/L		<0.05	<0.05	<0.05	----	----
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		----	----	----	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L		----	----	----	<0.0001	----
Chromium	7440-47-3	0.001	mg/L		----	----	----	<0.001	----
Copper	7440-50-8	0.001	mg/L		----	----	----	<0.001	----
Nickel	7440-02-0	0.001	mg/L		----	----	----	<0.001	----
Lead	7439-92-1	0.001	mg/L		----	----	----	<0.001	----
Zinc	7440-66-6	0.005	mg/L		----	----	----	<0.005	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	----	----	<0.0001	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.64**	<0.01	**1.96**	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		**0.18**	<0.01	**0.19**	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.58**	**2.50**	**0.37**	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.76**	**2.50**	**0.56**	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**1.1**	**0.6**	**3.5**	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ **Total Nitrogen as N**	----	0.1	mg/L		**1.9**	**3.1**	**4.1**	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**0.20**	**0.04**	**0.53**	----	----

Analytical Results

Sub-Matrix: **WATER**
(Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	BH104R	BH107R	BH112R	GWRB2	Trip Spike
				Sampling date / time	23-Jan-2025 00:00	23-Jan-2025 00:00	23-Jan-2025 00:00	23-Jan-2025 00:00	20-Jan-2025 00:00
					ES2501516-001	ES2501516-002	ES2501516-003	ES2501516-005	ES2501516-006
					Result	Result	Result	Result	Result
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.01**	<0.01	**0.03**	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**72.2**	**40.3**	**174**	----	----
ø Total Cations	----	0.01	meq/L		**82.9**	**40.7**	**179**	----	----
ø Ionic Balance	----	0.01	%		**6.86**	**0.48**	**1.57**	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	----	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	----	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	----	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		<20	<20	<20	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		<100	<100	<100	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L		<100	<100	<100	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	----	**15**
Toluene	108-88-3	2	µg/L		<2	<2	<2	----	**15**
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	----	**15**
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	----	**17**
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	----	**18**
^ **Total Xylenes**	----	2	µg/L		<2	<2	<2	----	**35**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH104R	BH107R	BH112R	GWRB2	Trip Spike
				Sampling date / time	23-Jan-2025 00:00	23-Jan-2025 00:00	23-Jan-2025 00:00	23-Jan-2025 00:00	20-Jan-2025 00:00
Compound	CAS Number	LOR	Unit		ES2501516-001	ES2501516-002	ES2501516-003	ES2501516-005	ES2501516-006
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
^ **Sum of BTEX**	----	1	µg/L		<1	<1	<1	----	**80**
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	----	**20**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**97.2**	**115**	**78.2**	----	**100**
Toluene-D8	2037-26-5	2	%		**102**	**116**	**80.0**	----	**110**
4-Bromofluorobenzene	460-00-4	2	%		**108**	**118**	**85.8**	----	**125**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	Trip Blank	----	----	----	----
			Sampling date / time	20-Jan-2025 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2501516-007	---------	---------	---------	---------
				Result	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ Total Xylenes	----	2	µg/L	<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**91.8**	----	----	----	----
Toluene-D8	2037-26-5	2	%	**98.9**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	**105**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72	143
Toluene-D8	2037-26-5	75	131
4-Bromofluorobenzene	460-00-4	73	137

QUALITY CONTROL REPORT

Work Order	: **ES2501516**	Page	: 1 of 9
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Contact	: Samiksha Sathish
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9239 7100	Telephone	: +61-2-8784 8555
Project	: 12554717	Date Samples Received	: 23-Jan-2025
Order number	: 12554717	Date Analysis Commenced	: 24-Jan-2025
C-O-C number	: ----	Issue Date	: 31-Jan-2025
Sampler	: Lia Saunders, Nica Hugo		
Site	: ----		
Quote number	: SY/322/21_V6		
No. of samples received	: 6		
No. of samples analysed	: 6		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
= Indicates failed QC
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 6340220)									
EN2501309-007	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	122	135	10.7	0% - 50%
EN2501309-017	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	474	484	2.0	0% - 20%
EN2501310-010	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	3380	3580	6.0	0% - 20%
ES2502078-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	11000	11200	1.9	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 6340219)									
EN2501309-007	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	7	11	42.3	No Limit
EN2501309-017	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	18	19	0.0	No Limit
EN2501310-010	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	54	51	4.3	0% - 50%
ES2502078-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	6080	5610	8.1	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 6331718)									
ES2501792-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	150	154	2.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	150	154	2.5	0% - 20%
ES2501753-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	123	123	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	123	123	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 6331789)									
ES2501516-001	BH104R	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	204	204	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED045G: Chloride by Discrete Analyser (QC Lot: 6331790)									
ES2501977-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	137	134	1.9	0% - 20%
ES2501516-001	BH104R	ED045G: Chloride	16887-00-6	1	mg/L	1660	1670	0.6	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 6336807)									
EN2501324-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	93	94	1.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	66	67	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	220	221	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
ES2501842-007	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6336804)									
EN2501324-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.003	0.002	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.026	0.035	30.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EN2501306-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 6336932)									
ES2501516-005	GWRB2	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 6336932) - continued									
ES2501516-005	GWRB2	EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
ES2501883-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0009	0.0009	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.014	0.014	0.0	0% - 50%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.010	0.010	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.009	0.009	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.017	0.018	5.9	0% - 50%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	2.16	2.21	2.4	0% - 20%
EG035F: Dissolved Mercury by FIMS (QC Lot: 6336806)									
EN2501324-011	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EN2501324-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6336397)									
ES2501522-003	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2501522-010	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 6340637)									
ES2501516-001	BH104R	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.64	0.60	6.5	0% - 20%
EW2500298-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.02	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 6331787)									
ES2501273-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2501941-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 6340638)									
ES2501516-001	BH104R	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.76	0.84	10.1	0% - 20%
EW2500298-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.14	0.14	0.0	0% - 50%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 6340641)									
ES2501516-001	BH104R	EK061G: Total Kjeldahl Nitrogen as N	----	0.1 (0.2)*	mg/L	1.1	1.1	0.0	No Limit
EW2500298-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.5	0.5	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 6340642)									
ES2501516-001	BH104R	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.20	0.17	12.2	0% - 50%
EW2500298-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.04	<0.01	114	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 6331788)									
ES2501516-001	BH104R	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.01	0.01	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6338447)									
ES2501522-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2501522-011	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6338447)									
ES2501522-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6338447) - continued									
ES2501522-011	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 6338447)									
ES2501522-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2501522-011	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 6340220)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	100	87.0	109
				<10	293 mg/L	101	75.2	126
				<10	2380 mg/L	106	83.0	124
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 6340219)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	107	83.0	129
				<5	1000 mg/L	100	82.0	110
				<5	828 mg/L	114	83.0	118
ED037P: Alkalinity by PC Titrator (QCLot: 6331718)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	96.1	81.0	115
				----	50 mg/L	97.7	80.0	128
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6331789)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	91.9	82.0	122
				<1	500 mg/L	96.8	82.0	122
ED045G: Chloride by Discrete Analyser (QCLot: 6331790)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	101	80.9	127
				<1	1000 mg/L	92.6	80.9	127
ED093F: Dissolved Major Cations (QCLot: 6336807)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	80.0	114
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	108	90.0	116
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	108	82.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	104	85.0	113
EG020F: Dissolved Metals by ICP-MS (QCLot: 6336804)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	105	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	102	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	103	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	101	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	99.5	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	101	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	102	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	105	81.0	117
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	102	82.0	112

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 6336932)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	97.8	82.0	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	96.2	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.2	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	94.7	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	95.9	85.0	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.7	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	96.8	79.0	117
EG035F: Dissolved Mercury by FIMS (QCLot: 6336806)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	89.8	83.0	105
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6336397)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	89.4	77.0	111
EK055G: Ammonia as N by Discrete Analyser (QCLot: 6340637)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	99.0	90.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6331787)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	91.8	82.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6340638)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	102	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 6340641)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	96.5	69.0	123
				<0.1	2.5 mg/L	102	70.0	123
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6340642)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	93.4	71.3	126
				<0.01	0.5 mg/L	90.9	71.3	126
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6331788)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	97.0	85.0	117
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6332537)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	80.8	53.7	97.0
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	101	63.3	107
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	96.6	58.3	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6338447)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	83.0	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6332537)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	72.9	53.9	95.5
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	107	57.8	110

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6332537) - continued								
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	76.4	50.5	115
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6338447)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	82.4	75.0	127
EP080: BTEXN (QCLot: 6338447)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	72.3	68.3	119
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	97.0	73.5	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	95.2	73.8	122
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	100	73.0	122
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	98.8	76.4	123
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	98.1	75.5	124

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6331789)							
ES2501516-001	BH104R	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 6331790)							
ES2501516-001	BH104R	ED045G: Chloride	16887-00-6	250 mg/L	# Not Determined	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 6336804)							
EN2501306-002	Anonymous	EG020A-F: Arsenic	7440-38-2	2 mg/L	86.0	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.5 mg/L	82.2	70.0	130
		EG020A-F: Chromium	7440-47-3	2 mg/L	85.9	70.0	130
		EG020A-F: Copper	7440-50-8	2 mg/L	83.0	70.0	130
		EG020A-F: Lead	7439-92-1	2 mg/L	84.2	70.0	130
		EG020A-F: Manganese	7439-96-5	2 mg/L	83.2	70.0	130
		EG020A-F: Nickel	7440-02-0	2 mg/L	83.1	70.0	130
		EG020A-F: Zinc	7440-66-6	2 mg/L	85.9	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 6336932)							
ES2501854-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	115	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	102	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 6336932) - continued							
ES2501854-001	Anonymous	EG020A-T: Chromium	7440-47-3	1 mg/L	100	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	105	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	110	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	106	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	110	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 6336806)							
EN2501309-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	88.5	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6336397)							
ES2501522-004	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	91.9	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 6340637)							
ES2501516-001	BH104R	EK055G: Ammonia as N	7664-41-7	0.5 mg/L	123	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6331787)							
ES2501273-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	97.2	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6340638)							
ES2501516-001	BH104R	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	117	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 6340641)							
ES2501516-002	BH107R	EK061G: Total Kjeldahl Nitrogen as N	----	10 mg/L	93.6	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6340642)							
ES2501516-002	BH107R	EK067G: Total Phosphorus as P	----	1 mg/L	93.9	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6331788)							
ES2501516-001	BH104R	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	104	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6338447)							
ES2501522-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	91.5	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6338447)							
ES2501522-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	87.5	70.0	130
EP080: BTEXN (QCLot: 6338447)							
ES2501522-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	71.4	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	93.0	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	90.4	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	98.0	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	93.7	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	93.4	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2501516**	Page	: 1 of 10
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Telephone	: +61-2-8784 8555
Project	: 12554717	Date Samples Received	: 23-Jan-2025
Site	: ----	Issue Date	: 31-Jan-2025
Sampler	: Lia Saunders, Nica Hugo	No. of samples received	: 6
Order number	: 12554717	No. of samples analysed	: 6

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES2501516--001	BH104R	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	ES2501516--001	BH104R	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)						
TRH - Semivolatile Fraction	EP071	0	5	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)						
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	10.00	15.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
TRH - Semivolatile Fraction	EP071	0	5	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container / Client Sample ID(s)*		*Sample Date*	*Extraction / Preparation*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Clear Plastic Bottle - Natural (EA015H)								
BH104R, BH112R	BH107R,	**23-Jan-2025**	**----**	----	----	**29-Jan-2025**	30-Jan-2025	✓
EA025: Total Suspended Solids dried at 104 ± 2°C								
Clear Plastic Bottle - Natural (EA025H)								
BH104R, BH112R	BH107R,	**23-Jan-2025**	**----**	----	----	**29-Jan-2025**	30-Jan-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA065: Total Hardness as CaCO3							
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
BH104R, BH107R, BH112R	**23-Jan-2025**	**----**	----	----	**29-Jan-2025**	20-Feb-2025	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
BH104R, BH107R, BH112R	**23-Jan-2025**	**----**	----	----	**24-Jan-2025**	06-Feb-2025	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
BH104R, BH107R, BH112R	**23-Jan-2025**	**----**	----	----	**24-Jan-2025**	20-Feb-2025	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
BH104R, BH107R, BH112R	**23-Jan-2025**	**----**	----	----	**24-Jan-2025**	20-Feb-2025	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
BH104R, BH107R, BH112R	**23-Jan-2025**	**----**	----	----	**29-Jan-2025**	20-Feb-2025	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
BH104R, BH107R, BH112R	**23-Jan-2025**	**----**	----	----	**29-Jan-2025**	22-Jul-2025	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)							
GWRB2	**23-Jan-2025**	**28-Jan-2025**	22-Jul-2025	✓	**29-Jan-2025**	22-Jul-2025	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)							
BH104R, BH107R, BH112R	**23-Jan-2025**	**----**	----	----	**29-Jan-2025**	20-Feb-2025	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
GWRB2	**23-Jan-2025**	**----**	----	----	**29-Jan-2025**	20-Feb-2025	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
BH107R	**23-Jan-2025**	**----**	----	----	**29-Jan-2025**	20-Feb-2025	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
BH104R, BH112R	**23-Jan-2025**	**----**	----	----	**30-Jan-2025**	20-Feb-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
BH104R, BH107R, BH112R	**23-Jan-2025**	**----**	----	----	**24-Jan-2025**	25-Jan-2025	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
BH104R, BH107R, BH112R	**23-Jan-2025**	**----**	----	----	**30-Jan-2025**	20-Feb-2025	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
BH104R, BH107R, BH112R	**23-Jan-2025**	**29-Jan-2025**	20-Feb-2025	✓	**29-Jan-2025**	20-Feb-2025	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
BH104R, BH107R, BH112R	**23-Jan-2025**	**29-Jan-2025**	20-Feb-2025	✓	**29-Jan-2025**	20-Feb-2025	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
BH104R, BH107R, BH112R	**23-Jan-2025**	**----**	----	----	**24-Jan-2025**	25-Jan-2025	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
BH104R, BH107R, BH112R	**23-Jan-2025**	**29-Jan-2025**	30-Jan-2025	✓	**31-Jan-2025**	10-Mar-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
Trip Blank	**20-Jan-2025**	**30-Jan-2025**	03-Feb-2025	✓	**31-Jan-2025**	03-Feb-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
BH104R, BH107R, BH112R	**23-Jan-2025**	**30-Jan-2025**	06-Feb-2025	✓	**31-Jan-2025**	06-Feb-2025	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071)							
BH104R, BH107R, BH112R	**23-Jan-2025**	**29-Jan-2025**	30-Jan-2025	✓	**31-Jan-2025**	10-Mar-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
Trip Blank	**20-Jan-2025**	**30-Jan-2025**	03-Feb-2025	✓	**31-Jan-2025**	03-Feb-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
BH104R, BH107R, BH112R	**23-Jan-2025**	**30-Jan-2025**	06-Feb-2025	✓	**31-Jan-2025**	06-Feb-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN								
Amber VOC Vial - Sulfuric Acid (EP080)								
Trip Spike,	Trip Blank	**20-Jan-2025**	**30-Jan-2025**	03-Feb-2025	✓	**31-Jan-2025**	03-Feb-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)								
BH104R, BH112R	BH107R,	**23-Jan-2025**	**30-Jan-2025**	06-Feb-2025	✓	**31-Jan-2025**	06-Feb-2025	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	5	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	8	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	5	39	**12.82**	**12.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	5	39	**12.82**	**12.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	20	**15.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	**10.00**	**15.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Control Samples (LCS) - Continued							
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	5	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).

Analytical Methods	Method	Matrix	Method Descriptions
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030E. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.

HT

Subcon / Forward Lab / Split WO
Lab / Analysis: Eurofins - GWDUP2
Organised by: Date:
Relinquished by: Date:
Courier Docket:
WO No: ES2504804
Attach. By / Consignment sheets:

CHAIN OF CUSTODY

ALS Laboratory please tick →

CLIENT: GHD Pty Ltd	TURNAROUND REQUIREME (Standard TAT may be longer for some tests e.g. Ultra Trace) ☐ Standard TAT (List due date): STANDARD TAT ☐ Non Standard or urgent TAT (List due date):		FOR LABORATORY USE ONLY (Circle)
OFFICE: Sydney			Custody Seal Intact? Yes No N/A
PROJECT: M12 Groundwater	ALS QUOTE NO.: SY/322/21 V5	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: 12554717		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Henry Luo	CONTACT PH: Henry Luo 0414 090 002	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: Lia Saunders, Nica Hugo	SAMPLER MOBILE: 0411 213 724	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): ESDAT	Nica Hugo	
Email Reports to: emily.smith@ghd.com, lia.saunders@ghd.com, henry.luo@ghd.com, nica.hugo@ghd.com, ghdlabreports@ghd.com		DATE/TIME: 19/02/2025 at 15:30	DATE/TIME: 19/2/25 1810
		RELINQUISHED BY:	RECEIVED BY:
		DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: ANALYSIS OF NITRITE 48 HRS HOLDING TIME REQUIRED. PLEASE DO NOT LOG ALL SAMPLES RECEIVED IN ONE WORKORDER. LOG AS TWO SEPARATE WORKORDERS AS PER THE TWO COCs PROVIDED.

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).												
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	Comments	TOTAL CONTAINERS	W-02 (dissolved 8 metals)	EG020F (dissolved Fe, Mn)	W-04 (TRH/BTEXN)	NT-08A (TN, NO2, NO3, NH3 TP soluble Reactive P)	NT-01D & 02 (major cations & anions, Hardness)	EA015H (TDS)	EA025H (TSS)	EP075A (SIM) (Phenols – Standard level (15 analytes))	W-02T (8 total metals)	BTEXN		
1	BH1104R	18/02/2025	Water		6	X	X	X	X	X	X	X					
2	BH107R	18/02/2025	Water		6	X	X	X	X	X	X	X					
3	BH112R	18/02/2025	Water		6	X	X	X	X	X	X	X					
4	BH145R	19/02/2025	Water		6	X	X	X	X	X	X	X					
5	GWDUP1	18/02/2025	Water		1	X											
—	GWDUP2	18/02/2025	Water	PLEASE FORWARD TO EUROFINS WITH ATTACHED COC	1												
6	GWRB2	19/02/2025	Water		1									X			
7	Trip spike	19/02/2025	Water		1										X		
8	Trip blank	19/02/2025	Water		1										X		

#1 Received as BH104R
#6 Received as GWRB1

Environmental Division
Sydney
Work Order Reference
ES2504804

Telephone : +61-2-8784 8555

SAMPLES RECEIVED WITHOUT COC

CLIENT: GHD	CARRIER: Client	ALS WO Label
PROJECT / QUOTE: 125547[illegible]	CONNOTE #:	
CONTACT NAME:	AWB #:	
CONTACT NUMBER:	# OF ESKIES: 1 SECURITY SEAL: Y N N/A	
SAMPLER NAME:	TYPE OF ESKIES: Large	
SAMPLER NUMBER:	ESKY NUMBERS: WED064-070.	
SAMPLES RECEIVED BY: [signature]	# OF SAMPLES:	
DATE/TIME RECEIVED: 19/2/25 1600 CLIENT SERVICES NOTIFIED BY:	TEMPERATURE: 0·6°C, 1·0°C, -0·2°C	

LAB ID	SAMPLE DETAILS: SAMPLE ID	DATE	MATRIX	NUMBER OF CONTAINERS
1	BH104a	18/2/25	W	
2	BH112R	"	W	
3				
4				
5				
		TOTAL		

ADDITIONAL INFORMATION / COMMENTS:

OTHER INFORMATION:

- ☐ MICRO
- ☐ BIOSECURITY
- ☐ BROKEN CONTAINERS
- ☐ COC EMAILED
- ☐ ALS COMPASS

CORRESPONDENCE (DATE, INITIALS - DETAILS OF CORRESPONDENCE):

eurofins | mgt

☑ **Sydney**
Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
Phone: +612 9900 8400
Email: enviro.syd@mgllabmark.com.au

☐ **Brisbane**
Unit 1-21 Smallwood Place, Murrarie
Phone: +617 3902 4600
Email: enviro.bris@mgllabmark.com.au

☐ **Melbourne**
2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 8564 5000 Fax: +613 8564 5090
Email: enquiries.melb@mgllabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : GHD Pty Ltd, Sydney	**Contact Name :** Lia Saunders 0411 213 724	**Purchase Order :** 12564717	**COC Number :**
Office Address :	**Project Manager:** Henry Luo 0414 096 002	**PROJECT Number :** 12564717	**Eurofins | mgt quote ID :**
Level 15, 133 Castlereagh Street, Sydney NSW 2000	**Email for results :** emily.smith@ghd.com; lia.saunders@ghd.com; nica.hugo@ghd.com; henry.luo@ghd.com; ghdlabreports@ghd.com	**PROJECT Name :** M12 Water Sampling	**Data output format:** ESDAT

Special Directions & Comments :

Sent from ALS

Eurofins | mgt DI water batch number:

Analytes

	Sample ID	Date	Matrix	Dissolved metals	Total metals					
1	GWDUP2	18/02/2025	Water		X					
2	SWDUP2	19/02/2025	Water	X						
3										
4										
5										
6										
7										
8										
9										
10										

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

	500P	250P	60P	1LA	40mL vial	200mL A	Jar	Bag	Sample comments:
1			1						
2			1						
3									
4									
5									
6									
7									
8									
9									
10									

Laboratory Staff

Relinquished By: Nica Hugo	**Received By:**
Date & Time : 19/02/2025 at 15:30	**Date & Time :**
Signature:	**Signature:**

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal
☐ **Courier Consignment # :**

Temperature on arrival:

Report number:

96.2

UPDATED COC

HT

Subcon / Forward Lab / Split WO
Lab / Analysis: Eurofins - GWDUP2
Organised by: Date:
Released by: Date:
Courier:
WO no: ES2504804
Attach additional sheet:

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: GHD Pty Ltd	**TURNAROUND REQUIREME** ☐ Standard TAT (List due date):	STANDARD TAT	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Sydney	(Standard TAT may be longer for some tests e.g. Ultra Trace) ☐ Non Standard or urgent TAT (List due date):		Custody Seal Intact? Yes No N/A
PROJECT: M12 Groundwater	**ALS QUOTE NO.:** SY/322/21 V5	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: 12554717		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Henry Luo	**CONTACT PH:** Henry Luo 0414 096 002	OF: 1 2 3 4 5 6 7	Other comments:

SAMPLER: Lia Saunders, Nica Hugo	**SAMPLER MOBILE:** 0411 213 724	**RELINQUISHED BY:**	**RECEIVED BY:**
COC emailed to ALS? (YES / NO)	**EDD FORMAT (or default):** ESDAT	Nica Hugo	
Email Reports to: emily.smith@ghd.com; lia.saunders@ghd.com; henry.luo@ghd.com; nica.hugo@ghd.com; ghdlabreports@ghd.com		**DATE/TIME:** 19/02/2025 at 15:30	**DATE/TIME:** 19/2/25 1810
		RELINQUISHED BY:	**RECEIVED BY:**
		DATE/TIME:	**DATE/TIME:**

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: ANALYSIS OF NITRITE 48 HRS HOLDING TIME REQUIRED. PLEASE DO NOT LOG ALL SAMPLES RECEIVED IN ONE WORKORDER. LOG AS TWO SEPARATE WORKORDERS AS PER THE TWO COCs PROVIDED.

