Annual Environmental Review

Dulverton Landfill

November 2022 to November 2023

by Dulverton Waste Management

This report was researched and prepared by:

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For:

Environmental Protection Agency, (EPA)

Disclaimer

This report has been prepared for the EPA in accordance with EPN 7158/3 dated 26/11/1993. Information within this report is current as at 23 March 2024.

Any representation, statement, opinion or advice, expressed or implied in this report is made in good faith, but on the basis that Dulverton Waste Management is not liable (whether by reason of negligence, lack of care or otherwise) to any person for any damage or loss whatsoever, which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect to any representation, statement or advice referred to here.

Contents

1. Introduction

This report has been prepared in accordance with the requirements of Environment Protection Notice 7158/3, G9 (Annual Environmental Review) and H5 (Record of Controlled Wastes).

2. Business Profile

Dulverton Waste Management (DWM) was set up as a jointly-owned venture by Devonport City Council, Kentish Council, Central Coast Council, and Latrobe Council. DWM exists to provide environmentally effective waste management services for its owners, the community and industry.

Access to the landfill is by prior arrangement with DWM and is not open to the public. DWM's aim is to promote the facility as a 'last resort' and encourage all waste items to be recycled and reused wherever possible to limit the amount of waste to landfill.

Operation of the Landfill was contracted to Gradco during the reporting period. The company employs a Site Supervisor along with five full time staff who work across both the DORF and Landfill operations.

DWM have a well-established Environmental Management System (EMS) which is certified by BSI.

DWM can approve and accept a number of controlled wastes for disposal, provided the waste products are covered under the EPN conditions. EPA advice is sought wherever items fall outside of the licence conditions, and special approval may be given for unusual situations.

3. Environmental Policy

Appendix A – Environmental Policy

4. Reporting Period

The reporting period for this report is from November 2022 to November 2023.

5. Complaints Received from the Public and Actions Taken

As per G9 of EPN 7158/3 for Annual Environmental Review, Appendix B is a list of all complaints received from the public during the reporting period that relate to potential or actual environmental harm or nuisance.

Any complaints received by DWM, whether from the public, on-site personnel or other authorities, are recorded on a Corrective Action Requests (CAR's) task list and are assigned to a staff member to action any necessary corrective action. Once the necessary action/actions have been completed, staff discuss any suitable preventative action and ensure it is implemented.

Care has been taken to identify Landfill specific complaints regarding odour, in some cases however some complaints may be included in both landfill and DORF related reports.

Appendix B – Register of Complaints

6. Environment-Related Procedure and Process Changes

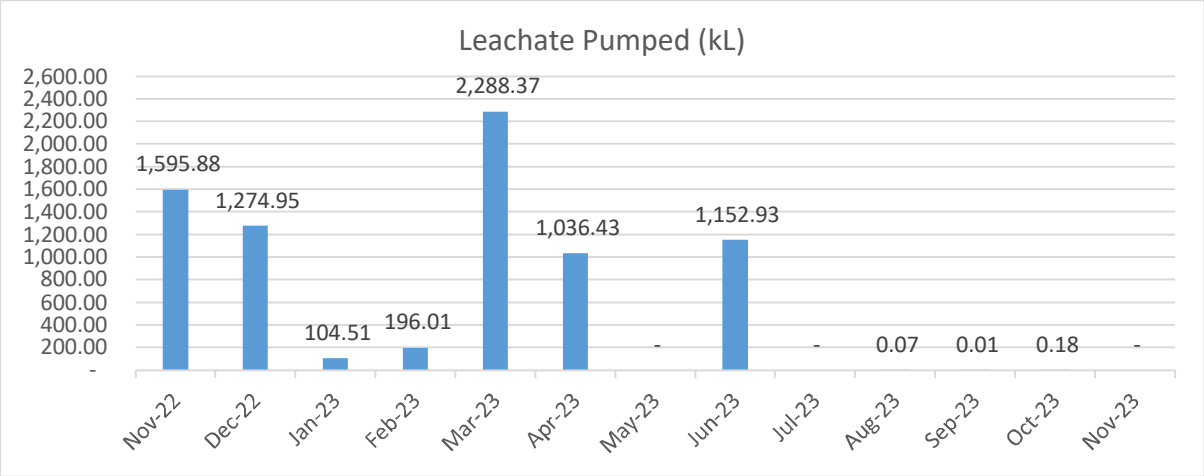
There were no significant changes to our procedures or processes during the reporting period. Although, it is worth noting that our EMS system is something we constantly review and improve.

7. Summary of Solid and Liquid Wastes Produced

The Landfill site generates leachate from disposal of waste. The leachate is stored in HDPE-lined lagoons and where necessary, in accordance with a Trade Waste Agreement with TasWater, is pumped through an underground pipeline to the Latrobe sewerage treatment plant.

The graph below shows the amount of leachate disposed of during the reporting period for each month, totalling 7,649.34 kL for the reporting period. A decrease in leachate disposal when compared to the previous reporting period (10,427.4 kL) is evident, and is believed to be due to a reduction in rainfall from the previous reporting period.

Pumping volumes can vary and may be impacted by levels of residual leachate after evaporation, the rainfall experienced in that particular month, or restrictions imposed by TasWater governing the volume of Trade Waste material pumped to their treatment plant. DWM continue to improve the method of construction and capping of landfill cells in order to reduce the amount of leachate that is generated and continue to minimise the environmental risk wherever possible.



8. Environmental Incidents and Non-Compliance

Appendix C - Summary of environmental incidents and/or Non-Compliance

9. Improvement of Compliance with EPN

DWM has a certified EMS, which has been audited against ISO 14001:2015 by a third party and found to be compliant with only minor alterations required. Independent checking of the system ensures that DWM is making ongoing improvements to the way environmental hazards and risks are managed.

It is considered that there are no specific actions required to improve compliance with the EPN.

Appendix D - BSI Audit Report May 2023

10. Controlled Waste Deposited at the Landfill

Appendix E – Controlled Waste Report

11. Summary of Monitoring Data

Appendix F – GHD Landfill monitoring report

12. Community Consultation

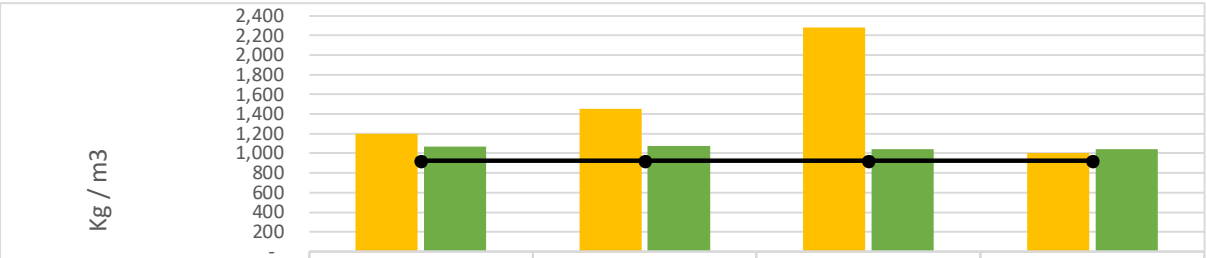
There was no formal community consultation in relation to the Landfill during the reporting period.

13. Density Figures for Landfill Disposal

The following graphs show the density figures achieved for landfill compaction throughout the reporting period, for our two active landfill cells; Cell B1 and Cell D2.

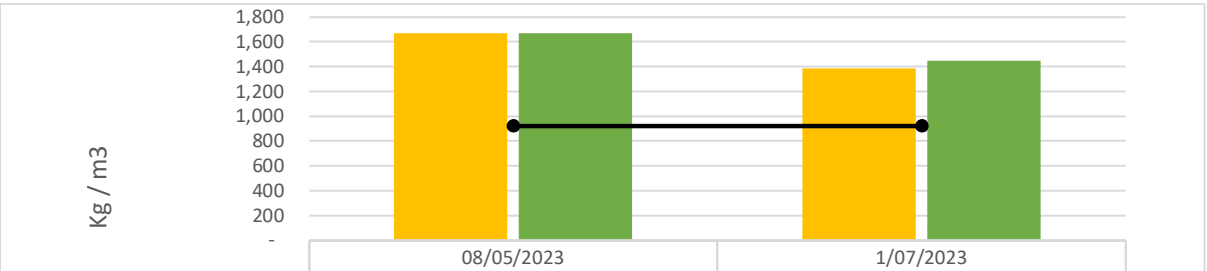
Density fluctuations are evident between the two cells, and are related to waste being landfilled in an established cell (Cell B1) compared with a brand new cell (Cell D2). Density fluctuations can also be attributed to high volumes of soil received, and impacts arising from the landfill fire in October 2023.

Cell B1 Compaction Density



	02/07/2022 02/12/2022	03/12/2022 07/05/2023	08/05/2023 30/06/2023	01/07/2023 11/12/2023
Period Density	1,198	1,453	2,277	1,000
Cumulative Cell Density	1,071	1,077	1,039	1,040
Target ≥ 925	925	925	925	925

Cell D2 Compaction Density



	08/05/2023 30/06/2023	1/07/2023 11/12/2023
Period Density	1,666	1,384
Cumulative Cell Density	1,666	1,445
Target ≥ 925	925	925

14. Acknowledgement of Report

I hereby acknowledge that the contents of this report are a true and accurate record of the activities of the Dulverton Landfill for the reporting period.

Signed by Veronica Schilling
Chief Executive Officer for Dulverton Waste Management

APPENDIX A – ENVIRONMENTAL POLICY

Environmental Policy

OBJECTIVE

Dulverton Waste Management (DWM) is committed to responsible environment management and the pursuit of providing a safe and sustainable waste management, minimisation and recycling service for our community.

LEGISLATION

Environmental Management & Pollution Control Act 1994 (Tas)

DEFINITIONS

Environmental Management System (EMS)	An Environmental Management System (EMS) is a structured management tool which provides a methodical approach to planning, implementing and reviewing the performance of an organisation in regard to its compliance obligations for environmental management. It follows the standards set out in AS/NZS ISO 14001:2015, and is regularly audited independently to assess adherence and for ongoing improvement.
Stakeholders	a person or group that has an investment, share, or interest in something, as a business or industry.

RESPONSIBILITIES

Board:

- To provide the financial and human resources required to support the objectives of this policy.

Chief Executive Officer:

- To provide the systems and procedures to support the objectives of this policy

Employees, Contractors & Sub-Contractors:

- To comply with all the systems and procedures relating to the environment;
- To at all times consider the effect of an activity on the environment; and
- To discontinue an activity if it becomes apparent that environmental harm may occur.

POLICY STATEMENT

DWM is committed to:

- Playing a leading role in promoting best practice in our industry;
- Protection of the local environment and minimisation of waste;
- Compliance with applicable compliance obligations and with other requirements to which the organisation subscribes;
- Communicating with all persons working for or on behalf of the organization the requirements of the Environmental Management System (EMS);
- Minimising and where possible avoid adverse impacts on our stakeholders, environment and social surrounds;
- The reduction of suitable waste stream volumes to landfill, through effective reuse, composting and minimization strategies; and
- Understanding and minimising our greenhouse gas contribution

DWM will:

- Actively pursue continual improvement in environmental management;
- Provide a framework for setting and reviewing environmental objectives and targets;
- Implement and maintain an Environmental Management System (EMS) certified to ISO 14001:2015; and
- Regularly review its environmental performance through:
    - Management review of the system;
    - Progress against objectives and targets; and
    - An internal and external audit.

OTHER KEY RELATED POLICIES

Nil

REVIEW

This policy will be reviewed every four years or as required by the Board.

REFERENCE			
APPROVED BY:	DWM Board of Directors	**MINUTE NO:**	MFID 1570156
APPROVAL DATE:	12th August 2020	**REVIEW DATE:**	by September 2024

APPENDIX B – REGISTER OF COMPLAINTS

dulverton waste management

ISO 14001:2015 Environmental Management

Environmental Management System (EMS)

ENVIRONMENTAL & GENERAL - CORRECTIVE ACTION REGISTER (CAR)

Abbreviation Key:
AW - Ashlee Wallace
BSM - Business Services Manager
DORF - Dulverton Organics Recycling Facility
DWM - Dulverton Waste Management
EMS - Environmental Management System
EPA - Environmental Protection Authority
JW - Jenna Westwood
LF - Landfill
ML - Matthew Layton
MP - Mel Pearce
OM - Operations Manager
SESL - Independent Laboratory
SMT - Senior Management Team
SP - Site Personnel
SS - Site Supervisor
SWMS - Safe Work Method Statement
TRES - Trees, Research & Environmental Solution
VS - Veronica Schillings

Status
TC = Task Complete
IP = In Progress
OH = On Hold
NS = Not

INITIAL ACTION								FURTHER INVESTIGATION				
CAR No.	**DWM CAR ID Form #**	**Generated from**	**Date** *(Non-conformance occurred)*	**Description of Non-conformance/Area for Improvement** *(details of the incident as received by reporting officer)*	**Action Taken** *(Outlines direct action taken to rectify the non-conformance. Staff to include MFID for documents and notes kept).*	**Action By** *(Name of staff member who carried out 'action taken')*	**Action Date** *(Is the date that the staff member carried out the 'action taken' or commenced the action)*	**Root Cause of Problem** *(to be updated following an investigation of the non-conformance and what underlying factors may have contributed to it).*	**Preventative Action** *(Measures put in place to prevent the non-conformance from reoccurring).*	**Preventive Action Verified By** *(Name of staff member who carried out 'Root Cause' and 'Preventative Action' investigations)*	**Verification Date** *(Is the date that the staff member has completed the 'Root Cause' and 'Preventative Action' investigations, this cell is to be left blank until both the investigations have been completed)*	**Status**
ENV-753	DWM1097	AW	24/01/2023	A resident close to site has called with an odour complaint. They have noticed a bad fish waste odour coming from site since Christmas.	Phone conference between Site Supervisor and Operations Manager. Deep burial holes filled with extra depth to reduce smell after end of day.	SS	24/01/2023	Waste delivery caused excessive smell for short period.	Site followed correct procedure and odour was managed within expected timeframes.	ML	14/04/2023	TC
ENV-762	1104	Office	14/11/2023	Local resident called with concerns around the number of flies on their property and in their house. Customer advised that a notification would be sent to site to investigate.	Investigate reason for flies, and perhaps treat the cause.	JW	14/11/2023	Primarily season changes in the area cause an increase in flies in November. The disruption to the landfill due to fire also contributes with larger than normal areas active.	There is no evidence that the flies being reported originated from the DWM activity. Due to the fire activity, the active face became bigger than expected, and in turn exacerbated the flies issue. The active face is now back to a acceptable level, due to remediation being complete. The additional of day cover reduces the food source. Environmental Auditors have been engaged to provide further advice regarding day cover requirements at DWM and Fire Management.	ML	16/01/2024	TC
ENV-763	1105	Office	22/11/2023	Local resident called with concerns about an increase in the number of flies they have noticed on their property and in their house.	Landfill cell may require spraying with pyrethrum.	JW	22/11/2023	Primarily season changes in the area cause an increase in flies in November. The disruption to the landfill due to fire also contributes with larger than normal areas active.	There is no evidence that the flies being reported originated from the DWM activity. Due to the fire activity, the active face became bigger than expected, and in turn exacerbated the flies issue. The active face is now back to a acceptable level, due to remediation being complete. The additional of day cover reduces the food source. Environmental Auditors have been engaged to provide further advice regarding day cover requirements at DWM and Fire Management.	ML	16/01/2024	TC

APPENDIX C – INCIDENTS OF ENVIRONMENTAL NON-COMPLIANCE

dulverton waste management

ISO 14001:2015 Environmental Management

Environmental Management System (EMS)

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WHS-167	DWM0529	SS	01/03/2023	Member of the public notified the Site Supervisor of a fire at the Landfill.	SS arrived onsite and assessed the fire. SS used compactor to push fire towards clay capping to smother. Will monitor for the day.	SS	01/03/2023	The cause of this fire is unknown but likely something disposed of within the landfill.	It is not possible to completely prevent this from occurring due to the varied nature of the waste disposed in the landfill. Machinery operators will remove waste, such as batteries, if they are noticed before compacting.	ML	14/04/2023	TC
WHS-174	0537	Site	10/10/2023	Site supervisor alerted to fire at Landfill in early hours. Arrived at site to Tas Fire Service (TFS) waiting to enter. Fire control plan put in place and actioned.	DWM were notified at 1am. Fire was contained and TFS left with Site Supervisor remaining onsite (with DWM OM) to keep watch for spot fires. CEO was notified at 7am, who provided updates to staff and Board. A query was made with Insurance provider, regarding damage to the new cell liner, awaiting a response. DWM proceeding with repairs to liner asap.	OM		DWM and TFS are unable to determine the exact cause of the fire, however it's likely to be caused by an incorrectly disposed of battery.	It is not possible to completely prevent this from occurring due to the varied nature of the waste disposed in the landfill. Machinery operators will remove waste, such as batteries, if they are noticed before compacting. Further flare up led to use of thermal imaging technology and additional water dousing and supervision.	VS		IP
WHS-176	0539	Site	02/11/2023	Site supervisor alerted to fire at Landfill in early hours. TFS arrived & helped put fire out.	Site contractor used water cart put out hot spots, someone was rostered on overnight watch to monitor.	GP/OM	02/11/2023	DWM and TFS are unable to determine the exact cause of the fire, however it's likely to be caused by an incorrectly disposed of battery.	It is not possible to completely prevent this from occurring due to the varied nature of the waste disposed in the landfill. Machinery operators will remove waste, such as batteries, if they are noticed before compacting. Further flare up led to use of thermal imaging technology and additional water dousing and supervision.	VS	30/11/2023	TC
ENV-761	0540	Site	23/11/2023	Hydraulic oil leak on loader. Fitting broke on quick hitch, spilt 15 litres on gravel. Grabbed spill kit & soaked up oil.	Spill kit used to contain leak and clean up spill.	GP	23/11/2023	General wear and tear.	Before each day operators conduct a pre-start checklist on each machine, and machines are serviced and maintained regularly.	SS	06/12/2023	TC
WHS-177	0541	Site	26/11/2023	While travelling to site SS noticed some smoke coming from near site. Upon arriving near site, noticed small fire on bush line. Inspected surrounding area and noticed that it was electrical wire on fire, and nearby noticed an old ute shell in bush. About an hour later driving back out noticed a person walking through the bush near the fire. He said it was his fire, he had cut the wires out of the old ute and was burning it to get the copper.	The fire was small enough to extinguish and make safe. Fire was not on DWM. Property so SS just monitored until he was able to speak to the person involved.	SS	26/11/2023	Behaviour on private property is not something DWM can control.	DWM Employees and site staff are vigilant in monitoring the surrounding bush areas for inappropriate behaviour and fires.	MP	30/11/2023	TC
WHS-178	0542	Site	24/11/2023	SS received a call saying landfill was on fire. Fire brigade attended site along with contractor crew and OM. Landfill was well alight. Pushed rubbish towards fire crews so they could extinguish fire. Contracted water trucks were used to help fire brigade. Fire brigade left about 11pm. Site contractor crews stayed and monitored remaining hot spots out over weekend.	Fire brigade originally on site, site contractors rostered on to monitor hot spots over weekend.	SS	24/11/2023	DWM and TFS are unable to determine the exact cause of the fire, however it's likely to be caused by an incorrectly disposed of battery.	DWM engaged Environmental Consultants (EC) to review the DWM operations, and they advised the Car 176 and 177 were likely a reignition from the original fire. The root cause was due to the time and intensity of the first blaze, caused hot spots within the landfilled waste. EC visited the site four times to review site and support the day cover recommendations. EC also participated in some mentoring and training for operators.	ML	31/01/2024	TC
WHS-179	0543	Site	29/11/2023	Compactor operator was pushing out rubbish and ran over a flare, this then started a fire.	Burning rubbish was pushed off landfill and wet down.	SS	29/11/2023	A flare incorrectly disposed of to landfill.	It is not possible to completely prevent this from occurring due to the varied nature of the waste disposed in the landfill. Machinery operators will remove waste, such as batteries and flares, if they are noticed before compacting. The flare was recovered for reference, there is free recycling at the WTS for this waste stream.	MP	30/11/2023	TC

APPENDIX D – BSI AUDIT REPORT

Assessment Report

Dulverton Waste Management

Assessment dates	30/05/2023 (Please refer to Appendix for details)
Assessment Location(s)	Devonport, Latrobe Tasmania.
Report Author	Craig Hobbins
Assessment Standard(s)	ISO 14001:2015

Table of contents

Executive Summary

Based on the results of this audit, it has been determined that the organisation fulfils the standards and audit criteria identified within the audit report, and it is deemed that the environmental management system achieves its intended outcomes. The audit objectives have been achieved. A recommendation for continued certification to ISO 14001:2015 is made.

Environmental management system and waste management process improvements continue to be generated, as detailed within the subsequent areas of this report. It is pleasing to observe the way the environmental management system is used to assist with waste management and associated infrastructure improvements. Future site planning and infrastructure improvements are designed to not only improve waste processing efficiencies, but to also reduce the site's environmental impacts. This aligns well with the requirements and intentions of ISO 14001.

No non-conformance or improvement opportunities were identified during this assessment. Enhanced details on audit findings and objective evidence sighted are detailed within the subsequent sections of this report.

I would like to thank Veronica and Matt for their hospitality and active participation in the audit.

Changes in the organisation since last assessment

The following changes in relation to organisation structure and key personnel involved in the certified management system were noted:

- Veronica Schilling was appointed as the new Chief Executive Officer in November 2022.

No change in relation to the audited organisation’s activities, products or services covered by the scope of certification was identified.

There was no change to the reference or normative documents which is related to the scope of certification.

NCR summary

There were no outstanding nonconformities to review from previous assessments.

No new nonconformities were identified during the assessment. Enhanced detail relating to the overall assessment findings is contained within subsequent sections of the report.

Assessment objective, scope and criteria

The objective of the assessment was to conduct a surveillance assessment and look for positive evidence to ensure that elements of the scope of certification and the requirements of the management standard are effectively addressed by the organisation's management system and that the system is demonstrating the ability to support the achievement of statutory, regulatory and contractual requirements and the organisation's specified objectives, as applicable with regard to the scope of the management standard, and to confirm the on-going achievement and applicability of the forward strategic plan and where applicable to identify potential areas for improvement of the management system.

The scope of the assessment is the documented management system with relation to the requirements of ISO 14001:2015 and the defined assessment plan provided in terms of locations and areas of the system and organisation to be assessed.

Criteria:

- ISO 14001:2015.
- DWM Environmental Management System Manual 30th November 2021.

Statutory and regulatory requirements

Dulverton Waste Management continues to operates under EPA Licence Numbers Landfill 7158/3 and DORF 7852/1. No changes have occurred to any licensing requirements and operating conditions since the previous BSI Assessment. The environmental management system continues to include waste management process controls, as well as reporting requirements implemented for the purpose of ensuring EPA licence compliance.

Processes and systems in place are sound and meet requirements.

Assessment Participants

Name	Position	Opening Meeting	Closing Meeting	Interviewed (processes)
Veronica Schilling	Chief Executive Officer	X	X	X
Matt Layton	Operations and Project Officer	X	X	X

BSI assessment team

Name	Position
Craig Hobbins	Team Leader

Assessment conclusion and recommendation

The audit objectives have been achieved and the certificate scope remains appropriate. The audit team concludes based on the results of this audit that the organisation does fulfil the standards and audit criteria identified within the audit report and it is deemed that the management system continues to achieve its intended outcomes.

RECOMMENDED - The audited organisation can be recommended for continued certification to the above listed standards, and has been found in general compliance with the audit criteria as stated in the above-mentioned audit plan.

Use of certification documents, mark / logo or report

The use of the BSI certification documents and mark / logo is effectively controlled.

Findings from this assessment

General requirements, management system implementation

Dulverton Waste Management's environmental management system information and process management controls were used as a reference during this assessment.

Management system implementation and maintenance processes covering the site environmental controls, site management processes and waste management operations were validated through an examination of infrastructure and waste management controls, changes and improvements as well as auditing and management review processes. The audit process and methodology confirmed controls for system documentation access, risk management processes, and system implementation across all facets of the business examined.

Dulverton Waste Management's Covid-19 risk management policies and procedures continue to be implemented. COVID management controls include risk assessment processes, cleaning and hygiene arrangements, as well as flexible working arrangements. Measures and controls are being monitored.

Processes and documentation in place are sound and meet requirements.

Records / documented information examined:

- DWM Environmental Management System Manual 30th November 2021.
- Confirmed in interview with the Chief Executive Officer and Operations and Project Officer.

Certification scope

The scope is confirmed as follows with no changes required:

"For the management of a waste management facility comprising landfill and compost production operations."

Changes and improvements since the previous BSI Assessment

Environmental management, processing and infrastructure improvements and changes made since the previous BSI Assessment are impressive and include:

- A new composting processing facility is under construction. The facility is designed to be 100% self-contained, and will capture all waste bi-products. Bi-products are planned to be sold to market. The future waste processing plan for the site is to process 48% of waste product as organic waste, and 52% as landfill.
- FOGO and waste packaging reduction strategies governed under the Tasmanian Waste Action Plan 2021 are in place. A shift in the waste products being processed has occurred, primarily through an increase in FOGO waste.
- A review of the DWM Strategic Plan occurred. This included a review of operations and waste treatment risks arising from changes occurring as result of the waste action plan.
- The Burnie Waste Transfer Station is to be managed by Dulverton Waste Management. Operations are to be contracted to the existing waste management contractor at the landfill / composting site (Graco).

Site and waste management improvements observed during the site visit included:

- A process to improve site boundary fencing is in place, which includes an upgrade of the litter fencing.
- Leachate ponds are being replaced by tanks, with the existing ponds to be used as a backup to deal with events such as severe rainfall. This improvement reduces the amount of site waste water, including leachate that is required to be discharged.
- CCTV cameras are installed across the site, improving incident investigation processes.

Policy framework

Dulverton Waste Management has developed and implemented an environmental management policy addressing the requirements of the ISO 14001 Standard. No changes have been made to the policy since the previous BSI Assessment. The policy is made available as documented information and is accessible to all interested parties. Compliance with the requirements of the Standard continues.

Records / documented information examined:

- Environmental Policy (12/8/2020).
- Confirmed in interview with the Chief Executive Officer and Operations and Project Officer.

Objectives and targets

Objectives and targets relevant to the Dulverton Waste Management are developed, documented and implemented. The Environmental Objectives Register refers. The register was reviewed and updated in November 2023 to include objectives and targets relevant to the reduction of organics in the landfill, the minimisation of leachate in irrigation areas, and to increase landfill capacity. The register outlines objective status details.

Compliance with the requirements of the standard is sound.

Records / documented information examined:

- Environmental Objectives Register.
- Confirmed in interview with the Chief Executive Officer and Operations and Project Officer.

Environmental aspects and impacts

Environmental aspects and impacts associated with the landfill operations and composting processes were examined with no changes made since the previous BSI Assessment. Environmental aspects and impacts continue documented within the Environmental Management System Aspects and Impacts Register 1/2/2023. This is a live document, continually reviewed and updated to reflect aspect and impact changes as the site changes and evolves. Changes are highlighted in 'pink'. Once the board approves changes, the colour coding is removed.

Compliance with the requirements on the Standard is sound.

Records / documented information and processes examined:

- Environmental Management System Aspects and Impacts Register 1/2/2023.
- Confirmed in interview with the Chief Executive Officer and Operations and Project Officer.

Management review processes

Management review processes are conducted in accordance with the requirements of the Standard and include an examination of all management review input and output requirements. Minutes from the review meeting held in November 2022 were examined. Meeting minutes demonstrate a comprehensive overview of environmental management performance, compliance and improvement.

Processes in place are sound and meet requirements.

Records / documented information examined:

- Management Review Meeting Minutes 10/11/2022.
- Confirmed in interview with the Chief Executive Officer and Operations and Project Officer.

Internal audit

Internal audit planning and scheduling continues to be managed and programmed as required by the Standard. Records and reports provide a detailed summary of audit findings and results, with summary detail reported during management review processes. Corrective action processes arising from audits when required include root cause analysis activities.

Records from the internal audit conducted on the 18th of February 2023 were sighted. The audit was conducted by an External Consultant. No significant environmental management findings were raised.

Internal auditing processes meet all requirements of the Standard.

Records / documented information examined:

- Internal Audit Report 18th of February 2023.
- Confirmed in interview with the Chief Executive Officer and Operations and Project Officer.

Control of non-conformances, incident management, corrective action

Non-conformance management and corrective action processes continue to be implemented, focusing on environmental management related issues. Procedures for corrective action activities include an examination of root cause issues as required. The process extends to customer / stakeholder complaints. As confirmed in interview with the Operations and Project Officer, no significant environmental issues or licence breaches have occurred since the previous BSI Assessment.

Processes in place are sound and meet requirements.

Records / documented information examined:

- Environmental and General Corrective Action Register.
- Confirmed in interview with the Chief Executive Officer and Operations and Project Officer.

Operation control, process management

A site visit was conducted at the landfill and composting operations, examining environmental management controls. The following controls and infrastructure were examined and confirmed to be compliant with the environmental management system and the standards requirements.

- Site entry and exit access points (including weighbridge and boom gate), and site security fencing.
- Litter netting.
- Leachate ponds and new tank installation process sighted.
- Composting operational controls (leachate, windrow and stockpile identification).
- Pest and weed management controls confirmed.
- Landfill operations confirmed, with no fundamental operational changes since the previous BSI Assessment. A new cell has however been established.

Records and processes relating to any complaint about the client that has been referred to BSI

No complaints regarding Dulverton Waste Management are known to have been directed to BSI by customers or stakeholders.

Next visit objectives, scope and criteria

The objective of the assessment is to conduct a re-assessment of the existing certification to ensure the elements of the proposed scope of registration and the requirements of the management standard are effectively addressed by the organisation's management system.

The scope of the assessment is the documented management system with relation to the requirements of ISO 14001:2015 and the defined assessment plan provided in terms of locations and areas of the system and organisation to be assessed.

Criteria:

- ISO 14001:2015.
- DWM Environmental Management System Manual 30th November 2021.

Please note that BSI reserves the right to apply a charge equivalent to the full daily rate for cancellation of the visit by the organisation within 30 days of an agreed visit date.

Next Visit Plan

Plan to be provided by BSI Assessor prior to next assessment.

Appendix: Your certification structure & ongoing assessment programme

Scope of Certification

EMS 698108 (ISO 14001:2015)

For the management of a waste management facility comprising landfill and compost production operations.

Assessed location(s)

Devonport / EMS 698108 (ISO 14001:2015)

Location reference	**0047695802-000**
Address	Dulverton Waste Management Dulverton Landfill Level 1, 17 Fenton Way Devonport Tasmania 7310 Australia
Visit type	Continuing assessment (surveillance)
Assessment number	3572553
Assessment dates	30/05/2023
Deviation from Audit Plan	No
Total number of Employees	6
Effective number of Employees	6
Scope of activities at the site	For the management of a waste management facility comprising landfill and compost production operations.
Assessment duration	0.5 day(s)

Latrobe / EMS 698108 (ISO 14001:2015)

Location reference	**0047695802-001**
Address	Dulverton Waste Management 145 Dawson Siding Road Latrobe Tasmania 7307 Australia
Visit type	Continuing assessment (surveillance)
Assessment number	3573785
Assessment dates	30/05/2023
Deviation from Audit Plan	No
Total number of Employees	6
Effective number of Employees	6
Scope of activities at the site	For the management of a waste management facility comprising landfill and compost production operations.
Assessment duration	0.5 day(s)

Certification assessment program

Certificate Number - EMS 698108
Location reference - 0047695802-000

		Audit1	Audit2	Audit3	Audit4
Business area/Location	**Date (mm/yy):**	05/21	05/22	05/23	04/24
	Duration (days):	1	1	1	2
Scope and Policy		X	X	X	X
Organisational context		X		X	X
Leadership and Commitment		X	X	X	X
Management System Support		X		X	X
Planning and Resources		X	X		X
Human Resource Management			X	X	X
Control of Documents and Records		X			X
Objectives / Aspects /Performance Monitoring & Measurement		X	X	X	X
Management Review		X	X	X	X
Internal Audits		X	X	X	X
Actions / Non-Conformity / Incidents / Complaints		X	X	X	X
Risk Management / Prevention		X	X	X	X
Legal and Other Requirements		X	X	X	X
Improvement		X	X	X	X
Operational Control		X	X	X	X

Expected outcomes for accredited certification.

What accredited management system certification means?

To achieve an organisation's objectives related to the Expected Outcomes intended by the management systems standard, the accredited management system certification is expected to provide confidence that the organisation has a management system that conforms to the applicable requirements of the specific ISO standard.

In particular, it is to be expected that the organisation

- has a system which is appropriate for its organisational context and certification scope, a defined policy appropriate for the intent of the specific management system standard and to the nature, scale and impacts of its activities, products and services over their lifecycles, is addressing risks and opportunities associated with its context and objectives;

- analyses and understands customer needs and expectations, as well as the relevant statutory and regulatory requirements related to its products, processes and services;
- ensures that product, process and service characteristics have been specified in order to meet customer and applicable statutory/regulatory requirements;
- has determined and is managing the processes needed to achieve the Expected Outcomes intended by the management system standard;
- has ensured the availability of resources necessary to support the operation and monitoring of these products, processes and services;
- monitors and controls the defined product process and service characteristics;
- aims to prevent nonconformities, and has systematic improvement processes in place including the addressing of complaints from interested parties;
- has implemented an effective internal audit and management review process;
- is monitoring, measuring, analysing, evaluating and improving the effectiveness of its management system and has implemented processes for communicating internally, as well as responding to and communicating with interested external parties.