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)												
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	Comments	TOTAL CONTAINERS	W-02 (dissolved 8 metals)	EG020F (dissolved Fe, Mn)	W-04 (TRH/BTEXN)	NT-08A (TN, NO2, NO3, NH3, TP, soluble Reactive P)	NT-01D & 02 (major cations & anions, Hardness)	EA015H (TDS)	EA025H (TSS)	EP075A (SIM) (Phenols – Standard level (15 analytes))	W-02T (8 total metals)	BTEXN			
1	~~BH104R~~ BU104R (SS)	18/02/2025	Water		6	X	X	X	X	X	X	X						
2	BH107R	18/02/2025	Water		6	X	X	X	X	X	X	X						
3	BH112R	18/02/2025	Water		6	X	X	X	X	X	X	X						
4	BH145R	19/02/2025	Water		6	X	X	X	X	X	X	X						
5	GWDUP1	18/02/2025	Water		1	X												
—	GWDUP2 (SS)	18/02/2025	Water	PLEASE FORWARD TO EUROFINS WITH ATTACHED COC	1													
6	GWRB2 (GWRB1)	19/02/2025	Water		1									X				
7	Trip spike	18/2/25 19/02/2025	Water		1										X			
8	Trip blank	18/2/25 19/02/2025	Water		1										X			

Environmental Division
Sydney
Work Order Reference
ES2504804

Telephone : +61-2-8784 8555

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2504804**

Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Contact	: Samiksha Sathish
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: henry.luo@ghd.com	E-mail	: samiksha.sathish@alsglobal.com
Telephone	: +61 02 9239 7100	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 9239 7199	Facsimile	: +61-2-8784 8500
Project	: 12554717	Page	: 1 of 3
Order number	: 12554717	Quote number	: ES2021GHDSER0026 (SY/322/21_V6)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: Lia Saunders, NICA HUGO		

Dates

Date Samples Received	: 19-Feb-2025 16:00	Issue Date	: 20-Feb-2025
Client Requested Due Date	: 26-Feb-2025	Scheduled Reporting Date	: **26-Feb-2025**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 7	Temperature	: 0.6°C, 1.0°C, -0.2°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 8 / 8

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Sample GWDUP2 forwarded to Eurofins for analysis.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Sydney, NATA accreditation no. 825, site no. 10911.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA015H Total Dissolved Solids - Standard Level	WATER - EA025H Suspended Solids - Standard Level	WATER - EG020F Dissolved Metals by ICP/MS	WATER - NT-01D & 02 Major Cations & Anions (Ca, Mg, Na, K, Cl, SO4,	WATER - NT-08A Total Nitrogen + NO2 + NO3 + NH3 + Total P +	WATER - W-02 8 Metals	WATER - W-04 TRH/BTEXN
ES2504804-001	18-Feb-2025 00:00	BH104R	✓	✓	✓	✓	✓	✓	✓
ES2504804-002	18-Feb-2025 00:00	BH107R	✓	✓	✓	✓	✓	✓	✓
ES2504804-003	18-Feb-2025 00:00	BH112R	✓	✓	✓	✓	✓	✓	✓
ES2504804-004	18-Feb-2025 00:00	BH145R	✓	✓	✓	✓	✓	✓	✓
ES2504804-005	18-Feb-2025 00:00	GWDUP1						✓	

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP080 BTEXN	WATER - W-02T 8 metals (Total)
ES2504804-006	19-Feb-2025 00:00	GWRB1		✓
ES2504804-007	18-Feb-2025 00:00	Trip Spike	✓	
ES2504804-008	18-Feb-2025 00:00	Trip blank	✓	

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

Accounts Payable Australia		
- A4 - AU Tax Invoice (INV)	Email	accountspayableAU@ghd.com
EMILY SMITH		
- *AU Certificate of Analysis - NATA (COA)	Email	emily.smith@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	emily.smith@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	emily.smith@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	emily.smith@ghd.com
- Chain of Custody (CoC) (COC)	Email	emily.smith@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	emily.smith@ghd.com
- EDI Format - XTab (XTAB)	Email	emily.smith@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	emily.smith@ghd.com
GHD LAB REPORTS		
- *AU Certificate of Analysis - NATA (COA)	Email	ghdlabreports@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ghdlabreports@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ghdlabreports@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ghdlabreports@ghd.com
- Chain of Custody (CoC) (COC)	Email	ghdlabreports@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	ghdlabreports@ghd.com
- EDI Format - XTab (XTAB)	Email	ghdlabreports@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	ghdlabreports@ghd.com
HENRY LUO		
- *AU Certificate of Analysis - NATA (COA)	Email	henry.luo@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	henry.luo@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	henry.luo@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	henry.luo@ghd.com
- Chain of Custody (CoC) (COC)	Email	henry.luo@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	henry.luo@ghd.com
- EDI Format - XTab (XTAB)	Email	henry.luo@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	henry.luo@ghd.com
Lia Saunders		
- *AU Certificate of Analysis - NATA (COA)	Email	Lia.Saunders@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	Lia.Saunders@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	Lia.Saunders@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	Lia.Saunders@ghd.com
- Chain of Custody (CoC) (COC)	Email	Lia.Saunders@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	Lia.Saunders@ghd.com
- EDI Format - XTab (XTAB)	Email	Lia.Saunders@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	Lia.Saunders@ghd.com
NICA HUGO		
- *AU Certificate of Analysis - NATA (COA)	Email	nica.hugo@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	nica.hugo@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	nica.hugo@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	nica.hugo@ghd.com
- Chain of Custody (CoC) (COC)	Email	nica.hugo@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	nica.hugo@ghd.com
- EDI Format - XTab (XTAB)	Email	nica.hugo@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	nica.hugo@ghd.com

CERTIFICATE OF ANALYSIS

Work Order	: **ES2504804**	Page	: 1 of 7
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Contact	: Samiksha Sathish
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9239 7100	Telephone	: +61-2-8784 8555
Project	: 12554717	Date Samples Received	: 19-Feb-2025 16:00
Order number	: 12554717	Date Analysis Commenced	: 20-Feb-2025
C-O-C number	: ----	Issue Date	: 28-Feb-2025 09:05
Sampler	: Lia Saunders, NICA HUGO		
Site	: ----		
Quote number	: SY/322/21_V6		
No. of samples received	: 8		
No. of samples analysed	: 8		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEXN compounds spiked at 20 ug/L.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH104R	BH107R	BH112R	BH145R	GWDUP1
				Sampling date / time	18-Feb-2025 00:00	18-Feb-2025 00:00	18-Feb-2025 00:00	18-Feb-2025 00:00	18-Feb-2025 00:00
Compound	CAS Number	LOR	Unit		ES2504804-001	ES2504804-002	ES2504804-003	ES2504804-004	ES2504804-005
					Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		**----**	**2510**	**11200**	**13800**	**----**
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		**----**	<5	<5	**39**	**----**
EA065: Total Hardness as CaCO3									
Total Hardness as CaCO3	----	1	mg/L		**704**	**542**	**2330**	**2880**	**----**
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	**----**
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	**----**
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**1140**	**1570**	**1340**	**1090**	**----**
Total Alkalinity as CaCO3	----	1	mg/L		**1140**	**1570**	**1340**	**1090**	**----**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**232**	**232**	**1750**	**370**	**----**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**1910**	**339**	**4390**	**6130**	**----**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**94**	**39**	**216**	**217**	**----**
Magnesium	7439-95-4	1	mg/L		**114**	**108**	**434**	**569**	**----**
Sodium	7440-23-5	1	mg/L		**1650**	**757**	**3130**	**3370**	**----**
Potassium	7440-09-7	1	mg/L		**17**	**15**	**42**	**19**	**----**
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		**0.002**	<0.001	**0.001**	**0.002**	**0.003**
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	**0.0001**
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L		<0.001	**0.002**	**0.001**	<0.001	**0.001**
Nickel	7440-02-0	0.001	mg/L		<0.001	**0.001**	**0.004**	<0.001	**0.001**
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L		<0.005	**0.008**	**0.011**	**0.007**	<0.005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH104R	BH107R	BH112R	BH145R	GWDUP1
				Sampling date / time	18-Feb-2025 00:00	18-Feb-2025 00:00	18-Feb-2025 00:00	18-Feb-2025 00:00	18-Feb-2025 00:00
Compound	CAS Number	LOR	Unit		ES2504804-001	ES2504804-002	ES2504804-003	ES2504804-004	ES2504804-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Manganese	7439-96-5	0.001	mg/L		**0.066**	**0.004**	**0.084**	**0.097**	----
Iron	7439-89-6	0.05	mg/L		**0.96**	<0.05	<0.05	**3.08**	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**1.80**	**0.05**	**2.16**	**2.45**	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		**0.02**	<0.01	**0.06**	<0.01	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		<0.01	**2.11**	**0.44**	<0.01	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.02**	**2.11**	**0.50**	<0.01	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**2.3**	**0.4**	**2.5**	**2.6**	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**2.3**	**2.5**	**3.0**	**2.6**	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**0.06**	**0.01**	**0.08**	**0.07**	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	**0.02**	<0.01	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**81.5**	**45.8**	**187**	**202**	----
ø Total Cations	----	0.01	meq/L		**86.3**	**44.1**	**184**	**205**	----
ø Ionic Balance	----	0.01	%		**2.86**	**1.80**	**0.90**	**0.57**	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH104R	BH107R	BH112R	BH145R	GWDUP1
				Sampling date / time	18-Feb-2025 00:00	18-Feb-2025 00:00	18-Feb-2025 00:00	18-Feb-2025 00:00	18-Feb-2025 00:00
Compound	CAS Number	LOR	Unit		ES2504804-001	ES2504804-002	ES2504804-003	ES2504804-004	ES2504804-005
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	----
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	<100	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	<100	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	----
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	----
^ Total Xylenes	----	2	µg/L		<2	<2	<2	<2	----
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	----
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**76.4**	**76.8**	**74.4**	**73.4**	----
Toluene-D8	2037-26-5	2	%		**110**	**82.0**	**84.9**	**105**	----
4-Bromofluorobenzene	460-00-4	2	%		**113**	**91.0**	**97.9**	**105**	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	GWRB1	Trip Spike	Trip blank	----	----
				Sampling date / time	19-Feb-2025 00:00	18-Feb-2025 00:00	18-Feb-2025 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2504804-006	ES2504804-007	ES2504804-008	--------	--------
					Result	Result	Result	----	----
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		----	**18**	<1	----	----
Toluene	108-88-3	2	µg/L		----	**18**	<2	----	----
Ethylbenzene	100-41-4	2	µg/L		----	**18**	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		----	**22**	<2	----	----
ortho-Xylene	95-47-6	2	µg/L		----	**20**	<2	----	----
^ **Total Xylenes**	----	2	µg/L		----	**42**	<2	----	----
^ **Sum of BTEX**	----	1	µg/L		----	**96**	<1	----	----
Naphthalene	91-20-3	5	µg/L		----	**22**	<5	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		----	**76.3**	**75.0**	----	----
Toluene-D8	2037-26-5	2	%		----	**110**	**105**	----	----
4-Bromofluorobenzene	460-00-4	2	%		----	**110**	**108**	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72	143
Toluene-D8	2037-26-5	75	131
4-Bromofluorobenzene	460-00-4	73	137

QUALITY CONTROL REPORT

Work Order	: **ES2504804**	Page	: 1 of 11
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Contact	: Samiksha Sathish
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9239 7100	Telephone	: +61-2-8784 8555
Project	: 12554717	Date Samples Received	: 19-Feb-2025
Order number	: 12554717	Date Analysis Commenced	: 20-Feb-2025
C-O-C number	: ----	Issue Date	: 28-Feb-2025
Sampler	: Lia Saunders, NICA HUGO		
Site	: ----		
Quote number	: SY/322/21_V6		
No. of samples received	: 8		
No. of samples analysed	: 8		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
= Indicates failed QC
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 6398583)									
ES2504630-004	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	860	890	3.4	0% - 20%
ES2504715-003	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	496	468	5.8	0% - 20%
ES2504746-007	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	76	75	1.3	No Limit
ES2504803-004	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	824	835	1.4	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 6398584)									
ES2504630-004	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ES2504715-003	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ES2504746-007	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ES2504803-004	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 6392017)									
ES2504761-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	280	280	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	280	280	0.0	0% - 20%
ES2504878-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	1800	1800	0.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	1800	1800	0.2	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 6390593)									
ES2504804-003	BH112R	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1750	1740	0.8	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 6390593) - continued									
ED2500249-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1 (100)*	mg/L	<100	<100	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 6390594)									
ES2504804-004	BH145R	ED045G: Chloride	16887-00-6	1	mg/L	6130	6020	1.7	0% - 20%
ED2500249-001	Anonymous	ED045G: Chloride	16887-00-6	1 (100)*	mg/L	2450	2510	2.2	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 6393304)									
ES2504804-002	BH107R	ED093F: Calcium	7440-70-2	1	mg/L	39	40	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	108	107	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	757	773	2.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	15	15	0.0	0% - 50%
ES2504752-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	169	171	0.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	121	122	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	59	58	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	14	14	0.0	0% - 50%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6393303)									
ES2504804-002	BH107R	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.008	0.007	19.9	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
ES2504752-003	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.024	0.024	0.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6395427)									
ES2504902-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.148	0.142	4.3	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6395427) - continued									
ES2504902-001	Anonymous	EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.014	0.013	0.0	0% - 50%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.015	0.016	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
ES2504950-009	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.018	0.020	11.6	0% - 50%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.28	0.29	3.9	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 6395377)									
ES2504803-004	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.002	0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.073	0.073	0.0	0% - 50%
ES2504803-014	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.005	0.005	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.004	0.003	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.012	0.007	54.2	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 6393305)									
ES2504752-005	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2504806-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 6395428)									
ES2504705-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EW2500940-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6391938)									
ED2500232-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.1 µg/L	<0.0001	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6391938) - continued									
ES2504803-007	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 6394743)									
ES2504803-012	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.05	0.05	0.0	No Limit
EW2500905-004	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.02	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 6390591)									
ES2504804-003	BH112R	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.06	0.06	0.0	No Limit
ED2500249-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01 (1.00)*	mg/L	<1.00	<1.00	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 6390595)									
ME2500253-010	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2504804-004	BH145R	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 6394744)									
ES2504803-012	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	1.05	1.04	1.3	0% - 20%
EW2500905-004	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.06	0.06	0.0	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 6394738)									
ES2504803-012	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.8	1.6	9.1	0% - 50%
EW2500905-005	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.2	0.3	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 6394737)									
ES2504803-012	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.37	0.43	13.7	0% - 20%
EW2500905-005	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 6390592)									
ES2504804-003	BH112R	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.02	0.02	0.0	No Limit
ED2500249-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01 (1.00)*	mg/L	12.4	13.8	10.0	0% - 50%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6392779)									
ES2504708-005	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<0.02 mg/L	<20	0.0	No Limit
ES2504804-001	BH104R	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6392779)									
ES2504708-005	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<0.02 mg/L	<20	0.0	No Limit
ES2504804-001	BH104R	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 6392779)									
ES2504708-005	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<0.001 mg/L	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<0.002 mg/L	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<0.002 mg/L	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<0.002 mg/L	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<0.002 mg/L	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<0.005 mg/L	<5	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080: BTEXN (QC Lot: 6392779) - continued									
ES2504804-001	BH104R	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 6398583)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	100	87.0	109
				<10	293 mg/L	98.6	75.2	126
				<10	2410 mg/L	100	83.0	124
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 6398584)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	106	83.0	129
				<5	1000 mg/L	90.7	82.0	110
				<5	842 mg/L	105	83.0	118
ED037P: Alkalinity by PC Titrator (QCLot: 6392017)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	100	81.0	115
				----	50 mg/L	106	80.0	128
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6390593)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	115	82.0	122
				<1	500 mg/L	89.6	82.0	122
ED045G: Chloride by Discrete Analyser (QCLot: 6390594)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	111	80.9	127
				<1	1000 mg/L	108	80.9	127
ED093F: Dissolved Major Cations (QCLot: 6393304)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	110	80.0	114
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	111	90.0	116
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	109	82.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	102	85.0	113
EG020F: Dissolved Metals by ICP-MS (QCLot: 6393303)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	93.3	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	92.2	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.0	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	92.5	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	93.3	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	96.5	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	93.2	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	91.7	81.0	117
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	99.9	82.0	112

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 6395427)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	98.4	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	91.0	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.6	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	93.7	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	93.8	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	92.3	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	95.2	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	95.9	81.0	117
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	95.8	82.0	112
EG020T: Total Metals by ICP-MS (QCLot: 6395377)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	98.7	82.0	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	97.1	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.3	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	96.2	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	97.1	85.0	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.0	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	88.1	79.0	117
EG035F: Dissolved Mercury by FIMS (QCLot: 6393305)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	99.2	83.0	105
EG035F: Dissolved Mercury by FIMS (QCLot: 6395428)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	95.1	83.0	105
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6391938)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	94.6	77.0	111
EK055G: Ammonia as N by Discrete Analyser (QCLot: 6394743)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	106	90.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6390591)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	103	82.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6390595)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	103	82.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6394744)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	98.0	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 6394738)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	108	69.0	123
				<0.1	2.5 mg/L	118	70.0	123

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6394737)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	110	71.3	126
				<0.01	0.5 mg/L	112	71.3	126
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6390592)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	99.5	85.0	117
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6391923)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	76.1	53.7	97.0
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	98.6	63.3	107
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	77.8	58.3	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6392779)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	92.6	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6391923)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	84.6	53.9	95.5
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	88.7	57.8	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	68.0	50.5	115
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6392779)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	81.3	75.0	127
EP080: BTEXN (QCLot: 6392779)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	81.0	68.3	119
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	85.7	73.5	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	91.3	73.8	122
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	103	73.0	122
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	101	76.4	123
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	117	75.5	124

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6390593)							
ED2500249-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1000 mg/L	106	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 6390594)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED045G: Chloride by Discrete Analyser (QCLot: 6390594) - continued							
ED2500249-001	Anonymous	ED045G: Chloride	16887-00-6	25000 mg/L	115	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 6393303)							
ES2504743-002	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	89.8	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	92.5	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	96.2	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	91.6	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	92.3	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	95.8	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	91.8	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	94.1	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 6395427)							
ES2504640-001	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	95.2	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	90.0	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	92.1	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	87.0	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	92.9	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	96.6	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	99.5	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 6395377)							
ES2504803-005	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	87.8	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	84.8	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	85.9	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	85.4	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	85.0	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	84.1	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	85.6	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 6393305)							
ES2504752-004	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	93.0	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 6395428)							
ES2504640-001	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	98.0	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6391938)							
ED2500232-002	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	91.4	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 6394743)							
ES2504803-012	Anonymous	EK055G: Ammonia as N	7664-41-7	0.5 mg/L	107	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6390591)							
ED2500249-001	Anonymous	EK057G: Nitrite as N	14797-65-0	50 mg/L	102	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6390595)							
ES2504804-004	BH145R	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	102	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6394744)							
ES2504803-012	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	98.7	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 6394738)							
ES2504803-013	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	100	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6394737)							
ES2504803-013	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	104	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6390592)							
ED2500249-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	# Not Determined	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6392779)							
ES2504708-005	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	86.8	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6392779)							
ES2504708-005	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	89.9	70.0	130
EP080: BTEXN (QCLot: 6392779)							
ES2504708-005	Anonymous	EP080: Benzene	71-43-2	25 µg/L	85.0	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	95.7	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	98.8	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	117	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	103	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	111	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2504804**	Page	: 1 of 9
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Telephone	: +61-2-8784 8555
Project	: 12554717	Date Samples Received	: 19-Feb-2025
Site	: ----	Issue Date	: 28-Feb-2025
Sampler	: Lia Saunders, NICA HUGO	No. of samples received	: 8
Order number	: 12554717	No. of samples analysed	: 8

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EK071G: Reactive Phosphorus as P by discrete analyse	ED2500249--001	Anonymous	**Reactive Phosphorus as P**	14265-44-2	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)						
TRH - Semivolatile Fraction	EP071	0	10	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
TRH - Semivolatile Fraction	EP071	0	10	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / Client Sample ID(s)	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EA015: Total Dissolved Solids dried at 180 ± 5 °C							
Clear Plastic Bottle - Natural (EA015H)							
BH107R, BH112R, BH145R	**18-Feb-2025**	**----**	----	----	**25-Feb-2025**	25-Feb-2025	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H)							
BH107R, BH112R, BH145R	**18-Feb-2025**	**----**	----	----	**25-Feb-2025**	25-Feb-2025	✓
EA065: Total Hardness as CaCO3							
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
BH104R, BH107R, BH112R, BH145R	**18-Feb-2025**	**----**	----	----	**21-Feb-2025**	18-Mar-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
BH104R, BH107R, BH112R, BH145R	**18-Feb-2025**	**----**	----	----	**21-Feb-2025**	04-Mar-2025	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
BH104R, BH107R, BH112R, BH145R	**18-Feb-2025**	**----**	----	----	**20-Feb-2025**	18-Mar-2025	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
BH104R, BH107R, BH112R, BH145R	**18-Feb-2025**	**----**	----	----	**20-Feb-2025**	18-Mar-2025	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
BH104R, BH107R, BH112R, BH145R	**18-Feb-2025**	**----**	----	----	**21-Feb-2025**	18-Mar-2025	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
BH104R, BH107R, BH112R, BH145R	**18-Feb-2025**	**----**	----	----	**21-Feb-2025**	17-Aug-2025	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
GWDUP1	**18-Feb-2025**	**----**	----	----	**24-Feb-2025**	17-Aug-2025	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)							
GWRB1	**19-Feb-2025**	**24-Feb-2025**	18-Aug-2025	✓	**24-Feb-2025**	18-Aug-2025	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)							
BH104R, BH107R, BH112R, BH145R	**18-Feb-2025**	**----**	----	----	**24-Feb-2025**	18-Mar-2025	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)							
GWDUP1	**18-Feb-2025**	**----**	----	----	**25-Feb-2025**	18-Mar-2025	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
GWRB1	**19-Feb-2025**	**----**	----	----	**24-Feb-2025**	19-Mar-2025	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
BH104R, BH107R, BH112R, BH145R	**18-Feb-2025**	**----**	----	----	**25-Feb-2025**	18-Mar-2025	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
BH104R, BH107R, BH112R, BH145R	**18-Feb-2025**	**----**	----	----	**20-Feb-2025**	20-Feb-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
BH145R	**18-Feb-2025**	**----**	----	----	**22-Feb-2025**	18-Mar-2025	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
BH104R, BH107R, BH112R	**18-Feb-2025**	**----**	----	----	**25-Feb-2025**	18-Mar-2025	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
BH104R, BH107R, BH112R, BH145R	**18-Feb-2025**	**23-Feb-2025**	18-Mar-2025	✓	**23-Feb-2025**	18-Mar-2025	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
BH104R, BH107R, BH112R, BH145R	**18-Feb-2025**	**23-Feb-2025**	18-Mar-2025	✓	**23-Feb-2025**	18-Mar-2025	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
BH104R, BH107R, BH112R, BH145R	**18-Feb-2025**	**----**	----	----	**20-Feb-2025**	20-Feb-2025	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
BH104R, BH107R, BH112R, BH145R	**18-Feb-2025**	**21-Feb-2025**	25-Feb-2025	✓	**24-Feb-2025**	02-Apr-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
BH104R, BH107R, BH112R, BH145R	**18-Feb-2025**	**21-Feb-2025**	04-Mar-2025	✓	**22-Feb-2025**	04-Mar-2025	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071)							
BH104R, BH107R, BH112R, BH145R	**18-Feb-2025**	**21-Feb-2025**	25-Feb-2025	✓	**24-Feb-2025**	02-Apr-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
BH104R, BH107R, BH112R, BH145R	**18-Feb-2025**	**21-Feb-2025**	04-Mar-2025	✓	**22-Feb-2025**	04-Mar-2025	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080)							
BH104R, BH107R, BH112R, BH145R, Trip Spike, Trip blank	**18-Feb-2025**	**21-Feb-2025**	04-Mar-2025	✓	**22-Feb-2025**	04-Mar-2025	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	4	23	**17.39**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	4	28	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	10	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	28	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	5	39	**12.82**	**12.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	5	39	**12.82**	**12.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	20	**15.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Control Samples (LCS) - Continued							
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	28	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	28	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	10	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).

Analytical Methods	Method	Matrix	Method Descriptions
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030E. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.

Environmental Division
Sydney
Work Order Reference
ES2507162

Telephone : +61-2-8784 8555

Subcon / Forward Lab / Split WO
Lab / Analysis: GWDUP2

CLIENT: GHD Pty Ltd	TURNAROUND REQUIREME ☐ Standard TAT (List due date):	STANDARD TAT	FOR LABORATORY USE ONLY (Circle)
OFFICE: Sydney	ndard TAT may be longer for e tests e.g. Ultra Trace ☐ Non Standard or urgent TAT (List due date):		Quarantine Seal Intact? Yes No N/A
PROJECT: M12 Groundwater	S QUOTE NO.: SY/322/21 V5	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: 12554717		COC 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Henry Luo	CONTACT PH: Henry Luo 0414 090 002	OF: 1 2 3 4 5 6 7	Other Comments:

SAMPLER: Lia Saunders, Nica Hugo	SAMPLER MOBILE: 0424 954 854	RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY: / RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): ESDAT	Nica Hugo	Nawa	
Email Reports to: emily.smith@ghd.com; lia.saunders@ghd.com, henry.luo@ghd.com, nica.hugo@ghd.com, ghdlabreports@ghd.com		DATE/TIME	DATE/TIME	DATE/TIME / DATE/TIME
		12/03/2025 at 15:30	12/03/25 15:10	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: ANALYSIS OF NITRITE 48 HRS HOLDING TIME REQUIRED. PLEASE DO NOT LOG ALL SAMPLES RECEIVED IN ONE WORKORDER. LOG AS TWO SEPARATE WORKORDERS AS PER THE TWO COCs PROVIDED

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)											
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	Comments	TOTAL CONTAINERS	W-02 (dissolved 8 metals)	EG020F (dissolved Fe, Mn)	W-04 (TRH/BTEXN)	NT-08A (TN, NO2, NO3, NH3, TP, soluble Reactive P)	NT-01D & 02 (major cations & anions, Hardness)	EA015H (TDS)	EA025H (TSS)	W-14A (PAH/phenols)	W-02T (8 total metals)	BTEXN		
1	BH1104R	11/03/2025	Water		6	X	X	X	X	X	X	X	X				
2	BH107R	11/03/2025	Water		6	X	X	X	X	X	X	X	X				
3	BH112R	11/03/2025	Water		6	X	X	X	X	X	X	X	X				
4	BH145R	12/03/2025	Water		6	X	X	X	X	X	X	X	X				
5	GWDUP1	11/03/2025	Water		1	X											
6	GWDUP2	11/03/2025	Water	PLEASE FORWARD TO EUROFINS WITH ATTACHED COC	1												
7	GWRB2	12/03/2025	Water		1									X			
8	Trip spike	12/03/2025	Water		1										X		
9	Trip blank	12/03/2025	Water		1										X		
	HT																

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2507162**

Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Contact	: Samiksha Sathish
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: henry.luo@ghd.com	E-mail	: samiksha.sathish@alsglobal.com
Telephone	: +61 02 9239 7100	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 9239 7199	Facsimile	: +61-2-8784 8500
Project	: 12554717	Page	: 1 of 3
Order number	: 12554717	Quote number	: ES2021GHDSER0026 (SY/322/21_V6)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: LIA Saunders, Nica Hugo		

Dates

Date Samples Received	: 12-Mar-2025 15:10	Issue Date	: 13-Mar-2025
Client Requested Due Date	: 19-Mar-2025	Scheduled Reporting Date	: **19-Mar-2025**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 7	Temperature	: 7.5'C, 1.4'C, 2.1'C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 8 / 8

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Sydney, NATA accreditation no. 825, site no. 10911.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- The ID on Sample 1 on the COC is BH1104R, but it was received as BH104R. Please confirm which ID is correct.
- Sample GWDUP 2 has been forwarded EUROFINS.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA025H Suspended Solids - Standard Level	WATER - EG020F Dissolved Metals by ICP/MS	WATER - NT-01D & 02 Major Cations & Anions (Ca, Mg, Na, K, Cl, SO4,	WATER - NT-08A Total Nitrogen + NO2 + NO3 + NH3 + Total P +	WATER - W-02 8 Metals	WATER - W-04 TRH/BTEXN	WATER - W-14A PAH/Phenols (SIM)
ES2507162-001	11-Mar-2025 00:00	BH1104R BH104R	✓	✓	✓	✓	✓	✓	✓
ES2507162-002	11-Mar-2025 00:00	BH107R	✓	✓	✓	✓	✓	✓	✓
ES2507162-003	11-Mar-2025 00:00	BH112R	✓	✓	✓	✓	✓	✓	✓
ES2507162-004	12-Mar-2025 00:00	BH145R	✓	✓	✓	✓	✓	✓	✓
ES2507162-005	11-Mar-2025 00:00	GWDUP1					✓		

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA015H Total Dissolved Solids - Standard Level	WATER - EP080 BTEXN	WATER - W-02T 8 metals (Total)	WATER - W-18 TRH(C6 - C9)/BTEXN
ES2507162-001	11-Mar-2025 00:00	BH1104R BH104R	✓			
ES2507162-002	11-Mar-2025 00:00	BH107R	✓			
ES2507162-003	11-Mar-2025 00:00	BH112R	✓			
ES2507162-004	12-Mar-2025 00:00	BH145R	✓			
ES2507162-006	12-Mar-2025 00:00	GWRB2			✓	
ES2507162-007	07-Mar-2025 00:00	TRIP SPIKE		✓		
ES2507162-008	07-Mar-2025 00:00	TRIP BLANK				✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

Accounts Payable Australia		
- A4 - AU Tax Invoice (INV)	Email	accountspayableAU@ghd.com
EMILY SMITH		
- *AU Certificate of Analysis - NATA (COA)	Email	emily.smith@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	emily.smith@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	emily.smith@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	emily.smith@ghd.com
- Chain of Custody (CoC) (COC)	Email	emily.smith@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	emily.smith@ghd.com
- EDI Format - XTab (XTAB)	Email	emily.smith@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	emily.smith@ghd.com
GHD LAB REPORTS		
- *AU Certificate of Analysis - NATA (COA)	Email	ghdlabreports@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ghdlabreports@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ghdlabreports@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ghdlabreports@ghd.com
- Chain of Custody (CoC) (COC)	Email	ghdlabreports@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	ghdlabreports@ghd.com
- EDI Format - XTab (XTAB)	Email	ghdlabreports@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	ghdlabreports@ghd.com
HENRY LUO		
- *AU Certificate of Analysis - NATA (COA)	Email	henry.luo@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	henry.luo@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	henry.luo@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	henry.luo@ghd.com
- A4 - AU Tax Invoice (INV)	Email	henry.luo@ghd.com
- Chain of Custody (CoC) (COC)	Email	henry.luo@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	henry.luo@ghd.com
- EDI Format - XTab (XTAB)	Email	henry.luo@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	henry.luo@ghd.com
Lia Saunders		
- *AU Certificate of Analysis - NATA (COA)	Email	Lia.Saunders@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	Lia.Saunders@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	Lia.Saunders@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	Lia.Saunders@ghd.com
- Chain of Custody (CoC) (COC)	Email	Lia.Saunders@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	Lia.Saunders@ghd.com
- EDI Format - XTab (XTAB)	Email	Lia.Saunders@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	Lia.Saunders@ghd.com
NICA HUGO		
- *AU Certificate of Analysis - NATA (COA)	Email	nica.hugo@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	nica.hugo@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	nica.hugo@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	nica.hugo@ghd.com
- Chain of Custody (CoC) (COC)	Email	nica.hugo@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	nica.hugo@ghd.com
- EDI Format - XTab (XTAB)	Email	nica.hugo@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	nica.hugo@ghd.com

CERTIFICATE OF ANALYSIS

Work Order	: **ES2507162**	Page	: 1 of 9
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Contact	: Samiksha Sathish
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9239 7100	Telephone	: +61-2-8784 8555
Project	: 12554717	Date Samples Received	: 12-Mar-2025 15:10
Order number	: 12554717	Date Analysis Commenced	: 13-Mar-2025
C-O-C number	: ----	Issue Date	: 19-Mar-2025 13:02
Sampler	: LIA Saunders, Nica Hugo		
Site	: ----		
Quote number	: SY/322/21_V6		
No. of samples received	: 8		
No. of samples analysed	: 8		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEXN compounds spiked at 20 ug/L.
- The ID on Sample 1 on the COC is BH1104R, but it was received as BH104R. Please confirm which ID is correct.
- Sample GWDUP 2 has been forwarded EUROFINS.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH104R	BH107R	BH112R	BH145R	GWDUP1
				Sampling date / time	11-Mar-2025 00:00	11-Mar-2025 00:00	11-Mar-2025 00:00	12-Mar-2025 00:00	11-Mar-2025 00:00
Compound	CAS Number	LOR	Unit		ES2507162-001	ES2507162-002	ES2507162-003	ES2507162-004	ES2507162-005
					Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		**4550**	**2030**	**10200**	**13000**	----
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		**37**	**127**	**993**	**78**	----
EA065: Total Hardness as CaCO3									
Total Hardness as CaCO3	----	1	mg/L		**842**	**467**	**2190**	**2600**	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**1030**	**1400**	**1030**	**835**	----
Total Alkalinity as CaCO3	----	1	mg/L		**1030**	**1400**	**1030**	**835**	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**230**	**223**	**1930**	**369**	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**2140**	**273**	**4320**	**5800**	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**123**	**37**	**254**	**237**	----
Magnesium	7439-95-4	1	mg/L		**130**	**91**	**377**	**489**	----
Sodium	7440-23-5	1	mg/L		**1410**	**597**	**2820**	**2970**	----
Potassium	7440-09-7	1	mg/L		**17**	**14**	**44**	**19**	----
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		**0.002**	<0.001	**0.003**	**0.002**	**0.002**
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L		<0.001	**0.002**	<0.001	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L		**0.001**	**0.001**	**0.006**	**0.001**	<0.001
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L		**0.006**	**0.010**	**0.005**	**0.017**	<0.005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH104R	BH107R	BH112R	BH145R	GWDUP1
				Sampling date / time	11-Mar-2025 00:00	11-Mar-2025 00:00	11-Mar-2025 00:00	12-Mar-2025 00:00	11-Mar-2025 00:00
Compound	CAS Number	LOR	Unit		ES2507162-001	ES2507162-002	ES2507162-003	ES2507162-004	ES2507162-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Manganese	7439-96-5	0.001	mg/L		**0.055**	**0.002**	**0.091**	**0.098**	----
Iron	7439-89-6	0.05	mg/L		**0.64**	<0.05	<0.05	**2.18**	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**1.10**	**0.02**	**2.24**	**1.92**	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	**0.26**	<0.01	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.14**	**2.68**	**0.11**	**0.01**	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.14**	**2.68**	**0.37**	**0.01**	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**1.2**	**0.5**	**3.6**	**2.2**	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**1.3**	**3.2**	**4.0**	**2.2**	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**0.10**	**0.13**	**1.14**	**0.08**	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	**0.02**	<0.01	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**85.7**	**40.3**	**183**	**188**	----
ø Total Cations	----	0.01	meq/L		**78.6**	**35.7**	**167**	**182**	----
ø Ionic Balance	----	0.01	%		**4.34**	**6.12**	**4.32**	**1.68**	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
2-Chlorophenol	95-57-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
2-Methylphenol	95-48-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH104R	BH107R	BH112R	BH145R	GWDUP1
				Sampling date / time	11-Mar-2025 00:00	11-Mar-2025 00:00	11-Mar-2025 00:00	12-Mar-2025 00:00	11-Mar-2025 00:00
Compound	CAS Number	LOR	Unit		ES2507162-001	ES2507162-002	ES2507162-003	ES2507162-004	ES2507162-005
					Result	Result	Result	Result	Result
EP075(SIM)A: Phenolic Compounds - Continued									
3- & 4-Methylphenol	1319-77-3	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	----
2-Nitrophenol	88-75-5	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
2.4-Dimethylphenol	105-67-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
2.4-Dichlorophenol	120-83-2	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
2.6-Dichlorophenol	87-65-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
2.4.6-Trichlorophenol	88-06-2	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
2.4.5-Trichlorophenol	95-95-4	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Pentachlorophenol	87-86-5	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Acenaphthene	83-32-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Fluorene	86-73-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Phenanthrene	85-01-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Anthracene	120-12-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Fluoranthene	206-44-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Pyrene	129-00-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Chrysene	218-01-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH104R	BH107R	BH112R	BH145R	GWDUP1
				Sampling date / time	11-Mar-2025 00:00	11-Mar-2025 00:00	11-Mar-2025 00:00	12-Mar-2025 00:00	11-Mar-2025 00:00
Compound	CAS Number	LOR	Unit		ES2507162-001	ES2507162-002	ES2507162-003	ES2507162-004	ES2507162-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	----
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	<100	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	<100	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	----
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	----
^ Total Xylenes	----	2	µg/L		<2	<2	<2	<2	----
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	----
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		**28.4**	**26.8**	**29.0**	**28.0**	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH104R	BH107R	BH112R	BH145R	GWDUP1
				Sampling date / time	11-Mar-2025 00:00	11-Mar-2025 00:00	11-Mar-2025 00:00	12-Mar-2025 00:00	11-Mar-2025 00:00
Compound	CAS Number	LOR	Unit		ES2507162-001	ES2507162-002	ES2507162-003	ES2507162-004	ES2507162-005
					Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
2-Chlorophenol-D4	93951-73-6	1.0	%		**58.2**	**68.0**	**61.0**	**65.7**	**----**
2.4.6-Tribromophenol	118-79-6	1.0	%		**36.9**	**47.4**	**35.8**	**46.0**	**----**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		**58.8**	**66.7**	**67.4**	**68.4**	**----**
Anthracene-d10	1719-06-8	1.0	%		**66.2**	**81.8**	**82.5**	**77.1**	**----**
4-Terphenyl-d14	1718-51-0	1.0	%		**69.0**	**85.1**	**85.7**	**84.7**	**----**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**95.6**	**94.2**	**101**	**96.7**	**----**
Toluene-D8	2037-26-5	2	%		**101**	**98.9**	**105**	**102**	**----**
4-Bromofluorobenzene	460-00-4	2	%		**93.8**	**93.8**	**96.1**	**94.4**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	GWRB2	TRIP SPIKE	TRIP BLANK	----	----
			Sampling date / time	12-Mar-2025 00:00	07-Mar-2025 00:00	07-Mar-2025 00:00	----	----
Compound	CAS Number	LOR	Unit	ES2507162-006	ES2507162-007	ES2507162-008	--------	--------
				Result	Result	Result	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	----	----	<20	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	----	----	<20	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	----	----	<20	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	----	**16**	<1	----	----
Toluene	108-88-3	2	µg/L	----	**17**	<2	----	----
Ethylbenzene	100-41-4	2	µg/L	----	**17**	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	----	**18**	<2	----	----
ortho-Xylene	95-47-6	2	µg/L	----	**18**	<2	----	----
^ **Total Xylenes**	----	2	µg/L	----	**36**	<2	----	----
^ **Sum of BTEX**	----	1	µg/L	----	**86**	<1	----	----
Naphthalene	91-20-3	5	µg/L	----	**20**	<5	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	----	**112**	**111**	----	----
Toluene-D8	2037-26-5	2	%	----	**111**	**112**	----	----
4-Bromofluorobenzene	460-00-4	2	%	----	**115**	**120**	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72	143
Toluene-D8	2037-26-5	75	131
4-Bromofluorobenzene	460-00-4	73	137