What accredited management systems certification does not mean?

It is important to recognize that management system standards define requirements for an organisation's management system, and not the specific performance criteria that are to be achieved (such as product or service standards, environmental performance criteria etc).

Accredited management systems certification should provide confidence in the organisation's ability to meet its objectives related to the intent of the management system standard. A management systems audit is not a full legal compliance audit, and does not necessarily ensure ethical behaviour or that the organisation will always achieve 100% conformity and legal compliance, though this should of course be a permanent goal.

Within its scope of certification, accredited management systems certification does not imply or ensure, for example:

- that the organisation is providing a superior product and service, or
- that the organisation's product and service itself is certified as meeting the requirements of an ISO (or any other) standard or specification.

Definitions of findings:

Non-conformity:

Non-fulfilment of a requirement.

Major nonconformity:

Nonconformity that affects the capability of the management system to achieve the intended results.

Nonconformities could be classified as major in the following circumstances:

- If there is a significant doubt that effective process control is in place, or that products or services will meet specified requirements;
- A number of minor nonconformities associated with the same requirement or issue could demonstrate a systemic failure and thus constitute a major nonconformity.

Minor nonconformity:

Nonconformity that does not affect the capability of the management system to achieve the intended results.

Opportunity for improvement:

It is a statement of fact made by an assessor during an assessment, and substantiated by objective evidence, referring to a weakness or potential deficiency in a management system which if not improved may lead to nonconformity in the future. We may provide generic information about industrial best practices but no specific solution shall be provided as a part of an opportunity for improvement.

Observation:

It is ONLY applicable for those schemes which prohibit the certification body to issue an opportunity for improvement.

It is a statement of fact made by the assessor referring to a weakness or potential deficiency in a management system which, if not improved, may lead to a nonconformity in the future.

How to contact BSI

Visit the BSI Connect Portal, our web-based self-service tool to access all your BSI assessment and testing data at a time that's convenient to you. View future audit schedules, submit your corrective action plans and download your reports and Mark of Trust logos to promote your achievement. Plus, you can benchmark your performance using our dashboards to help with your continual improvement journey.

Should you wish to speak with BSI in relation to your certification, please contact your local BSI office – contact details available from the BSI website:

https://www.bsigroup.com/en-AU/contact-us/

Notes

This report and related documents are prepared for and only for BSI's client and for no other purpose. As such, BSI does not accept or assume any responsibility (legal or otherwise) or accept any liability for or in connection with any other purpose for which the Report may be used, or to any other person to whom the Report is shown or in to whose hands it may come, and no other persons shall be entitled to rely on the Report. If you wish to distribute copies of this report external to your organisation, then all pages must be included.

BSI, its staff and agents shall keep confidential all information relating to your organisation and shall not disclose any such information to any third party, except that in the public domain or required by law or relevant accreditation bodies. BSI staff, agents and accreditation bodies have signed individual confidentiality undertakings and will only receive confidential information on a 'need to know' basis.

This audit was conducted through document reviews, interviews and observation of activities. The audit method used was based on sampling the organisation's activities and it was aimed to evaluate the fulfilment of the audited requirements of the relevant management system standard or other normative document and confirm the conformity and effectiveness of the management system and its continued relevance and applicability for the scope of certification.

As this audit was based on a sample of the organisation's activities, the findings reported do not imply to include all issues within the system.

Regulatory compliance

BSI requires to be informed of all relevant regulatory non-compliance or incidents that require notification to any regulatory authority. Acceptance of this report by the client signifies that all such issues have been disclosed as part of the assessment process and agreement that any such non-compliance or incidents occurring after this visit will be notified to BSI as soon as practical after the event.

APPENDIX E – CONTROLLED WASTE REPORT

APPENDIX F – GHD LANDFILL MONITORING REPORT

Annual Landfill Monitoring Report

2023

Dulverton Regional Waste Management Authority

20 February 2024

→ The Power of Commitment

Project name		Dulverton Landfill Water Monitoring					
Document title		Annual Landfill Monitoring Report | 2023					
Project number		12564388					
File name		12564388_REP_DRAFT A-2023 Landfill Monitoring Report.docx					
Status Code	**Revision**	**Author**	**Reviewer**		**Approved for issue**		
			Name	**Signature**	**Name**	**Signature**	**Date**
S4	0	S. King	D. Rockliff	By email 12/02/2024	S. Wright		20/02/2024

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[Compliance statement]

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1. Introduction

Dulverton Regional Waste Management Authority (DRWMA) engaged GHD Pty Ltd (GHD) to undertake periodic monitoring and reporting of groundwater and surface water at the DRWMA Landfill ("the landfill"). The landfill is situated at Dawsons Siding Road, Latrobe, Tasmania ("the site"). GHD has been conducting routine quarterly and 6-monthly surface water, leachate, and groundwater monitoring at the site since August 2016. This report outlines the results of the surface and groundwater monitoring for the period January 2023 to December 2023 inclusive. Much of the general information provided in the previous Landfill Annual Monitoring Reports has been retained in this report for completeness. Where changes have occurred, these have been noted and/or explained.

The landfill currently operates under Environmental Protection Notice (EPN) 7158/3, which was issued on 20 November 2015. The adjacent Dulverton composting facility operates under a separate EPN (No. 7852/1), with environmental monitoring for the composting facility reported separately. Prior to March 2019, monitoring results from the composting facility had been included in the Landfill Monitoring Report.

1.1 Objectives and purpose of this report

The principal objective of GHD's engagement, and purpose of this report, is to assess and report the status of groundwater and surface water at the site through the collection and analysis of water samples, with the aim of identifying potential impacts the landfill may be having on the surrounding environment. Emphasis is placed on receptors down-gradient of the landfill on Caroline Creek. The landfill is located within the catchment of Caroline Creek.

1.2 Scope and limitations

To meet the requirements outlined in EPN 7158/3, and address the stated project objectives above, the following scope of works was undertaken by GHD:

– Quarterly sampling of surface water, including stormwater and leachate, at nominated points across the site;
– Bi-annual (six monthly) monitoring of groundwater at nominated groundwater bores;
– Laboratory analysis of all water samples by an independent NATA accredited laboratory;
– Interpretation of laboratory analysis results; and
– Preparation of a concise technical report summarising the monitoring results (this report).

1.2.1 Limitations

This report: has been prepared by GHD for Dulverton Regional Waste Management Authority and may only be used and relied on by Dulverton Regional Waste Management Authority for the purpose agreed between GHD and Dulverton Regional Waste Management Authority as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than Dulverton Regional Waste Management Authority 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 any 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.

GHD has prepared this report on the basis of information provided by Dulverton Regional Waste Management Authority and others who provided information to GHD (including Government authorities)], which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

Accessibility of documents

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

2. Site description and history

The Dulverton landfill is located approximately 15 km south of Devonport in Northern Tasmania. The landfill receives waste streams from municipal kerb side waste collections, waste transfer stations, and private contractors. The landfill is not open to the public. The site is classified as a Category B – Putrescible Landfill under the *Landfill Sustainability Guidelines* (DPIPWE, 2004), and can accept inert waste, clean fill, and putrescible waste. Category B landfills can also accept some controlled wastes and low-level contaminated material (as defined under *Information Bulletin 105 – Classification and Management of Contaminated Soil for Disposal*) subject to EPA approval and the site's EPN conditions.

The site began operation in 1995. The key features of the site include:

– The landfill, consisting of an open tip face of approximately 50 metres;
– Two leachate storage lagoons: One lagoon uses an aerator to reduce nutrient load and odour; the other is used as an overflow/storage lagoon. Leachate drains through the open waste cell and is collected by the leachate collection system, which was updated in 2023 and now consists of a series of storage tanks, a shed, pumps, and a dedicated tap for collecting the leachate sample. Leachate flows by gravity through a network of pipes from the drainage system to the new leachate pump station. The leachate is then pumped to Latrobe and discharged to TasWater's sewerage system via an underground pipeline;
– One HDPE-lined emergency leachate overflow pond (formerly SP1 and SP2), and one stormwater pond;
– Historical hazardous waste cell that has been entombed for over five years;
– Underground gas recovery infrastructure on the closed landfill cells, and a gas flare;
– A weighbridge at the front gate for all customer loads to be weighed;
– Site office and facilities for on-site staff;
– A workshop for housing site machinery, which includes fuel storage tank and fuel trailer; and
– Firefighting infrastructure including a portable water cart, hydrants, and gear for personnel, including self-contained breathing apparatus sets.

The active landfill is lined and has a leachate collection system. The landfill is progressively covered and capped as per the site EPN. DRWMA have recently extended the landfill on the western side of the existing landfill cells.

Adjacent to the landfill site is an active composting operation, also managed by DRWMA, which operates under a separate EPN.

3. Monitoring network and program

Groundwater and surface water monitoring locations are shown on Figure 1.

3.1 Groundwater monitoring network

The groundwater monitoring network has historically numbered up to 17 bores as stated in the EPN. This included bores from various groundwater reviews / programs that have been installed over the history of the site, some of which have now been decommissioned:

– Bores installed as part of the original Environmental Management Plan (EMP) requirements for which no bore logs are available (B1 to B10);
– A second set of bores as part of a GHD hydrogeology review in 2009 (B11, B12, B14 and B21A); and
– Hazardous waste cell bores B15, B16 and B17 (now decommissioned).

Table 1 provides location information and a summary of bore details (where available) of those bores in and around the site. Due to the limited bore logs, GHD undertook a down-hole camera and down-hole geophysics assessment as part of a hydrogeology review in 2009 (GHD, 2009). The results were used to determine the likely aquifer that the bores may be screened in.

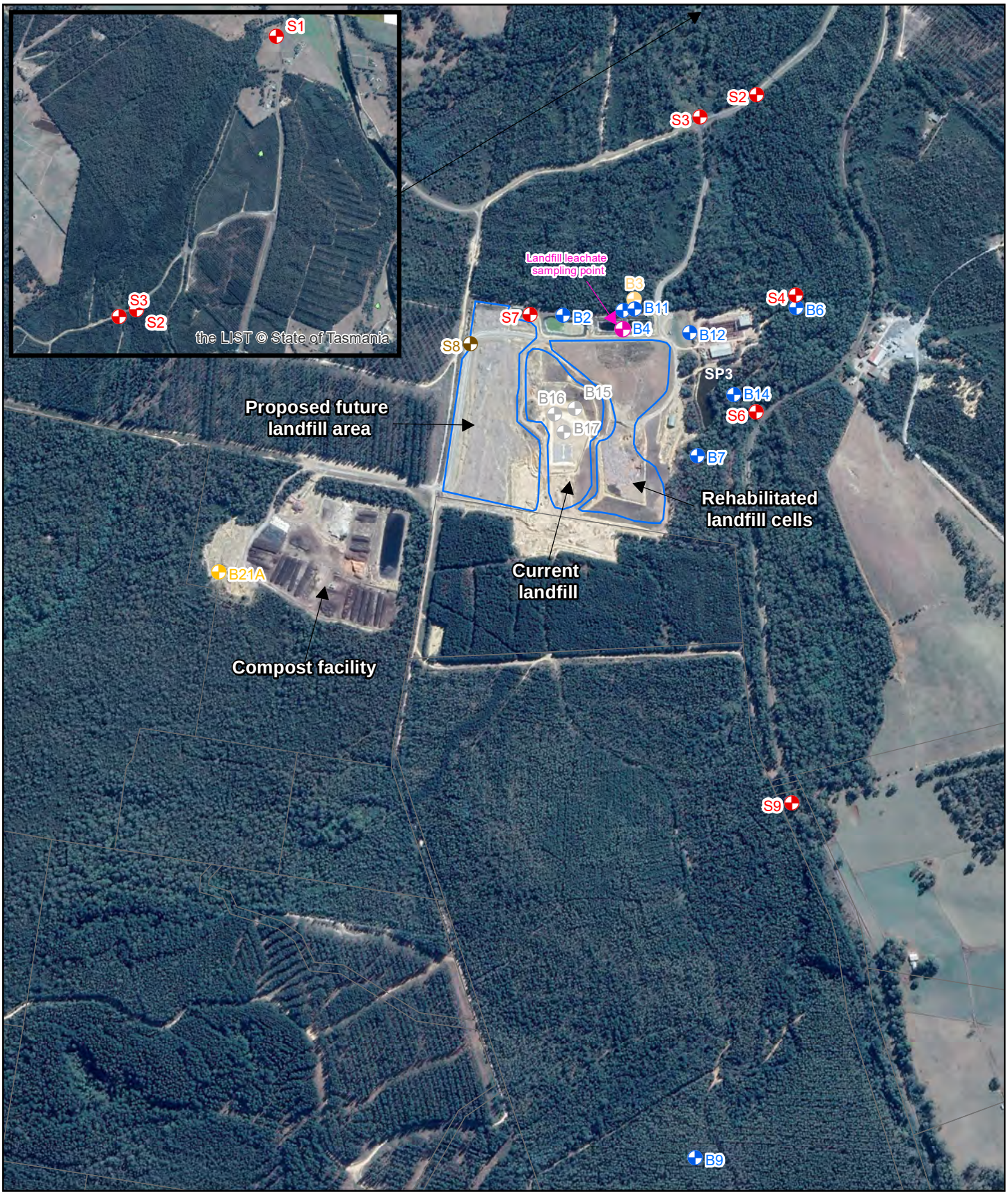
Some bores in the previous EPNs, such as B1, B3, B5 and B10 have not been included in the current EPN (as bore logs are unavailable, and field observations of bore conditions indicate that construction may not be adequate). The current groundwater monitoring network consists of the following bores:

– B2, B4, B6, B7, B9, B11, B12, B14.

The EPN states that groundwater monitoring shall include recording of the following:

– Standing water level;
– Volume of water in litres within the installed casing before purging;
– Volume of water in litres purged before sampling;
– Time required to purge the bore casing before sampling;
– Method of purging the casing water volumes;
– Flow rate of the purging method used for sampling;
– Time, date and identification code of the water sample; and
– Field primary water quality parameters, including at least, conductivity, pH, and temperature.

Additional bores have been drilled by Tasman Geotechnics to monitor groundwater levels in the landfill extension area to the west of the current landfill cells. These additional bores are not included in this report, or the current EPN, but may be useful for future detailed groundwater assessment.



LEGEND

- Surface Water Sampling Site
- Landfill leachate
- Surface Water Sampling Site (Decomissioned)
- Groundwater Monitoring Sites
- Decomissioned Monitoring Bore
- Monitoring Bore Not Sampled

Paper Size A3

0 50 100 200 300

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

Dulverton Regional Waste Management Authority

Job Number 32-19202
Revision B
Date 04 Mar 2020

Groundwater & Surface Water Sampling Locations

Figure 1

G:\32\3219202\GIS\Maps\Deliverables\3219202_Sampling_Sites_RevB.mxd

2 Salamanca Square Hobart TAS 7000 Australia T 61 3 6210 0600 F 61 3 6210 0601 E hbamail@ghd.com W www.ghd.com

Data source: DPIPWE TheLIST, cadastre, 2017; GEPro, Imagery, 2017; GHD, bore locations, sample sites, 2017. Created by: drockliff

Table 1 Summary of current and historical groundwater network

Bore ID	Easting	Northing	Total Depth	Screened from (mBG)	Screened to (mBG)	Screened lithology	Location and purpose
B2	449234	5429501	21.8	18.3	21.7	Sandstone	Next to stormwater pond.
B3	449396	5429537	17.5	14.5	18	Limestone	North of leachate pond No 1. No longer monitored.
B4	449371	5429511	19.6	16.6	19.6	Sandstone	Between leachate ponds 1 and 2.
B6	449766	5429518	6.72	3.5	6.5*	Shale/mudstone	Eastern side of boundary between the landfill and Caroline Creek.
B7	449541	5429180		17.6	20	Sandstone	South of sediment pond and in between landfill and Caroline Creek.
B9	449536	5427578	69.8			Unknown	Background groundwater site.
B11	449397	5429515	7.95	4.95	7.95	Clayey silts	Monitoring the upper most aquifer down gradient of the leachate ponds.
B12	449523	5429461	14.33	6.98	9.98	Clayey silts	Monitoring the deeper aquifer between the landfill and Caroline Creek.
B14	449624	5429320	4.47	1.47	4.47	Gravelly silt	Monitoring the upper most aquifer down gradient of the landfill.
B15	449261	5429288	14.5	10.5	14.5	Clayey silts	Monitoring the hazardous waste cell. No longer monitored.
B16	449215	5429275	14.5	10.5	14.5	Limestone	Monitoring the hazardous waste cell. No longer monitored.
B17	449236	5429234	16	11	16	Clayey silts	Monitoring the hazardous waste cell. No longer monitored.
B21A	448448	5428914	23	17	23	Clay, dolerite boulders and limestone	Former background groundwater site. No longer monitored.

3.2 Surface water and leachate monitoring sites

The main surface water feature near the landfill is Caroline Creek, which flows northwards through the north-eastern corner of the site. Caroline Creek joins the Mersey River approximately 3 km north-east of the landfill.

There are various sampling sites that sample Caroline Creek, including a background site (S9), down-gradient sites, and sites that are seasonally dry. The surface water and leachate monitoring sites are detailed in Table 2 below. Figure 1 shows the location of the surface water sampling sites for the landfill facility.

Table 2 Summary of surface water and leachate monitoring sites

Sample ID	Location and Purpose
S1	Furthest downstream site of Caroline Creek. Provides water quality prior to entering the Mersey River (600 m upstream from junction).
S2	On Caroline Creek, approximately 500 metres downstream of the landfill.
S3	A small drainage line, which flows after high rainfall events. This monitors stormwater run-off water quality leaving the site to Caroline Creek.
S4	Caroline Creek culvert on the road between the railway and the former Mushroom Compost Facility. Monitoring down-gradient Caroline Creek water quality as it passes adjacent the site.
S6	This was the listed as an historical background Caroline Creek site but due to proposed landfill expansion, a new background site has been added (S9).
S7	This is a stormwater drainage line from sediment pond 1 at the northern site boundary.
S9	The background surface water site monitoring Caroline Creek.
Landfill leachate	This is the onsite leachate pond which is monitored at least quarterly by GHD through the site Trade Waste Agreement with TasWater. During 2022 and 2023, samples were taken from the Pomona pump on site and recently from the new leachate collection system. Previously, they have been taken from either the Gilbert St pump or the Pomona pump.

Leachate monitoring at the site is currently undertaken as part of DRWMA's Trade Waste Agreement with TasWater (a landfill leachate monitoring program is not specified in the EPN). In the past, samples have been taken weekly and quarterly by DRWMA, and the quarterly results have been provided to GHD for inclusion in an assessment of historical results.

3.3 Rainfall

The Australian Bureau of Meteorology (BOM) weather station 91332 (Dowbiggin Street, Railton) provides rainfall data since 2003. In reports prior to the 2019 Annual Report, data from BOM weather station 91291 (Sheffield School Farm) was used; however, it is now considered that data from the Railton weather station is more relevant as it is closer to the landfill site. Daily rainfall, recorded during the current monitoring period (2023) is detailed in Figure 2 below. Rainfall in the 5 days preceding sampling is shown below in Table 3.

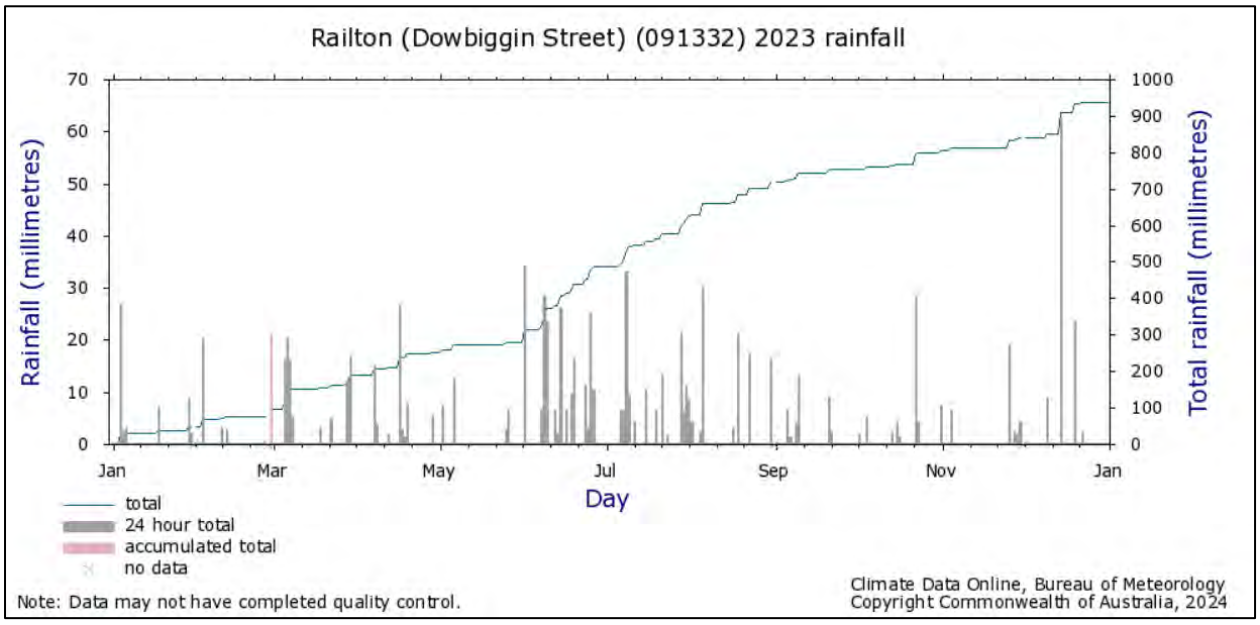


Figure 2 Daily rainfall for the reporting period[1]

Total annual rainfall for station 91332 for 2023 was 937.4 mm, which is significantly lower than the 2022 total of 1399.6 mm, and lower than the annual average of 1051.3 mm. There was one occasion where daily rainfall was recorded above 50 mm (14th December 2023 with 62 mm).

Table 3 Rainfall for 5 days preceding sampling[1]

Sampling start date	Rainfall on sampling day (mm)	Rainfall preceding 5 days (mm)
27/03/2023	0	4.6, 0, 0, 0, 0
17/05/2023	0	0, 0, 0, 0, 0
29/06/2023	0	3, 25, 10.2, 0, 0
05/09/2023	6.2	0, 0, 0, 0, 0
12/12/2023	0	0, 0, 8.8, 0, 0

1 BOM, 2024. http://www.bom.gov.au/

4. Sampling and analysis plan

Sampling and analyses were carried out according to relevant Australian guidelines. For a detailed description of the sampling plan, refer to Appendix A. GHD delivered the services in line with a quality control and assurance plan, tailored specifically for this project, which is detailed in Appendix B. A QA/QC summary table is provided in Table 7 of Appendix C.

The sampling program is based on the current EPN with some minor amendments which have incorporated recommendations from previous reports. The sampling programs are summarised in Table 4, Table 5, and Table 6.

Table 4 Groundwater sampling program

Frequency	Parameters
Six-monthly	Field parameters: Temperature, pH, EC, Dissolved Oxygen, Redox Potential Laboratory Analysis: Major ions (calcium, magnesium, potassium, sodium, chloride, sulfate, bicarbonate), Total Dissolved Solids, total nitrogen, ammonia, nitrite, nitrate, total phosphorus, orthophosphate (reactive phosphorus), Dissolved Organic Carbon, Biochemical Oxygen Demand, TPH, Dissolved metals (As, Fe, Cu, Zn, Cr, Hg, Mn, Ni, Pb, Se), total iron, bromide, iodide

Table 5 Surface water sampling program

Frequency	Parameters
Three monthly	Field parameters: Temperature, pH, EC, Dissolved Oxygen, Redox Potential Laboratory Analysis: pH, biological oxygen demand, total suspended solids, conductivity, total nitrogen, ammonium, oxides of nitrogen, total phosphorus, dissolved free phosphorus, major ions (calcium, magnesium, potassium, sodium, chloride, sulfate, bicarbonate)
Six monthly	Three monthly parameters, plus: Laboratory Analysis: Total metals (Fe, Cu, Zn, Cr, Mn, Ni, Pb, Cd) Dissolved metals (Fe, Cu, Zn, Cr, Mn, Ni, Pb, Cd)

Table 6 Leachate sampling program

Frequency	Parameters
Monthly	Laboratory Analysis: BOD, TSS, TDS, Oil & Grease, Sulphate, Sulphite, Sulphide, Total Nitrogen, Ammonia, Total phosphorus, thiosulphate, total oxidised sulphur, dissolved major cations, major ions, chloride, alkalinity, nitrate, nitrite, orthophosphate, chemical oxygen demand, dissolved organic carbon, total cyanide, formaldehyde, acetone derivatives, pesticides (OC & OP), phenoxyacetic acid herbicides, PCBs, MBAS, dissolved and total metals (Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Mn, Ni, Se, Zn), BTEX, PAHs, Total Chlorinated Hydrocarbons, Total Petroleum Hydrocarbons (including Silica gel clean up), phenolic compounds.

GHD undertook quarterly sampling of landfill leachate from January to June 2023 inclusive, and monthly from July to December 2023 inclusive, at the request of DRWMA. The weekly parameters (as listed in Table 2.2 of the TasWater Trade Waste Agreement) were used for the monthly sampling and were added to the extended quarterly sampling suite in December 2019.

The EPN states that landfill leachate results may be required by the Director, EPA; and if required by the Director, leachate pond water must be sampled for parameters as listed in the EPN. During the reporting period, no request was received from the EPA Director to undertake landfill leachate testing (in addition to that required under the Trade Waste Agreement).

4.1 Monitoring frequency

Environmental monitoring began at the DRWMA landfill site following issue of Permit Conditions Environmental (PCE) 5931 in November 1993, which included a similar network of groundwater and surface water sites as is currently monitored. Since this time, there have been additional bores drilled, surface water sites added and lost, and leachate is now monitored through a trade waste agreement with TasWater.

Monitoring undertaken by GHD during the 2023 period occurred in:

– March 2023 – Groundwater, surface water and leachate monitoring;
– May 2023 – Surface water monitoring (sites S1,S2 and S3 only);
– June 2023 – Surface water and leachate monitoring;
– July 2023 – Leachate monitoring;
– August 2023 – Leachate monitoring;
– September 2023 – Groundwater, surface water and leachate monitoring;
– October 2023 – Leachate monitoring;
– November 2023 – Leachate monitoring; and
– December 2023 – Surface water and leachate monitoring.

Previous monitoring undertaken during the 2022 period occurred in:

– March 2022 – Groundwater, surface water and leachate monitoring;
– April 2022 - Leachate monitoring;
– May 2022 – Leachate monitoring;
– June 2022 – Surface water and leachate monitoring;
– July 2022 – Leachate monitoring;
– August 2022 – Leachate monitoring;
– September 2022 – Groundwater, surface water and leachate monitoring;
– October 2022 – Leachate monitoring;
– November 2022 – Leachate monitoring; and
– December 2022 – Surface water and leachate monitoring plus select groundwater bores (B4 and B9 which were unable to be sampled or had incomplete data during the March round).

5. Basis for assessment

Surface and groundwater results are compared against the guidelines defined through the *State Policy on Water Quality Management 1997.* The State Policy defines a series of water quality objectives for protecting the environmental value of a water resource, depending on the usage of the environment in a given area. Achieving these objectives is met by either maintaining or enhancing water quality for the water resource in question.

The first step in the implementation of the *State Policy on Water Quality Management 1997* is identifying the Protected Environmental Values (PEVs) for the surface waters in the region of interest. PEVs are the current values and uses of a water body for which water quality should be protected.

The DRWMA landfill is located within the Mersey catchment, as defined in the *Environmental Management Goals for Tasmanian Surface Waters – Mersey December 2001.* The landfill is located on what is defined as "private land" in the report. PEVs apply to all surface waters within each land tenure category (i.e. public, private etc.), other than privately owned waters that are not accessible to the public, or are not connected to, or flow directly into, waters that are publicly accessible.

Caroline Creek flows through part of the site and discharges into the Mersey River which is publicly accessible and used for a variety of activities. Therefore, the landfill qualifies as having PEVs for surface waters that flow through private land, which sets specific target objectives for surface waters.

For surface waters flowing through private land (including forest on private land) the PEVs, as defined in the *Environmental Management Goals for Tasmanian Surface Waters – Mersey December 2001,* are:

- Protection of aquatic ecosystems
  - Protection of modified (not pristine) ecosystems from which edible fish are harvested
- Recreational Water Quality and Aesthetics
  - Primary contact water quality (Mersey River - at Union Bridge; adjacent to Bridle Track Road Kimberley Bridge picnic area, at Olivers Road Bridge, at Liena Road Bridge, at Merseylea Bridge and from Lovetts Flats to Bells Parade)
  - Secondary contact water quality
  - Aesthetic water quality
- Raw Water for Drinking Water Supply (creeks / groundwater extraction bores)
- Agricultural Water Uses
  - Irrigation
  - Stock watering

Overall, the management goals, (as taken from Environmental Management Goals for Tasmanian Surface Waters – Mersey) for this area are "*That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish may be harvested; that is acceptable for irrigation and stock watering purposes; is suitable for industrial supply in specified areas (pulp and paper production, mining and chemical works and brick production); for town drinking water supply (subject to coarse screening and disinfection) in specified area; and which will allow people to safely engage in recreation activities such as swimming (in specified areas), paddling or fishing in aesthetically pleasing waters. For private land (including forest on private land) within the Mole Creek karst system, water quality management should also have particular regard to the values associated with that system*" (2001, Department of Primary Industries, Water and the Environment).

The PEVs refer to the following nationally recognised documents for specific trigger values:

- Australian and New Zealand Governments and Australian state and territory governments (ANZG 2018). **Australian and New Zealand Guidelines for Fresh and Marine Water Quality.** These guidelines superseded the ANZECC (2000) guidelines;

- Australian and New Zealand Environmental Conservation Council & Agricultural and Resource Management Council of Australia and New Zealand (ANZECC & ARMCANZ 2000**) Australian and New Zealand Guidelines for Stock and Domestic;**
- Australian and New Zealand Environmental Conservation Council & Agricultural and Resource Management Council of Australia and New Zealand (ANZECC & ARMCANZ 2000) **Australian and New Zealand Guidelines for Irrigation Long Term Trigger values**;
- National Health and Medical Research Council and Natural Resource Management Council (NHMRC & NRMMC 2011) **Australian Drinking Water Guidelines.**

6. Site assessment results

6.1 Background

GHD has conducted quarterly surface water and 6-monthly groundwater monitoring on site since 2016. Prior to this, and as noted in the previous reports, there is a high degree of uncertainty around the results collected at the site between 2005 and 2016.

The reasons for the uncertainty were due to the groundwater sampling procedures followed, which are understood to have not been undertaken in line with Australian Standards such as:

– No dissolved metals results – samples were analysed for total metals only, which is difficult to assess against the guidelines as the trigger values are for bioavailable dissolved metals; and
– The previous groundwater sampling method did not include purging or stabilising field parameters prior to collecting a groundwater sample.

A brief summary of the results, adapted from the previous GHD report is provided in the following sections for completeness and comparison, however these results should still be treated with caution. Long-term surface water trends have been included, but as outlined above, groundwater trends have only been included dating back to the start of 2016, as results prior to this are not considered reliable.

Field sheets are provided in Appendix D. All laboratory documentation for the 2023 monitoring period is provided in Appendix E.

6.2 Assessment criteria

As previously described in Section 5, the PEV for the Mersey catchment includes protecting the receiving waters for a number of values. The trigger values used for comparison with site analytical results are:

– ANZG (2018) Trigger values for freshwater aquatic ecosystems with a level of protection for 95% of species **(FAE95%)**;
– National Health and Medical Research Council Primary Health and Contact, 2011 which is taken from the Australian Drinking Water Guidelines 2011 **(REC)**;
– ANZECC & ARMCANZ (2000) Irrigation Long Term Trigger values **(LTV),** Irrigation Short term Trigger Values **(STV)**; and
– ANZECC & ARMCANZ (2000) Stock and Domestic **(S&D)**.

6.3 Water chemistry results

The following section of this report provides a summary of monitoring results against assessment criteria for results collected after 2016. Results are compared against the adopted trigger values and figures are provided showing water chemistry trends. Water data for these periods is summarised in Tables 1-6 of Appendix C.

6.3.1 2023 Groundwater monitoring results

This section describes the results of monitoring from the six-monthly groundwater monitoring events during 2023 and compares them with previous results (since August 2016). Table 7 shows the sites with analytes above the adopted trigger levels only. Exceedances are shown for dissolved metals only, which are needed to compare against FAE95% [ANZG (2018)] guidelines. This sampling program adopted Australian Standards for sampling (detailed in Appendix A), which includes purging of three well volumes and / or achieving stabilised field parameters prior to a sample collection. Analytical results are summarised in Tables 1 and 2 of Appendix C. Field sheets and a summary of groundwater field parameters with stabilised field parameters is provided in Table 1 in Appendix D.