QUALITY CONTROL REPORT

Work Order	: **ES2507162**	Page	: 1 of 15
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Contact	: Samiksha Sathish
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9239 7100	Telephone	: +61-2-8784 8555
Project	: 12554717	Date Samples Received	: 12-Mar-2025
Order number	: 12554717	Date Analysis Commenced	: 13-Mar-2025
C-O-C number	: ----	Issue Date	: 19-Mar-2025
Sampler	: LIA Saunders, Nica Hugo		
Site	: ----		
Quote number	: SY/322/21_V6		
No. of samples received	: 8		
No. of samples analysed	: 8		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
= Indicates failed QC
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 6443601)									
ES2506856-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	450	448	0.4	0% - 20%
ES2506961-012	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	22	22	0.0	No Limit
ES2506975-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	70	80	12.3	No Limit
ES2507089-012	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	696	700	0.7	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 6443606)									
ES2506938-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	53	51	3.9	No Limit
ES2507041-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	104	98	5.0	0% - 50%
ES2507158-012	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	826	858	3.9	0% - 20%
EW2501384-003	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	558	572	2.6	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 6443602)									
ES2506856-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	147	136	7.4	0% - 20%
ES2506961-012	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	21	20	0.0	No Limit
ES2506975-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	6	6	0.0	No Limit
ES2507089-012	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	85	85	0.0	0% - 50%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 6443607)									
ES2506938-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ES2507041-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ES2507158-012	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	34	39	13.1	No Limit
EW2501384-003	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	6	6	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 6437792)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 6437792) - continued									
ES2507125-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	184	181	1.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	184	181	1.5	0% - 20%
ES2507149-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	71	72	1.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	71	72	1.5	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 6437276)									
ES2507112-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	43	44	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 6438238)									
ES2506940-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.0	No Limit
ES2506971-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	12	12	0.0	0% - 50%
ED045G: Chloride by Discrete Analyser (QC Lot: 6437279)									
ES2507112-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	23	24	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 6438242)									
ES2507139-005	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	51	47	7.2	0% - 20%
EW2501355-006	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	20	20	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 6441633)									
ES2506961-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	43	43	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	14	14	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	4	4	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.0	No Limit
ES2506995-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	354	353	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	404	405	0.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1840	1880	2.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	52	52	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 6441636)									
ES2507162-002	BH107R	ED093F: Calcium	7440-70-2	1	mg/L	37	39	4.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	91	97	6.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	597	639	6.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	14	14	0.0	0% - 50%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6441634)									
ME2500374-006	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6441634) - continued									
ME2500374-006	Anonymous	EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.076	0.074	2.5	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
ES2507162-002	BH107R	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.002	0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.010	0.007	31.8	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6441729)									
ES2507027-012	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.008	0.008	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.022	0.019	13.5	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EW2501285-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001 (0.0010)*	mg/L	<0.0010	<0.0010	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001 (0.010) *	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001 (0.010) *	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001 (0.010) *	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001 (0.010) *	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001 (0.010) *	mg/L	0.118	0.112	5.0	0% - 50%
		EG020A-F: Nickel	7440-02-0	0.001 (0.010) *	mg/L	<0.010	<0.010	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6441729) - continued									
EW2501285-002	Anonymous	EG020A-F: Zinc	7440-66-6	0.005 (0.050) *	mg/L	0.077	0.074	3.9	No Limit
		EG020A-F: Iron	7439-89-6	0.05 (0.10)*	mg/L	<0.10	<0.10	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 6439860)									
ES2506938-008	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.007	0.007	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
ES2507158-009	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.002	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.002	0.006	110	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.008	0.008	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 6441635)									
ES2507113-003	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 6441730)									
ES2507076-003	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6439857)									
ES2506938-009	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2507158-009	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 6440191)									
ES2507158-006	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.02	63.8	No Limit
ES2507162-002	BH107R	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.02	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 6437278)									
ES2507162-003	BH112R	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.26	0.26	0.0	0% - 20%
ES2507112-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 6438241)									
ES2507139-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2507158-011	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 6440190)									
ES2507158-006	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	<0.01	0.0	No Limit
ES2507162-002	BH107R	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	2.68	2.65	1.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 6440186)									
ES2507158-006	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.1	1.1	0.0	0% - 50%
ES2507162-003	BH112R	EK061G: Total Kjeldahl Nitrogen as N	----	0.1 (0.5)*	mg/L	3.6	3.5	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 6440187)									
ES2507158-006	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.08	0.10	19.7	0% - 50%
ES2507162-003	BH112R	EK067G: Total Phosphorus as P	----	0.01 (0.05)*	mg/L	1.14	1.02	11.3	0% - 20%
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 6437277)									
ES2507162-003	BH112R	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.02	0.02	0.0	No Limit
ES2507112-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 6438243)									
ES2507158-008	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	1.04	1.04	0.0	0% - 20%
EW2501355-003	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6437337)									
ES2507039-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6438446)									
EN2504337-006	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EN2504422-007	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6437337)									
ES2507039-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6438446)									
EN2504337-006	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EN2504422-007	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 6437337)									
ES2507039-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
EP080: BTEXN (QC Lot: 6438446)									
EN2504337-006	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080: BTEXN (QC Lot: 6438446) - continued									
EN2504422-007	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 6443601)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	96.2	87.0	109
				<10	293 mg/L	109	75.2	126
				<10	2410 mg/L	98.4	83.0	124
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 6443606)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	95.4	87.0	109
				<10	293 mg/L	109	75.2	126
				<10	2410 mg/L	99.7	83.0	124
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 6443602)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	100	83.0	129
				<5	1000 mg/L	92.4	82.0	110
				<5	842 mg/L	96.0	83.0	118
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 6443607)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	97.0	83.0	129
				<5	1000 mg/L	95.6	82.0	110
				<5	842 mg/L	103	83.0	118
ED037P: Alkalinity by PC Titrator (QCLot: 6437792)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	95.6	81.0	115
				----	50 mg/L	99.9	80.0	128
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6437276)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	93.6	82.0	122
				<1	500 mg/L	98.2	82.0	122
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6438238)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	90.5	82.0	122
				<1	500 mg/L	98.9	82.0	122
ED045G: Chloride by Discrete Analyser (QCLot: 6437279)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	116	80.9	127
				<1	1000 mg/L	114	80.9	127
ED045G: Chloride by Discrete Analyser (QCLot: 6438242)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	105	80.9	127
				<1	1000 mg/L	96.0	80.9	127
ED093F: Dissolved Major Cations (QCLot: 6441633)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
ED093F: Dissolved Major Cations (QCLot: 6441633) - continued								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	80.0	114
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	90.0	116
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	82.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	101	85.0	113
ED093F: Dissolved Major Cations (QCLot: 6441636)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	80.0	114
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.8	90.0	116
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	82.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	102	85.0	113
EG020F: Dissolved Metals by ICP-MS (QCLot: 6441634)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	94.7	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	97.1	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	105	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	93.6	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	92.3	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	97.7	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	92.0	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	92.2	81.0	117
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	104	82.0	112
EG020F: Dissolved Metals by ICP-MS (QCLot: 6441729)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	99.0	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	97.8	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.4	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	98.9	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	98.1	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	94.9	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	98.9	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	93.8	81.0	117
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	94.3	82.0	112
EG020T: Total Metals by ICP-MS (QCLot: 6439860)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	94.7	82.0	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	89.8	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	98.1	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	93.8	83.0	118

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 6439860) - continued								
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	94.0	85.0	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	92.1	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	92.9	79.0	117
EG035F: Dissolved Mercury by FIMS (QCLot: 6441635)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	104	83.0	105
EG035F: Dissolved Mercury by FIMS (QCLot: 6441730)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	105	83.0	105
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6439857)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	103	77.0	111
EK055G: Ammonia as N by Discrete Analyser (QCLot: 6440191)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	101	90.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6437278)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	104	82.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6438241)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	104	82.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6440190)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	106	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 6440186)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	97.1	69.0	123
				<0.1	2.5 mg/L	99.6	70.0	123
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6440187)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	104	71.3	126
				<0.01	0.5 mg/L	112	71.3	126
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6437277)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	97.7	85.0	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6438243)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	98.2	85.0	117
EP075(SIM)A: Phenolic Compounds (QCLot: 6438385)								
EP075(SIM): Phenol	108-95-2	1	µg/L	<1.0	5 µg/L	36.1	24.5	61.9
EP075(SIM): 2-Chlorophenol	95-57-8	1	µg/L	<1.0	5 µg/L	68.0	52.0	90.0
EP075(SIM): 2-Methylphenol	95-48-7	1	µg/L	<1.0	5 µg/L	72.9	51.0	91.0
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2	µg/L	<2.0	10 µg/L	65.6	44.0	88.0
EP075(SIM): 2-Nitrophenol	88-75-5	1	µg/L	<1.0	5 µg/L	77.8	48.0	100
EP075(SIM): 2.4-Dimethylphenol	105-67-9	1	µg/L	<1.0	5 µg/L	71.8	49.0	99.0

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP075(SIM)A: Phenolic Compounds (QCLot: 6438385) - continued								
EP075(SIM): 2.4-Dichlorophenol	120-83-2	1	µg/L	<1.0	5 µg/L	66.8	53.0	105
EP075(SIM): 2.6-Dichlorophenol	87-65-0	1	µg/L	<1.0	5 µg/L	68.4	57.0	105
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	1	µg/L	<1.0	5 µg/L	69.9	53.0	99.0
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	1	µg/L	<1.0	5 µg/L	80.0	50.0	106
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	1	µg/L	<1.0	5 µg/L	71.5	51.0	105
EP075(SIM): Pentachlorophenol	87-86-5	2	µg/L	<2.0	10 µg/L	34.2	10.0	95.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6438385)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	69.7	50.0	94.0
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	74.9	63.6	114
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	67.4	62.2	113
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	78.0	63.9	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	66.7	62.6	116
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	67.1	64.3	116
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	68.7	63.6	118
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	69.2	63.1	118
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	70.0	64.1	117
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	71.3	62.5	116
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	75.0	61.7	119
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	74.7	63.0	115
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	74.1	63.3	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	67.7	59.9	118
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	67.9	61.2	117
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	73.7	59.1	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6437337)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	84.4	75.0	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6438384)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	73.4	53.7	97.0
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	93.0	63.3	107
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	99.6	58.3	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6438446)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	92.9	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6437337)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	87.2	75.0	127

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6438384)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	80.6	53.9	95.5
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	99.7	57.8	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	99.3	50.5	115
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6438446)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	92.5	75.0	127
EP080: BTEXN (QCLot: 6437337)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	111	68.3	119
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	108	73.5	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	104	73.8	122
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	103	73.0	122
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	104	76.4	123
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	103	75.5	124
EP080: BTEXN (QCLot: 6438446)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	98.2	68.3	119
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	112	73.5	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	102	73.8	122
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	106	73.0	122
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	108	76.4	123
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	112	75.5	124

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6437276)							
ES2507112-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6438238)							
ES2506940-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	97.6	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 6437279)							
ES2507112-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	130	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED045G: Chloride by Discrete Analyser (QCLot: 6438242)							
ES2507139-005	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	116	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 6441634)							
ES2507113-001	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	98.4	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	96.0	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	96.6	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	95.6	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	95.6	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	94.4	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	96.3	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	98.5	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 6441729)							
ES2507027-013	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	95.8	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	98.8	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	98.2	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	97.3	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	94.5	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	95.6	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	99.5	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	98.1	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 6439860)							
ES2506938-009	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	97.0	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	93.7	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	102	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	101	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	99.0	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	95.5	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	98.1	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 6441635)							
ES2507113-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	70.1	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 6441730)							
ES2507076-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	101	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6439857)							
ES2506938-008	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	85.4	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 6440191)							
ES2507158-006	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	106	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6437278)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6437278) - continued							
ES2507112-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	119	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6438241)							
ES2507139-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	100	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6440190)							
ES2507158-006	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	104	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 6440186)							
ES2507158-007	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	81.0	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6440187)							
ES2507158-007	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	108	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6437277)							
ES2507112-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	109	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6438243)							
ES2507158-008	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	92.2	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6437337)							
ES2507039-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	86.6	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6438446)							
EN2504337-006	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	91.4	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6437337)							
ES2507039-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	83.7	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6438446)							
EN2504337-006	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	88.1	70.0	130
EP080: BTEXN (QCLot: 6437337)							
ES2507039-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	106	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	94.9	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	95.0	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	92.4	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	95.7	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	113	70.0	130
EP080: BTEXN (QCLot: 6438446)							
EN2504337-006	Anonymous	EP080: Benzene	71-43-2	25 µg/L	94.9	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	101	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	102	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	104	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080: BTEXN (QCLot: 6438446) - continued							
EN2504337-006	Anonymous	EP080: ortho-Xylene	95-47-6	25 µg/L	107	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	109	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2507162**	Page	: 1 of 11
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR HENRY LUO	Telephone	: +61-2-8784 8555
Project	: 12554717	Date Samples Received	: 12-Mar-2025
Site	: ----	Issue Date	: 19-Mar-2025
Sampler	: LIA Saunders, Nica Hugo	No. of samples received	: 8
Order number	: 12554717	No. of samples analysed	: 8

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES2507112--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)						
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	7	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	11	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	7	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	11	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / Client Sample ID(s)	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EA015: Total Dissolved Solids dried at 180 ± 5 °C							
Clear Plastic Bottle - Natural (EA015H) BH104R, BH107R, BH112R	**11-Mar-2025**	**----**	----	----	**17-Mar-2025**	18-Mar-2025	✓
Clear Plastic Bottle - Natural (EA015H) BH145R	**12-Mar-2025**	**----**	----	----	**17-Mar-2025**	19-Mar-2025	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H) BH104R, BH107R, BH112R	**11-Mar-2025**	**----**	----	----	**17-Mar-2025**	18-Mar-2025	✓
Clear Plastic Bottle - Natural (EA025H) BH145R	**12-Mar-2025**	**----**	----	----	**17-Mar-2025**	19-Mar-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA065: Total Hardness as CaCO3							
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
BH104R, BH107R, BH112R	**11-Mar-2025**	**----**	----	**----**	**17-Mar-2025**	08-Apr-2025	✓
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
BH145R	**12-Mar-2025**	**----**	----	**----**	**17-Mar-2025**	09-Apr-2025	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
BH104R, BH107R, BH112R	**11-Mar-2025**	**----**	----	**----**	**14-Mar-2025**	25-Mar-2025	✓
Clear Plastic Bottle - Natural (ED037-P)							
BH145R	**12-Mar-2025**	**----**	----	**----**	**14-Mar-2025**	26-Mar-2025	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
BH104R, BH107R, BH112R	**11-Mar-2025**	**----**	----	**----**	**13-Mar-2025**	08-Apr-2025	✓
Clear Plastic Bottle - Natural (ED041G)							
BH145R	**12-Mar-2025**	**----**	----	**----**	**14-Mar-2025**	09-Apr-2025	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
BH104R, BH107R, BH112R	**11-Mar-2025**	**----**	----	**----**	**13-Mar-2025**	08-Apr-2025	✓
Clear Plastic Bottle - Natural (ED045G)							
BH145R	**12-Mar-2025**	**----**	----	**----**	**14-Mar-2025**	09-Apr-2025	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
BH104R, BH107R, BH112R	**11-Mar-2025**	**----**	----	**----**	**17-Mar-2025**	08-Apr-2025	✓
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
BH145R	**12-Mar-2025**	**----**	----	**----**	**17-Mar-2025**	09-Apr-2025	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
BH104R, BH107R, BH112R, GWDUP1	**11-Mar-2025**	**----**	----	**----**	**17-Mar-2025**	07-Sep-2025	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
BH145R	**12-Mar-2025**	**----**	----	**----**	**17-Mar-2025**	08-Sep-2025	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)							
GWRB2	**12-Mar-2025**	**14-Mar-2025**	08-Sep-2025	✓	**14-Mar-2025**	08-Sep-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)							
GWDUP1	**11-Mar-2025**	**----**	----	----	**18-Mar-2025**	08-Apr-2025	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)							
BH104R, BH107R, BH112R	**11-Mar-2025**	**----**	----	----	**19-Mar-2025**	08-Apr-2025	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)							
BH145R	**12-Mar-2025**	**----**	----	----	**19-Mar-2025**	09-Apr-2025	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
GWRB2	**12-Mar-2025**	**----**	----	----	**18-Mar-2025**	09-Apr-2025	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
BH104R, BH107R, BH112R	**11-Mar-2025**	**----**	----	----	**14-Mar-2025**	08-Apr-2025	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
BH145R	**12-Mar-2025**	**----**	----	----	**14-Mar-2025**	09-Apr-2025	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
BH104R, BH107R, BH112R	**11-Mar-2025**	**----**	----	----	**13-Mar-2025**	13-Mar-2025	✓
Clear Plastic Bottle - Natural (EK057G)							
BH145R	**12-Mar-2025**	**----**	----	----	**14-Mar-2025**	14-Mar-2025	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
BH104R, BH107R, BH112R	**11-Mar-2025**	**----**	----	----	**14-Mar-2025**	08-Apr-2025	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
BH145R	**12-Mar-2025**	**----**	----	----	**14-Mar-2025**	09-Apr-2025	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
BH104R, BH107R, BH112R	**11-Mar-2025**	**14-Mar-2025**	08-Apr-2025	✓	**14-Mar-2025**	08-Apr-2025	✓
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
BH145R	**12-Mar-2025**	**14-Mar-2025**	09-Apr-2025	✓	**14-Mar-2025**	09-Apr-2025	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
BH104R, BH107R, BH112R	**11-Mar-2025**	**14-Mar-2025**	08-Apr-2025	✓	**14-Mar-2025**	08-Apr-2025	✓
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
BH145R	**12-Mar-2025**	**14-Mar-2025**	09-Apr-2025	✓	**14-Mar-2025**	09-Apr-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) BH104R, BH107R, BH112R	**11-Mar-2025**	**----**	----	----	**13-Mar-2025**	13-Mar-2025	✓
Clear Plastic Bottle - Natural (EK071G) BH145R	**12-Mar-2025**	**----**	----	----	**14-Mar-2025**	14-Mar-2025	✓
EP075(SIM)A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved (EP075(SIM)) BH104R, BH107R, BH112R	**11-Mar-2025**	**14-Mar-2025**	18-Mar-2025	✓	**16-Mar-2025**	23-Apr-2025	✓
Amber Glass Bottle - Unpreserved (EP075(SIM)) BH145R	**12-Mar-2025**	**14-Mar-2025**	19-Mar-2025	✓	**16-Mar-2025**	23-Apr-2025	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) BH104R, BH107R, BH112R	**11-Mar-2025**	**14-Mar-2025**	18-Mar-2025	✓	**16-Mar-2025**	23-Apr-2025	✓
Amber Glass Bottle - Unpreserved (EP075(SIM)) BH145R	**12-Mar-2025**	**14-Mar-2025**	19-Mar-2025	✓	**16-Mar-2025**	23-Apr-2025	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) BH104R, BH107R, BH112R	**11-Mar-2025**	**14-Mar-2025**	18-Mar-2025	✓	**18-Mar-2025**	23-Apr-2025	✓
Amber Glass Bottle - Unpreserved (EP071) BH145R	**12-Mar-2025**	**14-Mar-2025**	19-Mar-2025	✓	**18-Mar-2025**	23-Apr-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080) TRIP BLANK	**07-Mar-2025**	**14-Mar-2025**	21-Mar-2025	✓	**14-Mar-2025**	21-Mar-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080) BH104R, BH107R, BH112R	**11-Mar-2025**	**13-Mar-2025**	25-Mar-2025	✓	**14-Mar-2025**	25-Mar-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080) BH145R	**12-Mar-2025**	**13-Mar-2025**	26-Mar-2025	✓	**14-Mar-2025**	26-Mar-2025	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) BH104R, BH107R, BH112R	**11-Mar-2025**	**14-Mar-2025**	18-Mar-2025	✓	**18-Mar-2025**	23-Apr-2025	✓
Amber Glass Bottle - Unpreserved (EP071) BH145R	**12-Mar-2025**	**14-Mar-2025**	19-Mar-2025	✓	**18-Mar-2025**	23-Apr-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080) TRIP BLANK	**07-Mar-2025**	**14-Mar-2025**	21-Mar-2025	✓	**14-Mar-2025**	21-Mar-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080) BH104R, BH107R, BH112R	**11-Mar-2025**	**13-Mar-2025**	25-Mar-2025	✓	**14-Mar-2025**	25-Mar-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080) BH145R	**12-Mar-2025**	**13-Mar-2025**	26-Mar-2025	✓	**14-Mar-2025**	26-Mar-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) TRIP SPIKE, TRIP BLANK	**07-Mar-2025**	**14-Mar-2025**	21-Mar-2025	✓	**14-Mar-2025**	21-Mar-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080) BH104R, BH107R, BH112R	**11-Mar-2025**	**13-Mar-2025**	25-Mar-2025	✓	**14-Mar-2025**	25-Mar-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080) BH145R	**12-Mar-2025**	**13-Mar-2025**	26-Mar-2025	✓	**14-Mar-2025**	26-Mar-2025	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	3	15	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	4	36	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	25	**12.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	4	34	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	7	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	4	23	**17.39**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	3	25	**12.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	8	80	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	8	80	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	11	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	3	30	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	15	**26.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	15	**13.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	25	**16.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	10	80	**12.50**	**12.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	10	80	**12.50**	**12.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	20	**15.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Control Samples (LCS) - Continued							
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	15	**13.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	15	**13.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	4	80	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	4	80	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	15	**13.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	15	**13.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	7	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	11	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).