The HydraSleeve method has been used for sampling background bore B9 since September 2020, due to the depth of the bore (69.8 m) making manual purging difficult. There also appears to be an obstruction in the bore, preventing the use of a pump. The HydraSleeve was lowered to the bottom of the well to take a sample from the screened section only, eliminating the need for purging. A Water Monitoring Plan prepared by GHD in August 2023 for DRWMA's new Dulverton Organics Facility proposes that a new background bore for the site will be installed in 2024 to replace B9.

Table 7 Summary of groundwater parameters above trigger levels in 2023 compared to the previous reporting period

Bore	Year	FAE95%	REC	LTV	STV	S&D
B2	2022	Ammonia, Cu, Mn, Ni, Zn	Mn, Ni	Chloride, N (total),	P (total), Fe	
	2023	Ammonia, Ni, Zn		Chloride, N (total), Fe, Mn		
B4	2022			Fe		
	2023			Fe, Mn		
B6	2022	Cu, Zn		P (total)	Fe	
	2023			P (total), Fe		
B7	2022	No exceedances				
	2023	No exceedances				
B9	2022			P (total)		
	2023	No exceedances				
B11	2022	Cd, Cu, Pb, Ni, Zn	Ni		Fe	
	2023	Cu, Ni, Pb		Chloride	Fe	
B12	2022	Cu, Zn				
	2023	Nitrate, Zn				
B14	2022	Cu, Zn		Fe	P (total)	
	2023			Fe		

Generally, exceedances in metals were similar to the 2021 reporting period; with a general reduction in exceedances compared to the 2021 and 2022 monitoring rounds. The stock watering criteria was not exceeded during the reporting period. Consistent with 2021 and 2022 data, there were no exceedances at B7 in 2023.

Exceedances in lead were noted at B11 which is consistent with the previous four reporting periods.

Arsenic, cadmium, chromium, mercury and selenium were below or close to the laboratory limit of detection in all samples collected during 2023, which is consistent with the previous reporting period. Iron and / or phosphorus were above the LTV for irrigation PEVs in around half of the bores, which is generally consistent with previous groundwater monitoring results. It is possible that phosphorus is a product of the region's agricultural setting and iron is naturally occurring.

There were no exceedances at background bore B9 in 2023. Historically, B9 has shown elevated levels of Cu, Mn, and Zn; however, these levels have reduced to within the limits of applied criteria in recent years, indicating that background levels may not be as high as previously thought.

The down gradient bores show a similar pattern with respect to metal concentrations, namely copper, zinc and nickel which show an increasing trend compared with previous years, although levels do still appear to be fluctuating. Zinc in particular experienced a spike in 2023 at B11. These metals have previously been observed in elevated concentrations in background bore samples. B11 appears to be the most enriched bore on site in terms of dissolved metal concentrations (Fe, Cu, Pb, Zn, Ni), although there were fewer exceedances at this bore in 2023. Coupled with a low pH of around 4, contaminants could be mobilised in groundwater more easily at this site.

The concentrations of Cu, Ni and Zn at the monitoring bores since August 2016 are shown in Figure 3, Figure 4 and Figure 5 respectively. Plots of total phosphorus (Figure 6) and Ammonia (Figure 7) have also been included as they are contaminants of potential concern (COPC), and concentrations on site have fluctuated over previous monitoring periods with some significant spikes noted.

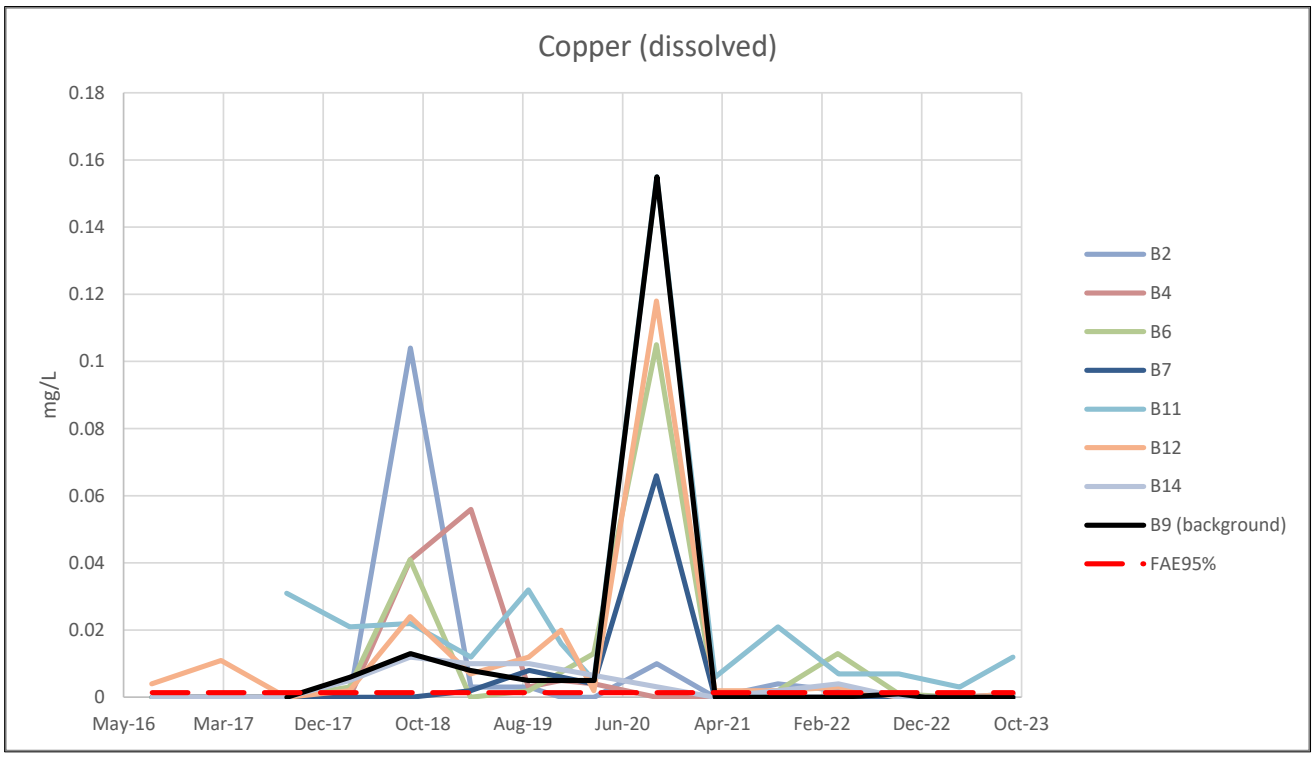


Figure 3 *Dissolved copper concentrations (monitoring bores)*

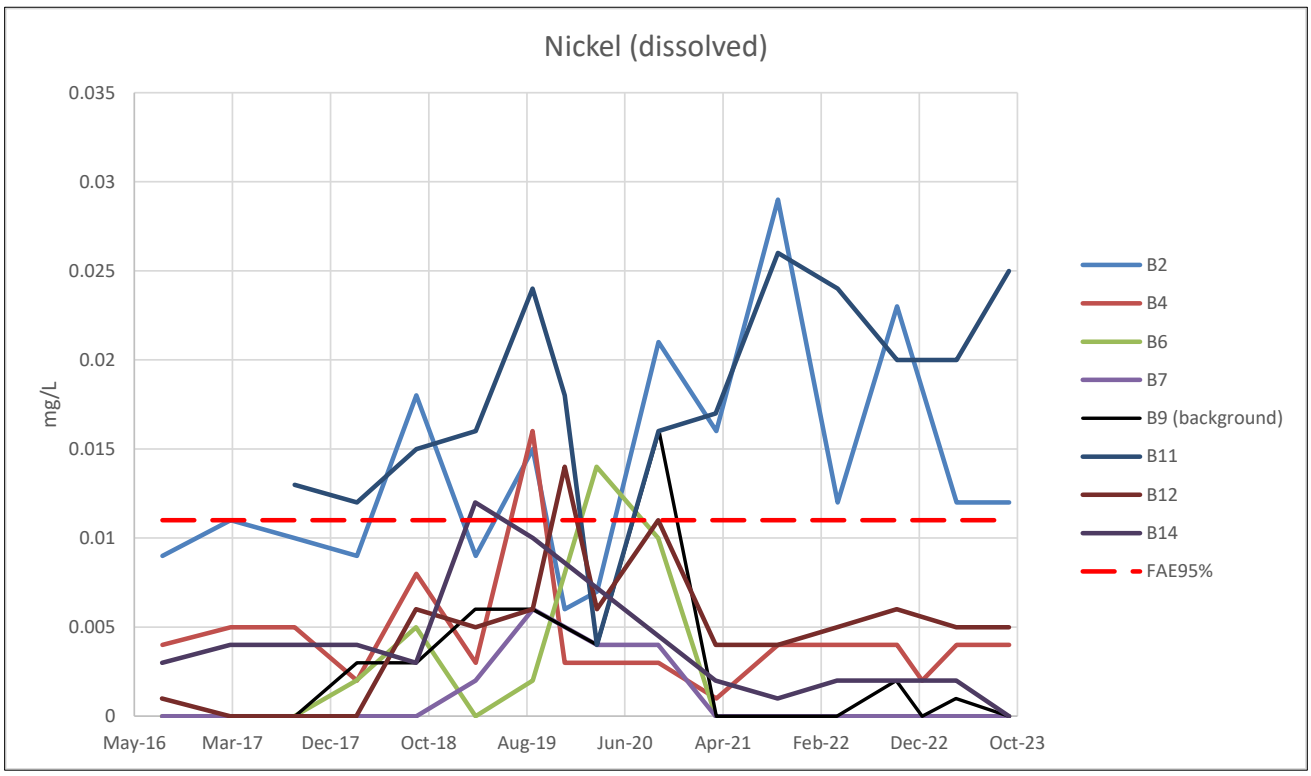


Figure 4 *Dissolved nickel concentrations (monitoring bores)*

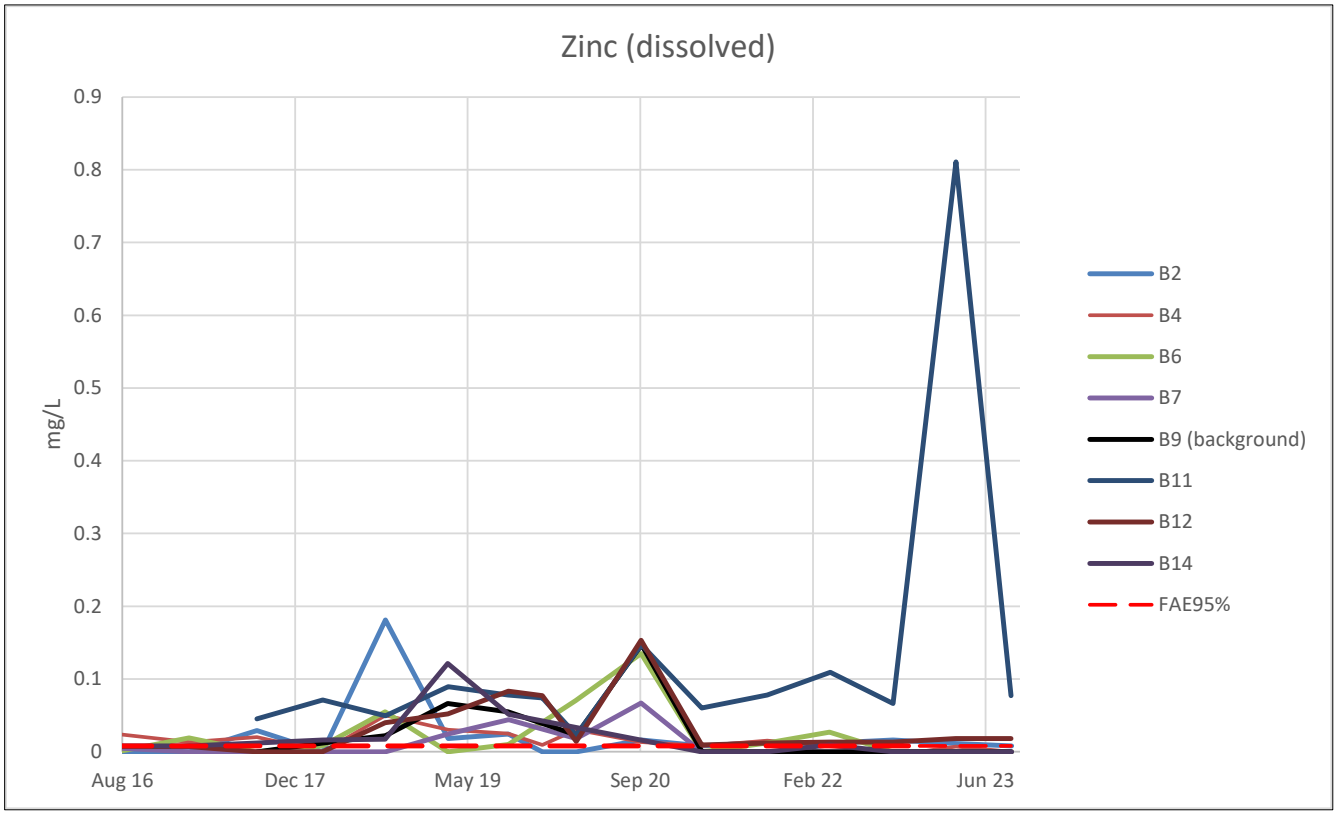


Figure 5 *Dissolved zinc (monitoring bores)*

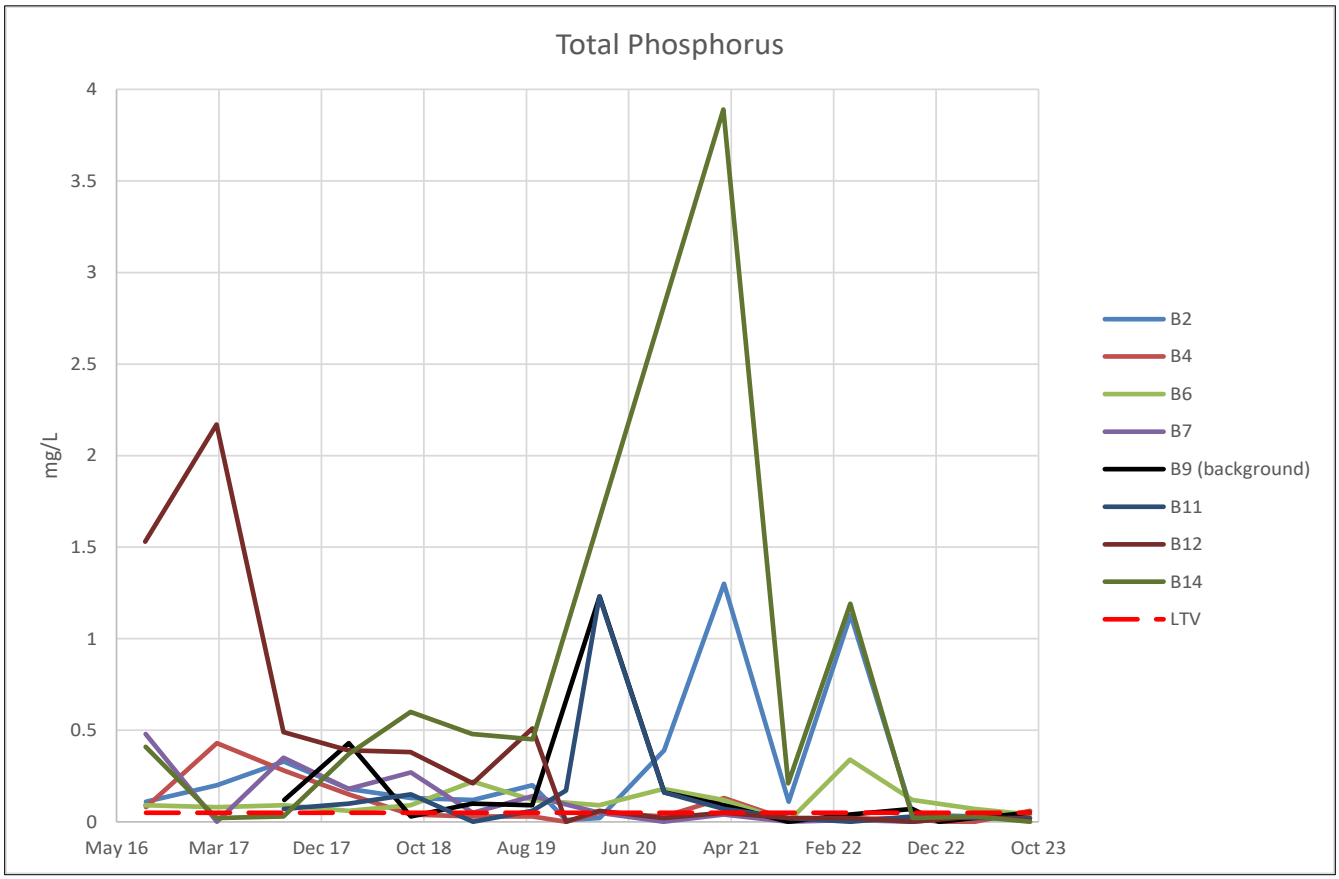


Figure 6 *Total Phosphorus (monitoring bores)*

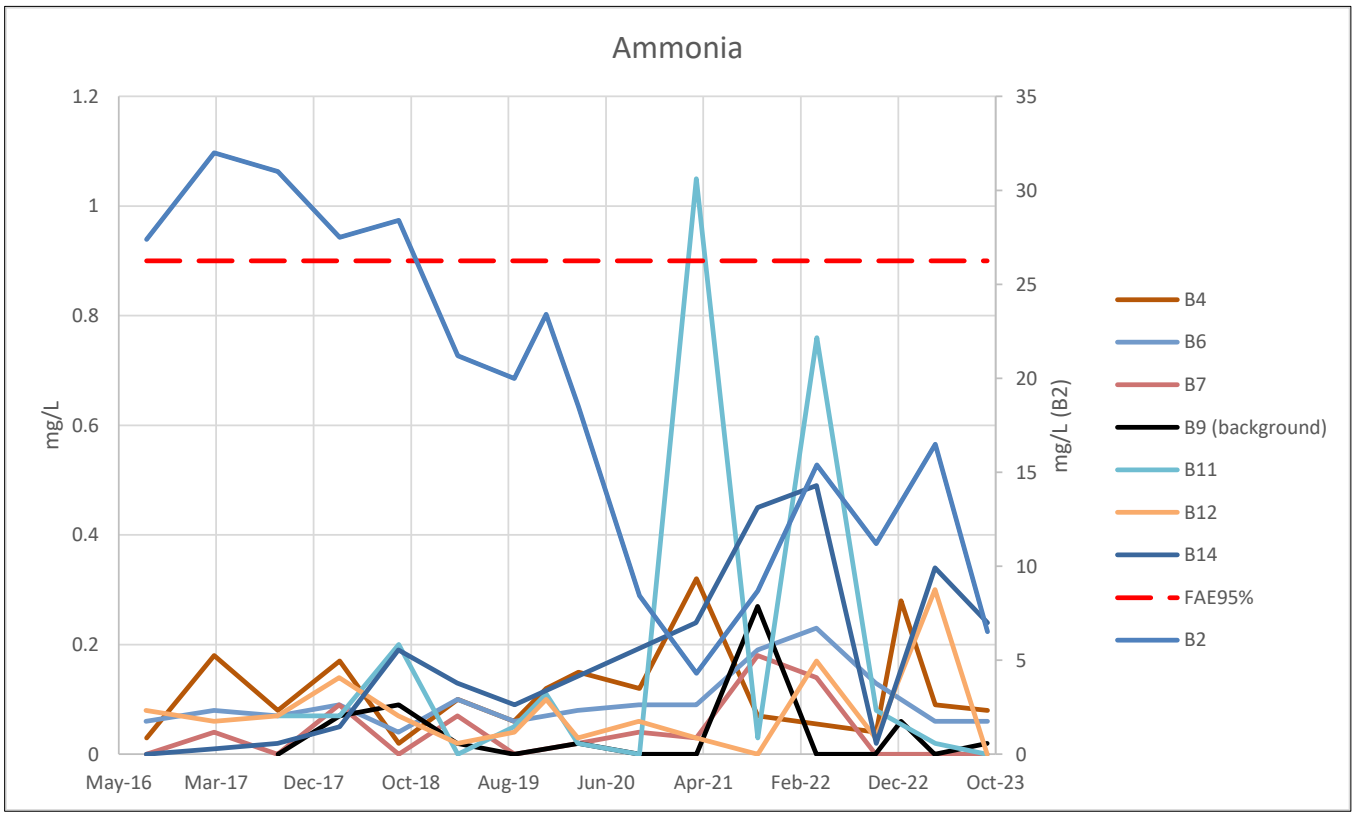


Figure 7 *Ammonia concentrations (monitoring bores)*

Total phosphorus concentrations have continued to fluctuate since August 2018, though have decreased significantly since the previous monitoring event. B6 was the only bore which recorded an exceedance of the LTV during the reporting period.

Consistent with previous monitoring, ammonia concentrations in groundwater across the site have continued to fluctuate, however showed a general reduction in levels. Ammonia levels at B2 increased since the previous monitoring round and were in exceedance of the FAE95% criteria during March and September. B2 is plotted against a secondary axis in Figure 7.

BTEX, TPH and TRH were analysed for in the March and September monitoring events. Minor concentrations of toluene were detected in most bores (with the exception of B4 and B6) during the 2023 monitoring event. TPH/TRH concentrations remained below or close to laboratory limits of reporting in all bores. Although BTEX is not specifically required as part of the groundwater monitoring program in the EPN (TPH required only), BTEX has been tested for historically and should continue to be part of the groundwater monitoring program going forward, particularly given the detection of toluene in most bores during 2023, which is a CoPC present in the landfill leachate.

Monitoring should continue to draw out any similarities between the landfill leachate and groundwater chemistry signatures. Major ion analysis (discussed later) will also aid in classifying the amount of mixing, if any, of these waters.

6.3.2 2023 Surface water monitoring results

Exceedances for the parameters analysed in the surface water results are shown in Table 8. Metals exceedances are dissolved concentrations unless otherwise stated. Results are summarised in Tables 3 and 4 of Appendix C.

Surface water sampling sites that were unable to be sampled due to low flow are outlined in Table 9.

Table 8 Summary of surface water parameters above trigger levels in 2023 compared to the previous reporting period

Site	Year	FAE95%	REC	LTV	STV	S&D
S1	2022	No exceedances				
	2023	No exceedances				
S2	2022	Nitrate, Zn				
	2023			Total P		
S3	2022	Ammonia, Nitrate, Cr, Cu, Zn		Total N, Total P, Fe, Mn	P (total)	
	2023	Ammonia, Cr, Cu		P (total), Fe, Mn	N (total), P (total)	
S4	2022	Nitrate		Total P		
	2023	No exceedances				
S6	2022	Nitrate				
	2023	No exceedances				
S7	2022	Ammonia, Nitrate, Cr, Cu Fe, Ni, Pb, Zn	Nitrate	Total N, Pb, Mn,	N (total), P (total)	
	2023	Ammonia, Cr, Cu, Ni		Fe, Mn	N (total), P (total)	
S9	2022	Nitrate				
	2023	No exceedances				

Table 9 Surface Water sites unable to be sampled during 2023

Monitoring Round	Surface water site
March	S1, S2, S3 (sampled in May 2023), S7
December	S7, S9

Exceedances of the assessment criteria in surface water are similar to the previous reporting period, with a general reduction in overall exceedances. Sites S1, S4, S6 and background site S9 recorded no exceedances.

Nitrate levels continue to fluctuate at all sites, with a reduction in levels noted in 2023. Figure 8 shows trends in total nitrate concentrations.

Total phosphorus levels also continued to fluctuate, with some slight increases noted at S2 and S7.

Consistent with previous monitoring events, ammonia concentrations at S3 and S7 are elevated above the FAE95% trigger levels.

Previous reports have noted that given the surrounding land use adjacent to the landfill appears to be agricultural (an industry which typically uses fertiliser) and forestry, elevated nutrient levels in background monitoring site(s) are not necessarily unexpected. It is considered that this explanation is still valid, particularly given the further disturbance and land clearing (timber harvesting) which has occurred recently on the surrounding land which may have resulted in mobilisation of contaminants.

Copper, lead, and zinc concentrations have generally shown an increase at most locations since 2016, when levels were almost non-detectable, however concentrations continue to fluctuate and have generally decreased during 2022 and 2023. The concentrations of these metals at background site S9 have also tended to fluctuate, which may explain the concentrations downstream. Figure 10 shows the trends in copper concentrations, which remained low at all sites during the monitoring period.

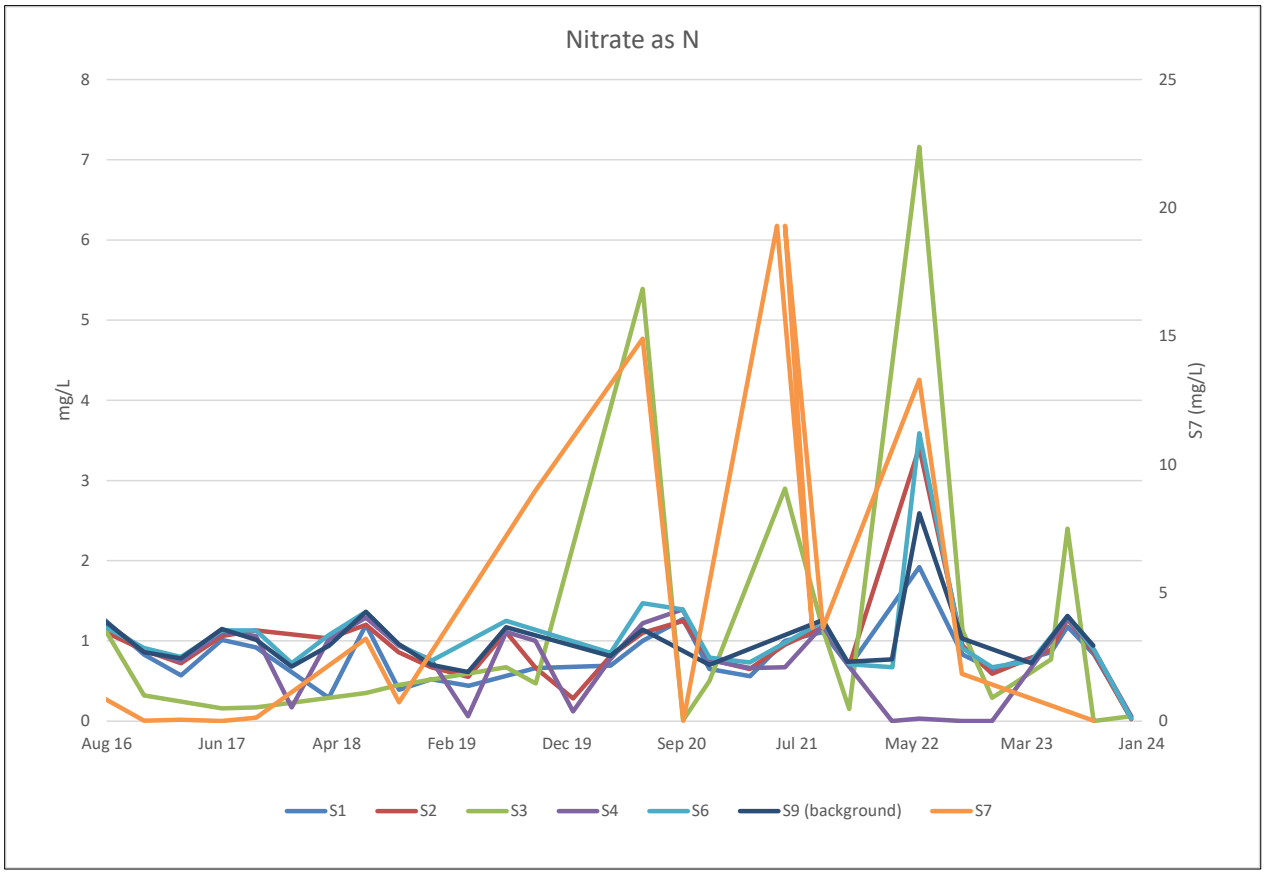


Figure 8 *Nitrate results at surface water monitoring sites*

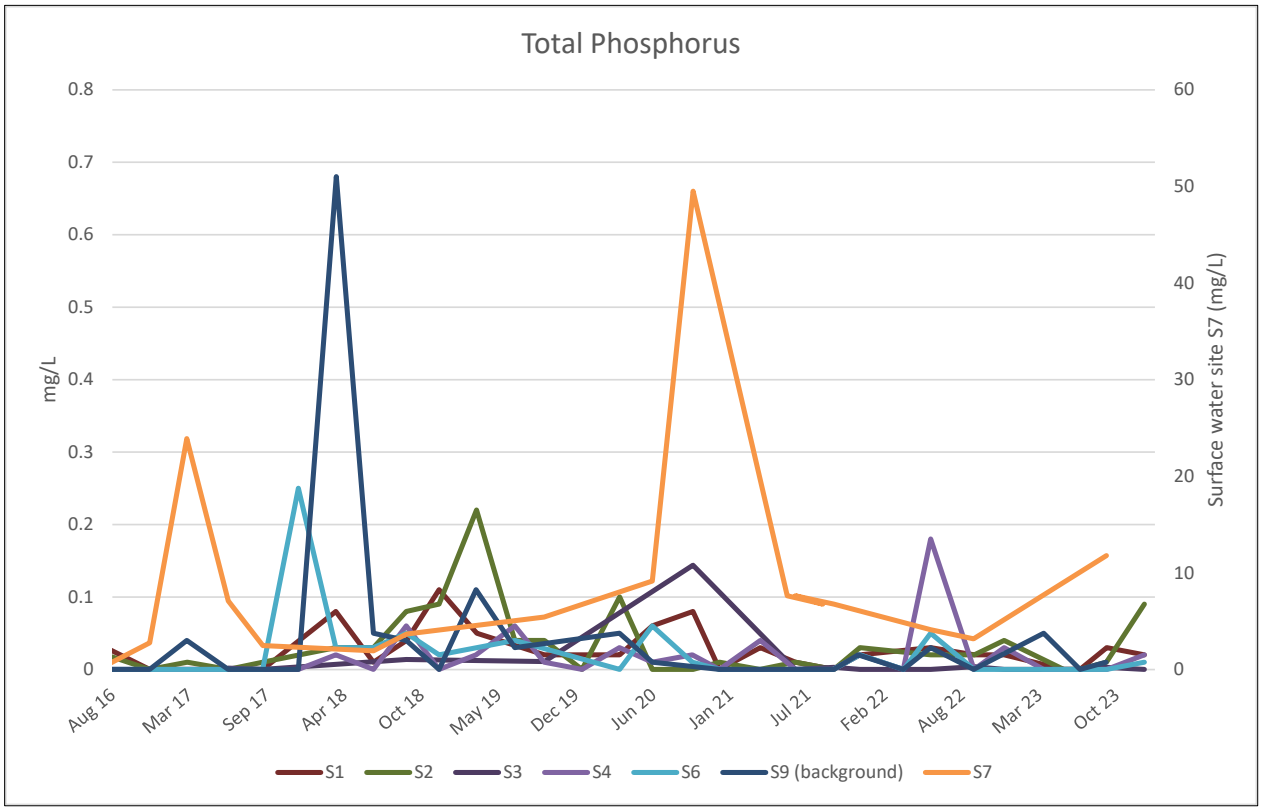


Figure 9 *Total phosphorus results at surface water monitoring sites*

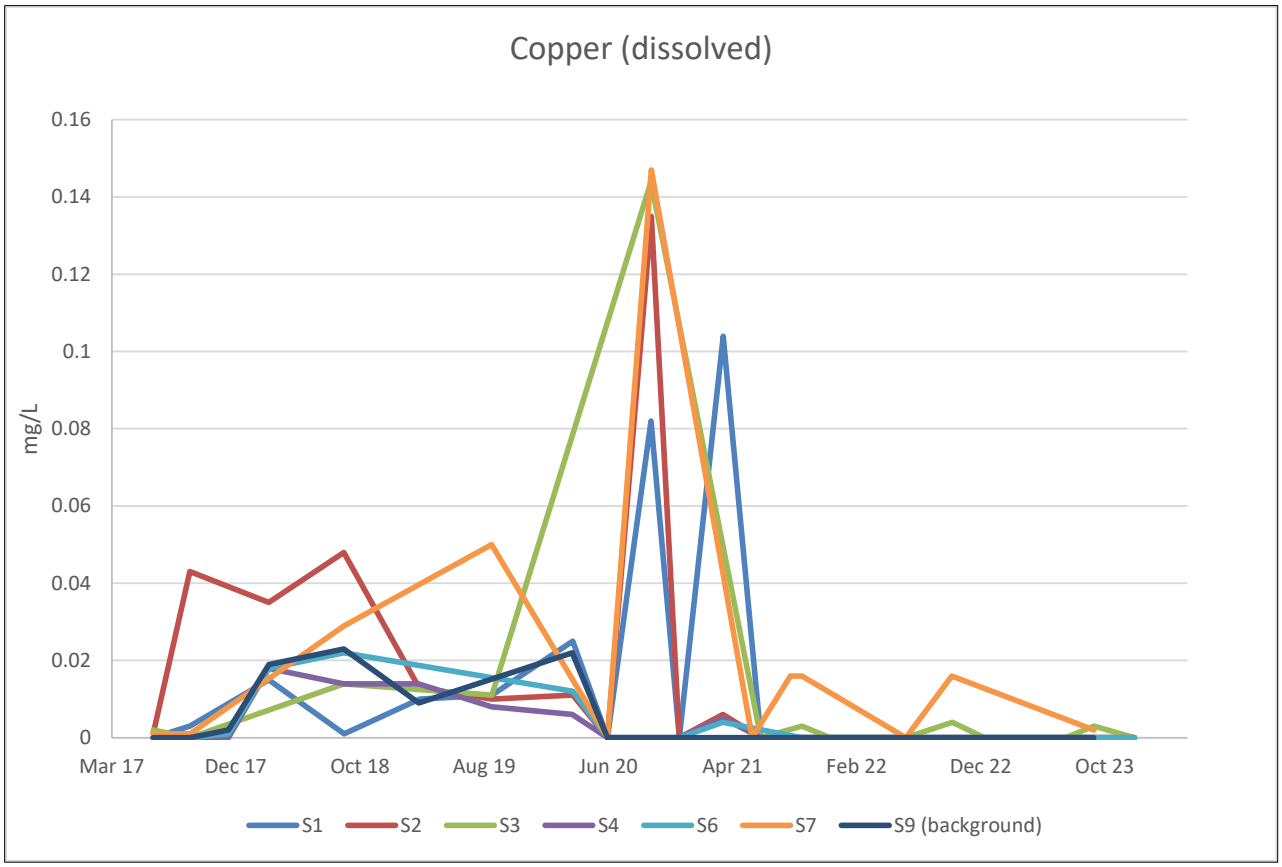


Figure 10 *Dissolved copper results at surface water monitoring sites*

6.3.3 2023 Leachate monitoring results

The following section outlines the results of the leachate sampling conducted by GHD at the landfill facility over the most recent monitoring period. Results are summarised in Tables 5 and 6 of Appendix C. This section aims to classify the leachate make up so that potential contaminants or parameters can be identified and used to assess if any leachate seepage to the environment has occurred.

Results that are in exceedance of PEV assessment criteria are summarised in Table 10. It is important to note that landfill leachate is unlikely to be continuously discharged to Caroline Creek, but does provide a snapshot of the elevated parameters and likely contaminants. Dissolved metals have been used in this report for comparison against trigger levels. In previous reports, total metal values were used in line with the leachate data provided by DRWMA; however, since DRWMA no longer provide leachate data, values for dissolved metals can be used for comparison to allow more accurate assessment of exceedances.

Table 10 *Summary of leachate parameters above trigger levels in 2023 compared to the previous reporting period*

Sampling point	Year	FAE95%	REC	LTV	STV	S&D
Landfill Leachate	2022	Cyanide, Ammonia, Al, Zn	Cu, Pb, Mn Benzene, formaldehyde	TDS, Chloride, Al, As, Cd, Cr III+VI, As, Cu, Ni, Se	Total N, Total P, Cr III+VI, Cu, Fe	
	2023	Cyanide, Ammonia, Nitrate, Al, As, Cr III+IV, Cu, Ni, Pb, Zn	As, Ni	Chloride, As, Cr III +IV, Fe, Mn, Ni	Total N, Total P	TDS

Exceedances in landfill leachate are generally similar to those noted in the previous report (2022), particularly in relation to nutrients (ammonia, nitrogen and phosphorus), chloride and some metals. Exceedances in the FAE95% criteria are similar to the 2021 reporting period. Overall however, there are fewer exceedances compared to the previous reporting period.

Formaldehyde exceeded the drinking water guidelines (REC) in 2021 and 2022 but were below criteria levels in 2023.

Trends in key COPC are shown in Figures 11 to 15 below.

It can be seen that ammonia and nitrogen levels fluctuated in 2023, with a slight increasing trend over time. Arsenic, chromium and nickel levels fluctuated during 2023, consistent with historical trends.

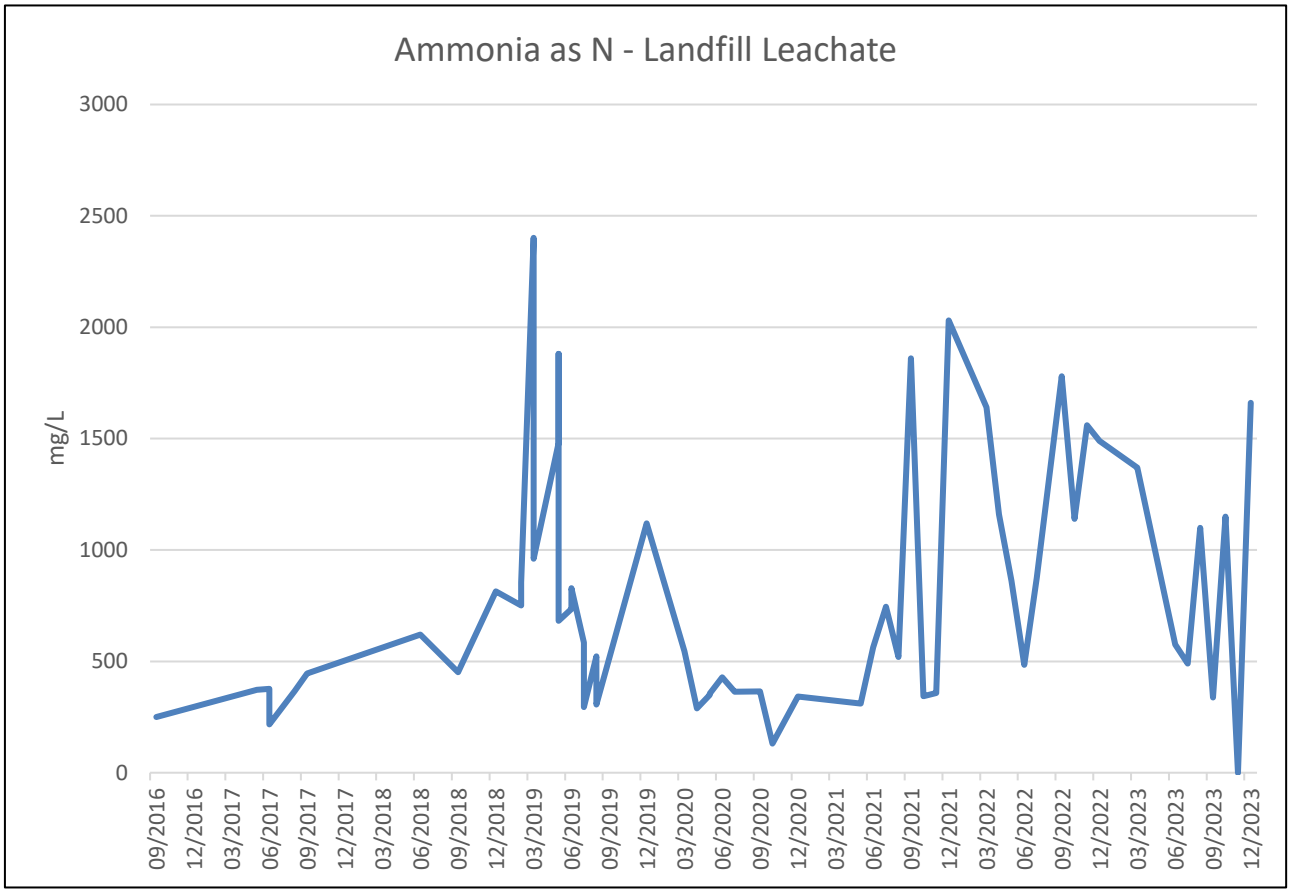


Figure 11 ***Landfill leachate ammonia concentrations over time***

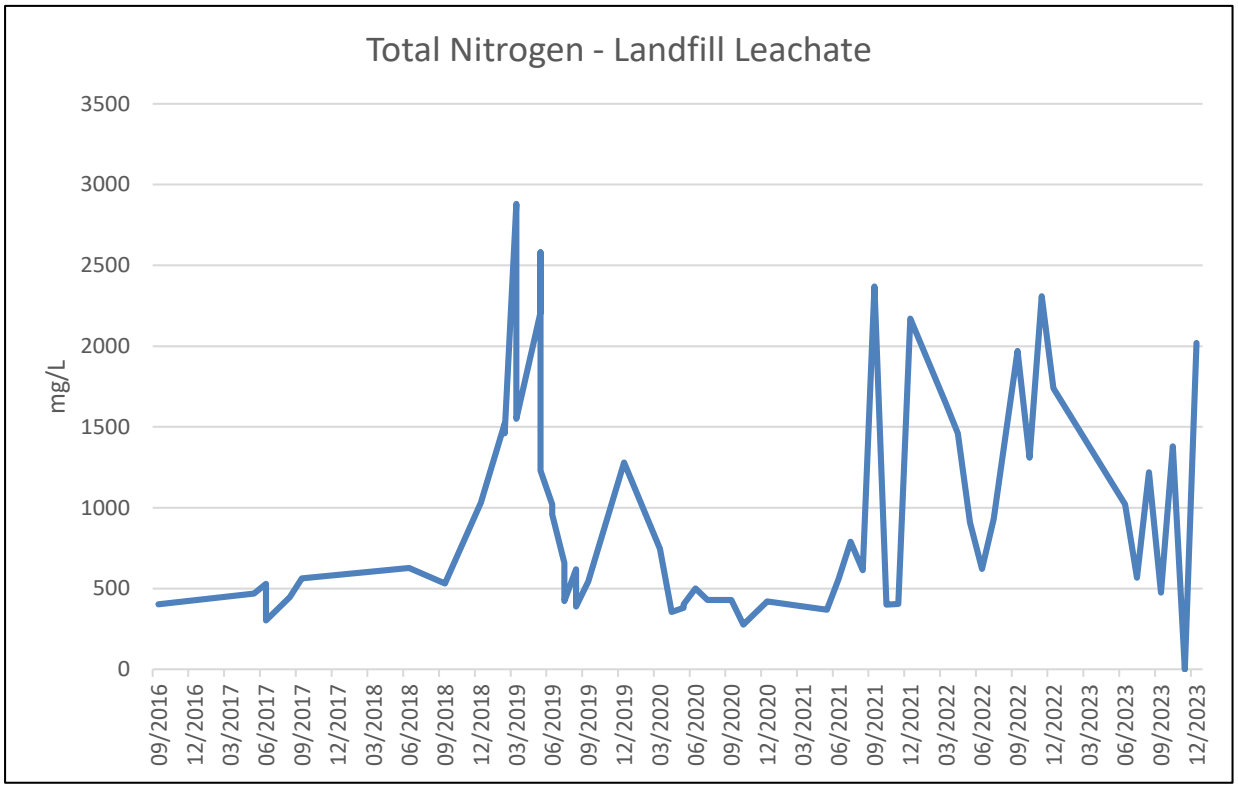


Figure 12 ***Landfill leachate total nitrogen concentrations over time***

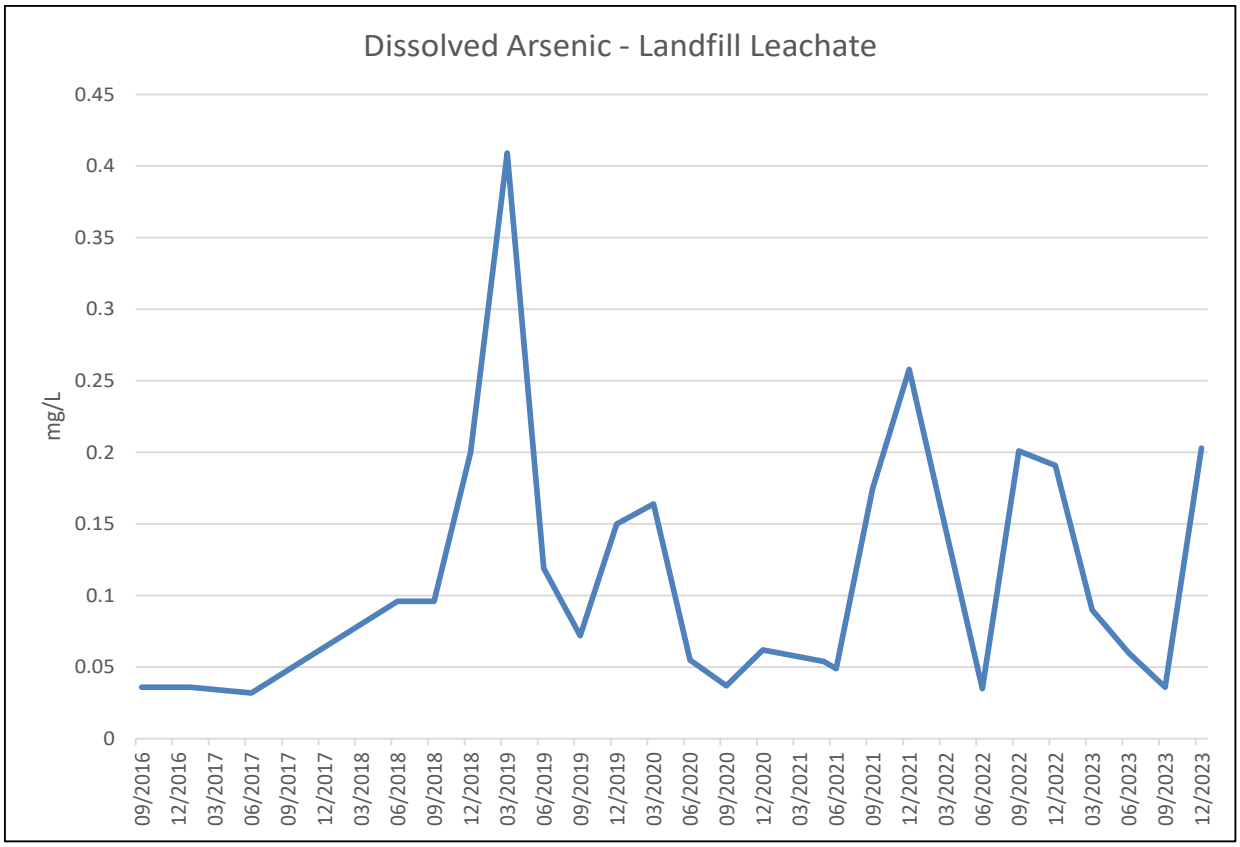


Figure 13 ***Landfill leachate dissolved arsenic concentrations over time***

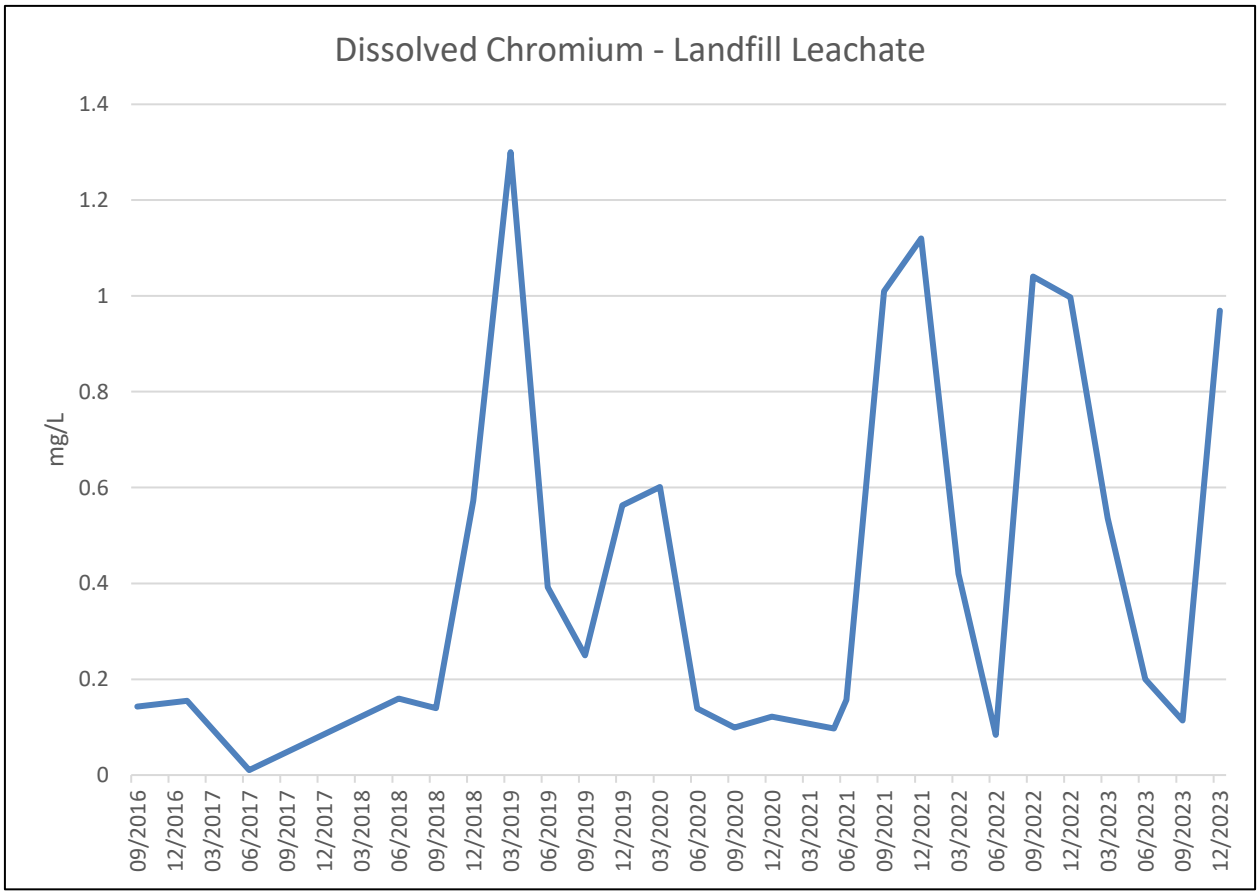


Figure 14 ***Landfill leachate dissolved chromium (III & IV) concentrations over time***

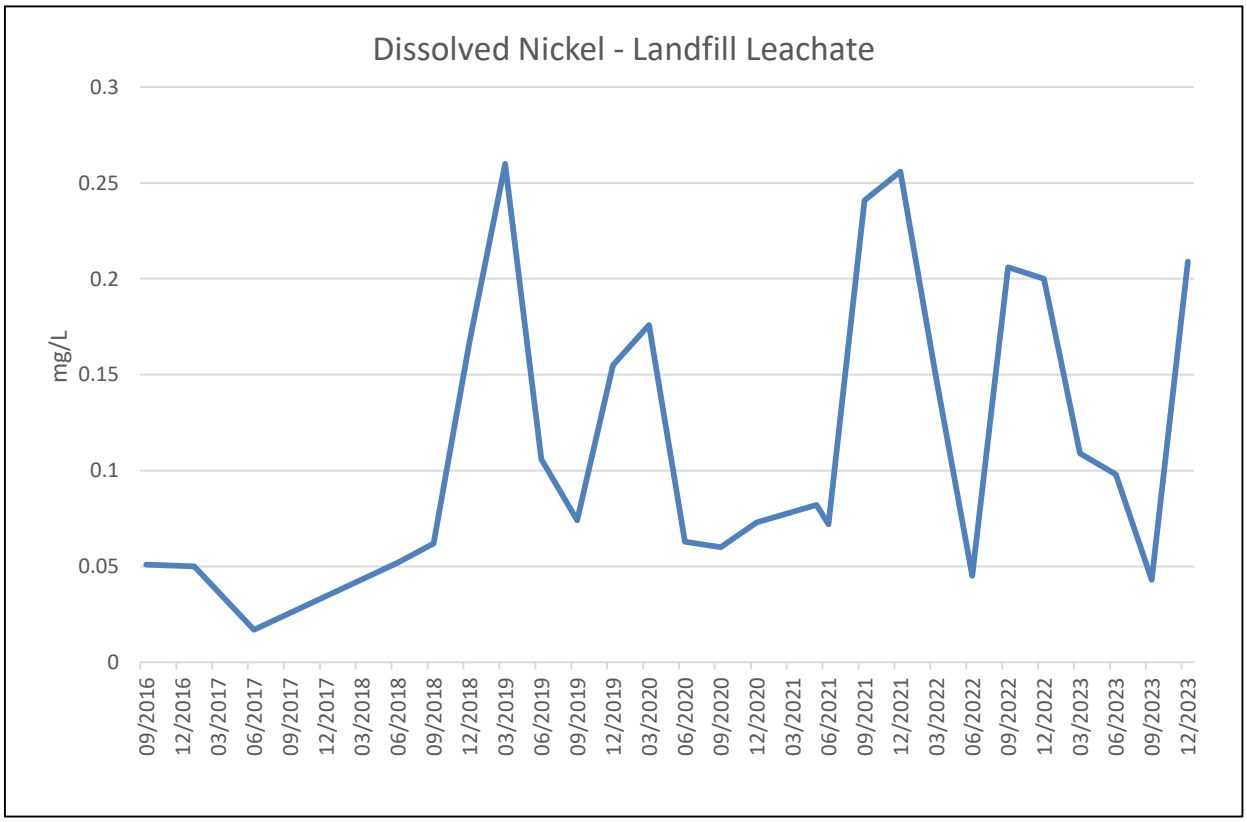


Figure 15 ***Landfill leachate dissolved nickel concentrations over time***

Total Recoverable Hydrocarbon (TRH) levels in landfill leachate continue to fluctuate with a potentially increasing trend, and were elevated in 2023 compared to the previous reporting periods. In September 2023, a total of 33,600 µg/L was recorded for the F3 (C_{16}-C_{34}) fraction. As recommended in the 2021 monitoring report, silica gel clean-up was conducted on samples with TRH levels above laboratory limits of reporting to determine the likely origin of the hydrocarbons present. Results indicate that the majority of TRH in the landfill leachate is of organic origin, rather than petroleum based.

Methylene Blue Active Substances (MBAS) levels were elevated in March and December 2023 but were below levels of reporting in September.

PAHs, SVOCs, OC Pesticides, herbicides, PCBs, dioxins, explosives, nitroaromatics and phthlanthates were generally all recorded at levels close to, or below the laboratory LOR. Aniline and acetone levels continue to fluctuate however, with elevated acetone levels (1,240 µg/L) recorded in December 2023.

The presence of pesticides, phenols, acetone and BTEX in landfill leachate has generally been intermittent and generally low in concentrations over time. They may be used as tracer parameters for the groundwater and surface water monitoring program, as their presence in the natural environment is limited, although they can be adsorbed and broken down within the aquifer. In June 2022, benzene exceeded the REC limit of 1 µg/L with a concentration of 3 µg/L recorded. Although this exceedance was not considered significant, it should continue to be monitored. It is noted that the REC criteria for benzene was amended in 2022 and the limit is now 10 µg/L, hence no exceedance was triggered in 2023, although a benzene concentration of 3 µg/L was again recorded.

Toluene and xylene levels were slightly elevated in 2023 and should continue to be monitored for increasing trends.

7. Discussion & recommendations

The following discussion and subsequent recommendations should be considered to assess more completely the impact of the landfill operations on the surrounding environment. Recommendations from previous annual reports have been implemented, such as the inclusion of major ions and dissolved metals in the analytical suite, and inclusion of additional parameters to landfill leachate. These have contributed to the overall program and validity of the risk assessment, by confirming the presence (or absence in most cases) of these Contaminants of Potential Concern (COPC) or providing further information on the interactions between surface water, groundwater, and leachate. A summary of recommendations from this report is provided in Table 11.

7.1 Monitoring parameters

7.1.1 Naturally occurring background elements

Collecting background information on regional groundwater and surface water for the site is a key piece of evidence for informing interpretations and risk assessment. It was agreed with DRWMA that the background bore 'B21a' was no longer suitable to collect samples from and B9 was chosen as a replacement in 2017. There are some differences in reported chemical concentrations that have been observed in the results between the two locations.

B21a reported elevated concentrations of Cd, Cr, Cu, Pb, Ni, Zn over the previously used FAE95% assessment criteria (ANZECC 2000), and total and dissolved Fe and Mn over the STV criteria. Given this, it was speculated that some occurrences of Cd, Cr and Pb recorded in other surface and / or bores were possibly as a result of regional geology, and not landfill leachate. B9 has previously recorded dissolved Cu, and Zn over the FAE95% criteria, in addition to elevated phosphorus levels, but Cd, Cr and Pb are generally below (or close to) the LOR.

The recorded concentrations in B9 may indicate that there aren't naturally elevated concentrations of Cd, Cr and Pb in groundwater for the region. The cause of concentrations reported in B21a are unknown. Therefore, elevated concentrations of Cd, Cr and Pb on site should continue to be investigated in any future risk assessments.

Cr exceeded the FAE 95% guideline at surface water sites S3 and S7 in 2023, consistent with the 2022 monitoring round. Cd levels remain below or close to laboratory limits of reporting at all groundwater and surface water sites. Pb was elevated at groundwater bore B11 which is consistent with historical results and levels still appear to be fluctuating at that bore.

Concentrations of Cu, Ni and Zn continue to fluctuate across the site and remained relatively low in 2023, with the exception of a spike in zinc observed in B11. Levels of these metals should continue to be investigated over the next monitoring period to detect any potential increasing trends.

7.1.2 Contaminants of potential concern (COPC)

Dissolved metals have been included in the analytical suite since 2016 when GHD commenced monitoring the site. Consistency should be maintained by ensuring that samples continue to be field filtered for metals in order to build a substantial dataset for risk assessment purposes.

Collection of dissolved metal results has shown that total metal concentrations recorded up until 2016 are higher than the dissolved concentrations on which risk assessment criteria are based. Given this, prior assessments based on total concentrations are conservative at best, as some reported total concentrations (i.e. copper, cadmium, lead and zinc) subsequently reported dissolved concentrations for the same element below the laboratory LOR. In this case, the risk posed by such elements would be lower.

Analysis of landfill leachate intermittently shows levels of BTEX (benzene, toluene, ethylbenzene & xylene) above the laboratory limit of reporting suggesting that these contaminants are present and mobile in the landfill. Groundwater bores were analysed for BTEX in 2023. Minor concentrations of toluene were detected in most bores (with the exception of B4 and B6) during the 2023 monitoring event, although no increasing trends are noted at this stage. Toluene levels should continue to be monitored throughout 2024 to determine whether there is a continued presence of toluene in groundwater and consideration should be given to its potential origin.

7.1.3 Major ion analysis

As water flows through an aquifer it assumes a diagnostic signature related to the composition of the aquifer material and recharge chemistry. The major anions and cations are used to determine this signature and they can also be used to aid in determining if there is any mixing of water from other potential sources.

The major ions have been plotted on the Piper Plot shown in Figure 16 below. The majority of the groundwater appears to be a predominantly calcium bicarbonate type (Ca-HCO_3) which is indicative of a groundwater that has had a close association with a limestone aquifer.

The leachate samples tend to be dominated by sodium and potassium cations and chloride anions, as are bores B11 and B12, indicating a potential pathway between leachate and groundwater, which may warrant further investigation. Although some metal concentrations remain elevated at B11 and B12, there have been no increases in any CoPC or nutrients which would suggest any influence from leachate at this stage (with the exception of toluene, which suggests a potential influence and will continue to be monitored). These bores will continue to be monitored closely over the next monitoring period to assess whether any further investigation is required.

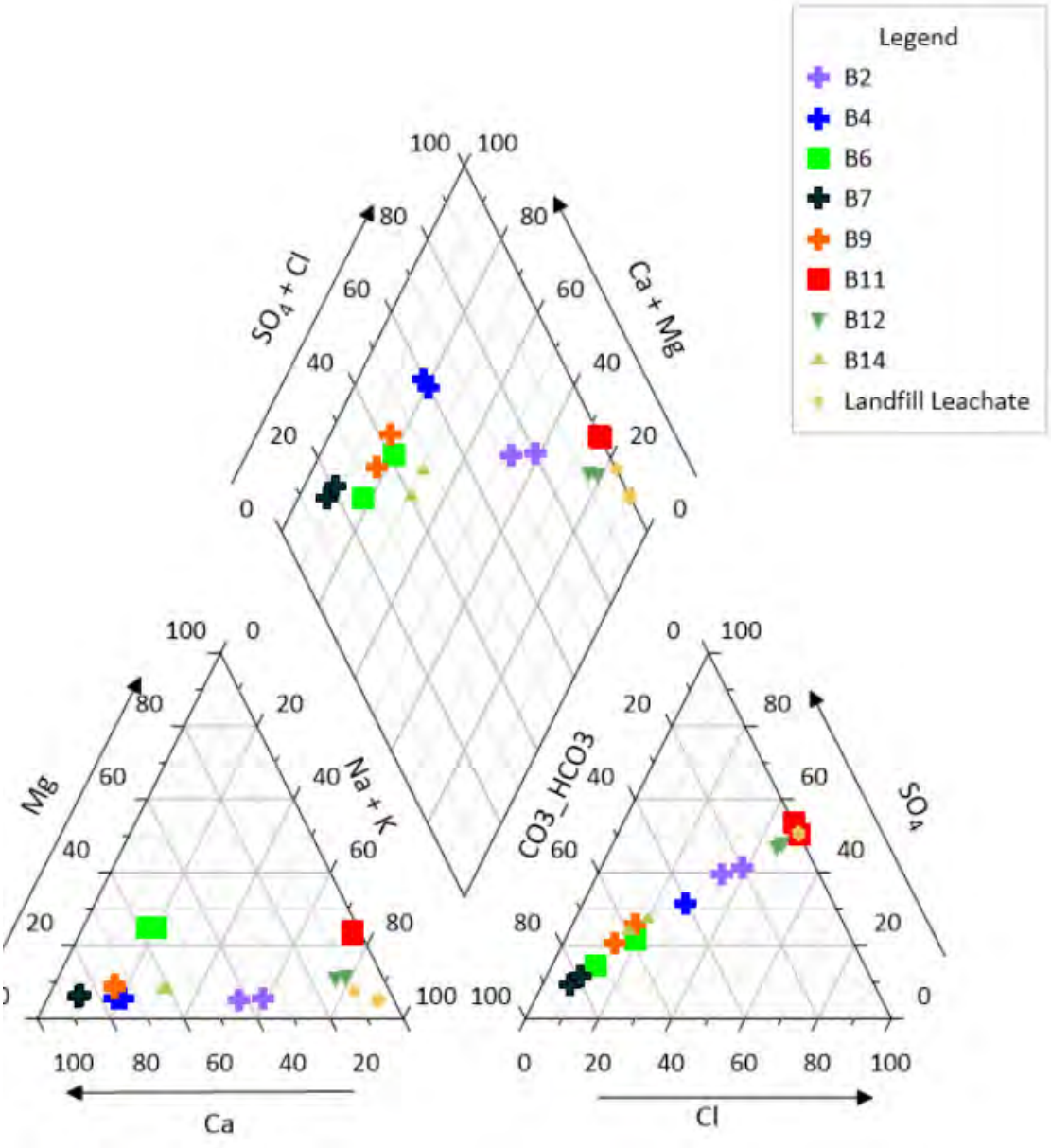


Figure 16 *Piper Plot indicating groundwater types*

7.2 Monitoring frequency

Future monitoring events at the landfill site should continue at the current frequency (as specified in the current EPN and any subsequent changes), unless any changes are required due to site conditions at the time of sampling, or at the request of DRWMA or the EPA.

Parameters will continue to be sampled according to the requirements of the EPN and any changes / additions that have been implemented since it was issued, and relevant standards.

7.3 Groundwater and surface water monitoring network

7.3.1 Groundwater bores

A general condition assessment of all bores will continue be undertaken during monitoring, to identify any bores that require maintenance. This should take into account the condition of the surface seal, if the bores have caps, and if any need to be labelled. If required, the bores should be fixed appropriately. No issues were noted in relation to monitoring bore condition during the 2023 monitoring period.

7.4 Recommendations

The following table summarises the recommendations from this report.

Table 11 Summary of Recommendations

Section	Recommendations	Timing
6.3.2	BTEX, in addition to TPH should continue to be monitored as part of the groundwater monitoring program	During each groundwater monitoring event
7.1	Elevated concentrations of metals on site should continue to be investigated in any future risk assessments.	Following each quarterly monitoring event
	Levels of Cu, Ni and Zn in addition to toluene should continue to be investigated over the next monitoring period to detect any potential increasing trends.	Following each six-monthly monitoring event
7.1.3	Bores B11 and B12 should continue to be monitored closely over the next monitoring period in relation to any leachate pathway, to determine whether any further investigation is required.	During each groundwater monitoring event
7.2	Future monitoring events at the landfill site should continue at the current frequency (as specified in the current EPN and any subsequent changes), unless any changes are required due to site conditions at the time of sampling, or at the request of DRWMA or the EPA. Parameters will continue to be sampled according to the requirements of the EPN and any changes / additions that have been implemented since it was issued, and relevant standards.	On-going
7.3.1	A general condition assessment of all bores should continue to be undertaken during monitoring to identify any bores that require maintenance.	During each groundwater monitoring event

Appendices

Appendix A

Sampling and Analysis Plan

Appendix A – Sampling and analysis plan

Data Quality Objectives

The purpose of establishing Data Quality Objectives (DQOs) is to ensure that the field investigations and subsequent analyses are undertaken in a way that enables the collection and reporting of reliable data on which to base the assessment.

A process for establishing DQOs for a site has been defined by the US EPA. That process has been adopted within the Australian Standard: AS 4482.1-2005 and referenced by the *National Environment Protection (Assessment of Site Contamination) Measure* (NEPC, 1999). The DQO process was taken into account in designing the scope of work carried out over the course of the program.