Analytical Methods	Method	Matrix	Method Descriptions
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030E. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions

Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.

Lab / Analysis: Eurofins - SWDUP2

HT

CHAIN OF CUSTODY

ALS Laboratory: please tick →

Environmental Division Sydney

Work Order Reference ES2433144

CLIENT: GHD Pty Ltd	TURNAROUND REQUIREMENTS: ☐ Standard TAT (List due date): STAND/		
OFFICE: Sydney	(Standard TAT may be longer for some tests e.g., Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):		
PROJECT: M12 Surface Water	ALS QUOTE NO.: SY/322/21 V5		
ORDER NUMBER: 12554717		1 2 3 4	
PROJECT MANAGER: Henry Luo	CONTACT PH: Henry Luo 0414 090 002	1 2 3 4	
SAMPLER: Lia Saunders, Nica Hugo	SAMPLER MOBILE: 0411 213 724	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): ESDAT	Nica Hugo	
Email Reports to: emily.smith@ghd.com; lia.saunders@ghd.com; henry.luo@ghd.com,nica.hugo@ghd.com, ghdlabreports@ghd.com		DATE/TIME: 10/10/2024 @ 15:00	DATE/TIME: 10/10/24 1500

Telephone : + 61-2-8784 8555

LY (Circle) No N/A

upon receipt? No N/A

eceipt: 10.4 °C

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: ANALYSIS OF NITRITE (48 HRS HOLDING TIME). PLEASE DO NOT LOG ALL SAMPLES RECEIVED IN ONE WORKORDER. LOG AS TWO SEPARATE WORKORDERS AS PER THE TWO COCs PROVIDED.

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).													
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	Comments	TOTAL CONTAINERS	W-027T (8 total metals)	EN020T (total Fe, Mn)	NT-08A (total N, NO2, NO3, NH3, Total P, reactive P)	EP009 (chlorophyll a)	EP020 (oil & grease)	Ultra trace OPP (EP233AX)	EP074DEFG (VOC + fumigants, Hal aliphatics, Hal Aromatics, THM)	MW003 (PC, Thiophanate/Imidacloprid, Colifarm)	W-144 (PAH/phenols)	EA013H (TDS), EA025H (TSS)	EP080 (BTEXN)	UTO-9W Ultra trace OC/OP	Super Ultra Trace PCB's (EP131B-ST)	PFAS - full suite (EP231X)
1	BADDS	9/10/2024	Water		11	X	X	X	X	X	X	X		X	X	X			
2	BADMS	9/10/2024	Water		11	X	X	X	X	X	X	X		X	X	X			
3	BADUS	9/10/2024	Water		11	X	X	X	X	X	X	X		X	X	X			
4	COSDS	9/10/2024	Water		11	X	X	X	X	X	X	X		X	X	X			
5	COSUS	9/10/2024	Water		11	X	X	X	X	X	X	X		X	X	X			
6	HINDS	10/10/2024	Water		11	X	X	X	X	X	X	X		X	X	X			
7	HINUS	10/10/2024	Water		11	X	X	X	X	X	X	X		X	X	X			
8	KEMDS	10/10/2024	Water		11	X	X	X	X	X	X	X		X	X	X			
9	KEMUS	10/10/2024	Water		11	X	X	X	X	X	X	X		X	X	X			
10	ROPDS	10/10/2024	Water		11	X	X	X	X	X	X	X		X	X	X			
11	ROPUS	10/10/2024	Water		11	X	X	X	X	X	X	X		X	X	X			
12	SOUDS	10/10/2024	Water		11	X	X	X	X	X	X	X		X	X	X			
13	SOUUS	10/10/2024	Water		11	X	X	X	X	X	X	X		X	X	X			
14	SWDUP1	9/10/2024	Water		1	X													
FWD	SWDUP2	9/10/2024	Water	PLEASE FORWARD TO EUROFINS WITH ATTACHED COC	1														

1148295

HT

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: GHD Pty Ltd	TURNAROUND REQUIREME ☐ Standard TAT (List due date):	STANDARD TAT	FOR LABORATORY USE ONLY (Circle)
OFFICE: Sydney	(Standard TAT may be longer for some tests e.g. Ultra Trace ☐ Non Standard or urgent TAT (List due date):		Custody Seal Intact? Yes No N/A
PROJECT: M12 Groundwater	ALS QUOTE NO.: SY/322/21 V5	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: 12554717		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Henry Luo	CONTACT PH: Henry Luo 0414 090 002	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: Lia Saunders, Nica Hugo	SAMPLER MOBILE: 0468 301 344	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): ESDAT	Nica Hugo	RELINQUISHED BY:
Email Reports to: emily.smith@ghd.com; lia.saunders@ghd.com, henry.luo@ghd.com, nica.hugo@ghd.com, ghdlabreports@ghd.com		DATE/TIME: 10/10/2024 @ 15:00	DATE/TIME:
			DATE/TIME:
			RECEIVED BY: DATE/TIME: 10/10/24 1500

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: ANALYSIS OF NITRITE 48 HRS HOLDING TIME REQUIRED. PLEASE DO NOT LOG ALL SAMPLES RECEIVED IN ONE WORKORDER. LOG AS TWO SEPARATE WORKORDERS AS PER THE TWO COCs PROVIDED.

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).												
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	Comments	TOTAL CONTAINERS	W-02 (dissolved 8 metals)	EG020F (dissolved Fe, Mn)	W-04 (SRH/BTEXN)	NT-08A (TN, NO2, NO3, NH3, TP, soluble Reactive P)	NT-01D & 02 (major cations & anions, Hardness)	EA015H (TDS)	EA025H (TSS)	EP075A (SIN) (Phenols – Standard level (15 analytes))	W-02T (8 total metals)	BTEXN			
1	BH104R	9/10/2024	Water		6	X	X	X	X	X	X	X						
2	BH107R	9/10/2024	Water		6	X	X	X	X	X	X	X						
3	BH112R	9/10/2024	Water		6	X	X	X	X	X	X	X						
4	BH145R	10/09/2024	Water		6	X	X	X	X	X	X	X						
5	GWDUP1	9/10/2024	Water		1	X												
Fwd	GWDUP2	9/10/2024	Water	PLEASE FORWARD TO EUROFINS WITH ATTACHED COC	1													
6	GWRB1	9/10/2024	Water		1									X				
7	Trip spike	9/10/2024	Water		1										X			
8	Trip blank	9/10/2024	Water		1										X			

Environmental Division
Sydney
Work Order Reference
ES2433147



Telephone : +61-2-8784 8555

eurofins mgt

☑ **Sydney**
Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
Phone: +612 9900 8400
Email: enviro.syd@mgtlabmark.com.au

☐ **Brisbane**
Unit 1-21 Smallwood Place, Murrarie
Phone: +617 3902 4600
Email: enviro.bris@mgtlabmark.com.au

☐ **Melbourne**
2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 8564 5000 Fax: +613 8564 5090
Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : GHD Pty Ltd, Sydney	**Contact Name :** Lia Saunders 0411 213 724	**Purchase Order :** 12554717	**COC Number :**
Office Address :	**Project Manager:** Henry Luo 0414 090 002	**PROJECT Number :** 12554717	**Eurofins | mgt quote ID :**
Level 15, 133 Castlereagh Street, Sydney NSW 2000	**Email for results :** emily.smith@ghd.com; lia.saunders@ghd.com, nica.hugo@ghd.com, henry.luo@ghd.com; ghdlabreports@ghd.com	**PROJECT Name :** M12 Water Sampling	**Data output format:** ESDAT

Special Directions & Comments :

Sent from ALS

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	Dissolved metals	Total metals					
1	SWDUP2	10/10/2024	Water		X					
2	GWDUP2	10/10/2024	Water	X						
3										
4										
5										
6										
7										
8										
9										
10										

Analytes

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

	500P	250P	60P	1LA	40mL vial	200mL A	Jar	Bag	Sample comments:
1			1						
2			1						
3									
4									
5									
6									
7									
8									
9									
10									

Laboratory Staff

Relinquished By: Nica Hugo	**Received By:**
Date & Time : 10/10/2024 @ 15:00	**Date & Time :**
Signature:	**Signature:**

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival:

Report number:

eurofins | Environment Testing

www.eurofins.com.au EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise,	43 Detroit Drive	1277 Cameron Road,
Penrose,	Mount Wellington,	Rolleston,	Gate Pa,
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name: GHD Pty Ltd NSW
Contact name: Henry Luo
Project name: M12 WATER SAMPLING
Project ID: 12554717
Turnaround time: 5 Day
Date/Time received Oct 11, 2024 1:05 PM
Eurofins reference 1148295

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 10.9 degrees Celsius.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Adam Bateup on phone : or by email: AdamBateup@eurofins.com

Results will be delivered electronically via email to Henry Luo - henry.luo@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd NSW email address.

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise,	43 Detroit Drive	1277 Cameron Road,
Penrose,	Mount Wellington,	Rolleston,	Gate Pa,
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: M12 WATER SAMPLING
Project ID: 12554717

Order No.: 12554717
Report #: 1148295
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Oct 11, 2024 1:05 PM
Due: Oct 18, 2024
Priority: 5 Day
Contact Name: Henry Luo

Eurofins Analytical Services Manager : Adam Bateup

Sample Detail						Metals M8	Metals M8 filtered
Sydney Laboratory - NATA # 1261 Site # 18217						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	SWDUP2	Oct 10, 2024		Water	S24-Oc0029025	X	
2	GWDUP2	Oct 10, 2024		Water	S24-Oc0029026		X
Test Counts						1	1

GHD Pty Ltd NSW
Level 15, 133 Castlereagh Street
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Henry Luo**

Report **1148295-W**
Project name M12 WATER SAMPLING
Project ID 12554717
Received Date Oct 11, 2024

Client Sample ID			**SWDUP2**	**GWDUP2**
Sample Matrix			**Water**	**Water**
Eurofins Sample No.			**S24-Oc0029025**	**S24-Oc0029026**
Date Sampled			**Oct 10, 2024**	**Oct 10, 2024**
Test/Reference	LOR	Unit		
Heavy Metals				
Arsenic	0.001	mg/L	0.002	-
Arsenic (filtered)	0.001	mg/L	-	< 0.001
Cadmium	0.0002	mg/L	< 0.0002	-
Cadmium (filtered)	0.0002	mg/L	-	< 0.0002
Chromium	0.001	mg/L	< 0.001	-
Chromium (filtered)	0.001	mg/L	-	< 0.001
Copper	0.001	mg/L	0.003	-
Copper (filtered)	0.001	mg/L	-	0.002
Lead	0.001	mg/L	0.001	-
Lead (filtered)	0.001	mg/L	-	< 0.001
Mercury	0.0001	mg/L	< 0.0001	-
Mercury (filtered)	0.0001	mg/L	-	< 0.0001
Nickel	0.001	mg/L	< 0.001	-
Nickel (filtered)	0.001	mg/L	-	< 0.001
Zinc	0.005	mg/L	0.007	-
Zinc (filtered)	0.005	mg/L	-	0.007

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Metals M8	Sydney	Oct 11, 2024	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Metals M8 filtered	Sydney	Oct 11, 2024	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise,	43 Detroit Drive	1277 Cameron Road,
Penrose,	Mount Wellington,	Rolleston,	Gate Pa,
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: M12 WATER SAMPLING
Project ID: 12554717

Order No.: 12554717
Report #: 1148295
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Oct 11, 2024 1:05 PM
Due: Oct 18, 2024
Priority: 5 Day
Contact Name: Henry Luo

Eurofins Analytical Services Manager : Adam Bateup

Sample Detail						Metals M8	Metals M8 filtered
Sydney Laboratory - NATA # 1261 Site # 18217						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	SWDUP2	Oct 10, 2024		Water	S24-Oc0029025	X	
2	GWDUP2	Oct 10, 2024		Water	S24-Oc0029026		X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
3. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with **blue** colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the sampling date; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ppm:** parts per million
µg/L: micrograms per litre	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony Forming Unit	**Colour:** Pt-Co Units (CU)	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 6.0
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Heavy Metals							
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic (filtered)	%	98			80-120	Pass	
Cadmium (filtered)	%	99			80-120	Pass	
Chromium (filtered)	%	99			80-120	Pass	
Copper (filtered)	%	97			80-120	Pass	
Lead (filtered)	%	101			80-120	Pass	
Mercury (filtered)	%	105			80-120	Pass	
Nickel (filtered)	%	99			80-120	Pass	
Zinc (filtered)	%	100			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S24-Oc0025385	NCP	%	103			75-125	Pass	
Cadmium	S24-Oc0025385	NCP	%	104			75-125	Pass	
Chromium	S24-Oc0025385	NCP	%	98			75-125	Pass	
Copper	S24-Oc0025385	NCP	%	95			75-125	Pass	
Lead	S24-Oc0025385	NCP	%	99			75-125	Pass	
Mercury	S24-Oc0025385	NCP	%	111			75-125	Pass	
Nickel	S24-Oc0025385	NCP	%	97			75-125	Pass	
Zinc	S24-Oc0025385	NCP	%	94			75-125	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	N24-Oc0022805	NCP	%	94			75-125	Pass	
Cadmium (filtered)	N24-Oc0022805	NCP	%	97			75-125	Pass	
Chromium (filtered)	N24-Oc0022805	NCP	%	95			75-125	Pass	
Copper (filtered)	R24-Oc0015558	NCP	%	105			75-125	Pass	
Lead (filtered)	N24-Oc0022805	NCP	%	98			75-125	Pass	
Mercury (filtered)	N24-Oc0022805	NCP	%	99			75-125	Pass	
Nickel (filtered)	N24-Oc0022805	NCP	%	94			75-125	Pass	
Zinc (filtered)	R24-Oc0015558	NCP	%	87			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S24-Oc0029025	CP	mg/L	0.002	0.002	<1	30%	Pass	
Cadmium	S24-Oc0029025	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	S24-Oc0029025	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	S24-Oc0029025	CP	mg/L	0.003	0.003	2.0	30%	Pass	
Lead	S24-Oc0029025	CP	mg/L	0.001	0.001	6.0	30%	Pass	
Mercury	S24-Oc0029025	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	S24-Oc0029025	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc	S24-Oc0029025	CP	mg/L	0.007	0.007	9.0	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	S24-Oc0029573	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium (filtered)	S24-Oc0029573	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	S24-Oc0029573	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	S24-Oc0029573	NCP	mg/L	0.043	0.042	1.0	30%	Pass	
Lead (filtered)	S24-Oc0029573	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	S24-Oc0029573	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	S24-Oc0029573	NCP	mg/L	0.017	0.017	<1	30%	Pass	
Zinc (filtered)	S24-Oc0029573	NCP	mg/L	0.033	0.032	2.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Adam Bateup	Analytical Services Manager
Mickael Ros	Senior Analyst-Metal



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

eurofins | mgt

☑ **Sydney**
Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
Phone: +612 9900 8400
Email: enviro.syd@mgtlabmark.com.au

☐ **Brisbane**
Unit 1-21 Smallwood Place, Murrarie
Phone: +617 3902 4600
Email: enviro.bris@mgtlabmark.com.au

☐ **Melbourne**
2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 8564 5000 Fax: +613 8564 5090
Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : GHD Pty Ltd, Sydney	**Contact Name :** Lia Saunders 0411 213 724	**Purchase Order :** 12554717	**COC Number :**
Office Address :	**Project Manager:** Henry Luo 0414 090 002	**PROJECT Number :** 12554717	**Eurofins | mgt quote ID :**
Level 15, 133 Castlereagh Street, Sydney NSW 2000	**Email for results :** emily.smith@ghd.com; lia.saunders@ghd.com, nica.hugo@ghd.com, henry.luo@ghd.com; ghdlabreports@ghd.com	**PROJECT Name :** M12 Water Sampling	**Data output format:** ESDAT

Special Directions & Comments :

Sent from ALS

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	Dissolved metals	Total metals
1	SWDUP2	6/11/2024	Water		X
2	GWDUP2	7/10/2024	Water	X	
3					
4					
5					
6					
7					
8					
9					
10					

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

500P	250P	60P	1LA	40mL vial	200mL A	Jar	Bag	Sample comments:
		1						
		1						

Laboratory Staff

Relinquished By: Nica Hugo	**Received By:** Brendan
Date & Time : 7/11/2024 @ 15:45	**Date & Time :** 8/11/24 12:05
Signature:	**Signature:**

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal
☐ Courier Consignment # :

Temperature on arrival: 2.3

Report number: 1158219

eurofins | Environment Testing

www.eurofins.com.au EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise,	43 Detroit Drive	1277 Cameron Road,
Penrose,	Mount Wellington,	Rolleston,	Gate Pa,
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name: GHD Pty Ltd NSW
Contact name: Henry Luo
Project name: M12 WATER SAMPLING
Project ID: 12554717
Turnaround time: 5 Day
Date/Time received Nov 8, 2024 12:05 PM
Eurofins reference 1158219

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 2.3 degrees Celsius.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Adam Bateup on phone : or by email: AdamBateup@eurofins.com

Results will be delivered electronically via email to Henry Luo - henry.luo@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd NSW email address.