Investigation Strategy

The works will include monitoring of all groundwater bores and surface water sites and leachate sumps associated with the landfill site.

Groundwater Investigation

Groundwater samples were collected in accordance with the following guidelines:

- *AS/NZ 5667.1:1998*: Water Quality – Sampling. Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples. Standards Australia, New South Wales; and
- *AS/NZ 5667.11:1998:* Water quality – Sampling. Part 11: Guidance on sampling of groundwaters. Standards Australia, New South Wales.
- Groundwater Sampling

Groundwater sampling and analysis will be conducted on all existing monitoring bores as follows:

- The standing water level and LNAPL thickness (if present) will be gauged using an electronic interface probe;
- Bores which do not contain LNAPL will be purged and sampled using either pre-installed waterra inertial tubing or with clean, disposable bailers. During sampling, field parameters (pH, electrical conductivity (EC), oxidation-reduction potential (redox), dissolved oxygen (DO) and temperature) will be recorded. The presence of a sheen or odour will be noted;
- When field parameters (i.e. pH and EC) reach equilibrium (i.e. consecutive measurements within 10% of each other), a groundwater sample will be collected directly from the dedicated waterra tubing or bailer;
- The groundwater samples will be immediately placed into laboratory prepared bottles suitable for the required analyses. The sample containers will be labelled with the job number, sample identification, date collected and sampler's initials;
- Sample bottles will be immediately transferred to an ice filled cooler for preservation prior to being transported to the contract laboratory. Samples will be accompanied with chain of custody documentation to the project laboratory;
- Groundwater samples will be submitted for laboratory analysis in accordance with the EPN 7158/3; and
- Quality assurance / quality control sampling will include one blind duplicate and one split duplicate (where required).

Surface Water Investigation

Surface water samples (including leachate) were collected in accordance with the following guidelines:

- *AS/NZ 5667.1:1998*: Water Quality – Sampling. Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples. Standards Australia, New South Wales; and
- *AS/NZ 5667.6:1998:* Water quality – Sampling. Part 6: Guidance on sampling of rivers and streams. Standards Australia, New South Wales.

Surface Water Sampling

Surface water sampling and analysis was conducted as follows:

- Samples will be collected from leachate and surface water using laboratory supplied bottles and preservatives suitable for the selected analysis.
- The surface water and leachate samples will be immediately placed into laboratory prepared bottles suitable for the required analyses. The sample containers will be labelled with the job number, sample identification, date collected and sampler's initials;
- Sample bottles will be immediately transferred to an ice filled cooler for preservation prior to being transported to the contract laboratory. Samples will be accompanied with chain of custody documentation to the project laboratory;
- Surface water and leachate samples will be submitted for laboratory analysis in accordance with the EPN 7189/2; and
- Quality assurance / quality control sampling will include one blind duplicate and one split duplicate. (where required)

Appendix B

Quality Control and Assurance Plan

Appendix B – QA/QC Information

Field Program

All fieldwork was conducted in general accordance with GHD's Standard Field Operating Procedures (SFOP), which are aimed at collecting environmental samples using uniform and systematic methods, as required by GHD's Quality Assurance system. Key requirements of these procedures are as follows:

- Decontamination procedures – including the use of new disposable gloves for the collection of each sample, decontamination of all multiple use sampling equipment between each sampling location using a phosphate free detergent (i.e. Decon 90) and the use of dedicated sampling containers provided by the laboratory;
- Sample identification procedures – collected samples were immediately transferred to sample containers of appropriate composition and preservation for the required laboratory analysis. All sample containers were clearly labelled with a sample number, sample location, sample depth and sample date. The sample containers were then transferred to an ice filled cooler for sample preservation prior to and during shipment to the testing laboratory;
- Chain of custody protocols – a chain-of-custody form was completed and forwarded to the testing laboratory with each discrete batch of samples; and
- Sample duplicate frequency – field duplicates (blinds and splits) were collected and analysed at a rate not less than 10%.

Field Quality Control

All field works were conducted by experienced environmental scientists in general accordance with GHD's SFOP. Field quality control procedures used during the project comprised the collection and analysis of the following:

Blind duplicates: Comprise a single sample that is divided into two separate sampling containers. Both samples are sent anonymously to the primary laboratory. Blind duplicates provide an indication of the analytical precision of the laboratory, but are inherently influenced by other factors such as sampling techniques and sample media heterogeneity.

Split duplicates: Identical to a blind duplicate, except that the primary sample is sent to the project (primary) laboratory and the duplicate is sent to a secondary laboratory (check laboratory).

One blind duplicate (QC1) and one split duplicate (QQC1) sample are normally collected and analysed during each quarterly monitoring event, as part of the overall sampling program.

The precision of the data is assessed by calculating the Relative Percent Difference (RPD) between duplicate sample pairs, using the following formula:

$$RPD(\%) = \frac{|C_o - C_d|}{C_o + C_d} \times 200$$

Where Co = Analyte concentration of the original sample

Cd = Analyte concentration of the duplicate sample

GHD adopts nominal acceptance criteria of 30% and 50% RPD for field duplicates of inorganics and organics, respectively. Blind and split duplicate samples should return RPDs within these

criteria, however it is noted that the criteria will not always be achieved, particularly in heterogeneous soil or fill materials, or at low analyte concentrations.

The project laboratories (ALS Melbourne/ALS Sydney) adopted their internal procedures and NATA accredited methods in accordance with their quality assurance systems.

Laboratory Quality Control

Laboratory quality control procedures used during the project were:

Laboratory duplicate samples: The analytical laboratory collects duplicate sub samples from one sample submitted for analytical testing at a rate equivalent to one in twenty samples per analytical batch, or one sample per batch if less than twenty samples are analysed in a batch. A laboratory duplicate provides data on the analytical precision and reproducibility of the test result.

Spiked Samples: An authentic field sample is 'spiked' by adding an aliquot of known concentration of the target analyte(s) prior to sample extraction and analysis. A spike documents the effect of the sample matrix on the extraction and analytical techniques. Spiked samples will be analysed for each batch where samples are analysed for organic chemicals of concern.

Laboratory Control Sample: A reference standard of known concentration is analysed along with a batch of samples. The Laboratory Control Sample provides an indication of the analytical accuracy and the precision of the test method and is used for inorganic analyses.

Surrogate Standard/Spikes: These are organic compounds which are similar to the analyte of interest in terms of chemical composition, extractability, and chromatographic conditions (retention time), but which are not normally found in environmental samples. These surrogate compounds are 'spiked' into blanks, standards and samples submitted for organic analyses by gas-chromatographic techniques prior to sample extraction. Surrogate Standard/Spikes provide a means of checking that no gross errors have occurred during any stage of the test method leading to significant analyte loss.

Method Blank: Usually an organic or aqueous solution that is as free as possible of analytes of interest to which is added all the reagents, in the same volume, as used in the preparation and subsequent analysis of the samples. The reagent blank is carried through the complete sample preparation procedure and contains the same reagent concentrations in the final solution as in the sample solution used for analysis. The reagent blank is used to correct for possible contamination resulting from the preparation or processing of the sample.

The laboratory is required to provide this information to GHD. The individual testing laboratories conduct an internal assessment of the laboratory QC program; however, the results were also independently reviewed and assessed by GHD.

Laboratory duplicate samples should return RPDs within the NEPM acceptance criteria of ±30%. Percent recovery is used to assess spiked samples and surrogate standards. Percent recovery, although dependent on the type of analyte tested, the concentrations of analytes, and the sample matrix; should normally range from about 70-130%. Method (laboratory) blanks should return analyte concentrations as 'below the practical quantitation limit (PQL)'.

Laboratory QA/QC documentation is provided in Appendix E.

Appendix C

Summary Tables

			Misc.	NA	Inorganics	Acidity & Alkalinity				Major Ions					
			Naphthalene (value used in F2 calc)	Phosphorus reactive (as P)	Total Dissolved Solids	Alkalinity (Carbonate as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)	Chloride	Sulfate (filtered)
			mg/L	MG/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			0.005	0.01	10	1	1	1	1	1	1	1	1	1	1
ADWG 2011 Recreational (v3.7 updated 2022)															**5,000**
ANZG (2018) - FW - 95% (updated 26 July 2021)															
ANZECC 2000 - Stock Watering					5,000					1,000					1,000
ANZECC 2000 Irrigation - Long-term Trigger Values														350	
ANZECC 2000 Irrigation - Short-term Trigger Values															
Date	**Field ID**	**Lab Report Number**													
29 Mar 2023	B2	EM2305738	<0.005	<0.01	1,020	<1	314	<1	314	120	9	35	175	365	38
06 Sep 2023		EM2316170	<0.005	<0.01	1,060	<1	261	<1	261	98	8	26	113	142	55
29 Mar 2023	B4	EM2305738	<0.005	<0.01	986	<1	269	<1	269	165	7	<1	62	238	14
06 Sep 2023		EM2316170	<0.005	<0.01	693	<1	272	<1	272	133	6	<1	35	116	22
28 Mar 2023	B6	EM2305600	<0.005	<0.01	254	<1	166	<1	166	50	14	2	17	26	6
06 Sep 2023		EM2316170	<0.005	<0.01	331	<1	174	<1	174	51	15	2	19	41	7
28 Mar 2023	B7	EM2305600	<0.005	<0.01	294	<1	230	<1	230	92	4	<1	10	19	5
05 Sep 2023		EM2316083	<0.005	<0.01	318	<1	222	<1	222	94	4	<1	11	14	5
27 Mar 2023	B9	EM2305499-AA	<0.005	0.01	-	<1	162	<1	162	70	5	1	13	21	25
05 Sep 2023		EM2316083	<0.005	<0.01	186	<1	102	<1	102	47	3	<1	11	14	13
29 Mar 2023	B11	EM2305738	<0.005	<0.01	557	<1	2	<1	2	2	12	2	70	274	1
05 Sep 2023		EM2316083	<0.005	<0.01	687	<1	<1	<1	<1	2	16	2	91	399	2
28 Mar 2023	B12	EM2305600	<0.005	<0.01	133	<1	17	<1	17	6	2	<1	28	41	1
05 Sep 2023		EM2316083	<0.005	<0.01	174	<1	6	<1	6	3	2	<1	29	40	2
28 Mar 2023	B14	EM2305600	<0.005	<0.01	469	<1	296	<1	296	103	8	10	51	55	22
06 Sep 2023		EM2316170	<0.005	<0.01	513	<1	303	<1	303	98	8	8	47	60	20

						Minor Ions		Nutrients						Organic I
			Cations Total	Anions Total	Ionic Balance	Iodide	Bromide	Ammonia as N	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)	Kjeldahl Nitrogen Total	Phosphorus (Total)	BOD
			meq/L	meq/L	%	µg/L	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	10	0.01	0.01	0.01	0.01	0.01	0.1	0.1	0.01	2
ADWG 2011 Recreational (v3.7 updated 2022)						**5,000**			**112.9**	**9.1**					
ANZG (2018) - FW - 95% (updated 26 July 2021)								0.9	2.4						
ANZECC 2000 - Stock Watering									90	9.1					
ANZECC 2000 Irrigation - Long-term Trigger Values												5		0.05	
ANZECC 2000 Irrigation - Short-term Trigger Values												25		0.8	
Date	**Field ID**	**Lab Report Number**													
29 Mar 2023	B2	EM2305738	15.5	17.4	5.75	143	0.419	16.5	0.01	<0.01	0.01	16.2	16.2	0.03	<8
06 Sep 2023		EM2316170	11.1	10.4	3.55	69	<0.020	6.52	0.42	<0.01	0.42	7.3	6.9	0.02	22
29 Mar 2023	B4	EM2305738	12.0	12.4	1.77	<50	0.208	0.09	<0.01	<0.01	<0.01	0.3	0.3	<0.01	<2
06 Sep 2023		EM2316170	8.65	9.16	2.87	51	<0.020	0.08	<0.01	<0.01	<0.01	0.2	0.2	0.06	<8
28 Mar 2023	B6	EM2305600	4.44	4.18	3.05	21	0.100	0.06	0.03	<0.01	0.03	0.2	0.2	0.07	<2
06 Sep 2023		EM2316170	4.66	4.78	1.29	14	0.015	0.06	<0.01	<0.01	<0.01	0.1	0.1	0.04	<8
28 Mar 2023	B7	EM2305600	5.36	5.24	1.13	<10	0.049	<0.01	<0.01	<0.01	<0.01	<0.1	<0.1	0.03	<2
05 Sep 2023		EM2316083	5.50	4.93	5.40	<10	0.013	<0.01	<0.01	<0.01	<0.01	<0.1	<0.1	0.02	<2
27 Mar 2023	B9	EM2305499-AA	4.50	4.35	1.65	<10	0.059	<0.01	0.56	<0.01	0.56	1.0	0.4	0.02	2
05 Sep 2023		EM2316083	3.07	2.70	-	<10	0.014	0.02	0.25	<0.01	0.25	0.2	<0.1	0.05	3
29 Mar 2023	B11	EM2305738	8.73	7.79	5.68	112	0.331	0.02	<0.02	<0.02	<0.01	0.5	0.5	0.02	3
05 Sep 2023		EM2316083	10.8	11.3	2.33	190	0.402	<0.05	<0.01	<0.01	<0.01	0.2	0.2	0.02	3
28 Mar 2023	B12	EM2305600	1.68	1.52	-	<10	0.085	0.30	2.46	<0.01	2.46	3.3	0.8	0.03	<2
05 Sep 2023		EM2316083	1.58	1.46	<0.01	<10	0.081	<0.01	2.48	<0.01	2.48	3.3	0.8	0.01	<2
28 Mar 2023	B14	EM2305600	8.27	7.92	2.15	<10	0.258	0.34	0.01	<0.01	0.01	1.2	1.2	0.03	<2
06 Sep 2023		EM2316170	7.80	8.16	2.29	64	0.010	0.24	<0.01	<0.01	<0.01	0.6	0.6	<0.01	<8

		ndicators	Metals											
		Dissolved Organic Carbon	Arsenic (filtered)	Cadmium (filtered)	Chromium (III+VI) (filtered)	Copper (filtered)	Iron	Iron (filtered)	Lead (filtered)	Manganese (filtered)	Mercury (filtered)	Nickel (filtered)	Selenium (filtered)	Zinc (filtered)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL		1	0.001	0.0001	0.001	0.001	0.05	0.05	0.001	0.001	0.0001	0.001	0.01	0.005
ADWG 2011 Recreational (v3.7 updated 2022)			**0.1**	**0.02**		**20**			**0.1**	**5**	**0.01**	**0.2**	**0.1**	
ANZG (2018) - FW - 95% (updated 26 July 2021)			0.013	0.0002	0.001	0.0014			0.0034	1.9	0.0006	0.011	0.011	0.008
ANZECC 2000 - Stock Watering			0.5	0.01	1	1			0.1		0.002	1	0.02	20
ANZECC 2000 Irrigation - Long-term Trigger Values			0.1	0.01	0.1	0.2	0.2	0.2	2	0.2	0.002	0.2	0.02	2
ANZECC 2000 Irrigation - Short-term Trigger Values			2	0.05	1	5	10	10	5	10	0.002	2	0.05	5
Date	**Field ID**	**Lab Report Number**												
29 Mar 2023	B2	EM2305738	14	<0.001	<0.0001	<0.001	<0.001	4.47	4.49	<0.001	1.41	<0.0001	0.012	<0.01	0.011
06 Sep 2023		EM2316170	16	<0.001	<0.0001	<0.001	0.001	8.01	6.93	<0.001	0.774	<0.0001	0.012	<0.01	0.008
29 Mar 2023	B4	EM2305738	2	<0.001	<0.0001	<0.001	<0.001	8.94	8.35	<0.001	0.237	<0.0001	0.004	<0.01	0.007
06 Sep 2023		EM2316170	8	<0.001	<0.0001	<0.001	<0.001	4.86	4.63	<0.001	0.178	<0.0001	0.004	<0.01	<0.005
28 Mar 2023	B6	EM2305600	<1	<0.001	<0.0001	<0.001	<0.001	6.75	5.84	<0.001	0.128	<0.0001	<0.001	<0.01	<0.005
06 Sep 2023		EM2316170	5	<0.001	<0.0001	<0.001	<0.001	5.96	5.89	<0.001	0.135	<0.0001	<0.001	<0.01	<0.005
28 Mar 2023	B7	EM2305600	<1	<0.001	<0.0001	<0.001	<0.001	<0.05	<0.05	<0.001	0.006	<0.0001	<0.001	<0.01	<0.005
05 Sep 2023		EM2316083	3	<0.001	<0.0001	<0.001	<0.001	0.17	<0.05	<0.001	0.003	<0.0001	<0.001	<0.01	<0.005
27 Mar 2023	B9	EM2305499-AA	5	<0.001	-	<0.001	<0.001	<0.05	<0.05	<0.001	0.002	<0.0001	0.001	<0.01	<0.005
05 Sep 2023		EM2316083	5	<0.001	<0.0001	<0.001	<0.001	1.07	0.10	<0.001	0.008	<0.0001	<0.001	<0.01	<0.005
29 Mar 2023	B11	EM2305738	2	<0.001	0.0001	<0.001	0.003	84.6	84.4	0.002	0.119	<0.0001	0.020	<0.01	0.811
05 Sep 2023		EM2316083	4	0.001	0.0001	<0.001	0.012	105	99.7	0.007	0.134	<0.0001	0.025	<0.01	0.077
28 Mar 2023	B12	EM2305600	<1	<0.001	<0.0001	<0.001	<0.001	0.12	<0.05	<0.001	0.054	<0.0001	0.005	<0.01	0.018
05 Sep 2023		EM2316083	2	<0.001	<0.0001	<0.001	0.001	0.24	0.19	<0.001	0.059	<0.0001	0.005	<0.01	0.018
28 Mar 2023	B14	EM2305600	2	0.001	<0.0001	<0.001	<0.001	0.98	0.52	<0.001	0.148	<0.0001	0.002	<0.01	<0.005
06 Sep 2023		EM2316170	8	<0.001	<0.0001	<0.001	<0.001	0.48	0.42	<0.001	0.069	<0.0001	<0.001	<0.01	<0.005

			BTEXN						TRH - NEPM 2013					
			Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	BTEX (Sum of Total) - Lab Calc	F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)
			µg/L	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	2	2	2	2	2	1	20	20	100	100	100	100
ADWG 2011 Recreational (v3.7 updated 2022)			**10**	**8,000**	**3,000**			**6,000**							
ANZG (2018) - FW - 95% (updated 26 July 2021)			950	180	80	350									
ANZECC 2000 - Stock Watering															
ANZECC 2000 Irrigation - Long-term Trigger Values															
ANZECC 2000 Irrigation - Short-term Trigger Values															
Date	**Field ID**	**Lab Report Number**													
29 Mar 2023	B2	EM2305738	<1	16	<2	<2	<2	<2	16	<20	30	<100	<100	<100	<100
06 Sep 2023		EM2316170	<1	3	<2	<2	<2	<2	3	<20	<20	<100	<100	<100	<100
29 Mar 2023	B4	EM2305738	<1	12	<2	<2	<2	<2	12	<20	<20	<100	<100	<100	<100
06 Sep 2023		EM2316170	<1	<2	<2	<2	<2	<2	<1	<20	<20	<100	<100	<100	<100
28 Mar 2023	B6	EM2305600	<1	<2	<2	<2	<2	<2	<1	<20	<20	<100	<100	<100	<100
06 Sep 2023		EM2316170	<1	<2	<2	<2	<2	<2	<1	<20	<20	<100	<100	<100	<100
28 Mar 2023	B7	EM2305600	<1	3	<2	<2	2	2	5	<20	<20	<100	<100	<100	<100
05 Sep 2023		EM2316083	<1	8	<2	<2	<2	<2	8	<20	<20	<100	<100	<100	<100
27 Mar 2023	B9	EM2305499-AA	<1	8	<2	<2	4	4	12	<20	<20	<100	<100	<100	<100
05 Sep 2023		EM2316083	<1	<2	<2	<2	<2	<2	<1	<20	<20	<100	<100	<100	<100
29 Mar 2023	B11	EM2305738	<1	10	<2	<2	<2	<2	10	<20	<20	<100	<100	<100	<100
05 Sep 2023		EM2316083	<1	<2	<2	<2	<2	<2	<1	<20	<20	<100	<100	<100	<100
28 Mar 2023	B12	EM2305600	<1	10	<2	<2	<2	<2	10	<20	<20	<100	<100	<100	<100
05 Sep 2023		EM2316083	<1	<2	<2	<2	<2	<2	<1	<20	<20	<100	<100	<100	<100
28 Mar 2023	B14	EM2305600	<1	14	<2	<2	<2	<2	14	<20	20	<100	<100	<100	<100
06 Sep 2023		EM2316170	<1	<2	<2	<2	<2	<2	<1	<20	<20	<100	<100	<100	<100

			TRH - NEPM 1999					
			>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
EQL			100	20	50	100	50	50
ADWG 2011 Recreational (v3.7 updated 2022)								
ANZG (2018) - FW - 95% (updated 26 July 2021)								
ANZECC 2000 - Stock Watering								
ANZECC 2000 Irrigation - Long-term Trigger Values								
ANZECC 2000 Irrigation - Short-term Trigger Values								
Date	**Field ID**	**Lab Report Number**						
29 Mar 2023	B2	EM2305738	<100	30	<50	<100	<50	<50
06 Sep 2023		EM2316170	<100	<20	<50	<100	<50	<50
29 Mar 2023	B4	EM2305738	<100	<20	<50	<100	<50	<50
06 Sep 2023		EM2316170	<100	<20	<50	<100	<50	<50
28 Mar 2023	B6	EM2305600	<100	<20	<50	<100	<50	<50
06 Sep 2023		EM2316170	<100	<20	<50	<100	<50	<50
28 Mar 2023	B7	EM2305600	<100	<20	<50	<100	<50	<50
05 Sep 2023		EM2316083	<100	<20	<50	<100	<50	<50
27 Mar 2023	B9	EM2305499-AA	<100	<20	<50	<100	<50	<50
05 Sep 2023		EM2316083	<100	<20	<50	<100	<50	<50
29 Mar 2023	B11	EM2305738	<100	<20	<50	<100	<50	<50
05 Sep 2023		EM2316083	<100	<20	<50	<100	<50	<50
28 Mar 2023	B12	EM2305600	<100	<20	<50	<100	<50	<50
05 Sep 2023		EM2316083	<100	<20	<50	<100	<50	<50
28 Mar 2023	B14	EM2305600	<100	20	<50	<100	<50	<50
06 Sep 2023		EM2316170	<100	<20	<50	<100	<50	<50

Table 2 - Historical Groundwater

			Misc.	NA									Cyanide	Acidity & Alkalinity						
			Naphthalene (value used in F2 calc)	Filtered Total Phosphorus as P (filtered)	Phosphorus reactive (as P)	Phosphorus total (P2O5) (filtered)	pH (Lab)	Electrical conductivity (lab)	Total Dissolved Solids	Total Dissolved Solids (filtered)	Total Dissolved Solids (est.)	Total Suspended Solids	Cyanide (Total)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Calcium (filtered)	Magnesium (filtered)
			mg/L	mg/L	MG/L	µg/L	pH units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			0.005	0.01	0.01	10	0.01	1	10	10	1	5	0.004	1	1	1	1	1	1
ADWG 2011 Recreational (v3.7 updated 2022)													**0.8**						
ANZG (2018) - FW - 95% (updated 26 July 2021)													0.007						
ANZECC 2000 - Stock Watering									5,000	5,000	5,000							1,000	
ANZECC 2000 Irrigation - Long-term Trigger Values							6-9	2,900											
ANZECC 2000 Irrigation - Short-term Trigger Values																			
Date	**Field ID**	**Lab Report Number**																	
04 Aug 2016	B2	EM1609217	-	-	-	-	7.02	2,950	-	-	-	319	<0.004	-	-	-	-	132	14
28 Feb 2017	B2	EM1702250	-	-	-	-	-	-	-	2,210	-	-	<0.004	<1	442	<1	442	150	14
12 Sep 2017	B2	EM1712490	-	-	-	-	-	-	-	-	-	-	<0.004	<1	455	<1	455	156	14
21 Mar 2018	B2	EM1805110	-	-	-	-	-	-	-	-	-	-	<0.004	<1	414	<1	414	159	14
19 Sep 2018	B2	EM1815239	-	-	-	-	-	-	-	-	-	106	-	<1	419	<1	419	153	14
20 Mar 2019	B2	EM1904168	-	-	-	-	-	-	1,880	-	-	-	-	<1	408	<1	408	164	14
10 Sep 2019	B2	EM1915222	-	-	-	-	-	-	1,390	-	-	-	-	<1	412	<1	412	141	13
17 Dec 2019	B2	EM1921873	-	-	-	-	-	-	1,580	-	-	-	-	<1	401	<1	401	126	12
25 Mar 2020	B2	EM2005146	-	-	-	-	-	-	1,570	-	-	-	-	<1	338	<1	338	158	12
29 Sep 2020	B2	EM2017090	-	-	-	-	-	-	666	-	-	-	-	<1	244	<1	244	81	6
24 Mar 2021	B2	EM2105221	-	-	-	-	-	-	1,120	-	-	-	-	<1	171	<1	171	145	12
29 Sep 2021	B2	EM2119450	-	-	-	-	-	1,230	-	-	800	-	-	<1	261	<1	261	94	9
30 Mar 2022	B2	EM2205710	-	-	<0.01	-	-	-	1,170	-	-	-	-	<1	359	<1	359	124	11
28 Sep 2022	B2	EM2219086	-	-	<0.01	-	-	-	785	-	-	-	-	<1	308	<1	308	108	8
29 Mar 2023	B2	EM2305738	<0.005	-	<0.01	-	-	-	1,020	-	-	-	-	<1	314	<1	314	120	9
06 Sep 2023	B2	EM2316170	<0.005	-	<0.01	-	-	-	1,060	-	-	-	-	<1	261	<1	261	98	8
03 Aug 2016	B3	EM1609217	-	-	-	-	4.82	248	-	-	-	902	<0.004	-	-	-	-	<1	2
27 Feb 2017	B3	EM1702198	-	-	-	-	-	-	-	254	-	-	<0.004	<1	1	<1	1	<1	5
11 Sep 2017	B3	EM1712490	-	-	-	-	-	-	-	-	-	-	<0.004	<1	180	<1	180	66	4
04 Aug 2016	B4	EM1609217	-	-	-	-	7.50	724	-	-	-	72	<0.004	-	-	-	-	107	5
28 Feb 2017	B4	EM1702250	-	-	-	-	-	-	-	1,550	-	-	<0.004	<1	284	<1	284	206	8
12 Sep 2017	B4	EM1712490	-	-	-	-	-	-	-	-	-	-	<0.004	<1	293	<1	293	124	5
21 Mar 2018	B4	EM1805110	-	-	-	-	-	-	-	-	-	-	<0.004	<1	261	<1	261	253	11
19 Sep 2018	B4	EM1815239	-	-	-	-	-	-	-	-	-	610	-	<1	261	<1	261	152	6
20 Mar 2019	B4	EM1904168	-	-	-	-	-	-	1,600	-	-	-	-	<1	271	<1	271	246	11
09 Sep 2019	B4	EM1915222	-	-	-	-	-	-	509	-	-	-	-	<1	296	<1	296	127	5
17 Dec 2019	B4	EM1921873	-	-	-	-	-	-	1,170	-	-	-	-	<1	272	<1	272	172	9
25 Mar 2020	B4	EM2005146	-	-	-	-	-	-	1,670	-	-	-	-	<1	241	<1	241	255	14
29 Sep 2020	B4	EM2017090	-	-	-	-	-	-	664	-	-	-	-	<1	274	<1	274	163	7
24 Mar 2021	B4	EM2105221	-	-	-	-	-	-	1,660	-	-	-	-	<1	288	<1	288	283	14
29 Sep 2021	B4	EM2119450	-	-	-	-	-	-	-	-	-	-	-	<1	271	<1	271	142	6
28 Sep 2022	B4	EM2219086	-	-	<0.01	-	-	-	653	-	-	-	-	<1	267	<1	267	138	6
14 Dec 2022	B4	EM2225248	<0.005	-	<0.01	-	-	-	609	-	-	-	-	<1	269	<1	269	134	6
29 Mar 2023	B4	EM2305738	<0.005	-	<0.01	-	-	-	986	-	-	-	-	<1	269	<1	269	165	7
06 Sep 2023	B4	EM2316170	<0.005	-	<0.01	-	-	-	693	-	-	-	-	<1	272	<1	272	133	6
02 Aug 2016	B6	EM1609083	-	-	-	-	-	-	-	-	-	-	<0.004	-	-	-	-	-	14
27 Feb 2017	B6	EM1702198	-	-	-	-	-	-	-	276	-	-	<0.004	<1	193	<1	193	47	13
11 Sep 2017	B6	EM1712490	-	-	-	-	-	-	-	-	-	-	<0.004	<1	151	<1	151	45	12
20 Mar 2018	B6	EM1804934	-	-	-	-	-	-	-	-	-	-	<0.004	<1	186	<1	186	46	13
18 Sep 2018	B6	EM1815239	-	-	-	-	-	-	-	-	-	16	-	<1	142	<1	142	43	12
19 Mar 2019	B6	EM1904168	-	-	-	-	-	-	221	-	-	-	-	<1	180	<1	180	48	13
10 Sep 2019	B6	EM1915222	-	-	-	-	-	-	264	-	-	-	-	<1	201	<1	201	46	13
23 Mar 2020	B6	EM2005146	-	-	-	-	-	-	236	-	-	-	-	<1	153	<1	153	52	13
28 Sep 2020	B6	EM2017090	-	-	-	-	-	-	292	-	-	-	-	<1	185	<1	185	50	14
23 Mar 2021	B6	EM2105110	-	-	-	-	-	-	250	-	-	-	-	<1	181	<1	181	56	15
28 Sep 2021	B6	EM2119193	-	-	-	-	-	-	258	-	-	-	-	<1	176	<1	176	42	13
28 Mar 2022	B6	EM2205592	-	-	<0.01	-	-	-	284	-	-	-	-	<1	196	<1	196	57	15

Table 2 - Historical Groundwater

			Misc.	NA									Cyanide	Acidity & Alkalinity						
			Naphthalene (value used in F2 calc)	Filtered Total Phosphorus as P (filtered)	Phosphorus reactive (as P)	Phosphorus total (P2O5) (filtered)	pH (Lab)	Electrical conductivity (lab)	Total Dissolved Solids	Total Dissolved Solids (filtered)	Total Dissolved Solids (est.)	Total Suspended Solids	Cyanide (Total)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Calcium (filtered)	Magnesium (filtered)
			mg/L	mg/L	MG/L	µg/L	pH units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			0.005	0.01	0.01	10	0.01	1	10	10	1	5	0.004	1	1	1	1	1	1
ADWG 2011 Recreational (v3.7 updated 2022)													**0.8**						
ANZG (2018) - FW - 95% (updated 26 July 2021)													0.007						
ANZECC 2000 - Stock Watering									5,000	5,000	5,000							1,000	
ANZECC 2000 Irrigation - Long-term Trigger Values							6-9	2,900											
ANZECC 2000 Irrigation - Short-term Trigger Values																			
Date	**Field ID**	**Lab Report Number**																	
27 Sep 2022	B6	EM2218958	-	-	<0.01	-	-	-	240	-	-	-	-	<1	149	<1	149	44	12
28 Mar 2023	B6	EM2305600	<0.005	-	<0.01	-	-	-	254	-	-	-	-	<1	166	<1	166	50	14
06 Sep 2023	B6	EM2316170	<0.005	-	<0.01	-	-	-	331	-	-	-	-	<1	174	<1	174	51	15
03 Aug 2016	B7	EM1609217	-	-	-	-	7.33	546	-	-	-	781	<0.004	-	-	-	-	84	5
28 Feb 2017	B7	EM1702250	-	-	-	-	-	-	-	386	-	-	<0.004	<1	254	<1	254	78	4
11 Sep 2017	B7	EM1712490	-	-	-	-	-	-	-	-	-	-	<0.004	<1	257	<1	257	90	4
20 Mar 2018	B7	EM1804934	-	-	-	-	-	-	-	-	-	-	<0.004	<1	250	<1	250	84	4
19 Sep 2018	B7	EM1815239	-	-	-	-	-	-	-	-	-	332	-	<1	234	<1	234	89	4
19 Mar 2019	B7	EM1904168	-	-	-	-	-	-	325	-	-	-	-	<1	251	<1	251	89	4
11 Sep 2019	B7	EM1915222	-	-	-	-	-	-	288	-	-	-	-	<1	267	<1	267	87	4
24 Mar 2020	B7	EM2005146	-	-	-	-	-	-	439	-	-	-	-	<1	219	<1	219	95	4
28 Sep 2020	B7	EM2017090	-	-	-	-	-	-	302	-	-	-	-	<1	251	<1	251	92	4
23 Mar 2021	B7	EM2105110	-	-	-	-	-	-	303	-	-	-	-	<1	249	<1	249	95	4
28 Sep 2021	B7	EM2119193	-	-	-	-	-	-	335	-	-	-	-	<1	198	<1	198	84	4
29 Mar 2022	B7	EM2205592	-	-	<0.01	-	-	-	301	-	-	-	-	<1	247	<1	247	92	4
27 Sep 2022	B7	EM2218958	-	-	<0.01	-	-	-	287	-	-	-	-	<1	227	<1	227	88	4
28 Mar 2023	B7	EM2305600	<0.005	-	<0.01	-	-	-	294	-	-	-	-	<1	230	<1	230	92	4
05 Sep 2023	B7	EM2316083	<0.005	-	<0.01	-	-	-	318	-	-	-	-	<1	222	<1	222	94	4
13 Sep 2017	B9	EM1712490	-	-	-	-	-	-	-	-	-	-	<0.004	<1	112	<1	112	45	3
21 Mar 2018	B9	EM1805110	-	-	-	-	-	-	-	-	-	-	<0.004	<1	168	<1	168	69	4
19 Sep 2018	B9	EM1815239	-	-	-	-	-	-	-	-	-	31	-	<1	101	<1	101	37	3
18 Mar 2019	B9	EM1904168	-	-	-	-	-	-	268	-	-	-	-	<1	168	<1	168	70	4
09 Sep 2019	B9	EM1915222	-	-	-	-	-	-	212	-	-	-	-	<1	130	<1	130	49	3
25 Mar 2020	B9	EM2005146	-	-	-	-	-	-	332	-	-	-	-	<1	154	<1	154	77	5
30 Sep 2020	B9	EM2017163	-	-	-	-	-	-	-	-	-	-	-	<1	112	<1	112	47	3
24 Mar 2021	B9	EM2105221	-	-	-	-	-	-	533	-	-	-	-	<1	171	<1	171	70	4
28 Sep 2021	B9	EM2119193	-	-	-	-	-	-	198	-	-	-	-	<1	124	<1	124	51	3
28 Mar 2022	B9	EM2205592	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	73	5
26 Sep 2022	B9	EM2218846	-	-	0.01	-	-	-	331	-	-	-	-	<1	98	<1	98	39	3
14 Dec 2022	B9	EM2225248	<0.005	-	0.02	-	-	-	192	-	-	-	-	<1	120	<1	120	44	3
27 Mar 2023	B9	EM2305499-AA	<0.005	-	0.01	-	-	-	-	-	-	-	-	<1	162	<1	162	70	5
05 Sep 2023	B9	EM2316083	<0.005	-	<0.01	-	-	-	186	-	-	-	-	<1	102	<1	102	47	3
12 Sep 2017	B11	EM1712490	-	-	-	-	-	-	-	-	-	-	<0.004	<1	<1	<1	<1	2	7
21 Mar 2018	B11	EM1805110	-	-	-	-	-	-	-	-	-	-	<0.004	<1	<1	<1	<1	1	6
19 Sep 2018	B11	EM1815239	-	-	-	-	-	-	-	-	-	875	-	<1	<1	<1	<1	1	6
20 Mar 2019	B11	EM1904168	-	-	-	-	-	-	260	-	-	-	-	<1	<1	<1	<1	1	6
09 Sep 2019	B11	EM1915222	-	-	-	-	-	-	420	-	-	-	-	<1	<1	<1	<1	2	10
17 Dec 2019	B11	EM1921873	-	-	-	-	-	-	380	-	-	-	-	<1	<1	<1	<1	2	9
24 Mar 2020	B11	EM2005146	-	-	-	-	-	-	210	-	-	-	-	<1	2	<1	2	1	6
29 Sep 2020	B11	EM2017090	-	-	-	-	-	-	442	-	-	-	-	<1	<1	<1	<1	2	12
23 Mar 2021	B11	EM2105110	-	-	-	-	-	-	430	-	-	-	-	<1	<1	<1	<1	2	10
29 Sep 2021	B11	EM2119450	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	2	15
30 Mar 2022	B11	EM2205710	-	-	<0.01	-	-	-	442	-	-	-	-	<1	<1	<1	<1	2	14
28 Sep 2022	B11	EM2219086	-	-	<0.01	-	-	-	547	-	-	-	-	<1	<1	<1	<1	2	12
29 Mar 2023	B11	EM2305738	<0.005	-	<0.01	-	-	-	557	-	-	-	-	<1	2	<1	2	2	12
05 Sep 2023	B11	EM2316083	<0.005	-	<0.01	-	-	-	687	-	-	-	-	<1	<1	<1	<1	2	16
02 Aug 2016	B12	EM1609083	-	-	-	-	-	-	-	-	-	-	<0.004	-	-	-	-	-	8
27 Feb 2017	B12	EM1702198	-	-	-	-	-	-	-	427	-	-	<0.004	<1	272	<1	272	91	7
11 Sep 2017	B12	EM1712490	-	-	-	-	-	-	-	-	-	-	<0.004	<1	272	<1	272	95	7

Table 2 - Historical Groundwater

			Misc.	NA									Cyanide	Acidity & Alkalinity						
			Naphthalene (value used in F2 calc)	Filtered Total Phosphorus as P (filtered)	Phosphorus reactive (as P)	Phosphorus total (P2O5) (filtered)	pH (Lab)	Electrical conductivity (lab)	Total Dissolved Solids	Total Dissolved Solids (filtered)	Total Dissolved Solids (est.)	Total Suspended Solids	Cyanide (Total)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Calcium (filtered)	Magnesium (filtered)
			mg/L	mg/L	MG/L	µg/L	pH units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			0.005	0.01	0.01	10	0.01	1	10	10	1	5	0.004	1	1	1	1	1	1
ADWG 2011 Recreational (v3.7 updated 2022)													**0.8**						
ANZG (2018) - FW - 95% (updated 26 July 2021)													0.007						
ANZECC 2000 - Stock Watering									5,000	5,000	5,000							1,000	
ANZECC 2000 Irrigation - Long-term Trigger Values							6-9	2,900											
ANZECC 2000 Irrigation - Short-term Trigger Values																			
Date	**Field ID**	**Lab Report Number**																	
20 Mar 2018	B12	EM1804934	-	-	-	-	-	-	-	-	-	-	<0.004	<1	288	<1	288	103	8
18 Sep 2018	B12	EM1815239	-	-	-	-	-	-	-	-	-	2,700	-	<1	7	<1	7	2	1
19 Mar 2019	B12	EM1904168	-	-	-	-	-	-	98	-	-	-	-	<1	10	<1	10	4	1
10 Sep 2019	B12	EM1915222	-	-	-	-	-	-	138	-	-	-	-	<1	5	<1	5	2	1
17 Dec 2019	B12	EM1921873	-	-	-	-	-	-	74	-	-	-	-	<1	2	<1	2	<1	<1
24 Mar 2020	B12	EM2005146	-	-	-	-	-	-	116	-	-	-	-	<1	12	<1	12	6	2
28 Sep 2020	B12	EM2017090	-	-	-	-	-	-	108	-	-	-	-	<1	7	<1	7	3	1
23 Mar 2021	B12	EM2105110	-	-	-	-	-	-	160	-	-	-	-	<1	9	<1	9	3	2
29 Sep 2021	B12	EM2119450	-	-	-	-	-	174	-	-	113	-	-	<1	5	<1	5	3	2
29 Mar 2022	B12	EM2205592	-	-	<0.01	-	-	-	150	-	-	-	-	<1	7	<1	7	3	2
27 Sep 2022	B12	EM2218958	-	-	<0.01	-	-	-	145	-	-	-	-	<1	11	<1	11	4	2
28 Mar 2023	B12	EM2305600	<0.005	-	<0.01	-	-	-	133	-	-	-	-	<1	17	<1	17	6	2
05 Sep 2023	B12	EM2316083	<0.005	-	<0.01	-	-	-	174	-	-	-	-	<1	6	<1	6	3	2
03 Aug 2016	B14	EM1609217	-	-	-	-	6.84	321	-	-	-	3,460	<0.004	-	-	-	-	34	3
27 Feb 2017	B14	EM1702198	-	-	-	-	-	-	-	143	-	-	<0.004	<1	16	<1	16	4	1
11 Sep 2017	B14	EM1712490	-	-	-	-	-	-	-	-	-	-	<0.004	<1	21	<1	21	6	2
21 Mar 2018	B14	EM1805110	-	-	-	-	-	-	-	-	-	-	<0.004	<1	21	<1	21	6	1
18 Sep 2018	B14	EM1815239	-	-	-	-	-	-	-	-	-	5,950	-	<1	264	<1	264	109	8
18 Mar 2019	B14	EM1904168	-	-	-	-	-	-	384	-	-	-	-	<1	298	<1	298	101	7
11 Sep 2019	B14	EM1915222	-	-	-	-	-	-	450	-	-	-	-	<1	308	<1	308	99	7
24 Mar 2020	B14	EM2005146	-	-	-	-	-	-	446	-	-	-	-	<1	239	<1	239	121	9
28 Sep 2020	B14	EM2017090	-	-	-	-	-	-	760	-	-	-	-	<1	268	<1	268	128	10
22 Mar 2021	B14	EM2104983	-	-	-	-	-	-	712	-	-	-	-	<1	430	<1	430	118	9
28 Sep 2021	B14	EM2119193	-	-	-	-	-	-	2,230	-	-	-	-	<1	296	<1	296	119	10
29 Mar 2022	B14	EM2205592	-	-	<0.01	-	-	-	529	-	-	-	-	<1	329	<1	329	111	9
28 Sep 2022	B14	EM2219086	-	-	<0.01	-	-	-	492	-	-	-	-	<1	282	<1	282	105	8
28 Mar 2023	B14	EM2305600	<0.005	-	<0.01	-	-	-	469	-	-	-	-	<1	296	<1	296	103	8
06 Sep 2023	B14	EM2316170	<0.005	-	<0.01	-	-	-	513	-	-	-	-	<1	303	<1	303	98	8
04 Aug 2016	B15	EM1609217	-	-	-	-	6.82	297	-	-	-	196	<0.004	-	-	-	-	42	2
15 Dec 2016	B15	EM1615347	-	0.02	-	20	5.40	107	-	-	-	276	-	-	-	-	-	3	<1
01 Mar 2017	B15	EM1702335	-	-	-	-	-	-	-	141	-	-	0.004	<1	10	<1	10	5	<1
14 Jun 2017	BH15	EM1707805	-	-	-	-	-	-	-	-	-	-	-	<1	10	<1	10	2	<1
13 Sep 2017	B15	EM1712490	-	-	-	-	-	-	-	-	-	-	<0.004	<1	8	<1	8	6	<1
03 Aug 2016	B16	EM1609217	-	-	-	-	7.39	635	-	-	-	1,500	<0.004	-	-	-	-	96	5
15 Dec 2016	B16	EM1615347	-	0.36	-	360	7.41	531	-	-	-	1,610	-	-	-	-	-	71	3
01 Mar 2017	B16	EM1702335	-	-	-	-	-	-	-	340	-	-	<0.004	<1	112	<1	112	76	3
14 Jun 2017	BH16	EM1707805	-	-	-	-	-	-	-	-	-	-	-	<1	239	<1	239	77	4
12 Sep 2017	B16	EM1712490	-	-	-	-	-	-	-	-	-	-	<0.004	<1	271	<1	271	85	4
03 Aug 2016	B17	EM1609217	-	-	-	-	7.36	603	-	-	-	9,370	<0.004	-	-	-	-	94	4
15 Dec 2016	B17	EM1615347	-	0.46	-	460	7.36	628	-	-	-	4,260	-	-	-	-	-	96	4
01 Mar 2017	B17	EM1702335	-	-	-	-	-	-	-	360	-	-	<0.004	<1	129	<1	129	97	4
14 Jun 2017	BH17	EM1707805	-	-	-	-	-	-	-	-	-	-	-	<1	287	<1	287	98	4
13 Sep 2017	B17	EM1712490	-	-	-	-	-	-	-	-	-	-	<0.004	<1	300	<1	300	108	4
03 Aug 2016	B21A	EM1609217	-	-	-	-	7.63	749	-	-	-	7,430	<0.004	-	-	-	-	108	8
14 Jun 2017	BH21A	EM1707805	-	-	-	-	-	-	-	-	-	-	-	<1	205	<1	205	143	10

Table 2 - Historical Groundwater

											Minor Ions								
			Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)	Chloride	Sulfate (filtered)	Sulfate as S (filtered)	Cations Total	Anions Total	Ionic Balance	Iodide	Bromide	Ammonia as N	Ammonia as N (filtered)	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)
			mg/kg	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	%	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			10	1	1	1	1	1	0.01	0.01	0.01	10	0.01	0.01	0.01	0.01	0.01	0.01	0.1
ADWG 2011 Recreational (v3.7 updated 2022)							**5,000**					**5,000**				**112.9**	**9.1**		
ANZG (2018) - FW - 95% (updated 26 July 2021)														0.9	0.9	2.4			
ANZECC 2000 - Stock Watering							1,000	333								90	9.1		
ANZECC 2000 Irrigation - Long-term Trigger Values						350													5
ANZECC 2000 Irrigation - Short-term Trigger Values																			25
Date	**Field ID**	**Lab Report Number**																	
04 Aug 2016	B2	EM1609217	-	65	407	729	11	11	-	-	-	-	-	27.4	-	<0.01	<0.01	<0.01	30.8
28 Feb 2017	B2	EM1702250	-	64	376	896	5	5	30.6	34.2	5.51	820	1.03	32.0	-	0.02	<0.01	0.02	40.1
12 Sep 2017	B2	EM1712490	-	64	350	764	14	-	25.8	30.9	9.05	-	-	31.0	-	0.01	<0.01	0.01	31.4
21 Mar 2018	B2	EM1805110	-	57	350	762	7	-	25.8	29.9	7.44	432	1.01	27.5	-	0.08	<0.01	0.08	28.9
19 Sep 2018	B2	EM1815239	-	61	321	710	109	-	24.3	30.7	11.6	<100	0.747	28.4	-	<0.01	<0.01	<0.01	33.6
20 Mar 2019	B2	EM1904168	-	56	317	844	9	-	26.1	32.1	10.4	<10	0.883	21.2	-	<0.01	<0.01	<0.01	30.6
10 Sep 2019	B2	EM1915222	-	53	265	568	144	-	24.0	27.2	6.37	<50	<0.050	20.0	-	0.05	0.03	0.08	26.6
17 Dec 2019	B2	EM1921873	-	56	306	737	29	-	25.0	29.4	8.13	301	0.621	23.4	-	<0.01	<0.01	<0.01	27.0
25 Mar 2020	B2	EM2005146	-	45	285	717	25	-	23.9	27.5	7.06	353	0.548	18.5	-	0.01	0.01	0.02	27.6
29 Sep 2020	B2	EM2017090	-	21	77	205	75	-	9.02	12.2	15.0	<50	<0.050	8.43	-	0.95	0.04	0.99	10.9
24 Mar 2021	B2	EM2105221	-	46	242	100	48	-	19.9	7.24	46.7	<500	0.105	4.31	-	2.38	0.15	2.53	11.1
29 Sep 2021	B2	EM2119450	-	24	105	218	58	-	10.6	12.6	8.45	42	0.275	8.69	-	0.10	0.02	0.12	8.7
30 Mar 2022	B2	EM2205710	-	40	211	497	48	-	19.7	22.2	6.02	143	0.453	15.4	-	0.01	0.02	0.03	23.0
28 Sep 2022	B2	EM2219086	-	31	136	280	62	-	12.8	15.3	9.21	<200	0.254	11.2	-	0.02	<0.01	0.02	11.8
29 Mar 2023	B2	EM2305738	-	35	175	365	38	-	15.5	17.4	5.75	143	0.419	16.5	-	0.01	<0.01	0.01	16.2
06 Sep 2023	B2	EM2316170	-	26	113	142	55	-	11.1	10.4	3.55	69	<0.020	6.52	-	0.42	<0.01	0.42	7.3
03 Aug 2016	B3	EM1609217	-	<1	24	52	3	3	-	-	-	-	-	0.02	-	<0.01	<0.01	<0.01	<0.1
27 Feb 2017	B3	EM1702198	-	<1	40	111	2	2	3.07	3.19	1.96	20	0.248	0.06	-	<0.01	<0.01	<0.01	0.3
11 Sep 2017	B3	EM1712490	-	<1	13	23	15	-	4.19	4.56	4.22	-	-	0.05	-	0.01	0.02	0.03	19.5
04 Aug 2016	B4	EM1609217	-	<1	24	51	14	14	-	-	-	-	-	0.03	-	0.07	<0.01	0.07	<0.1
28 Feb 2017	B4	EM1702250	-	<1	56	374	3	3	14.0	16.3	7.50	90	0.295	0.18	-	0.01	<0.01	0.01	0.4
12 Sep 2017	B4	EM1712490	-	<1	32	64	11	-	7.99	7.89	0.64	-	-	0.08	-	<0.01	0.01	0.01	0.3
21 Mar 2018	B4	EM1805110	-	<1	94	518	2	-	17.6	19.9	6.00	146	0.421	0.17	-	<0.01	<0.01	<0.01	0.2
19 Sep 2018	B4	EM1815239	-	<1	45	168	10	-	10.0	10.2	0.62	<50	0.170	0.02	-	0.02	<0.01	0.02	<0.1
20 Mar 2019	B4	EM1904168	-	<1	102	562	<1	-	17.6	21.3	9.39	<10	0.434	0.10	-	<0.01	<0.01	<0.01	0.5
09 Sep 2019	B4	EM1915222	-	<1	35	126	12	-	9.85	9.72	0.67	<20	<0.020	0.06	-	<0.01	<0.01	<0.01	<0.1
17 Dec 2019	B4	EM1921873	-	<1	86	379	6	-	14.1	16.2	7.06	<100	0.260	0.12	-	<0.01	<0.01	<0.01	<0.1
25 Mar 2020	B4	EM2005146	-	<1	136	615	4	-	19.8	22.2	5.84	<10	0.324	0.15	-	<0.01	<0.01	<0.01	0.3
29 Sep 2020	B4	EM2017090	-	<1	56	172	10	-	11.1	10.5	2.82	<50	<0.050	0.12	-	<0.01	<0.01	<0.01	0.2
24 Mar 2021	B4	EM2105221	-	<1	151	660	5	-	21.8	24.5	5.69	<500	0.490	0.32	-	0.02	<0.01	0.02	0.4
29 Sep 2021	B4	EM2119450	-	<1	41	160	14	-	9.36	10.2	4.37	33	0.161	0.07	-	<0.01	<0.01	<0.01	0.2
28 Sep 2022	B4	EM2219086	-	<1	38	133	21	-	9.03	9.52	2.64	<50	0.124	0.04	-	<0.01	<0.01	<0.01	<0.1
14 Dec 2022	B4	EM2225248	-	<1	43	134	21	-	9.05	9.59	2.90	<50	0.122	0.28	-	<0.01	<0.01	<0.01	0.4
29 Mar 2023	B4	EM2305738	-	<1	62	238	14	-	12.0	12.4	1.77	<50	0.208	0.09	-	<0.01	<0.01	<0.01	0.3
06 Sep 2023	B4	EM2316170	-	<1	35	116	22	-	8.65	9.16	2.87	51	<0.020	0.08	-	<0.01	<0.01	<0.01	0.2
02 Aug 2016	B6	EM1609083	-	1	20	40	8	8	-	-	-	<20	0.115	0.06	-	0.04	<0.01	0.04	<0.1
27 Feb 2017	B6	EM1702198	-	1	19	30	5	5	4.57	4.81	2.57	28	0.133	0.08	-	<0.01	<0.01	<0.01	0.2
11 Sep 2017	B6	EM1712490	-	1	22	44	7	-	4.22	4.40	2.18	-	-	0.07	-	<0.01	0.02	<0.01	0.1
20 Mar 2018	B6	EM1804934	-	1	17	24	3	-	4.13	4.46	3.79	<10	0.095	0.09	-	0.03	<0.01	0.03	<0.1
18 Sep 2018	B6	EM1815239	-	2	20	34	5	-	4.05	3.90	1.94	<10	0.114	0.04	-	0.02	<0.01	0.02	<0.1
19 Mar 2019	B6	EM1904168	-	2	16	27	4	-	4.21	4.44	2.65	<10	0.113	0.10	-	<0.01	<0.01	<0.01	0.1
10 Sep 2019	B6	EM1915222	-	2	17	28	7	-	4.47	4.95	5.13	<10	<0.010	0.06	-	0.01	<0.01	0.01	<0.1
23 Mar 2020	B6	EM2005146	-	2	17	24	6	-	4.46	3.86	7.17	<10	0.079	0.08	-	<0.01	<0.01	<0.01	0.1
28 Sep 2020	B6	EM2017090	-	2	18	28	4	-	4.48	4.57	0.97	<10	0.109	0.09	-	<0.01	<0.01	<0.01	<0.1
23 Mar 2021	B6	EM2105110	-	2	19	27	11	-	4.91	4.61	3.15	<500	<0.500	0.09	-	<0.01	<0.01	<0.01	0.1
28 Sep 2021	B6	EM2119193	-	2	18	30	7	-	4.00	4.51	5.98	-	-	0.19	-	<0.01	<0.01	<0.01	0.2
28 Mar 2022	B6	EM2205592	-	2	19	23	6	-	4.96	4.69	2.76	<10	0.093	0.23	-	<0.01	<0.01	<0.01	0.2

Table 2 - Historical Groundwater

											Minor Ions							
			Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)	Chloride	Sulfate (filtered)	Sulfate as S (filtered)	Cations Total	Anions Total	Ionic Balance	Iodide	Bromide	Ammonia as N	Ammonia as N (filtered)	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)
			mg/kg	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	%	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			10	1	1	1	1	1	0.01	0.01	0.01	10	0.01	0.01	0.01	0.01	0.01	0.01	0.1
ADWG 2011 Recreational (v3.7 updated 2022)							**5,000**					**5,000**				**112.9**	**9.1**		
ANZG (2018) - FW - 95% (updated 26 July 2021)														0.9	0.9	2.4			
ANZECC 2000 - Stock Watering							1,000	333								90	9.1		
ANZECC 2000 Irrigation - Long-term Trigger Values						350													5
ANZECC 2000 Irrigation - Short-term Trigger Values																			25
Date	**Field ID**	**Lab Report Number**																	
27 Sep 2022	B6	EM2218958	-	1	18	35	5	-	3.99	4.07	0.95	<10	0.098	0.13	-	<0.01	<0.01	<0.01	0.2
28 Mar 2023	B6	EM2305600	-	2	17	26	6	-	4.44	4.18	3.05	21	0.100	0.06	-	0.03	<0.01	0.03	0.2
06 Sep 2023	B6	EM2316170	-	2	19	41	7	-	4.66	4.78	1.29	14	0.015	0.06	-	<0.01	<0.01	<0.01	0.1
03 Aug 2016	B7	EM1609217	-	<1	10	18	5	5	-	-	-	-	-	<0.01	-	0.03	<0.01	0.03	<0.1
28 Feb 2017	B7	EM1702250	-	<1	10	16	5	5	4.66	5.63	9.47	<10	0.071	0.04	-	<0.01	<0.01	<0.01	<0.1
11 Sep 2017	B7	EM1712490	-	<1	10	17	5	-	5.26	5.72	4.22	-	-	<0.01	-	<0.01	0.02	0.01	0.2
20 Mar 2018	B7	EM1804934	-	<1	10	17	6	-	4.96	5.60	6.10	<10	0.051	0.09	-	<0.01	<0.01	<0.01	<0.1
19 Sep 2018	B7	EM1815239	-	<1	11	18	5	-	5.25	5.29	0.36	<20	0.053	<0.01	-	0.01	<0.01	0.01	<0.1
19 Mar 2019	B7	EM1904168	-	<1	10	18	5	-	5.20	5.63	3.89	<10	0.064	0.07	-	<0.01	<0.01	<0.01	<0.1
11 Sep 2019	B7	EM1915222	-	<1	10	17	4	-	5.10	5.90	7.20	<10	<0.010	<0.01	-	<0.01	<0.01	<0.01	<0.1
24 Mar 2020	B7	EM2005146	-	<1	10	19	6	-	5.50	5.04	4.44	<10	0.043	0.02	-	0.02	<0.01	0.02	<0.1
28 Sep 2020	B7	EM2017090	-	<1	10	18	5	-	5.36	5.63	2.48	<10	0.052	0.04	-	<0.01	<0.01	<0.01	<0.1
23 Mar 2021	B7	EM2105110	-	<1	11	16	5	-	5.55	5.53	0.16	<500	<0.500	0.03	-	<0.01	<0.01	<0.01	<0.1
28 Sep 2021	B7	EM2119193	-	<1	11	16	5	-	5.00	4.51	5.13	-	-	0.18	-	<0.01	<0.01	<0.01	0.1
29 Mar 2022	B7	EM2205592	-	<1	10	16	5	-	5.36	5.49	1.25	<10	0.049	0.14	-	<0.01	<0.01	<0.01	<0.1
27 Sep 2022	B7	EM2218958	-	<1	10	19	6	-	5.16	5.20	0.40	<10	0.044	<0.01	-	<0.01	<0.01	<0.01	<0.1
28 Mar 2023	B7	EM2305600	-	<1	10	19	5	-	5.36	5.24	1.13	<10	0.049	<0.01	-	<0.01	<0.01	<0.01	<0.1
05 Sep 2023	B7	EM2316083	-	<1	11	14	5	-	5.50	4.93	5.40	<10	0.013	<0.01	-	<0.01	<0.01	<0.01	<0.1
13 Sep 2017	B9	EM1712490	-	<1	11	17	13	-	2.97	2.99	0.29	-	-	<0.01	-	0.25	0.01	0.26	0.7
21 Mar 2018	B9	EM1805110	-	<1	11	21	26	-	4.25	4.49	2.74	<20	0.062	0.07	-	0.56	<0.01	0.56	0.9
19 Sep 2018	B9	EM1815239	-	<1	12	20	14	-	2.62	2.87	4.71	<10	0.040	0.09	-	0.26	<0.01	0.26	0.3
18 Mar 2019	B9	EM1904168	-	<1	13	21	24	-	4.39	4.45	0.69	<10	0.074	0.02	-	0.59	<0.01	0.59	0.8
09 Sep 2019	B9	EM1915222	-	<1	11	20	14	-	3.17	3.45	-	<10	<0.010	<0.01	-	0.30	<0.01	0.30	0.4
25 Mar 2020	B9	EM2005146	-	<1	13	23	30	-	4.82	4.35	5.11	<10	0.052	0.02	-	0.63	<0.01	0.63	2.0
30 Sep 2020	B9	EM2017163	-	<1	11	27	16	-	3.07	3.33	4.09	<10	0.032	<0.01	-	0.27	<0.01	0.27	0.9
24 Mar 2021	B9	EM2105221	-	<1	12	21	21	-	4.34	4.45	1.16	<500	0.056	<0.01	-	0.49	<0.01	0.49	1.0
28 Sep 2021	B9	EM2119193	-	<1	10	20	14	-	3.23	3.33	1.62	-	-	0.27	-	0.26	<0.01	0.26	0.6
28 Mar 2022	B9	EM2205592	-	<1	14	-	-	-	-	-	-	-	-	-	-	-	-	0.62	0.7
26 Sep 2022	B9	EM2218846	-	<1	10	21	14	-	2.63	2.84	3.91	<10	0.039	<0.01	-	0.21	<0.01	0.21	0.4
14 Dec 2022	B9	EM2225248	-	1	11	18	12	-	2.95	3.16	3.42	<10	0.040	0.06	-	0.20	<0.01	0.20	0.4
27 Mar 2023	B9	EM2305499-AA	-	1	13	21	25	-	4.50	4.35	1.65	<10	0.059	<0.01	-	0.56	<0.01	0.56	1.0
05 Sep 2023	B9	EM2316083	-	<1	11	14	13	-	3.07	2.70	-	<10	0.014	0.02	-	0.25	<0.01	0.25	0.2
12 Sep 2017	B11	EM1712490	-	1	52	195	1	-	2.96	5.52	30.1	-	-	0.07	-	0.01	0.01	0.02	0.2
21 Mar 2018	B11	EM1805110	-	<1	47	95	1	-	2.59	2.70	2.13	<20	0.186	0.07	-	0.01	<0.01	0.01	<0.1
19 Sep 2018	B11	EM1815239	-	1	43	182	2	-	2.44	5.18	35.9	<20	0.264	0.20	-	0.03	<0.01	0.03	0.2
20 Mar 2019	B11	EM1904168	-	1	53	177	2	-	5.89	5.03	7.90	<10	0.271	<0.01	-	<0.01	<0.01	<0.01	<0.1
09 Sep 2019	B11	EM1915222	-	1	74	246	2	-	6.29	6.98	5.14	<20	<0.020	0.05	-	0.02	<0.01	0.02	<0.1
17 Dec 2019	B11	EM1921873	-	1	68	223	3	-	6.16	6.35	1.54	<50	0.082	0.11	-	<0.01	<0.01	<0.01	0.9
24 Mar 2020	B11	EM2005146	-	<1	40	133	2	-	4.13	3.83	3.80	74	0.207	0.06	-	<0.01	<0.01	<0.01	0.7
29 Sep 2020	B11	EM2017090	-	1	78	275	2	-	7.63	7.80	1.08	<20	0.076	0.08	-	0.01	<0.01	0.01	1.3
23 Mar 2021	B11	EM2105110	-	1	67	263	2	-	7.14	7.46	2.20	<500	<0.500	1.05	-	<0.01	0.01	<0.01	1.3
29 Sep 2021	B11	EM2119450	-	2	91	347	1	-	10.3	9.81	2.45	114	0.353	0.03	-	<0.01	<0.01	<0.01	0.5
30 Mar 2022	B11	EM2205710	-	2	81	297	2	-	8.81	8.42	2.28	53	0.313	0.76	-	<0.01	<0.01	<0.01	<1.0
28 Sep 2022	B11	EM2219086	-	2	72	324	64	-	8.50	10.5	10.4	<200	0.303	0.08	-	0.01	<0.01	0.01	0.3
29 Mar 2023	B11	EM2305738	-	2	70	274	1	-	8.73	7.79	5.68	112	0.331	0.02	-	<0.02	<0.02	<0.01	0.5
05 Sep 2023	B11	EM2316083	-	2	91	399	2	-	10.8	11.3	2.33	190	0.402	<0.05	-	<0.01	<0.01	<0.01	0.2
02 Aug 2016	B12	EM1609083	-	3	21	49	12	12	-	-	-	<20	0.085	0.08	-	0.06	<0.01	0.06	3.2
27 Feb 2017	B12	EM1702198	-	3	18	40	8	8	5.98	6.73	5.92	11	0.102	0.06	-	<0.01	<0.01	<0.01	4.4
11 Sep 2017	B12	EM1712490	-	2	17	39	7	-	6.11	6.68	4.48	-	-	0.07	-	<0.01	0.02	0.02	1.4