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise,	43 Detroit Drive	1277 Cameron Road,
Penrose,	Mount Wellington,	Rolleston,	Gate Pa,
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: M12 WATER SAMPLING
Project ID: 12554717

Order No.:
Report #: 1158219
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Nov 8, 2024 12:05 PM
Due: Nov 15, 2024
Priority: 5 Day
Contact Name: Henry Luo

Eurofins Analytical Services Manager : Adam Bateup

Sample Detail						Metals M8	Metals M8 filtered
Sydney Laboratory - NATA # 1261 Site # 18217						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	SWDUP2	Nov 06, 2024		Water	S24-No0022607	X	
2	GWDUP2	Nov 06, 2024		Water	S24-No0022608		X
Test Counts						1	1

GHD Pty Ltd NSW
Level 15, 133 Castlereagh Street
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Henry Luo**

Report **1158219-W**
Project name M12 WATER SAMPLING
Project ID 12554717
Received Date Nov 08, 2024

Client Sample ID			**SWDUP2**	**GWDUP2**
Sample Matrix			**Water**	**Water**
Eurofins Sample No.			**S24-No0022607**	**S24-No0022608**
Date Sampled			**Nov 06, 2024**	**Nov 06, 2024**
Test/Reference	LOR	Unit		
Heavy Metals				
Arsenic	0.001	mg/L	< 0.001	-
Arsenic (filtered)	0.001	mg/L	-	0.003
Cadmium	0.0002	mg/L	< 0.0002	-
Cadmium (filtered)	0.0002	mg/L	-	< 0.0002
Chromium	0.001	mg/L	0.002	-
Chromium (filtered)	0.001	mg/L	-	< 0.001
Copper	0.001	mg/L	0.002	-
Copper (filtered)	0.001	mg/L	-	< 0.001
Lead	0.001	mg/L	< 0.001	-
Lead (filtered)	0.001	mg/L	-	< 0.001
Mercury	0.0001	mg/L	< 0.0001	-
Mercury (filtered)	0.0001	mg/L	-	< 0.0001
Nickel	0.001	mg/L	0.001	-
Nickel (filtered)	0.001	mg/L	-	< 0.001
Zinc	0.005	mg/L	< 0.005	-
Zinc (filtered)	0.005	mg/L	-	< 0.005

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Metals M8	Sydney	Nov 09, 2024	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Metals M8 filtered	Sydney	Nov 09, 2024	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise,	43 Detroit Drive	1277 Cameron Road,
Penrose,	Mount Wellington,	Rolleston,	Gate Pa,
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: M12 WATER SAMPLING
Project ID: 12554717

Order No.:
Report #: 1158219
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Nov 8, 2024 12:05 PM
Due: Nov 15, 2024
Priority: 5 Day
Contact Name: Henry Luo

Eurofins Analytical Services Manager : Adam Bateup

Sample Detail						Metals M8	Metals M8 filtered
Sydney Laboratory - NATA # 1261 Site # 18217						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	SWDUP2	Nov 06, 2024		Water	S24-No0022607	X	
2	GWDUP2	Nov 06, 2024		Water	S24-No0022608		X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
3. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with **blue** colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the sampling date; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ppm:** parts per million
µg/L: micrograms per litre	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony Forming Unit	**Colour:** Pt-Co Units (CU)	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 6.0
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
Method Blank							
Heavy Metals							
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	96			80-120	Pass	
Cadmium	%	97			80-120	Pass	
Chromium	%	100			80-120	Pass	
Copper	%	97			80-120	Pass	
Lead	%	95			80-120	Pass	
Mercury	%	97			80-120	Pass	
Nickel	%	97			80-120	Pass	
Zinc	%	99			80-120	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic (filtered)	%	96			80-120	Pass	
Cadmium (filtered)	%	98			80-120	Pass	
Chromium (filtered)	%	106			80-120	Pass	
Copper (filtered)	%	97			80-120	Pass	
Lead (filtered)	%	108			80-120	Pass	
Mercury (filtered)	%	106			80-120	Pass	
Nickel (filtered)	%	106			80-120	Pass	
Zinc (filtered)	%	106			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	S24-No0024630	NCP	%	114			75-125	Pass	
Cadmium (filtered)	S24-No0024630	NCP	%	103			75-125	Pass	
Chromium (filtered)	S24-No0024630	NCP	%	96			75-125	Pass	
Copper (filtered)	S24-No0024630	NCP	%	83			75-125	Pass	
Lead (filtered)	S24-No0024630	NCP	%	92			75-125	Pass	
Mercury (filtered)	S24-No0024630	NCP	%	90			75-125	Pass	
Nickel (filtered)	S24-No0024630	NCP	%	91			75-125	Pass	
Zinc (filtered)	S24-No0024630	NCP	%	88			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	R24-No0012692	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	R24-No0012692	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	R24-No0012692	NCP	mg/L	< 0.001	0.002	140	30%	Fail	Q15
Copper	R24-No0012692	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead	R24-No0012692	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury	R24-No0012692	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	R24-No0012692	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc	R24-No0012692	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	S24-No0024631	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium (filtered)	S24-No0024631	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	S24-No0024631	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	S24-No0024631	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead (filtered)	S24-No0024631	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	S24-No0024631	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	S24-No0024631	NCP	mg/L	0.001	0.001	<1	30%	Pass	
Zinc (filtered)	S24-No0024631	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Adam Bateup	Analytical Services Manager
Mickael Ros	Senior Analyst-Metal



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

eurofins | mgt

☑ **Sydney**
Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
Phone: +612 9900 8400
Email: enviro.syd@mgtlabmark.com.au

☐ **Brisbane**
Unit 1-21 Smallwood Place, Murrarie
Phone: +617 3902 4600
Email: enviro.bris@mgtlabmark.com.au

☐ **Melbourne**
2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 8564 5000 Fax: +613 8564 5090
Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : GHD Pty Ltd, Sydney
Office Address : Level 15, 133 Castlereagh Street, Sydney NSW 2000

Contact Name : Lia Saunders 0411 213 724
Project Manager: Henry Luo 0414 090 002
Email for results : emily.smith@ghd.com; lia.saunders@ghd.com, nica.hugo@ghd.com, henry.luo@ghd.com; ghdlabreports@ghd.com

Purchase Order : 12554717
PROJECT Number : 12554717
PROJECT Name : M12 Water Sampling

COC Number :
Eurofins | mgt quote ID :
Data output format: ESDAT

Special Directions & Comments : Sent from ALS

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	Dissolved metals	Total metals	Analytes						
1	SWDUP2	11/12/2024	Water		X							
2	GWDUP2	12/12/2024	Water	X								
3												
4												
5												
6												
7												
8												
9												
10												

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

500P	250P	60P	1LA	40mL vial	200mL A	Jar	Bag
		1					
		1					

Sample comments:

Laboratory Staff

Relinquished By: Lia Saunders
Date & Time : 12/12/2024 @ 19:00
Signature: L. Saunders

Received By: Brenton
Date & Time : 13/12/24 1:05
Signature:

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival: 3.8

Report number: 171608

eurofins | Environment Testing

www.eurofins.com.au EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise,	43 Detroit Drive	1277 Cameron Road,
Penrose,	Mount Wellington,	Rolleston,	Gate Pa,
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name: GHD Pty Ltd NSW
Contact name: Henry Luo
Project name: M12 WATER SAMPLING
Project ID: 12554717
Turnaround time: 3 Day
Date/Time received Dec 13, 2024 1:05 PM
Eurofins reference 1171608

Sample Information

✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

✓ Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 3.8 degrees Celsius.

✓ All samples have been received as described on the above COC.

✓ COC has been completed correctly.

✓ Attempt to chill was evident.

✓ Appropriately preserved sample containers have been used.

✓ All samples were received in good condition.

✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

✓ Appropriate sample containers have been used.

✓ Sample containers for volatile analysis received with zero headspace.

X Split sample sent to requested external lab.

X Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Adam Bateup on phone : or by email: Adam.Bateup@eurofinsanz.com

Results will be delivered electronically via email to Henry Luo - henry.luo@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd NSW email address.

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise,	43 Detroit Drive	1277 Cameron Road,
Penrose,	Mount Wellington,	Rolleston,	Gate Pa,
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: M12 WATER SAMPLING
Project ID: 12554717

Order No.:
Report #: 1171608
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Dec 13, 2024 1:05 PM
Due: Dec 18, 2024
Priority: 3 Day
Contact Name: Henry Luo

Eurofins Analytical Services Manager : Adam Bateup

Sample Detail						Metals M8	Metals M8 filtered
Sydney Laboratory - NATA # 1261 Site # 18217						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	SWDUP2	Dec 11, 2024		Water	S24-De0039623	X	
2	GWDUP2	Dec 12, 2024		Water	S24-De0039624		X
Test Counts						1	1

eurofins | Environment Testing

Certificate of Analysis

GHD Pty Ltd NSW
Level 15, 133 Castlereagh Street
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Henry Luo**

Report **1171608-W**
Project name M12 WATER SAMPLING
Project ID 12554717
Received Date Dec 13, 2024

Client Sample ID			**SWDUP2**	**GWDUP2**
Sample Matrix			**Water**	**Water**
Eurofins Sample No.			**S24-De0039623**	**S24-De0039624**
Date Sampled			**Dec 11, 2024**	**Dec 12, 2024**
Test/Reference	LOR	Unit		
Heavy Metals				
Arsenic	0.001	mg/L	0.002	-
Arsenic (filtered)	0.001	mg/L	-	0.002
Cadmium	0.0002	mg/L	< 0.0002	-
Cadmium (filtered)	0.0002	mg/L	-	< 0.0002
Chromium	0.001	mg/L	0.002	-
Chromium (filtered)	0.001	mg/L	-	< 0.001
Copper	0.001	mg/L	0.004	-
Copper (filtered)	0.001	mg/L	-	< 0.001
Lead	0.001	mg/L	< 0.001	-
Lead (filtered)	0.001	mg/L	-	< 0.001
Mercury	0.0001	mg/L	< 0.0001	-
Mercury (filtered)	0.0001	mg/L	-	< 0.0001
Nickel	0.001	mg/L	0.002	-
Nickel (filtered)	0.001	mg/L	-	< 0.001
Zinc	0.005	mg/L	0.012	-
Zinc (filtered)	0.005	mg/L	-	< 0.005

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Metals M8	Sydney	Dec 17, 2024	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Metals M8 filtered	Sydney	Dec 17, 2024	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise,	43 Detroit Drive	1277 Cameron Road,
Penrose,	Mount Wellington,	Rolleston,	Gate Pa,
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: M12 WATER SAMPLING
Project ID: 12554717

Order No.:
Report #: 1171608
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Dec 13, 2024 1:05 PM
Due: Dec 18, 2024
Priority: 3 Day
Contact Name: Henry Luo

Eurofins Analytical Services Manager : Adam Bateup

Sample Detail						Metals M8	Metals M8 filtered
Sydney Laboratory - NATA # 1261 Site # 18217						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	SWDUP2	Dec 11, 2024		Water	S24-De0039623	X	
2	GWDUP2	Dec 12, 2024		Water	S24-De0039624		X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
3. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with **blue** colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the sampling date; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ppm:** parts per million
µg/L: micrograms per litre	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony Forming Unit	**Colour:** Pt-Co Units (CU)	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 6.0
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
Method Blank							
Heavy Metals							
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	94			80-120	Pass	
Cadmium	%	88			80-120	Pass	
Chromium	%	93			80-120	Pass	
Copper	%	92			80-120	Pass	
Lead	%	92			80-120	Pass	
Mercury	%	98			80-120	Pass	
Nickel	%	91			80-120	Pass	
Zinc	%	93			80-120	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic (filtered)	%	92			80-120	Pass	
Cadmium (filtered)	%	90			80-120	Pass	
Chromium (filtered)	%	93			80-120	Pass	
Copper (filtered)	%	94			80-120	Pass	
Lead (filtered)	%	92			80-120	Pass	
Mercury (filtered)	%	94			80-120	Pass	
Nickel (filtered)	%	92			80-120	Pass	
Zinc (filtered)	%	93			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	S24-De0044553	NCP	%	120			75-125	Pass	
Cadmium (filtered)	S24-De0044553	NCP	%	99			75-125	Pass	
Chromium (filtered)	S24-De0044553	NCP	%	96			75-125	Pass	
Copper (filtered)	S24-De0044553	NCP	%	89			75-125	Pass	
Lead (filtered)	S24-De0044553	NCP	%	91			75-125	Pass	
Nickel (filtered)	S24-De0044553	NCP	%	89			75-125	Pass	
Zinc (filtered)	S24-De0044553	NCP	%	91			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S24-De0035962	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	S24-De0035962	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	S24-De0035962	NCP	mg/L	0.002	0.003	32	30%	Fail	Q15
Copper	S24-De0035962	NCP	mg/L	< 0.001	0.001	49	30%	Fail	Q15
Lead	S24-De0035962	NCP	mg/L	0.003	0.006	53	30%	Fail	Q15
Mercury	S24-De0035962	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	S24-De0035962	NCP	mg/L	0.001	0.002	54	30%	Fail	Q15
Zinc	S24-De0035962	NCP	mg/L	0.007	0.010	37	30%	Fail	Q15
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	S24-De0044644	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium (filtered)	S24-De0044644	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	S24-De0044644	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	S24-De0044644	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead (filtered)	S24-De0044644	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	S24-De0044644	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	S24-De0044644	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc (filtered)	S24-De0044644	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Nileshni Goundar	Analytical Services Manager
Mickael Ros	Senior Analyst-Metal



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

eurofins | mgt

☑ **Sydney**
Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
Phone: +612 9900 8400
Email: enviro.syd@mgtlabmark.com.au

☐ **Brisbane**
Unit 1-21 Smallwood Place, Murrarie
Phone: +617 3902 4600
Email: enviro.bris@mgtlabmark.com.au

☐ **Melbourne**
2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 8564 5000 Fax: +613 8564 5090
Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : GHD Pty Ltd, Sydney	**Contact Name :** Lia Saunders 0411 213 724	**Purchase Order :** 12554717	**COC Number :**
Office Address :	**Project Manager:** Henry Luo 0414 090 002	**PROJECT Number :** 12554717	**Eurofins | mgt quote ID :**
Level 15, 133 Castlereagh Street, Sydney NSW 2000	**Email for results :** emily.smith@ghd.com; lia.saunders@ghd.com, nica.hugo@ghd.com, henry.luo@ghd.com; ghdlabreports@ghd.com	**PROJECT Name :** M12 Water Sampling	**Data output format:** ESDAT

Special Directions & Comments :

Sent from ALS

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	Dissolved metals	Total metals					
1	SWDUP2	16/01/2025	Water		X					
2	GWDUP2	17/01/2025	Water	X						
3										
4										
5										
6										
7										
8										
9										
10										

ES2501192 / ES2501188

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

500P	250P	60P	1LA	40mL vial	200mL A	Jar	Bag
		1					
		1					

Sample comments:

Laboratory Staff

Relinquished By: Lia Saunders	**Received By:** Elizabeth Brotherton
Date & Time : 17/01/2025 at 18:00	**Date & Time :** 20/1 11:43am
Signature: L. Saunders	**Signature:** E/B

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal
☐
Courier Consignment # :

Temperature on arrival: 9.6

Report number: #1178885

eurofins | Environment Testing

www.eurofins.com.au EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise,	43 Detroit Drive	1277 Cameron Road,
Penrose,	Mount Wellington,	Rolleston,	Gate Pa,
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name: GHD Pty Ltd NSW
Contact name: Henry Luo
Project name: M12 WATER SAMPLING
Project ID: 12554717
Turnaround time: 5 Day
Date/Time received Jan 20, 2025 11:43 AM
Eurofins reference 1178885

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 9.6 degrees Celsius.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Adam Bateup on phone : or by email: Adam.Bateup@eurofinsanz.com

Results will be delivered electronically via email to Henry Luo - henry.luo@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd NSW email address.

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise,	43 Detroit Drive	1277 Cameron Road,
Penrose,	Mount Wellington,	Rolleston,	Gate Pa,
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: M12 WATER SAMPLING
Project ID: 12554717

Order No.: 12554717
Report #: 1178885
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Jan 20, 2025 11:43 AM
Due: Jan 28, 2025
Priority: 5 Day
Contact Name: Henry Luo

Eurofins Analytical Services Manager : Adam Bateup

Sample Detail						Metals M8	Metals M8 filtered
Sydney Laboratory - NATA # 1261 Site # 18217						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	SWDUP2	Jan 16, 2025		Water	S25-Ja0026757	X	
2	GWDUP2	Jan 17, 2025		Water	S25-Ja0026758		X
Test Counts						1	1

GHD Pty Ltd NSW
Level 15, 133 Castlereagh Street
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Henry Luo**

Report **1178885-W**
Project name M12 WATER SAMPLING
Project ID 12554717
Received Date Jan 20, 2025

Client Sample ID			**SWDUP2**	**GWDUP2**
Sample Matrix			**Water**	**Water**
Eurofins Sample No.			**S25-Ja0026757**	**S25-Ja0026758**
Date Sampled			**Jan 16, 2025**	**Jan 17, 2025**
Test/Reference	LOR	Unit		
Heavy Metals				
Arsenic	0.001	mg/L	0.002	-
Arsenic (filtered)	0.001	mg/L	-	0.004
Cadmium	0.0002	mg/L	< 0.0002	-
Cadmium (filtered)	0.0002	mg/L	-	< 0.0002
Chromium	0.001	mg/L	0.002	-
Chromium (filtered)	0.001	mg/L	-	< 0.001
Copper	0.001	mg/L	0.006	-
Copper (filtered)	0.001	mg/L	-	0.005
Lead	0.001	mg/L	0.001	-
Lead (filtered)	0.001	mg/L	-	< 0.001
Mercury	0.0001	mg/L	< 0.0001	-
Mercury (filtered)	0.0001	mg/L	-	< 0.0001
Nickel	0.001	mg/L	0.002	-
Nickel (filtered)	0.001	mg/L	-	0.003
Zinc	0.005	mg/L	0.018	-
Zinc (filtered)	0.005	mg/L	-	0.011

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Metals M8	Sydney	Jan 20, 2025	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Metals M8 filtered	Sydney	Jan 20, 2025	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise,	43 Detroit Drive	1277 Cameron Road,
Penrose,	Mount Wellington,	Rolleston,	Gate Pa,
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: M12 WATER SAMPLING
Project ID: 12554717

Order No.: 12554717
Report #: 1178885
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Jan 20, 2025 11:43 AM
Due: Jan 28, 2025
Priority: 5 Day
Contact Name: Henry Luo

Eurofins Analytical Services Manager : Adam Bateup

Sample Detail						Metals M8	Metals M8 filtered
Sydney Laboratory - NATA # 1261 Site # 18217						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	SWDUP2	Jan 16, 2025		Water	S25-Ja0026757	X	
2	GWDUP2	Jan 17, 2025		Water	S25-Ja0026758		X
Test Counts						1	1

eurofins | Environment Testing

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
3. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with **blue** colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the sampling date; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ppm:** parts per million
µg/L: micrograms per litre	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony Forming Unit	**Colour:** Pt-Co Units (CU)	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 6.0
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	99			80-120	Pass	
Cadmium	%	91			80-120	Pass	
Chromium	%	102			80-120	Pass	
Copper	%	96			80-120	Pass	
Lead	%	100			80-120	Pass	
Mercury	%	106			80-120	Pass	
Nickel	%	99			80-120	Pass	
Zinc	%	95			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S25-Ja0030651	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	S25-Ja0030651	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	S25-Ja0030651	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	S25-Ja0030651	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead	S25-Ja0030651	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury	S25-Ja0030651	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	S25-Ja0030651	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc	S25-Ja0030651	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	N25-Ja0022457	NCP	mg/L	0.002	0.003	13	30%	Pass	
Cadmium (filtered)	N25-Ja0022457	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	N25-Ja0022457	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	N25-Ja0022457	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead (filtered)	N25-Ja0022457	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	N25-Ja0022457	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	N25-Ja0022457	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc (filtered)	N25-Ja0022457	NCP	mg/L	< 0.005	0.005	2.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Adam Bateup	Analytical Services Manager
Mickael Ros	Senior Analyst-Metal



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

HT

Subcon / Forward Lab / Split WO
Lab / Analysis: Eurofins - GWDUP2
Organised by / Date:
Relinquished by / Date:
Courier / Carrier:
WO / Batch No: ES2504804
Attach to Report Sheet:

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: GHD Pty Ltd	TURNAROUND REQUIREME ☐ Standard TAT (List due date): STANDARD TAT	FOR LABORATORY USE ONLY (Circle)	
OFFICE: Sydney	(Standard TAT may be longer for some tests e.g. Ultra Trace) ☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact?	Yes / No / N/A
PROJECT: M12 Groundwater	ALS QUOTE NO.: SY/322/21 V5	Free ice / frozen ice bricks present upon receipt?	Yes / No / N/A
ORDER NUMBER: 12554717	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt:	°C
PROJECT MANAGER: Henry Luo	CONTACT PH: Henry Luo 0414 090 002 OF: 1 2 3 4 5 6 7	Other comment:	12.9
SAMPLER: Lia Saunders, Nica Hugo	SAMPLER MOBILE: 0411 213 724		
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): ESDAT		
Email Reports to: emily.smith@ghd.com; lia.saunders@ghd.com, henry.luo@ghd.com, nica.hugo@ghd.com, ghdlabreports@ghd.com			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Nica Hugo			Mary Ann
DATE/TIME: 19/02/2025 at 15:30	DATE/TIME: 19/2/25 1810	DATE/TIME:	DATE/TIME: 21/2 2:15 pm

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: ANALYSIS OF NITRITE 48 HRS HOLDING TIME REQUIRED. PLEASE DO NOT LOG ALL SAMPLES RECEIVED IN ONE WORKORDER. LOG AS TWO SEPARATE WORKORDERS AS PER THE TWO COCs PROVIDED.