Table 2 - Historical Groundwater

											Minor Ions							
			Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)	Chloride	Sulfate (filtered)	Sulfate as S (filtered)	Cations Total	Anions Total	Ionic Balance	Iodide	Bromide	Ammonia as N	Ammonia as N (filtered)	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)
			mg/kg	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	%	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			10	1	1	1	1	1	0.01	0.01	0.01	10	0.01	0.01	0.01	0.01	0.01	0.01	0.1
ADWG 2011 Recreational (v3.7 updated 2022)							**5,000**					**5,000**				**112.9**	**9.1**		
ANZG (2018) - FW - 95% (updated 26 July 2021)														0.9	0.9	2.4			
ANZECC 2000 - Stock Watering							1,000	333								90	9.1		
ANZECC 2000 Irrigation - Long-term Trigger Values						350													5
ANZECC 2000 Irrigation - Short-term Trigger Values																			25
Date	**Field ID**	**Lab Report Number**																	
20 Mar 2018	B12	EM1804934	-	3	24	56	9	-	6.92	7.52	4.17	<10	0.113	0.14	-	<0.01	<0.01	<0.01	0.2
18 Sep 2018	B12	EM1815239	-	<1	25	32	2	-	1.27	1.08	-	<20	0.086	0.07	-	2.54	<0.01	2.54	3.2
19 Mar 2019	B12	EM1904168	-	<1	20	25	1	-	1.15	0.92	-	<10	0.095	0.02	-	1.72	<0.01	1.72	1.7
10 Sep 2019	B12	EM1915222	-	<1	23	37	2	-	1.18	1.18	0.12	<10	<0.010	0.04	-	2.32	<0.01	2.32	3.4
17 Dec 2019	B12	EM1921873	-	<1	21	36	2	-	0.91	1.10	-	<100	0.077	0.10	-	2.29	<0.01	2.29	2.3
24 Mar 2020	B12	EM2005146	-	<1	24	36	2	-	1.51	1.30	-	<10	0.068	0.03	-	2.37	<0.01	2.37	3.1
28 Sep 2020	B12	EM2017090	-	<1	23	36	1	-	1.23	1.18	2.34	<10	0.085	0.06	-	2.30	<0.01	2.30	2.5
23 Mar 2021	B12	EM2105110	-	<1	25	41	2	-	1.40	1.38	0.85	<500	<0.500	0.03	-	2.16	<0.01	2.16	3.1
29 Sep 2021	B12	EM2119450	-	<1	24	34	1	-	1.36	1.24	4.56	<10	0.081	<0.01	-	2.24	<0.01	2.24	2.5
29 Mar 2022	B12	EM2205592	-	<1	27	36	1	-	1.49	1.18	-	<10	0.080	0.17	-	2.24	<0.01	2.24	2.8
27 Sep 2022	B12	EM2218958	-	<1	27	44	1	-	1.54	1.48	1.88	<10	0.078	0.03	-	2.18	<0.01	2.18	2.5
28 Mar 2023	B12	EM2305600	-	<1	28	41	1	-	1.68	1.52	-	<10	0.085	0.30	-	2.46	<0.01	2.46	3.3
05 Sep 2023	B12	EM2316083	-	<1	29	40	2	-	1.58	1.46	<0.01	<10	0.081	<0.01	-	2.48	<0.01	2.48	3.3
03 Aug 2016	B14	EM1609217	-	<1	20	22	2	2	-	-	-	-	-	<0.01	-	2.21	<0.01	2.21	2.7
27 Feb 2017	B14	EM1702198	-	<1	17	29	2	2	1.02	1.18	-	<10	0.068	0.01	-	1.70	<0.01	1.70	2.1
11 Sep 2017	B14	EM1712490	-	<1	20	117	1	-	1.33	3.74	47.4	-	-	0.02	-	1.70	0.01	1.71	2.0
21 Mar 2018	B14	EM1805110	-	<1	18	24	2	-	1.16	1.14	1.15	<100	0.059	0.05	-	1.92	<0.01	1.92	1.9
18 Sep 2018	B14	EM1815239	-	4	24	65	11	-	7.24	7.34	0.64	<20	0.117	0.19	-	0.02	<0.01	0.02	0.9
18 Mar 2019	B14	EM1904168	-	4	23	35	7	-	6.72	7.09	2.67	<10	0.116	0.13	-	<0.01	<0.01	<0.01	0.4
11 Sep 2019	B14	EM1915222	-	4	24	48	11	-	6.66	7.74	7.46	<20	<0.020	0.09	-	0.04	<0.01	0.04	1.0
24 Mar 2020	B14	EM2005146	-	5	36	109	30	-	8.47	8.47	0.01	<10	0.085	0.20	-	0.14	0.02	0.16	2.9
28 Sep 2020	B14	EM2017090	-	5	39	124	59	-	9.03	10.1	5.47	<50	0.261	0.37	-	0.03	<0.01	0.03	3.7
22 Mar 2021	B14	EM2104983	-	9	63	114	44	-	9.60	12.7	14.0	<500	<0.500	0.24	-	<0.01	<0.01	<0.01	11.3
28 Sep 2021	B14	EM2119193	-	7	62	99	44	-	9.64	9.62	0.07	-	-	0.45	-	<0.01	<0.01	<0.01	1.1
29 Mar 2022	B14	EM2205592	-	10	59	65	37	-	9.10	9.18	0.41	<10	0.019	0.49	-	<0.01	<0.01	<0.01	3.8
28 Sep 2022	B14	EM2219086	-	9	54	75	36	-	8.48	8.50	0.13	<50	0.192	0.02	-	0.20	<0.01	0.20	0.7
28 Mar 2023	B14	EM2305600	-	10	51	55	22	-	8.27	7.92	2.15	<10	0.258	0.34	-	0.01	<0.01	0.01	1.2
06 Sep 2023	B14	EM2316170	-	8	47	60	20	-	7.80	8.16	2.29	64	0.010	0.24	-	<0.01	<0.01	<0.01	0.6
04 Aug 2016	B15	EM1609217	-	<1	11	24	2	2	-	-	-	-	-	0.02	-	0.05	<0.01	0.05	<0.1
15 Dec 2016	B15	EM1615347	-	<1	11	19	2	2	-	-	-	-	-	0.06	-	0.03	<0.01	0.03	0.1
01 Mar 2017	B15	EM1702335	-	<1	11	22	5	-	0.73	0.92	-	<10	0.060	0.07	-	0.10	<0.01	0.10	0.5
14 Jun 2017	BH15	EM1707805	-	<1	10	19	2	-	0.53	0.78	-	-	-	0.04	-	0.16	<0.01	0.16	0.9
13 Sep 2017	B15	EM1712490	-	<1	11	24	<1	-	0.78	0.84	3.65	-	-	0.04	-	0.09	0.01	0.10	0.3
03 Aug 2016	B16	EM1609217	-	<1	19	32	9	9	-	-	-	-	-	0.07	-	0.37	<0.01	0.37	0.4
15 Dec 2016	B16	EM1615347	-	<1	27	26	9	9	-	-	-	-	-	<0.01	-	0.27	<0.01	0.27	1.0
01 Mar 2017	B16	EM1702335	-	<1	21	29	4	-	4.95	3.14	-	<10	0.067	0.06	-	0.21	<0.01	0.21	0.7
14 Jun 2017	BH16	EM1707805	-	<1	24	22	6	-	5.22	5.52	2.84	-	-	0.04	-	0.25	<0.01	0.25	0.6
12 Sep 2017	B16	EM1712490	-	<1	31	26	6	-	5.92	6.27	2.90	-	-	0.01	-	0.33	<0.01	0.33	0.8
03 Aug 2016	B17	EM1609217	-	<1	14	25	4	4	-	-	-	-	-	0.03	-	0.40	<0.01	0.40	3.1
15 Dec 2016	B17	EM1615347	-	2	21	32	14	14	-	-	-	-	-	<0.01	-	1.18	0.02	1.20	5.5
01 Mar 2017	B17	EM1702335	-	<1	18	35	11	-	5.95	3.79	-	<10	0.083	0.06	-	0.98	0.02	1.00	1.3
14 Jun 2017	BH17	EM1707805	-	2	17	24	17	-	6.01	6.76	5.91	-	-	0.02	-	0.33	0.02	0.35	3.8
13 Sep 2017	B17	EM1712490	-	2	18	28	16	-	6.55	7.12	4.13	-	-	0.01	-	0.53	0.03	0.56	5.6
03 Aug 2016	B21A	EM1609217	-	1	28	71	63	63	-	-	-	-	-	0.09	-	<0.01	<0.01	<0.01	0.8
14 Jun 2017	BH21A	EM1707805	-	2	35	64	226	-	9.53	10.6	5.33	-	-	0.04	-	0.08	<0.01	0.08	0.4

Table 2 - Historical Groundwater

			Kjeldahl Nitrogen Total	Reactive Phosphorus as P	Phosphorus (Total)	Phosphorus (Total) (filtered)	BOD	Dissolved Organic Carbon	Aluminium	Aluminium (filtered)	Arsenic	Arsenic (filtered)	Cadmium	Cadmium (filtered)	Chromium (III+VI)	Chromium (III+VI) (filtered)	Copper	Copper (filtered)	Iron
			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
EQL			0.1	0.01	0.01	0.01	2	1	0.01	0.01	0.001	0.001	0.0001	0.0001	0.001	0.001	0.001	0.001	0.05
ADWG 2011 Recreational (v3.7 updated 2022)											**0.1**	**0.1**	**0.02**	**0.02**			**20**	**20**	
ANZG (2018) - FW - 95% (updated 26 July 2021)									0.055	0.055	0.013	0.013	0.0002	0.0002	0.001	0.001	0.0014	0.0014	
ANZECC 2000 - Stock Watering									5	5	0.5	0.5	0.01	0.01	1	1	1	1	
ANZECC 2000 Irrigation - Long-term Trigger Values					0.05	0.05			5	5	0.1	0.1	0.01	0.01	0.1	0.1	0.2	0.2	0.2
ANZECC 2000 Irrigation - Short-term Trigger Values					0.8	0.8			20	20	2	2	0.05	0.05	1	1	5	5	10
Date	**Field ID**	**Lab Report Number**																	
04 Aug 2016	B2	EM1609217	30.8	<0.01	0.11	-	<2	24	-	-	-	0.002	-	<0.0001	-	<0.001	-	<0.001	27.9
28 Feb 2017	B2	EM1702250	40.1	<0.01	0.20	-	11	14	-	-	-	0.002	-	<0.0001	-	<0.001	-	<0.001	50.7
12 Sep 2017	B2	EM1712490	31.4	<0.01	0.33	-	<2	13	-	-	-	0.001	-	<0.0001	-	<0.001	-	<0.001	61.8
21 Mar 2018	B2	EM1805110	28.8	<0.01	0.18	-	<2	<10	-	-	-	0.001	-	<0.0001	-	<0.001	-	<0.001	33.8
19 Sep 2018	B2	EM1815239	33.6	<0.01	0.13	0.07	<2	-	0.54	0.02	0.003	0.003	0.0004	<0.0001	0.002	0.001	0.004	0.104	23.1
20 Mar 2019	B2	EM1904168	30.6	<0.01	0.12	-	2	26	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.003	-
10 Sep 2019	B2	EM1915222	26.5	<0.01	0.20	-	<2	16	-	-	-	0.002	-	<0.0001	-	<0.001	-	0.003	-
17 Dec 2019	B2	EM1921873	27.0	0.02	0.01	-	<2	13	-	-	-	0.001	-	<0.0001	-	<0.001	-	<0.001	-
25 Mar 2020	B2	EM2005146	27.6	<0.01	0.02	-	<2	<5	-	-	-	0.002	-	<0.0001	-	<0.001	-	<0.001	-
29 Sep 2020	B2	EM2017090	9.9	0.01	0.39	-	<10	19	-	-	-	0.002	-	0.0002	-	0.001	-	0.010	-
24 Mar 2021	B2	EM2105221	8.6	0.12	1.30	-	<10	9	-	-	-	0.002	-	<0.0001	-	<0.001	-	<0.001	-
29 Sep 2021	B2	EM2119450	8.6	<0.01	0.11	-	<10	17	-	-	-	0.001	-	0.0001	-	0.002	-	0.004	-
30 Mar 2022	B2	EM2205710	23.0	-	1.13	-	17	11	-	-	-	0.002	-	<0.0001	-	<0.001	-	0.002	63.6
28 Sep 2022	B2	EM2219086	11.8	-	0.04	-	<10	14	-	-	-	-	<0.0001	0.0002	<0.001	<0.001	0.002	<0.001	8.62
29 Mar 2023	B2	EM2305738	16.2	-	0.03	-	<8	14	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	4.47
06 Sep 2023	B2	EM2316170	6.9	-	0.02	-	22	16	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.001	8.01
03 Aug 2016	B3	EM1609217	<0.1	<0.01	0.02	-	2	5	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.018	10.4
27 Feb 2017	B3	EM1702198	0.3	<0.01	0.07	-	2	3	-	-	-	<0.001	-	<0.0001	-	0.001	-	0.020	34.7
11 Sep 2017	B3	EM1712490	19.5	<0.01	19.2	-	<2	6	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	483
04 Aug 2016	B4	EM1609217	<0.1	<0.01	0.08	-	4	14	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	6.81
28 Feb 2017	B4	EM1702250	0.4	<0.01	0.43	-	<2	2	-	-	-	0.001	-	<0.0001	-	<0.001	-	<0.001	45.3
12 Sep 2017	B4	EM1712490	0.3	<0.01	0.28	-	<2	2	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	36.8
21 Mar 2018	B4	EM1805110	0.2	<0.01	0.15	-	<2	<1	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	24.0
19 Sep 2018	B4	EM1815239	<0.1	<0.01	0.04	0.03	<2	-	1.01	0.02	0.001	<0.001	<0.0001	<0.0001	0.002	<0.001	0.003	0.041	8.03
20 Mar 2019	B4	EM1904168	0.5	<0.01	0.03	-	<2	14	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.056	-
09 Sep 2019	B4	EM1915222	<0.1	0.01	0.03	-	<2	4	-	-	-	0.002	-	<0.0001	-	<0.001	-	0.003	-
17 Dec 2019	B4	EM1921873	<0.1	<0.01	<0.01	-	3	3	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.005	-
25 Mar 2020	B4	EM2005146	0.3	<0.01	0.05	-	4	<5	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.004	-
29 Sep 2020	B4	EM2017090	0.2	<0.01	0.03	-	<10	<1	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	-
24 Mar 2021	B4	EM2105221	0.4	<0.01	0.13	-	<10	<1	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	-
29 Sep 2021	B4	EM2119450	0.2	<0.01	0.01	-	<10	2	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	-
28 Sep 2022	B4	EM2219086	<0.1	-	0.02	-	<10	1	-	-	-	-	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	5.90
14 Dec 2022	B4	EM2225248	0.4	-	<0.01	-	<2	6	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	4.85
29 Mar 2023	B4	EM2305738	0.3	-	<0.01	-	<2	2	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	8.94
06 Sep 2023	B4	EM2316170	0.2	-	0.06	-	<8	8	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	4.86
02 Aug 2016	B6	EM1609083	<0.1	<0.01	0.09	-	<2	13	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	6.03
27 Feb 2017	B6	EM1702198	0.2	<0.01	0.08	-	3	2	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	7.78
11 Sep 2017	B6	EM1712490	0.1	<0.01	0.09	-	<2	3	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	7.33
20 Mar 2018	B6	EM1804934	<0.1	<0.01	0.06	-	<2	3	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.003	5.59
18 Sep 2018	B6	EM1815239	<0.1	<0.01	0.09	<0.01	<2	-	0.10	0.04	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	0.001	0.041	7.10
19 Mar 2019	B6	EM1904168	0.1	<0.01	0.22	-	4	4	-	-	-	0.001	-	<0.0001	-	<0.001	-	<0.001	-
10 Sep 2019	B6	EM1915222	<0.1	<0.01	0.12	-	6	5	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.002	-
23 Mar 2020	B6	EM2005146	0.1	<0.01	0.09	-	<2	<5	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.013	-
28 Sep 2020	B6	EM2017090	<0.1	<0.01	0.18	-	<10	5	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.105	-
23 Mar 2021	B6	EM2105110	0.1	<0.01	0.12	-	<10	<1	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	-
28 Sep 2021	B6	EM2119193	0.2	<0.01	<0.01	-	<10	<1	-	-	0.001	<0.001	<0.0001	-	0.002	<0.001	0.024	0.002	13.8
28 Mar 2022	B6	EM2205592	0.2	-	0.34	-	<2	<1	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.013	20.4

Table 2 - Historical Groundwater

			Kjeldahl Nitrogen Total	Reactive Phosphorus as P	Phosphorus (Total)	Phosphorus (Total) (filtered)	BOD	Dissolved Organic Carbon	Aluminium	Aluminium (filtered)	Arsenic	Arsenic (filtered)	Cadmium	Cadmium (filtered)	Chromium (III+VI)	Chromium (III+VI) (filtered)	Copper	Copper (filtered)	Iron
			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
EQL			0.1	0.01	0.01	0.01	2	1	0.01	0.01	0.001	0.001	0.0001	0.0001	0.001	0.001	0.001	0.001	0.05
ADWG 2011 Recreational (v3.7 updated 2022)											**0.1**	**0.1**	**0.02**	**0.02**			**20**	**20**	
ANZG (2018) - FW - 95% (updated 26 July 2021)									0.055	0.055	0.013	0.013	0.0002	0.0002	0.001	0.001	0.0014	0.0014	
ANZECC 2000 - Stock Watering									5	5	0.5	0.5	0.01	0.01	1	1	1	1	
ANZECC 2000 Irrigation - Long-term Trigger Values					0.05	0.05			5	5	0.1	0.1	0.01	0.01	0.1	0.1	0.2	0.2	0.2
ANZECC 2000 Irrigation - Short-term Trigger Values					0.8	0.8			20	20	2	2	0.05	0.05	1	1	5	5	10
Date	**Field ID**	**Lab Report Number**																	
27 Sep 2022	B6	EM2218958	0.2	-	0.12	-	<10	25	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.001	10.3
28 Mar 2023	B6	EM2305600	0.2	-	0.07	-	<2	<1	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	6.75
06 Sep 2023	B6	EM2316170	0.1	-	0.04	-	<8	5	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	5.96
03 Aug 2016	B7	EM1609217	<0.1	<0.01	0.48	-	4	5	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	2.61
28 Feb 2017	B7	EM1702250	<0.1	<0.01	<0.01	-	<2	2	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	4.31
11 Sep 2017	B7	EM1712490	0.2	<0.01	0.35	-	<2	<1	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	2.62
20 Mar 2018	B7	EM1804934	<0.1	<0.01	0.18	-	<2	<1	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	5.76
19 Sep 2018	B7	EM1815239	<0.1	<0.01	0.27	0.05	<2	-	3.18	0.01	<0.001	<0.001	<0.0001	<0.0001	0.006	<0.001	0.003	<0.001	1.82
19 Mar 2019	B7	EM1904168	<0.1	<0.01	0.05	-	4	9	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.002	-
11 Sep 2019	B7	EM1915222	<0.1	<0.01	0.14	-	<2	<1	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.008	-
24 Mar 2020	B7	EM2005146	<0.1	<0.01	0.05	-	<2	<1	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.004	-
28 Sep 2020	B7	EM2017090	<0.1	<0.01	<0.01	-	<10	<1	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.066	-
23 Mar 2021	B7	EM2105110	<0.1	<0.01	0.04	-	<10	<1	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	-
28 Sep 2021	B7	EM2119193	0.1	<0.01	<0.01	-	<10	<1	-	-	<0.001	<0.001	<0.0001	-	<0.001	<0.001	<0.001	<0.001	0.14
29 Mar 2022	B7	EM2205592	<0.1	-	0.01	-	<2	<1	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	0.41
27 Sep 2022	B7	EM2218958	<0.1	-	<0.01	-	<10	2	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	0.20
28 Mar 2023	B7	EM2305600	<0.1	-	0.03	-	<2	<1	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	<0.05
05 Sep 2023	B7	EM2316083	<0.1	-	0.02	-	<2	3	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	0.17
13 Sep 2017	B9	EM1712490	0.4	<0.01	0.12	-	<2	4	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	2.44
21 Mar 2018	B9	EM1805110	0.3	<0.01	0.43	-	<2	6	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.006	10.1
19 Sep 2018	B9	EM1815239	<0.1	<0.01	0.03	0.02	<2	-	1.20	0.05	<0.001	<0.001	<0.0001	<0.0001	0.003	<0.001	0.002	0.013	1.00
18 Mar 2019	B9	EM1904168	0.2	<0.01	0.10	-	<2	-	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.008	-
09 Sep 2019	B9	EM1915222	0.1	0.01	0.09	-	<2	6	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.005	-
25 Mar 2020	B9	EM2005146	1.4	<0.01	1.23	-	<2	2	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.005	-
30 Sep 2020	B9	EM2017163	0.6	0.01	0.16	-	<16	10	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.155	-
24 Mar 2021	B9	EM2105221	0.5	<0.01	0.09	-	<10	<1	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	-
28 Sep 2021	B9	EM2119193	0.3	0.15	<0.01	-	<10	10	-	-	0.001	<0.001	0.0002	-	0.011	<0.001	0.006	<0.001	5.99
28 Mar 2022	B9	EM2205592	0.1	-	0.04	-	-	1	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	1.35
26 Sep 2022	B9	EM2218846	0.2	-	0.07	-	<10	7	-	-	-	<0.001	-	-	-	<0.001	-	0.001	5.66
14 Dec 2022	B9	EM2225248	0.2	-	<0.01	-	<2	8	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	<0.05
27 Mar 2023	B9	EM2305499-AA	0.4	-	0.02	-	2	5	-	-	-	<0.001	-	-	-	<0.001	-	<0.001	<0.05
05 Sep 2023	B9	EM2316083	<0.1	-	0.05	-	3	5	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	1.07
12 Sep 2017	B11	EM1712490	0.2	<0.01	0.07	-	<2	2	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.031	25.6
21 Mar 2018	B11	EM1805110	<0.1	<0.01	0.10	-	<2	4	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.021	41.5
19 Sep 2018	B11	EM1815239	0.2	<0.01	0.15	0.03	<2	-	8.28	0.74	0.013	<0.001	<0.0001	<0.0001	0.022	0.001	0.035	0.022	51.7
20 Mar 2019	B11	EM1904168	<0.1	<0.01	<0.01	-	2	10	-	-	-	<0.001	-	0.0002	-	<0.001	-	0.012	-
09 Sep 2019	B11	EM1915222	<0.1	<0.01	0.06	-	<2	<1	-	-	-	<0.001	-	0.0001	-	0.001	-	0.032	-
17 Dec 2019	B11	EM1921873	0.9	<0.01	0.17	-	3	4	-	-	-	<0.001	-	0.0001	-	<0.001	-	0.016	-
24 Mar 2020	B11	EM2005146	0.7	<0.01	0.22	-	2	<1	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.010	-
29 Sep 2020	B11	EM2017090	1.3	<0.01	0.10	-	<10	6	-	-	-	<0.001	-	0.0002	-	0.001	-	0.147	-
23 Mar 2021	B11	EM2105110	1.3	<0.01	0.07	-	8	<1	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.006	-
29 Sep 2021	B11	EM2119450	0.5	<0.01	0.02	-	7	3	-	-	-	<0.001	-	<0.0001	-	0.001	-	0.021	-
30 Mar 2022	B11	EM2205710	<1.0	-	<0.10	-	6	<1	-	-	-	<0.001	-	0.0003	-	<0.001	-	0.007	190
28 Sep 2022	B11	EM2219086	0.3	-	0.03	-	<10	3	-	-	-	-	<0.0001	<0.0001	<0.001	<0.001	0.024	0.007	71.1
29 Mar 2023	B11	EM2305738	0.5	-	0.02	-	3	2	-	-	-	<0.001	-	0.0001	-	<0.001	-	0.003	84.6
05 Sep 2023	B11	EM2316083	0.2	-	0.02	-	3	4	-	-	-	0.001	-	0.0001	-	<0.001	-	0.012	105
02 Aug 2016	B12	EM1609083	3.1	<0.01	1.53	-	<2	2	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.004	44.2
27 Feb 2017	B12	EM1702198	4.4	<0.01	2.17	-	2	2	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.011	32.4
11 Sep 2017	B12	EM1712490	1.4	<0.01	0.49	-	<2	2	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	28.4

Table 2 - Historical Groundwater

			Kjeldahl Nitrogen Total	Reactive Phosphorus as P	Phosphorus (Total)	Phosphorus (Total) (filtered)	BOD	Dissolved Organic Carbon	Aluminium	Aluminium (filtered)	Arsenic	Arsenic (filtered)	Cadmium	Cadmium (filtered)	Chromium (III+VI)	Chromium (III+VI) (filtered)	Copper	Copper (filtered)	Iron
			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
EQL			0.1	0.01	0.01	0.01	2	1	0.01	0.01	0.001	0.001	0.0001	0.0001	0.001	0.001	0.001	0.001	0.05
ADWG 2011 Recreational (v3.7 updated 2022)											**0.1**	**0.1**	**0.02**	**0.02**			**20**	**20**	
ANZG (2018) - FW - 95% (updated 26 July 2021)									0.055	0.055	0.013	0.013	0.0002	0.0002	0.001	0.001	0.0014	0.0014	
ANZECC 2000 - Stock Watering									5	5	0.5	0.5	0.01	0.01	1	1	1	1	
ANZECC 2000 Irrigation - Long-term Trigger Values					0.05	0.05			5	5	0.1	0.1	0.01	0.01	0.1	0.1	0.2	0.2	0.2
ANZECC 2000 Irrigation - Short-term Trigger Values					0.8	0.8			20	20	2	2	0.05	0.05	1	1	5	5	10
Date	**Field ID**	**Lab Report Number**																	
20 Mar 2018	B12	EM1804934	0.2	<0.01	0.39	-	<2	2	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.002	2.75
18 Sep 2018	B12	EM1815239	0.7	<0.01	0.38	0.15	<2	-	8.55	0.03	0.003	<0.001	0.0002	<0.0001	0.018	<0.001	0.018	0.024	7.58
19 Mar 2019	B12	EM1904168	<0.1	<0.01	0.21	-	<2	7	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.007	-
10 Sep 2019	B12	EM1915222	1.1	<0.01	0.51	-	<2	4	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.012	-
17 Dec 2019	B12	EM1921873	<0.1	<0.01	<0.01	-	<2	4	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.020	-
24 Mar 2020	B12	EM2005146	0.7	<0.01	0.06	-	<2	4	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.002	-
28 Sep 2020	B12	EM2017090	0.2	<0.01	0.02	-	<10	5	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.118	-
23 Mar 2021	B12	EM2105110	0.9	<0.01	0.05	-	<10	<1	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.002	-
29 Sep 2021	B12	EM2119450	0.3	<0.01	0.02	-	<10	2	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.002	-
29 Mar 2022	B12	EM2205592	0.6	-	0.02	-	<2	2	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.003	0.70
27 Sep 2022	B12	EM2218958	0.3	-	<0.01	-	<10	2	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	0.07
28 Mar 2023	B12	EM2305600	0.8	-	0.03	-	<2	<1	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	0.12
05 Sep 2023	B12	EM2316083	0.8	-	0.01	-	<2	2	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.001	0.24
03 Aug 2016	B14	EM1609217	0.5	<0.01	0.41	-	<2	15	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	27.3
27 Feb 2017	B14	EM1702198	0.4	<0.01	0.02	-	<2	2	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	1.24
11 Sep 2017	B14	EM1712490	0.3	<0.01	0.03	-	<2	2	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	0.98
21 Mar 2018	B14	EM1805110	<0.1	<0.01	0.37	-	<2	9	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.005	0.26
18 Sep 2018	B14	EM1815239	0.9	<0.01	0.60	0.41	<2	-	25.5	0.02	0.005	<0.001	0.0002	<0.0001	0.092	<0.001	0.057	0.012	22.6
18 Mar 2019	B14	EM1904168	0.4	<0.01	0.48	-	<2	-	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.010	-
11 Sep 2019	B14	EM1915222	1.0	<0.01	0.45	-	<2	3	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.010	-
24 Mar 2020	B14	EM2005146	2.7	0.01	1.36	-	8	2	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.006	-
28 Sep 2020	B14	EM2017090	3.7	<0.01	1.33	-	<10	9	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.074	-
22 Mar 2021	B14	EM2104983	11.3	<0.01	3.89	-	<10	2	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	-
28 Sep 2021	B14	EM2119193	1.1	<0.01	0.21	-	<10	5	-	-	0.006	<0.001	0.0007	-	0.129	<0.001	0.147	0.002	37.4
29 Mar 2022	B14	EM2205592	3.8	-	1.19	-	4	5	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.004	23.6
28 Sep 2022	B14	EM2219086	0.5	-	0.02	-	<10	10	-	-	-	-	<0.0001	<0.0001	<0.001	<0.001	0.001	<0.001	<0.05
28 Mar 2023	B14	EM2305600	1.2	-	0.03	-	<2	2	-	-	-	0.001	-	<0.0001	-	<0.001	-	<0.001	0.98
06 Sep 2023	B14	EM2316170	0.6	-	<0.01	-	<8	8	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	0.48
04 Aug 2016	B15	EM1609217	<0.1	<0.01	0.11	-	<2	10	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	4.72
15 Dec 2016	B15	EM1615347	0.1	0.02	0.13	-	17	-	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.002	-
01 Mar 2017	B15	EM1702335	0.4	<0.01	0.03	-	<2	3	-	-	-	<0.001	-	0.0002	-	<0.001	-	0.002	3.84
14 Jun 2017	BH15	EM1707805	0.7	<0.01	0.64	-	5	-	-	-	-	<0.001	-	0.0002	-	<0.001	-	0.001	-
13 Sep 2017	B15	EM1712490	0.2	<0.01	0.09	-	<2	2	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	1.64
03 Aug 2016	B16	EM1609217	<0.1	<0.01	0.64	-	<2	9	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	8.52
15 Dec 2016	B16	EM1615347	0.7	<0.01	1.04	-	<2	-	-	-	-	<0.001	-	<0.0001	-	0.001	-	0.002	-
01 Mar 2017	B16	EM1702335	0.5	<0.01	0.51	-	<2	2	-	-	-	<0.001	-	<0.0001	-	0.001	-	0.002	11.2
14 Jun 2017	BH16	EM1707805	0.4	<0.01	4.00	-	5	-	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	-
12 Sep 2017	B16	EM1712490	0.5	<0.01	0.42	-	<2	1	-	-	-	<0.001	-	<0.0001	-	0.001	-	<0.001	8.33
03 Aug 2016	B17	EM1609217	2.7	<0.01	2.15	-	<2	3	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.001	59.9
15 Dec 2016	B17	EM1615347	4.3	<0.01	2.23	-	<2	-	-	-	-	<0.001	-	<0.0001	-	<0.001	-	0.012	-
01 Mar 2017	B17	EM1702335	0.3	<0.01	0.55	-	<2	<1	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	51.2
14 Jun 2017	BH17	EM1707805	3.4	<0.01	2.78	-	<2	-	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	-
13 Sep 2017	B17	EM1712490	5.0	0.01	4.25	-	<2	1	-	-	-	<0.001	-	<0.0001	-	<0.001	-	<0.001	36.7
03 Aug 2016	B21A	EM1609217	0.8	<0.01	0.70	-	<2	7	-	-	-	0.002	-	<0.0001	-	<0.001	-	<0.001	23.0
14 Jun 2017	BH21A	EM1707805	0.3	<0.01	0.23	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 2 - Historical Groundwater