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).											
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	Comments	TOTAL CONTAINERS	W-02 (dissolved 8 metals)	EG020F (dissolved Fe, Mn)	W-04 (TRH/BTEXN)	NT-08A (TN, NO2, NO3, NH3, TP, soluble Reactive P)	NT-01D & 02 (major cations & anions, Hardness)	EA015H (TDS)	EA025H (TSS)	EP075A (SIM) (Phenols – Standard level (15 analytes))	W-02T (8 total metals)	BTEXN		
1	BH1104R	18/02/2025	Water		6	X	X	X	X	X	X	X					
2	BH107R	18/02/2025	Water		6	X	X	X	X	X	X	X					
3	BH112R	18/02/2025	Water		6	X	X	X	X	X	X	X					
4	BH145R	19/02/2025	Water		6	X	X	X	X	X	X	X					
5	GWDUP1	18/02/2025	Water		1	X											
—	GWDUP2	18/02/2025	Water	PLEASE FORWARD TO EUROFINS WITH ATTACHED COC	1												
6	GWRB2	19/02/2025	Water		1									X			
7	Trip spike	18/2/25 19/02/2025	Water		1										X		
8	Trip blank	18/2/25 19/02/2025	Water		1										X		

#1 Received as BH104R
#6 Received as GWRB1

Environmental Division
Sydney
Work Order Reference
ES2504804

Telephone : + 61-2-8784 8555

1190687

eurofins mgt

☑ **Sydney**
Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
Phone: +612 9900 8400
Email: enviro.syd@mgtlabmark.com.au

☐ **Brisbane**
Unit 1-21 Smallwood Place, Murrarie
Phone: +617 3902 4600
Email: enviro.bris@mgtlabmark.com.au

☐ **Melbourne**
2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 8564 5000 Fax: +613 8564 5090
Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : GHD Pty Ltd, Sydney	**Contact Name :** Lia Saunders 0411 213 724	**Purchase Order :** 12554717	**COC Number :**
Office Address :	**Project Manager: Henry Luo** 0414 090 002	**PROJECT Number :** 12554717	**Eurofins | mgt quote ID :**
Level 15, 133 Castlereagh Street, Sydney NSW 2000	**Email for results :** emily.smith@ghd.com; lia.saunders@ghd.com, nica.hugo@ghd.com, henry.luo@ghd.com; ghdlabreports@ghd.com	**PROJECT Name :** M12 Water Sampling	**Data output format:** ESDAT

Special Directions & Comments :

Sent from ALS

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	Dissolved metals	Total metals					
1	GWDUP2	18/02/2025	Water		X					
2	SWDUP2	19/02/2025	Water	X						
3										
4										
5										
6										
7										
8										
9										
10										

Analytes

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

500P	250P	60P	1LA	40mL vial	200mL A	Jar	Bag
		1					
		1					

Sample comments:

Laboratory Staff

Relinquished By: Nica Hugo	**Received By:**
Date & Time : 19/02/2025 at 15:30	**Date & Time :**
Signature:	**Signature:**

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival:

Report number:

eurofins | Environment Testing

www.eurofins.com.au EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	+61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise	43 Detroit Drive	1277 Cameron Road
Penrose	Mount Wellington	Rolleston	Gate Pa
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	GHD Pty Ltd NSW
Contact name:	Henry Luo
Project name:	M12 WATER SAMPLING
Project ID:	12554717
Turnaround time:	5 Day
Date/Time received	Feb 21, 2025 3:15 PM
Eurofins reference	1190687

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 12.9 degrees Celsius.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Please confirm analysis.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Adam Bateup on phone : or by email: Adam.Bateup@eurofinsanz.com

Results will be delivered electronically via email to Henry Luo - henry.luo@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd NSW email address.

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	+61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise	43 Detroit Drive	1277 Cameron Road
Penrose	Mount Wellington	Rolleston	Gate Pa
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: M12 WATER SAMPLING
Project ID: 12554717

Order No.:
Report #: 1190687
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Feb 21, 2025 3:15 PM
Due: Feb 28, 2025
Priority: 5 Day
Contact Name: Henry Luo

Eurofins Analytical Services Manager : Adam Bateup

Sample Detail						Metals M8 filtered
Sydney Laboratory - NATA # 1261 Site # 18217						X
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	GWDUP2	Feb 18, 2025		Water	S25-Fe0055515	X
Test Counts						1

GHD Pty Ltd NSW
Level 15, 133 Castlereagh Street
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Henry Luo**

Report **1190687-W**
Project name M12 WATER SAMPLING
Project ID 12554717
Received Date Feb 21, 2025

Client Sample ID			**GWDUP2**
Sample Matrix			**Water**
Eurofins Sample No.			**S25-Fe0055515**
Date Sampled			**Feb 18, 2025**
Test/Reference	LOR	Unit	
Heavy Metals			
Arsenic (filtered)	0.001	mg/L	0.002
Cadmium (filtered)	0.0002	mg/L	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001
Nickel (filtered)	0.001	mg/L	< 0.001
Zinc (filtered)	0.005	mg/L	0.006

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Metals M8 filtered	Sydney	Feb 26, 2025	28 Days

- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	+61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise	43 Detroit Drive	1277 Cameron Road
Penrose	Mount Wellington	Rolleston	Gate Pa
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: M12 WATER SAMPLING
Project ID: 12554717

Order No.:
Report #: 1190687
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Feb 21, 2025 3:15 PM
Due: Feb 28, 2025
Priority: 5 Day
Contact Name: Henry Luo

Eurofins Analytical Services Manager : Adam Bateup

Sample Detail						Metals M8 filtered
Sydney Laboratory - NATA # 1261 Site # 18217						X
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	GWDUP2	Feb 18, 2025		Water	S25-Fe0055515	X
Test Counts						1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
3. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with **blue** colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the sampling date; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ppm:** parts per million
µg/L: micrograms per litre	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony Forming Unit	**Colour:** Pt-Co Units (CU)	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 6.0
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Heavy Metals							
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic (filtered)	%	97			80-120	Pass	
Cadmium (filtered)	%	95			80-120	Pass	
Chromium (filtered)	%	95			80-120	Pass	
Copper (filtered)	%	96			80-120	Pass	
Lead (filtered)	%	100			80-120	Pass	
Mercury (filtered)	%	107			80-120	Pass	
Nickel (filtered)	%	95			80-120	Pass	
Zinc (filtered)	%	98			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	N25-Fe0049426	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium (filtered)	N25-Fe0049426	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	N25-Fe0049426	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	N25-Fe0049426	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead (filtered)	N25-Fe0049426	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	N25-Fe0049426	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	N25-Fe0049426	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc (filtered)	N25-Fe0049426	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Nileshni Goundar	Analytical Services Manager
Mickael Ros	Senior Analyst-Metal



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Environmental Division
Sydney
Work Order Reference
ES2507162

Telephone : + 61-2-8784 8555

CLIENT:	GHD Pty Ltd
OFFICE:	Sydney
PROJECT:	M12 Groundwater
ORDER NUMBER:	12554717
PROJECT MANAGER:	Henry Luo
SAMPLER:	Lia Saunders, Nica Hugo
SAMPLER MOBILE:	0424 954 854
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): ESDAT
Email Reports to:	emily.smith@ghd.com; lia.saunders@ghd.com, henry.luo@ghd.com, nica.hugo@ghd.com, ghdlabreports@ghd.com

RNAROUND REQUIREME ☐ Standard TAT (List due date): STANDARD TAT
ndard TAT may be longer for e tests e.g. Ultra Trace ☐ Non Standard or urgent TAT (List due date):
S QUOTE NO.: SY/322/21 V5
CONTACT PH: Henry Luo 0414 090 002

COC SEQUENCE NUMBER (Circle)
COC: 1 2 3 4 5 6 7
OF: 1 2 3 4 5 6 7

Lab / Analysis: SWDUP

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No
Free ice / frozen ice bricks present upon receipt? Yes No
Random Sample Temperature on Receipt: 7.1 °C
Other comments:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Nica Hugo	Nawa		Brenton TS
DATE/TIME: 12/03/2025 at 15:30	DATE/TIME: 12/03/25 15:10	DATE/TIME:	DATE/TIME: 13/3 12:5

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: ANALYSIS OF NITRITE 48 HRS HOLDING TIME REQUIRED. PLEASE DO NOT LOG ALL SAMPLES RECEIVED IN ONE WORKORDER. LO TWO SEPARATE WORKORDERS AS PER THE TWO COCs PROVIDED.

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)
Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION												
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	Comments	TOTAL CONTAINERS	W-02 (dissolved 8 metals)	EG020F (dissolved Fe, Mn)	W-04 (TRH/BTEXN)	NT-08A (TN, NO2, NO3, NH3, TP soluble Reactive P)	NT-01D & 02 (major cations & anions, Hardness)	EA015H (TDS)	EA025H (TSS)	W-14A (PAH/phenols)	W-027 (8 total metals)	BTEXN	
1	BH1104R	11/03/2025	Water		6	X	X	X	X	X	X	X	X			
2	BH107R	11/03/2025	Water		6	X	X	X	X	X	X	X	X			
3	BH112R	11/03/2025	Water		6	X	X	X	X	X	X	X	X			
4	BH145R	12/03/2025	Water		6	X	X	X	X	X	X	X	X			
5	GWDUP1	11/03/2025	Water		1	X										
6	GWDUP2	11/03/2025	Water	PLEASE FORWARD TO EUROFINS WITH ATTACHED COC	1											
7	GWRB2	12/03/2025	Water		1									X		
8	Trip spike	12/03/2025	Water		1										X	
9	Trip blank	12/03/2025	Water		1										X	

HT

1192874

eurofins | Environment Testing

www.eurofins.com.au EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	+61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise	43 Detroit Drive	1277 Cameron Road
Penrose	Mount Wellington	Rolleston	Gate Pa
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	GHD Pty Ltd NSW
Contact name:	Henry Luo
Project name:	M12 GROUNDWATER
Project ID:	Not provided
Turnaround time:	5 Day
Date/Time received	Mar 14, 2025 12:50 PM
Eurofins reference	1197874

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 13.1 degrees Celsius.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Adam Bateup on phone : or by email: Adam.Bateup@eurofinsanz.com

Results will be delivered electronically via email to Henry Luo - henry.luo@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd NSW email address.

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	+61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise	43 Detroit Drive	1277 Cameron Road
Penrose	Mount Wellington	Rolleston	Gate Pa
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: M12 GROUNDWATER

Order No.:
Report #: 1197874
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Mar 14, 2025 12:50 PM
Due: Mar 21, 2025
Priority: 5 Day
Contact Name: Henry Luo

Eurofins Analytical Services Manager : Adam Bateup

Sample Detail						Metals M8 filtered
Sydney Laboratory - NATA # 1261 Site # 18217						X
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	GWDUP2	Mar 11, 2025		Water	S25-Ma0032309	X
Test Counts						1

GHD Pty Ltd NSW
Level 15, 133 Castlereagh Street
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Henry Luo**

Report **1197874-W**
Project name M12 GROUNDWATER
Received Date Mar 14, 2025

Client Sample ID			**GWDUP2**
Sample Matrix			**Water**
Eurofins Sample No.			**S25-Ma0032309**
Date Sampled			**Mar 11, 2025**
Test/Reference	LOR	Unit	
Heavy Metals			
Arsenic (filtered)	0.001	mg/L	0.002
Cadmium (filtered)	0.0002	mg/L	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001
Nickel (filtered)	0.001	mg/L	< 0.001
Zinc (filtered)	0.005	mg/L	< 0.005

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Metals M8 filtered	Sydney	Mar 17, 2025	28 Days

- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	+61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise	43 Detroit Drive	1277 Cameron Road
Penrose	Mount Wellington	Rolleston	Gate Pa
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: M12 GROUNDWATER

Order No.:
Report #: 1197874
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Mar 14, 2025 12:50 PM
Due: Mar 21, 2025
Priority: 5 Day
Contact Name: Henry Luo

Eurofins Analytical Services Manager : Adam Bateup

Sample Detail						Metals M8 filtered
Sydney Laboratory - NATA # 1261 Site # 18217						X
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	GWDUP2	Mar 11, 2025		Water	S25-Ma0032309	X
Test Counts						1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
3. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with **blue** colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the sampling date; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ppm:** parts per million
µg/L: micrograms per litre	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony Forming Unit	**Colour:** Pt-Co Units (CU)	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 6.0
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Heavy Metals							
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic (filtered)	%	118			80-120	Pass	
Cadmium (filtered)	%	117			80-120	Pass	
Chromium (filtered)	%	118			80-120	Pass	
Copper (filtered)	%	107			80-120	Pass	
Lead (filtered)	%	99			80-120	Pass	
Mercury (filtered)	%	102			80-120	Pass	
Nickel (filtered)	%	114			80-120	Pass	
Zinc (filtered)	%	114			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	X25-Ma0024178	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium (filtered)	X25-Ma0024178	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	X25-Ma0024178	NCP	mg/L	0.001	< 0.001	5.0	30%	Pass	
Copper (filtered)	X25-Ma0024178	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead (filtered)	X25-Ma0024178	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	X25-Ma0024178	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	X25-Ma0024178	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc (filtered)	X25-Ma0024178	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Nileshni Goundar	Analytical Services Manager
Mickael Ros	Senior Analyst-Metal



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

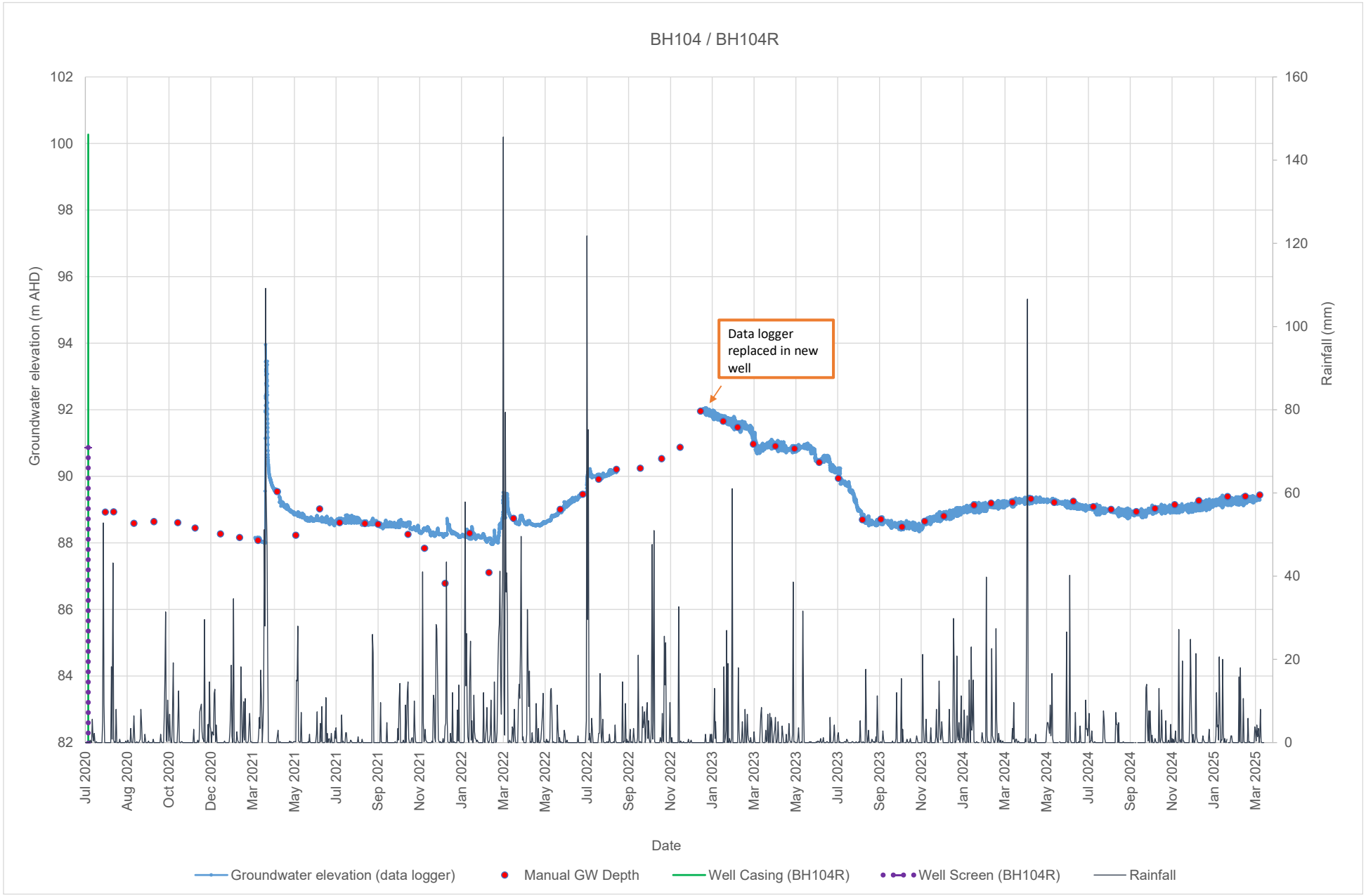
* Indicates NATA accreditation does not cover the performance of this service

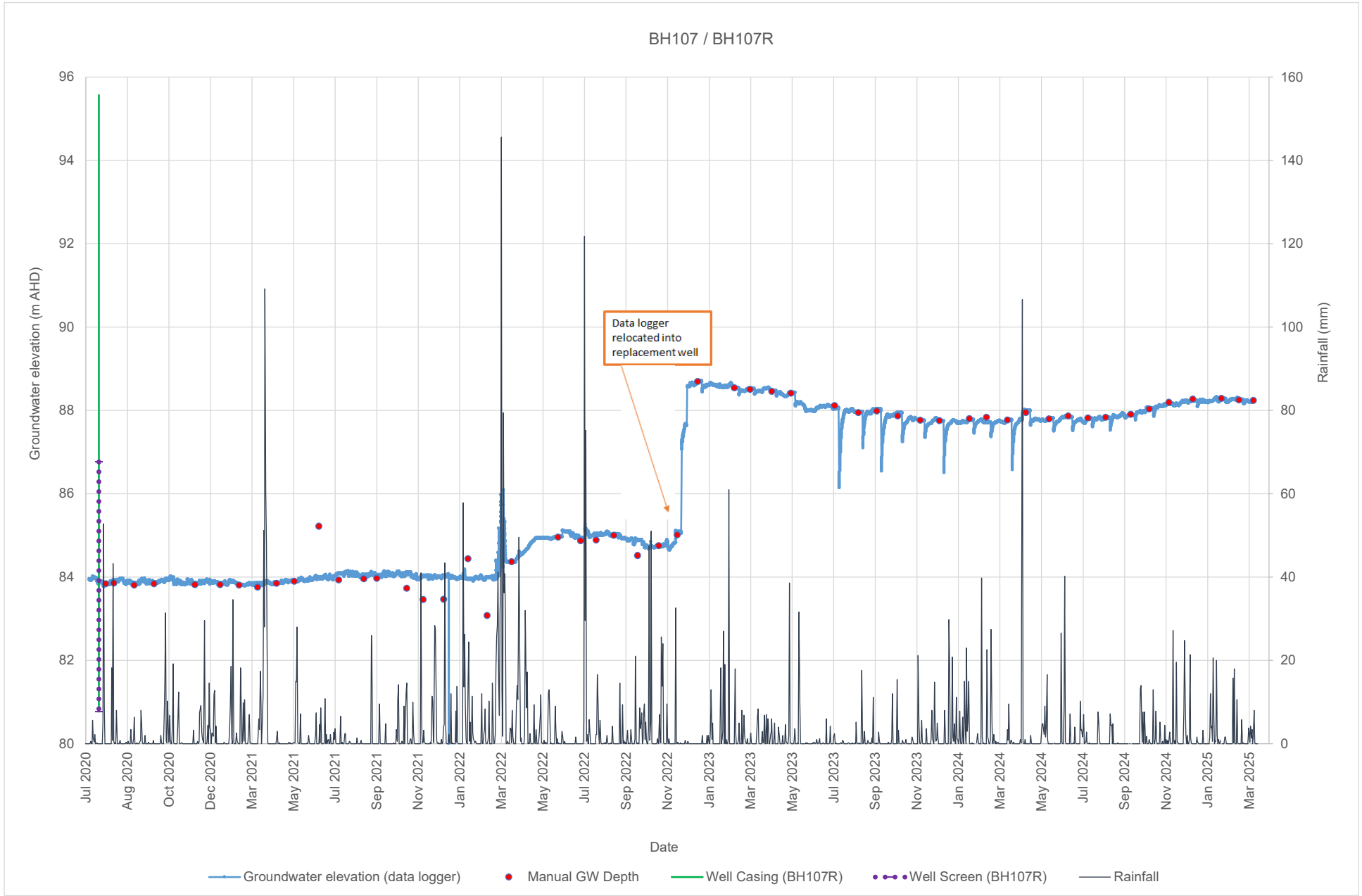
Measurement uncertainty of test data is available on request or please click here.

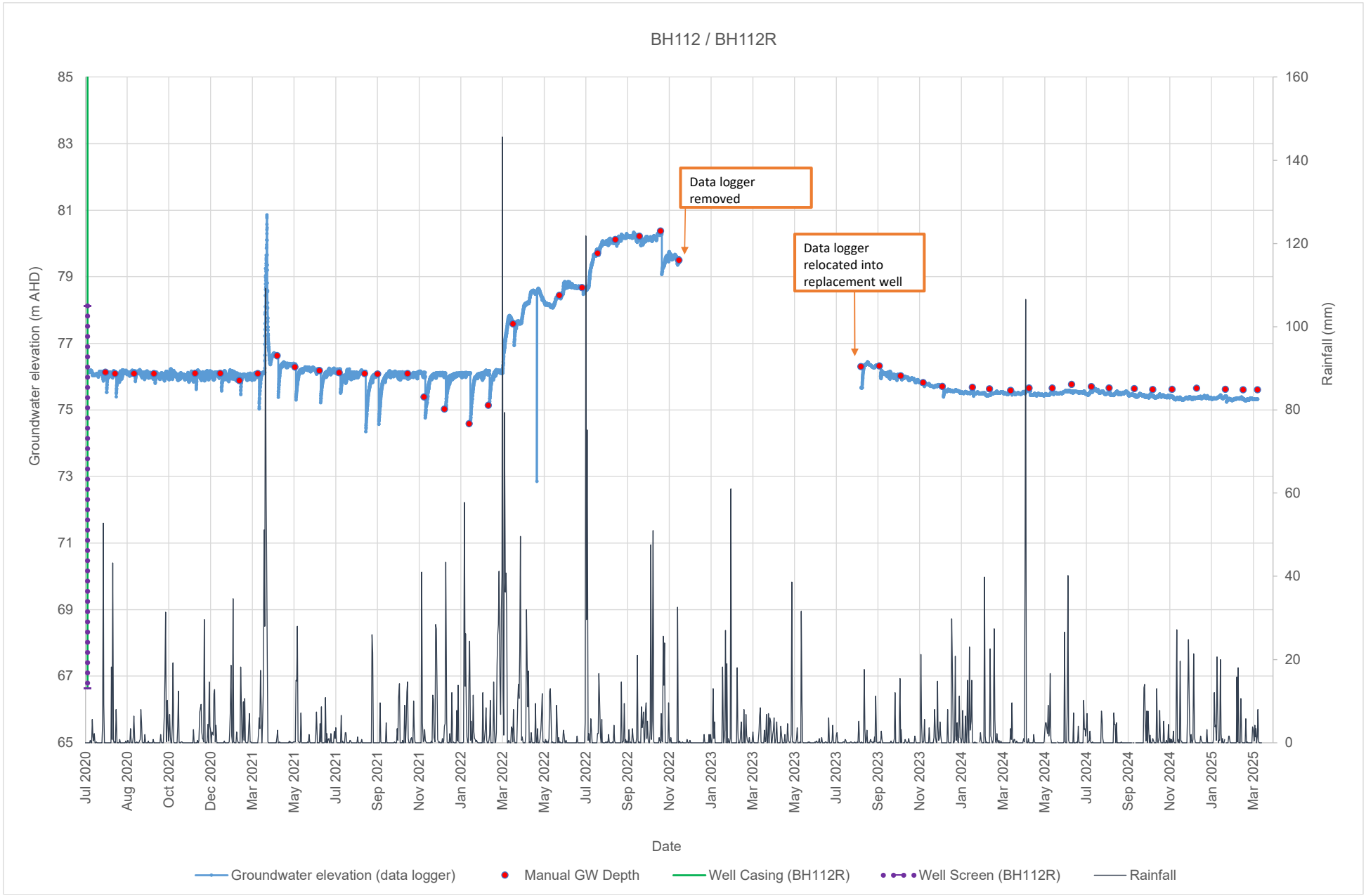
Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

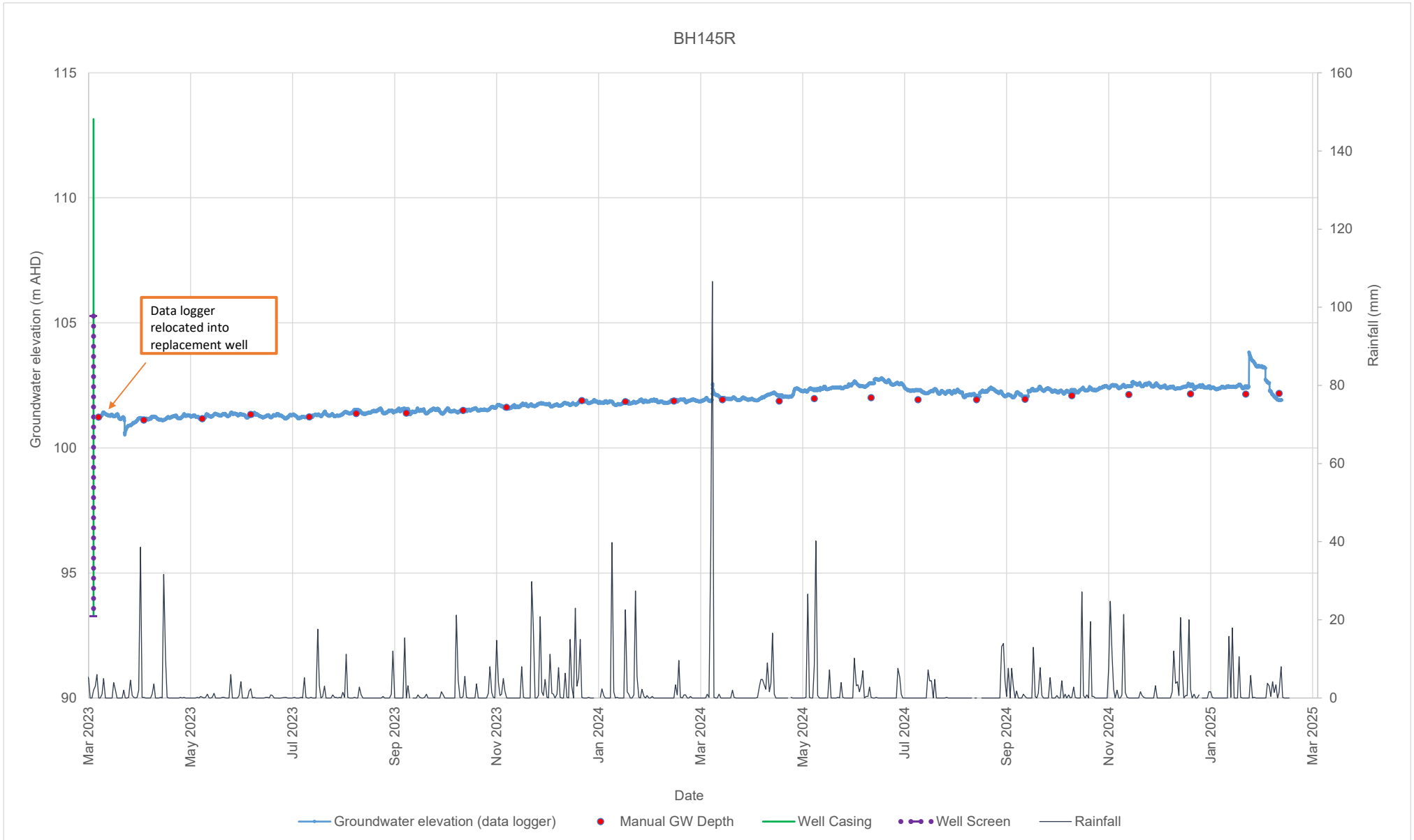
Appendix I

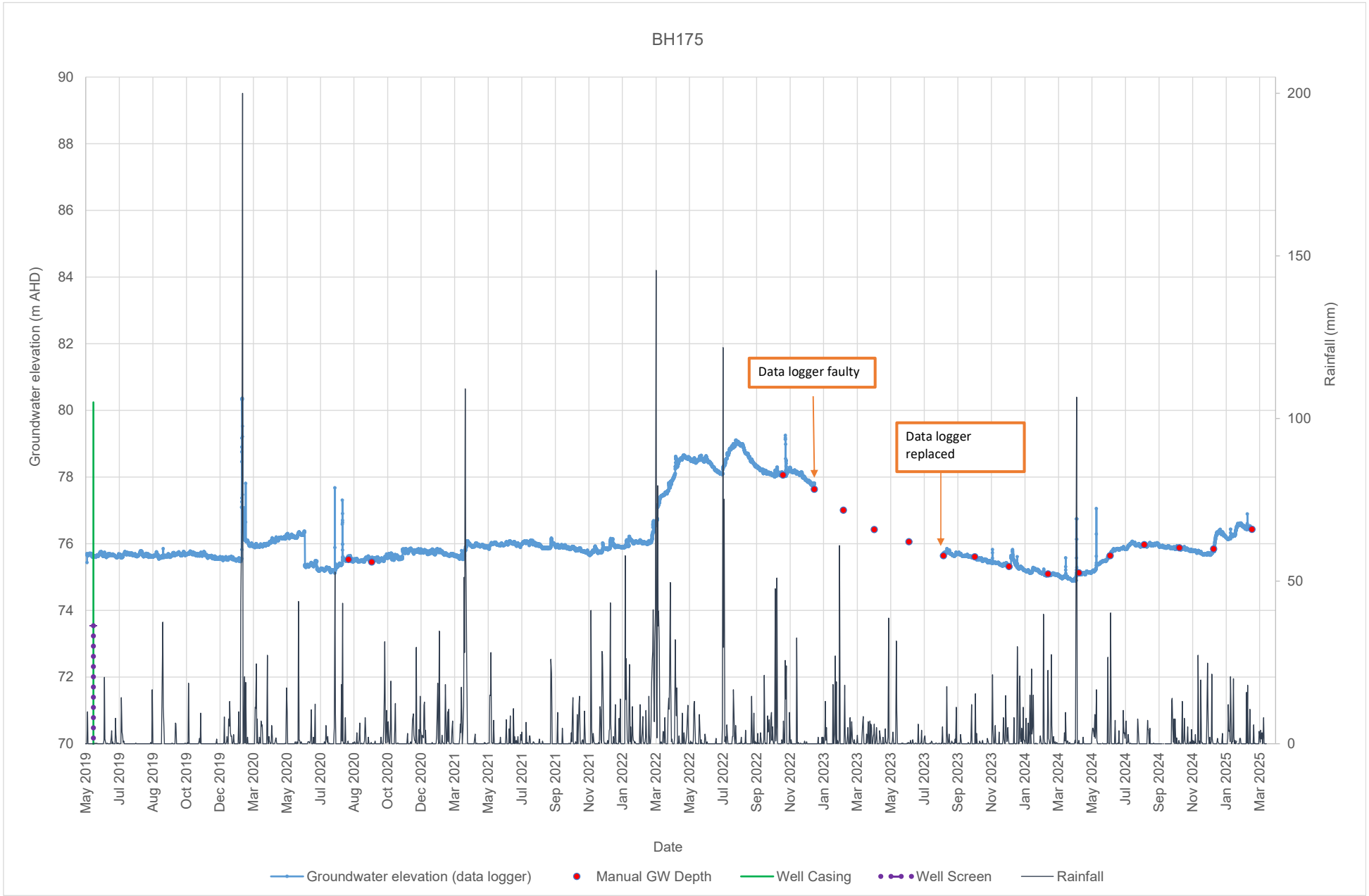
Groundwater level plots

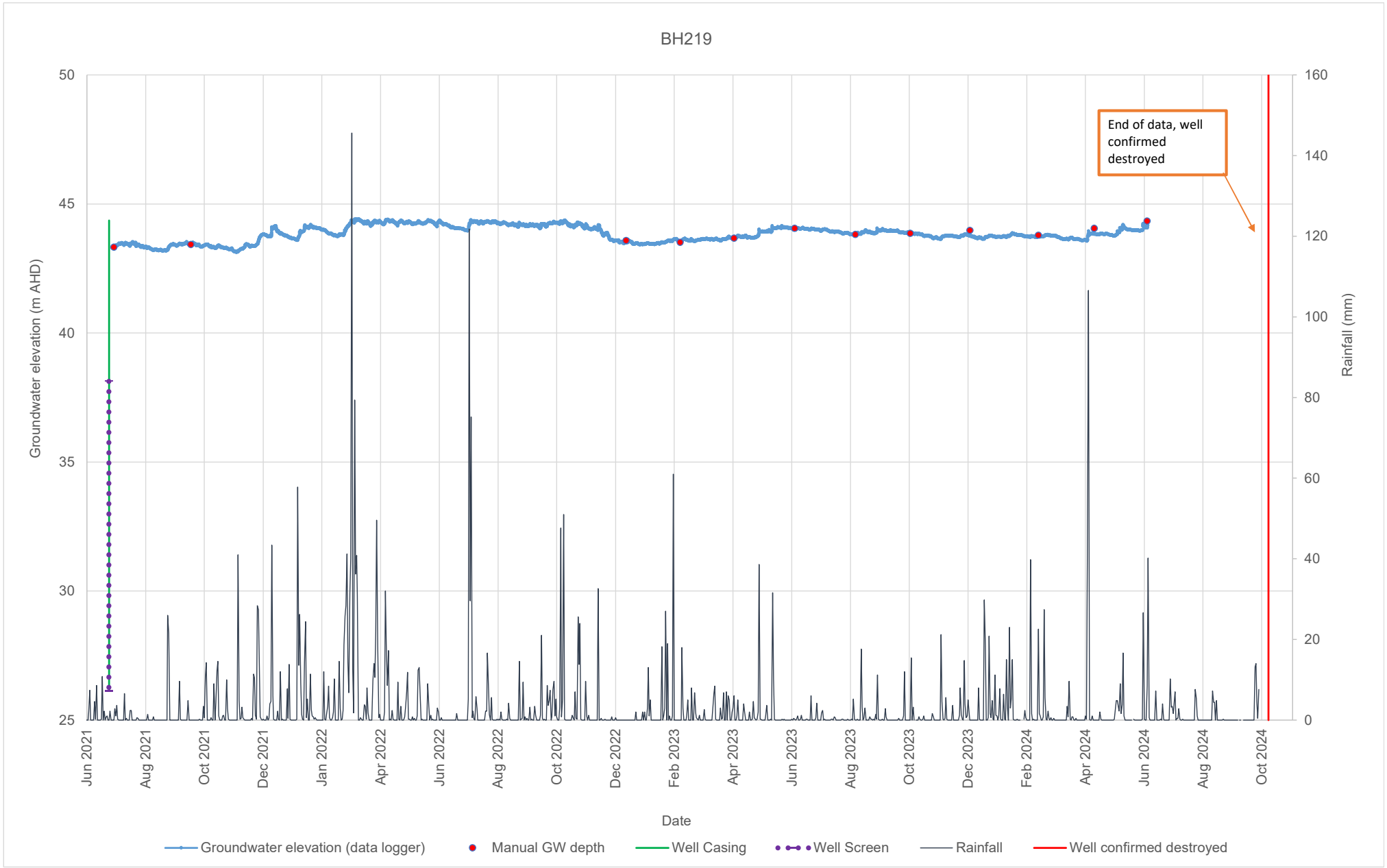

BH104 / BH104R
Groundwater elevation (m AHD)
Rainfall (mm)
Data logger replaced in new well
Date
Groundwater elevation (data logger)
Manual GW Depth
Well Casing (BH104R)
Well Screen (BH104R)
Rainfall


BH107 / BH107R
Groundwater elevation (m AHD)
Rainfall (mm)
Data logger relocated into replacement well
Date
Groundwater elevation (data logger)
Manual GW Depth
Well Casing (BH107R)
Well Screen (BH107R)
Rainfall


BH112 / BH112R
Groundwater elevation (m AHD)
Rainfall (mm)
Date
Data logger removed
Data logger relocated into replacement well
85
83
81
79
77
75
73
71
69
67
65
160
140
120
100
80
60
40
20
0
Jul 2020
Aug 2020
Oct 2020
Dec 2020
Mar 2021
May 2021
Jul 2021
Sep 2021
Nov 2021
Jan 2022
Mar 2022
May 2022
Jul 2022
Sep 2022
Nov 2022
Jan 2023
Mar 2023
May 2023
Jul 2023
Sep 2023
Nov 2023
Jan 2024
Mar 2024
May 2024
Jul 2024
Sep 2024
Nov 2024
Jan 2025
Mar 2025
Groundwater elevation (data logger)
Manual GW Depth
Well Casing (BH112R)
Well Screen (BH112R)
Rainfall


BH145R
Groundwater elevation (m AHD)
Rainfall (mm)
115
110
105
100
95
90
160
140
120
100
80
60
40
20
0
Data logger relocated into replacement well
Mar 2023
May 2023
Jul 2023
Sep 2023
Nov 2023
Jan 2024
Mar 2024
May 2024
Jul 2024
Sep 2024
Nov 2024
Jan 2025
Mar 2025
Date
Groundwater elevation (data logger)
Manual GW Depth
Well Casing
Well Screen
Rainfall


BH175
Groundwater elevation (m AHD)
Rainfall (mm)
Data logger faulty
Data logger replaced
Date
Groundwater elevation (data logger)
Manual GW Depth
Well Casing
Well Screen
Rainfall


BH219
Groundwater elevation (m AHD)
Rainfall (mm)
50
45
40
35
30
25
160
140
120
100
80
60
40
20
0
End of data, well confirmed destroyed
Jun 2021
Aug 2021
Oct 2021
Dec 2021
Jan 2022
Apr 2022
Jun 2022
Aug 2022
Oct 2022
Dec 2022
Feb 2023
Apr 2023
Jun 2023
Aug 2023
Oct 2023
Dec 2023
Feb 2024
Apr 2024
Jun 2024
Aug 2024
Oct 2024
Date
Groundwater elevation (data logger)
Manual GW depth
Well Casing
Well Screen
Rainfall
Well confirmed destroyed

ghd.com

→ The Power of Commitment