			Metals																
			Iron (filtered)	Lead	Lead (filtered)	Manganese	Manganese (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	Selenium	Selenium (filtered)	Zinc	Zinc (filtered)	Benzene	Toluene	Ethylbenzene	Xylene (o)
			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
EQL			0.05	0.001	0.001	0.001	0.001	0.0001	0.0001	0.001	0.001	0.01	0.01	0.005	0.005	1	2	2	2
ADWG 2011 Recreational (v3.7 updated 2022)				**0.1**	**0.1**	**5**	**5**	**0.01**	**0.01**	**0.2**	**0.2**	**0.1**	**0.1**			**10**	**8,000**	**3,000**	
ANZG (2018) - FW - 95% (updated 26 July 2021)				0.0034	0.0034	1.9	1.9	0.0006	0.0006	0.011	0.011	0.011	0.011	0.008	0.008	950	180	80	350
ANZECC 2000 - Stock Watering				0.1	0.1			0.002	0.002	1	1	0.02	0.02	20	20				
ANZECC 2000 Irrigation - Long-term Trigger Values			0.2	2	2	0.2	0.2	0.002	0.002	0.2	0.2	0.02	0.02	2	2				
ANZECC 2000 Irrigation - Short-term Trigger Values			10	5	5	10	10	0.002	0.002	2	2	0.05	0.05	5	5				
Date	**Field ID**	**Lab Report Number**																	
04 Aug 2016	B2	EM1609217	15.6	-	<0.001	-	1.50	-	<0.0001	-	0.009	-	<0.01	-	<0.005	<1	<2	<2	<2
28 Feb 2017	B2	EM1702250	29.9	-	<0.001	-	3.35	-	<0.0001	-	0.011	-	<0.01	-	<0.005	<1	<2	<2	<2
12 Sep 2017	B2	EM1712490	-	-	<0.001	-	2.14	-	<0.0001	-	0.010	-	<0.01	-	0.029	<1	<2	<2	<2
21 Mar 2018	B2	EM1805110	-	-	<0.001	-	3.55	-	<0.0001	-	0.009	-	<0.01	-	<0.005	<1	<2	<2	<2
19 Sep 2018	B2	EM1815239	26.4	0.004	0.007	2.34	2.30	<0.0001	<0.0001	0.063	0.018	<0.01	<0.01	0.060	0.181	-	-	-	-
20 Mar 2019	B2	EM1904168	11.4	-	<0.001	-	3.49	-	<0.0001	-	0.009	-	<0.01	-	0.018	<1	<2	<2	<2
10 Sep 2019	B2	EM1915222	29.3	-	<0.001	-	2.25	-	<0.0001	-	0.015	-	<0.01	-	0.024	<1	<2	<2	<2
17 Dec 2019	B2	EM1921873	24.2	-	<0.001	-	3.72	-	<0.0001	-	0.006	-	<0.01	-	<0.005	<1	<2	<2	<2
25 Mar 2020	B2	EM2005146	27.1	-	<0.001	-	3.19	-	<0.0001	-	0.007	-	<0.01	-	<0.005	-	-	-	-
29 Sep 2020	B2	EM2017090	2.67	-	<0.001	-	0.454	-	<0.0001	-	0.021	-	<0.01	-	0.016	<1	<2	<2	<2
24 Mar 2021	B2	EM2105221	23.4	-	<0.001	-	2.89	-	<0.0001	-	0.016	-	<0.01	-	0.008	<1	<2	<2	<2
29 Sep 2021	B2	EM2119450	3.79	-	<0.001	-	0.533	-	<0.0001	-	0.029	-	<0.01	-	0.013	<1	<2	<2	<2
30 Mar 2022	B2	EM2205710	23.9	-	<0.001	-	2.33	-	<0.0001	-	0.012	-	<0.01	-	0.012	-	-	-	-
28 Sep 2022	B2	EM2219086	8.88	<0.001	<0.001	0.876	0.812	-	-	0.025	0.023	-	-	0.025	0.016	-	-	-	-
29 Mar 2023	B2	EM2305738	4.49	-	<0.001	-	1.41	-	<0.0001	-	0.012	-	<0.01	-	0.011	<1	16	<2	<2
06 Sep 2023	B2	EM2316170	6.93	-	<0.001	-	0.774	-	<0.0001	-	0.012	-	<0.01	-	0.008	<1	3	<2	<2
03 Aug 2016	B3	EM1609217	3.15	-	0.006	-	0.038	-	<0.0001	-	0.008	-	<0.01	-	0.046	<1	<2	<2	<2
27 Feb 2017	B3	EM1702198	17.1	-	0.007	-	0.047	-	<0.0001	-	0.010	-	<0.01	-	0.038	<1	<2	<2	<2
11 Sep 2017	B3	EM1712490	-	-	<0.001	-	0.226	-	<0.0001	-	0.009	-	<0.01	-	0.022	<1	<2	<2	<2
04 Aug 2016	B4	EM1609217	2.00	-	<0.001	-	0.128	-	<0.0001	-	0.004	-	<0.01	-	0.024	<1	<2	<2	<2
28 Feb 2017	B4	EM1702250	12.0	-	<0.001	-	0.358	-	<0.0001	-	0.005	-	<0.01	-	0.013	<1	<2	<2	<2
12 Sep 2017	B4	EM1712490	-	-	<0.001	-	0.158	-	<0.0001	-	0.005	-	<0.01	-	0.020	<1	<2	<2	<2
21 Mar 2018	B4	EM1805110	-	-	<0.001	-	0.470	-	<0.0001	-	0.002	-	<0.01	-	<0.005	<1	<2	<2	<2
19 Sep 2018	B4	EM1815239	10.1	0.004	0.002	0.254	0.246	<0.0001	<0.0001	0.014	0.008	<0.01	<0.01	0.098	0.050	-	-	-	-
20 Mar 2019	B4	EM1904168	21.6	-	<0.001	-	0.491	-	<0.0001	-	0.003	-	<0.01	-	0.030	<1	<2	<2	<2
09 Sep 2019	B4	EM1915222	29.4	-	<0.001	-	2.28	-	<0.0001	-	0.016	-	<0.01	-	0.025	<1	<2	<2	<2
17 Dec 2019	B4	EM1921873	19.5	-	<0.001	-	0.374	-	<0.0001	-	0.003	-	<0.01	-	0.009	<1	<2	<2	<2
25 Mar 2020	B4	EM2005146	32.7	-	<0.001	-	0.476	-	<0.0001	-	0.003	-	<0.01	-	0.030	-	-	-	-
29 Sep 2020	B4	EM2017090	11.8	-	<0.001	-	0.265	-	<0.0001	-	0.003	-	<0.01	-	0.013	<1	<2	<2	<2
24 Mar 2021	B4	EM2105221	29.9	-	<0.001	-	0.571	-	<0.0001	-	0.001	-	<0.01	-	0.008	<1	<2	<2	<2
29 Sep 2021	B4	EM2119450	6.28	-	<0.001	-	0.214	-	<0.0001	-	0.004	-	<0.01	-	0.015	<1	<2	<2	<2
28 Sep 2022	B4	EM2219086	6.27	<0.001	<0.001	0.188	0.181	-	-	0.004	0.004	-	-	<0.005	<0.005	-	-	-	-
14 Dec 2022	B4	EM2225248	<0.05	-	<0.001	-	0.111	-	<0.0001	-	0.002	-	<0.01	-	<0.005	<1	17	<2	<2
29 Mar 2023	B4	EM2305738	8.35	-	<0.001	-	0.237	-	<0.0001	-	0.004	-	<0.01	-	0.007	<1	12	<2	<2
06 Sep 2023	B4	EM2316170	4.63	-	<0.001	-	0.178	-	<0.0001	-	0.004	-	<0.01	-	<0.005	<1	<2	<2	<2
02 Aug 2016	B6	EM1609083	-	-	<0.001	-	0.11	-	<0.0001	-	<0.001	-	-	-	<0.005	<1	<2	<2	<2
27 Feb 2017	B6	EM1702198	5.62	-	<0.001	-	0.120	-	<0.0001	-	<0.001	-	<0.01	-	0.019	<1	<2	<2	<2
11 Sep 2017	B6	EM1712490	-	-	<0.001	-	0.104	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	<1	<2	<2	<2
20 Mar 2018	B6	EM1804934	4.33	-	<0.001	-	0.116	-	<0.0001	-	0.002	-	<0.01	-	0.008	<1	<2	<2	<2
18 Sep 2018	B6	EM1815239	8.32	<0.001	0.003	0.117	0.114	<0.0001	<0.0001	<0.001	0.005	<0.01	<0.01	<0.005	0.055	-	-	-	-
19 Mar 2019	B6	EM1904168	4.36	-	<0.001	-	0.120	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	<1	<2	<2	<2
10 Sep 2019	B6	EM1915222	5.79	-	<0.001	-	0.135	-	<0.0001	-	0.002	-	<0.01	-	0.010	<1	<2	<2	<2
23 Mar 2020	B6	EM2005146	6.13	-	0.001	-	0.121	-	<0.0001	-	0.014	-	<0.01	-	0.070	-	-	-	-
28 Sep 2020	B6	EM2017090	6.07	-	<0.001	-	0.126	-	<0.0001	-	0.010	-	<0.01	-	0.135	<1	<2	<2	<2
23 Mar 2021	B6	EM2105110	3.36	-	<0.001	-	0.103	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	<1	<2	<2	<2
28 Sep 2021	B6	EM2119193	<0.05	0.005	<0.001	0.136	0.070	<0.0001	<0.0001	<0.001	<0.001	<0.01	<0.01	0.010	0.012	<1	<2	<2	<2
28 Mar 2022	B6	EM2205592	11.1	-	<0.001	-	0.122	-	<0.0001	-	<0.001	-	<0.01	-	0.027	-	-	-	-

Table 2 - Historical Groundwater

Dulverton Regional Waste Management Authority

Dulverton Environmental Monitoring

			Metals																	
			Iron (filtered)	Lead	Lead (filtered)	Manganese	Manganese (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	Selenium	Selenium (filtered)	Zinc	Zinc (filtered)	Benzene	Toluene	Ethylbenzene	Xylene (o)
			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
EQL			0.05	0.001	0.001	0.001	0.001	0.0001	0.0001	0.001	0.001	0.01	0.01	0.005	0.005	1	2	2	2
ADWG 2011 Recreational (v3.7 updated 2022)				**0.1**	**0.1**	**5**	**5**	**0.01**	**0.01**	**0.2**	**0.2**	**0.1**	**0.1**			**10**	**8,000**	**3,000**	
ANZG (2018) - FW - 95% (updated 26 July 2021)				0.0034	0.0034	1.9	1.9	0.0006	0.0006	0.011	0.011	0.011	0.011	0.008	0.008	950	180	80	350
ANZECC 2000 - Stock Watering				0.1	0.1			0.002	0.002	1	1	0.02	0.02	20	20				
ANZECC 2000 Irrigation - Long-term Trigger Values			0.2	2	2	0.2	0.2	0.002	0.002	0.2	0.2	0.02	0.02	2	2				
ANZECC 2000 Irrigation - Short-term Trigger Values			10	5	5	10	10	0.002	0.002	2	2	0.05	0.05	5	5				
Date	**Field ID**	**Lab Report Number**																	
27 Sep 2022	B6	EM2218958	6.31	-	<0.001	-	0.118	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	-	-	-	-
28 Mar 2023	B6	EM2305600	5.84	-	<0.001	-	0.128	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	<1	<2	<2	<2
06 Sep 2023	B6	EM2316170	5.89	-	<0.001	-	0.135	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	<1	<2	<2	<2
03 Aug 2016	B7	EM1609217	<0.05	-	<0.001	-	0.004	-	<0.0001	-	<0.001	-	<0.01	-	0.005	<1	<2	<2	<2
28 Feb 2017	B7	EM1702250	<0.05	-	<0.001	-	0.008	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	<1	<2	<2	<2
11 Sep 2017	B7	EM1712490	-	-	<0.001	-	0.005	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	<1	<2	<2	<2
20 Mar 2018	B7	EM1804934	0.06	-	<0.001	-	0.009	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	<1	<2	<2	<2
19 Sep 2018	B7	EM1815239	0.05	0.006	<0.001	0.017	0.005	<0.0001	<0.0001	0.002	<0.001	<0.01	<0.01	0.013	<0.005	-	-	-	-
19 Mar 2019	B7	EM1904168	<0.05	-	<0.001	-	0.008	-	<0.0001	-	0.002	-	<0.01	-	0.024	<1	<2	<2	<2
11 Sep 2019	B7	EM1915222	<0.05	-	<0.001	-	0.005	-	<0.0001	-	0.006	-	<0.01	-	0.044	<1	<2	<2	<2
24 Mar 2020	B7	EM2005146	<0.05	-	<0.001	-	0.007	-	<0.0001	-	0.004	-	<0.01	-	0.018	-	-	-	-
28 Sep 2020	B7	EM2017090	<0.05	-	0.002	-	0.009	-	<0.0001	-	0.004	-	<0.01	-	0.067	<1	<2	<2	<2
23 Mar 2021	B7	EM2105110	<0.05	-	<0.001	-	0.005	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	<1	<2	<2	<2
28 Sep 2021	B7	EM2119193	<0.05	<0.001	<0.001	0.006	0.002	<0.0001	<0.0001	<0.001	<0.001	<0.01	<0.01	<0.005	<0.005	<1	<2	<2	<2
29 Mar 2022	B7	EM2205592	0.06	-	<0.001	-	0.008	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	-	-	-	-
27 Sep 2022	B7	EM2218958	<0.05	-	<0.001	-	0.004	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	-	-	-	-
28 Mar 2023	B7	EM2305600	<0.05	-	<0.001	-	0.006	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	<1	3	<2	<2
05 Sep 2023	B7	EM2316083	<0.05	-	<0.001	-	0.003	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	<1	8	<2	<2
13 Sep 2017	B9	EM1712490	-	-	<0.001	-	<0.001	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	<1	<2	<2	<2
21 Mar 2018	B9	EM1805110	-	-	<0.001	-	0.021	-	<0.0001	-	0.003	-	<0.01	-	0.012	<1	<2	<2	<2
19 Sep 2018	B9	EM1815239	0.08	0.001	<0.001	0.171	0.003	<0.0001	<0.0001	0.010	0.003	<0.01	<0.01	0.010	0.022	-	-	-	-
18 Mar 2019	B9	EM1904168	0.06	-	<0.001	-	0.004	-	<0.0001	-	0.006	-	<0.01	-	0.066	<1	<2	<2	<2
09 Sep 2019	B9	EM1915222	0.16	-	<0.001	-	0.013	-	<0.0001	-	0.006	-	<0.01	-	0.055	<1	<2	<2	<2
25 Mar 2020	B9	EM2005146	<0.05	-	<0.001	-	0.037	-	<0.0001	-	0.004	-	<0.01	-	0.023	-	-	-	-
30 Sep 2020	B9	EM2017163	0.21	-	0.003	-	0.008	-	<0.0001	-	0.016	-	<0.01	-	0.147	<1	<2	<2	<2
24 Mar 2021	B9	EM2105221	<0.05	-	<0.001	-	0.001	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	<1	<2	<2	<2
28 Sep 2021	B9	EM2119193	<0.05	0.008	<0.001	0.992	0.001	<0.0001	<0.0001	0.054	<0.001	<0.01	<0.01	0.054	<0.005	<1	<2	<2	<2
28 Mar 2022	B9	EM2205592	<0.05	-	<0.001	-	0.001	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	-	-	-	-
26 Sep 2022	B9	EM2218846	0.17	-	<0.001	-	0.008	-	<0.0001	-	0.002	-	<0.01	-	<0.005	-	-	-	-
14 Dec 2022	B9	EM2225248	<0.05	-	<0.001	-	0.004	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	<1	19	<2	<2
27 Mar 2023	B9	EM2305499-AA	<0.05	-	<0.001	-	0.002	-	<0.0001	-	0.001	-	<0.01	-	<0.005	<1	8	<2	<2
05 Sep 2023	B9	EM2316083	0.10	-	<0.001	-	0.008	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	<1	<2	<2	<2
12 Sep 2017	B11	EM1712490	-	-	0.018	-	0.056	-	<0.0001	-	0.013	-	<0.01	-	0.045	<1	<2	<2	<2
21 Mar 2018	B11	EM1805110	-	-	0.008	-	0.077	-	<0.0001	-	0.012	-	<0.01	-	0.071	<1	<2	<2	<2
19 Sep 2018	B11	EM1815239	21.0	0.034	0.011	0.072	0.070	<0.0001	<0.0001	0.019	0.015	<0.01	<0.01	0.056	0.049	-	-	-	-
20 Mar 2019	B11	EM1904168	27.2	-	0.003	-	0.100	-	<0.0001	-	0.016	-	<0.01	-	0.089	<1	<2	<2	<2
09 Sep 2019	B11	EM1915222	36.9	-	0.017	-	0.100	-	<0.0001	-	0.024	-	<0.01	-	0.078	<1	<2	<2	<2
17 Dec 2019	B11	EM1921873	43.5	-	0.006	-	0.092	-	<0.0001	-	0.018	-	<0.01	-	0.074	<1	<2	<2	<2
24 Mar 2020	B11	EM2005146	34.5	-	0.002	-	0.075	-	<0.0001	-	0.018	-	<0.01	-	0.091	-	-	-	-
29 Sep 2020	B11	EM2017090	58.2	-	0.012	-	0.106	-	<0.0001	-	0.029	-	<0.01	-	0.185	<1	<2	<2	<2
23 Mar 2021	B11	EM2105110	61.1	-	0.003	-	0.091	-	<0.0001	-	0.017	-	<0.01	-	0.060	<1	<2	<2	<2
29 Sep 2021	B11	EM2119450	72.3	-	0.017	-	0.128	-	<0.0001	-	0.026	-	<0.01	-	0.078	<1	<2	<2	<2
30 Mar 2022	B11	EM2205710	73.2	-	0.007	-	0.135	-	<0.0001	-	0.024	-	<0.01	-	0.109	-	-	-	-
28 Sep 2022	B11	EM2219086	78.8	0.007	0.005	0.135	0.121	-	-	0.024	0.020	-	-	0.079	0.066	-	-	-	-
29 Mar 2023	B11	EM2305738	84.4	-	0.002	-	0.119	-	<0.0001	-	0.020	-	<0.01	-	0.811	<1	10	<2	<2
05 Sep 2023	B11	EM2316083	99.7	-	0.007	-	0.134	-	<0.0001	-	0.025	-	<0.01	-	0.077	<1	<2	<2	<2
02 Aug 2016	B12	EM1609083	-	-	<0.001	-	0.062	-	<0.0001	-	0.001	-	-	-	0.007	<1	7	<2	<2
27 Feb 2017	B12	EM1702198	0.06	-	<0.001	-	0.081	-	<0.0001	-	<0.001	-	<0.01	-	0.007	<1	<2	<2	<2
11 Sep 2017	B12	EM1712490	-	-	<0.001	-	0.053	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	<1	<2	<2	<2

Table 2 - Historical Groundwater

	Metals																	
	Iron (filtered)	Lead	Lead (filtered)	Manganese	Manganese (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	Selenium	Selenium (filtered)	Zinc	Zinc (filtered)	Benzene	Toluene	Ethylbenzene	Xylene (o)
	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
EQL	0.05	0.001	0.001	0.001	0.001	0.0001	0.0001	0.001	0.001	0.01	0.01	0.005	0.005	1	2	2	2
ADWG 2011 Recreational (v3.7 updated 2022)		**0.1**	**0.1**	**5**	**5**	**0.01**	**0.01**	**0.2**	**0.2**	**0.1**	**0.1**			**10**	**8,000**	**3,000**	
ANZG (2018) - FW - 95% (updated 26 July 2021)		0.0034	0.0034	1.9	1.9	0.0006	0.0006	0.011	0.011	0.011	0.011	0.008	0.008	950	180	80	350
ANZECC 2000 - Stock Watering		0.1	0.1			0.002	0.002	1	1	0.02	0.02	20	20				
ANZECC 2000 Irrigation - Long-term Trigger Values	0.2	2	2	0.2	0.2	0.002	0.002	0.2	0.2	0.02	0.02	2	2				
ANZECC 2000 Irrigation - Short-term Trigger Values	10	5	5	10	10	0.002	0.002	2	2	0.05	0.05	5	5				
Date	**Field ID**	**Lab Report Number**																
20 Mar 2018	B12	EM1804934	0.22	-	<0.001	-	0.087	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	<1	<2	<2	<2
18 Sep 2018	B12	EM1815239	<0.05	0.042	0.002	0.128	0.011	<0.0001	<0.0001	0.045	0.006	<0.01	<0.01	0.112	0.040	-	-	-	-
19 Mar 2019	B12	EM1904168	<0.05	-	<0.001	-	0.025	-	<0.0001	-	0.005	-	<0.01	-	0.052	<1	<2	<2	<2
10 Sep 2019	B12	EM1915222	<0.05	-	0.001	-	0.014	-	<0.0001	-	0.006	-	<0.01	-	0.083	<1	<2	<2	<2
17 Dec 2019	B12	EM1921873	<0.05	-	0.002	-	0.014	-	<0.0001	-	0.014	-	<0.01	-	0.077	<1	<2	<2	<2
24 Mar 2020	B12	EM2005146	<0.05	-	<0.001	-	0.031	-	<0.0001	-	0.006	-	<0.01	-	0.014	-	-	-	-
28 Sep 2020	B12	EM2017090	<0.05	-	0.003	-	0.029	-	<0.0001	-	0.011	-	<0.01	-	0.153	<1	<2	<2	<2
23 Mar 2021	B12	EM2105110	<0.05	-	<0.001	-	0.020	-	<0.0001	-	0.004	-	<0.01	-	0.009	<1	<2	<2	<2
29 Sep 2021	B12	EM2119450	<0.05	-	<0.001	-	0.026	-	<0.0001	-	0.004	-	<0.01	-	0.012	<1	<2	<2	<2
29 Mar 2022	B12	EM2205592	<0.05	-	<0.001	-	0.037	-	<0.0001	-	0.005	-	<0.01	-	0.013	-	-	-	-
27 Sep 2022	B12	EM2218958	<0.05	-	<0.001	-	0.131	-	<0.0001	-	0.006	-	<0.01	-	0.013	-	-	-	-
28 Mar 2023	B12	EM2305600	<0.05	-	<0.001	-	0.054	-	<0.0001	-	0.005	-	<0.01	-	0.018	<1	10	<2	<2
05 Sep 2023	B12	EM2316083	0.19	-	<0.001	-	0.059	-	<0.0001	-	0.005	-	<0.01	-	0.018	<1	<2	<2	<2
03 Aug 2016	B14	EM1609217	<0.05	-	<0.001	-	0.014	-	<0.0001	-	0.003	-	<0.01	-	0.008	<1	<2	<2	<2
27 Feb 2017	B14	EM1702198	<0.05	-	<0.001	-	0.016	-	<0.0001	-	0.004	-	<0.01	-	0.008	<1	<2	<2	<2
11 Sep 2017	B14	EM1712490	-	-	<0.001	-	0.014	-	<0.0001	-	0.004	-	<0.01	-	0.012	<1	<2	<2	<2
21 Mar 2018	B14	EM1805110	-	-	<0.001	-	0.016	-	<0.0001	-	0.004	-	<0.01	-	0.016	<1	<2	<2	<2
18 Sep 2018	B14	EM1815239	0.17	0.043	<0.001	0.238	0.074	0.0011	<0.0001	0.060	0.003	<0.01	<0.01	0.150	0.017	-	-	-	-
18 Mar 2019	B14	EM1904168	0.07	-	0.001	-	0.060	-	<0.0001	-	0.012	-	<0.01	-	0.121	<1	<2	<2	<2
11 Sep 2019	B14	EM1915222	0.28	-	<0.001	-	0.074	-	<0.0001	-	0.010	-	<0.01	-	0.051	<1	<2	<2	<2
24 Mar 2020	B14	EM2005146	0.27	-	<0.001	-	0.119	-	<0.0001	-	0.007	-	<0.01	-	0.025	-	-	-	-
28 Sep 2020	B14	EM2017090	0.67	-	0.004	-	0.137	-	<0.0001	-	0.010	-	<0.01	-	0.161	<1	<2	<2	<2
22 Mar 2021	B14	EM2104983	0.51	-	<0.001	-	0.105	-	<0.0001	-	0.002	-	<0.01	-	<0.005	<1	<2	<2	<2
28 Sep 2021	B14	EM2119193	<0.05	**0.114**	<0.001	0.461	0.010	<0.0001	<0.0001	0.092	0.001	<0.01	<0.01	0.276	<0.005	<1	<2	<2	<2
29 Mar 2022	B14	EM2205592	0.42	-	<0.001	-	0.124	-	<0.0001	-	0.002	-	<0.01	-	0.009	-	-	-	-
28 Sep 2022	B14	EM2219086	<0.05	<0.001	<0.001	0.078	0.078	-	-	0.001	0.002	-	-	<0.005	<0.005	-	-	-	-
28 Mar 2023	B14	EM2305600	0.52	-	<0.001	-	0.148	-	<0.0001	-	0.002	-	<0.01	-	<0.005	<1	14	<2	<2
06 Sep 2023	B14	EM2316170	0.42	-	<0.001	-	0.069	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	<1	<2	<2	<2
04 Aug 2016	B15	EM1609217	<0.05	-	<0.001	-	0.542	-	<0.0001	-	0.027	-	<0.01	-	0.018	<1	<2	<2	<2
15 Dec 2016	B15	EM1615347	0.14	-	<0.001	-	0.012	-	<0.0001	-	0.010	-	<0.01	-	0.029	<1	5	<2	<2
01 Mar 2017	B15	EM1702335	0.11	-	<0.001	-	0.008	-	<0.0001	-	0.010	-	<0.01	-	0.028	<1	<2	<2	<2
14 Jun 2017	BH15	EM1707805	-	-	<0.001	-	-	-	<0.0001	-	0.010	-	-	-	0.026	<1	<2	<2	<2
13 Sep 2017	B15	EM1712490	-	-	<0.001	-	0.006	-	<0.0001	-	0.009	-	<0.01	-	0.030	<1	<2	<2	<2
03 Aug 2016	B16	EM1609217	<0.05	-	<0.001	-	0.001	-	<0.0001	-	<0.001	-	<0.01	-	0.005	<1	<2	<2	<2
15 Dec 2016	B16	EM1615347	<0.05	-	<0.001	-	0.005	-	<0.0001	-	0.001	-	<0.01	-	<0.005	<1	<2	<2	<2
01 Mar 2017	B16	EM1702335	<0.05	-	<0.001	-	0.002	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	<1	<2	<2	<2
14 Jun 2017	BH16	EM1707805	-	-	<0.001	-	-	-	<0.0001	-	0.003	-	-	-	0.005	<1	<2	<2	<2
12 Sep 2017	B16	EM1712490	-	-	<0.001	-	<0.001	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	<1	<2	<2	<2
03 Aug 2016	B17	EM1609217	<0.05	-	<0.001	-	0.034	-	<0.0001	-	0.001	-	<0.01	-	0.005	<1	<2	<2	<2
15 Dec 2016	B17	EM1615347	<0.05	-	<0.001	-	0.007	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	<1	<2	<2	<2
01 Mar 2017	B17	EM1702335	<0.05	-	<0.001	-	0.008	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	<1	<2	<2	<2
14 Jun 2017	BH17	EM1707805	-	-	<0.001	-	-	-	<0.0001	-	<0.001	-	-	-	0.006	<1	<2	<2	<2
13 Sep 2017	B17	EM1712490	-	-	<0.001	-	0.008	-	<0.0001	-	<0.001	-	<0.01	-	<0.005	<1	<2	<2	<2
03 Aug 2016	B21A	EM1609217	<0.05	-	<0.001	-	0.519	-	<0.0001	-	0.008	-	<0.01	-	<0.005	<1	<2	<2	<2
14 Jun 2017	BH21A	EM1707805	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

			BTEXN					TRH - NEPM 2013							TRH - NEPM 1999				
			Xylene (m & p)	Xylene Total	BTEX (Sum of Total) - Lab Calc	Naphthalene (BTEXN suite)	Naphthalene	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	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			2	2	1	5	1	20	20	100	100	100	100	100	20	50	100	50	50
ADWG 2011 Recreational (v3.7 updated 2022)				**6,000**															
ANZG (2018) - FW - 95% (updated 26 July 2021)						16	16												
ANZECC 2000 - Stock Watering																			
ANZECC 2000 Irrigation - Long-term Trigger Values																			
ANZECC 2000 Irrigation - Short-term Trigger Values																			
Date	**Field ID**	**Lab Report Number**																	
04 Aug 2016	B2	EM1609217	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
28 Feb 2017	B2	EM1702250	<2	<2	<1	<5	-	<20	<20	<100	<100	100	<100	100	<20	<50	110	<50	110
12 Sep 2017	B2	EM1712490	<2	<2	<1	<5	-	<20	<20	<100	<100	150	<100	150	<20	<50	140	<50	140
21 Mar 2018	B2	EM1805110	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
19 Sep 2018	B2	EM1815239	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50
20 Mar 2019	B2	EM1904168	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
10 Sep 2019	B2	EM1915222	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
17 Dec 2019	B2	EM1921873	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
25 Mar 2020	B2	EM2005146	-	-	-	-	-	-	-	-	<100	240	<100	240	-	<50	140	130	270
29 Sep 2020	B2	EM2017090	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
24 Mar 2021	B2	EM2105221	<2	<2	<1	-	<5	<20	<20	<100	<100	900	<100	900	<20	<50	580	390	970
29 Sep 2021	B2	EM2119450	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
30 Mar 2022	B2	EM2205710	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50
28 Sep 2022	B2	EM2219086	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50
29 Mar 2023	B2	EM2305738	<2	<2	16	-	-	<20	30	<100	<100	<100	<100	<100	30	<50	<100	<50	<50
06 Sep 2023	B2	EM2316170	<2	<2	3	-	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
03 Aug 2016	B3	EM1609217	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
27 Feb 2017	B3	EM1702198	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
11 Sep 2017	B3	EM1712490	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
04 Aug 2016	B4	EM1609217	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
28 Feb 2017	B4	EM1702250	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
12 Sep 2017	B4	EM1712490	<2	<2	<1	<5	-	<20	<20	<100	<100	150	<100	150	<20	<50	<100	80	80
21 Mar 2018	B4	EM1805110	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
19 Sep 2018	B4	EM1815239	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50
20 Mar 2019	B4	EM1904168	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
09 Sep 2019	B4	EM1915222	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
17 Dec 2019	B4	EM1921873	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
25 Mar 2020	B4	EM2005146	-	-	-	-	-	-	-	-	<100	110	<100	110	-	<50	<100	<50	<50
29 Sep 2020	B4	EM2017090	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
24 Mar 2021	B4	EM2105221	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
29 Sep 2021	B4	EM2119450	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
28 Sep 2022	B4	EM2219086	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50
14 Dec 2022	B4	EM2225248	<2	<2	17	-	-	<20	30	<100	<100	<100	<100	<100	20	<50	<100	<50	<50
29 Mar 2023	B4	EM2305738	<2	<2	12	-	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
06 Sep 2023	B4	EM2316170	<2	<2	<1	-	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
02 Aug 2016	B6	EM1609083	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
27 Feb 2017	B6	EM1702198	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
11 Sep 2017	B6	EM1712490	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
20 Mar 2018	B6	EM1804934	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
18 Sep 2018	B6	EM1815239	-	-	-	-	-	-	-	-	<100	170	<100	170	-	<50	<100	60	60
19 Mar 2019	B6	EM1904168	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
10 Sep 2019	B6	EM1915222	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
23 Mar 2020	B6	EM2005146	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50
28 Sep 2020	B6	EM2017090	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
23 Mar 2021	B6	EM2105110	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
28 Sep 2021	B6	EM2119193	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
28 Mar 2022	B6	EM2205592	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50

Table 2 - Historical Groundwater

			BTEXN					TRH - NEPM 2013							TRH - NEPM 1999				
			Xylene (m & p)	Xylene Total	BTEX (Sum of Total) - Lab Calc	Naphthalene (BTEXN suite)	Naphthalene	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	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			2	2	1	5	1	20	20	100	100	100	100	100	20	50	100	50	50
ADWG 2011 Recreational (v3.7 updated 2022)				**6,000**				20		100		100			20	50			
ANZG (2018) - FW - 95% (updated 26 July 2021)						16	16												
ANZECC 2000 - Stock Watering																			
ANZECC 2000 Irrigation - Long-term Trigger Values																			
ANZECC 2000 Irrigation - Short-term Trigger Values																			
Date	**Field ID**	**Lab Report Number**																	
27 Sep 2022	B6	EM2218958	-	-	-	-	-	-	-	<100	<100	<100	<100	<100	-	<50	<100	<50	<50
28 Mar 2023	B6	EM2305600	<2	<2	<1	-	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
06 Sep 2023	B6	EM2316170	<2	<2	<1	-	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
03 Aug 2016	B7	EM1609217	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
28 Feb 2017	B7	EM1702250	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
11 Sep 2017	B7	EM1712490	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
20 Mar 2018	B7	EM1804934	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
19 Sep 2018	B7	EM1815239	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50
19 Mar 2019	B7	EM1904168	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
11 Sep 2019	B7	EM1915222	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
24 Mar 2020	B7	EM2005146	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50
28 Sep 2020	B7	EM2017090	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
23 Mar 2021	B7	EM2105110	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
28 Sep 2021	B7	EM2119193	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
29 Mar 2022	B7	EM2205592	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50
27 Sep 2022	B7	EM2218958	-	-	-	-	-	-	-	<100	<100	<100	<100	<100	-	<50	<100	<50	<50
28 Mar 2023	B7	EM2305600	2	2	5	-	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
05 Sep 2023	B7	EM2316083	<2	<2	8	-	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
13 Sep 2017	B9	EM1712490	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
21 Mar 2018	B9	EM1805110	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
19 Sep 2018	B9	EM1815239	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50
18 Mar 2019	B9	EM1904168	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
09 Sep 2019	B9	EM1915222	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
25 Mar 2020	B9	EM2005146	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50
30 Sep 2020	B9	EM2017163	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
24 Mar 2021	B9	EM2105221	<2	<2	<1	-	<5	<20	<20	<100	<100	140	<100	140	<20	<50	120	<50	120
28 Sep 2021	B9	EM2119193	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
28 Mar 2022	B9	EM2205592	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50
26 Sep 2022	B9	EM2218846	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50
14 Dec 2022	B9	EM2225248	<2	<2	19	-	-	20	40	<100	<100	<100	<100	<100	30	<50	<100	<50	<50
27 Mar 2023	B9	EM2305499-AA	4	4	12	-	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
05 Sep 2023	B9	EM2316083	<2	<2	<1	-	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
12 Sep 2017	B11	EM1712490	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
21 Mar 2018	B11	EM1805110	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
19 Sep 2018	B11	EM1815239	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50
20 Mar 2019	B11	EM1904168	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
09 Sep 2019	B11	EM1915222	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
17 Dec 2019	B11	EM1921873	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
24 Mar 2020	B11	EM2005146	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50
29 Sep 2020	B11	EM2017090	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
23 Mar 2021	B11	EM2105110	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
29 Sep 2021	B11	EM2119450	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
30 Mar 2022	B11	EM2205710	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50
28 Sep 2022	B11	EM2219086	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50
29 Mar 2023	B11	EM2305738	<2	<2	10	-	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
05 Sep 2023	B11	EM2316083	<2	<2	<1	-	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
02 Aug 2016	B12	EM1609083	<2	<2	7	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
27 Feb 2017	B12	EM1702198	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
11 Sep 2017	B12	EM1712490	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50

Table 2 - Historical Groundwater

			BTEXN					TRH - NEPM 2013							TRH - NEPM 1999				
			Xylene (m & p)	Xylene Total	BTEX (Sum of Total) - Lab Calc	Naphthalene (BTEXN suite)	Naphthalene	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	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			2	2	1	5	1	20	20	100	100	100	100	100	20	50	100	50	50
ADWG 2011 Recreational (v3.7 updated 2022)				**6,000**				20		100		100		100	20	50			
ANZG (2018) - FW - 95% (updated 26 July 2021)						16	16												
ANZECC 2000 - Stock Watering																			
ANZECC 2000 Irrigation - Long-term Trigger Values																			
ANZECC 2000 Irrigation - Short-term Trigger Values																			
Date	**Field ID**	**Lab Report Number**																	
20 Mar 2018	B12	EM1804934	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
18 Sep 2018	B12	EM1815239	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50
19 Mar 2019	B12	EM1904168	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
10 Sep 2019	B12	EM1915222	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
17 Dec 2019	B12	EM1921873	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
24 Mar 2020	B12	EM2005146	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50
28 Sep 2020	B12	EM2017090	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
23 Mar 2021	B12	EM2105110	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
29 Sep 2021	B12	EM2119450	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
29 Mar 2022	B12	EM2205592	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50
27 Sep 2022	B12	EM2218958	-	-	-	-	-	-	-	<100	<100	<100	<100	<100	-	<50	<100	<50	<50
28 Mar 2023	B12	EM2305600	<2	<2	10	-	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
05 Sep 2023	B12	EM2316083	<2	<2	<1	-	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
03 Aug 2016	B14	EM1609217	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
27 Feb 2017	B14	EM1702198	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
11 Sep 2017	B14	EM1712490	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
21 Mar 2018	B14	EM1805110	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
18 Sep 2018	B14	EM1815239	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50
18 Mar 2019	B14	EM1904168	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
11 Sep 2019	B14	EM1915222	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
24 Mar 2020	B14	EM2005146	-	-	-	-	-	-	-	-	<100	220	<100	220	-	<50	<100	150	150
28 Sep 2020	B14	EM2017090	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
22 Mar 2021	B14	EM2104983	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
28 Sep 2021	B14	EM2119193	<2	<2	<1	-	<5	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
29 Mar 2022	B14	EM2205592	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50
28 Sep 2022	B14	EM2219086	-	-	-	-	-	-	-	-	<100	<100	<100	<100	-	<50	<100	<50	<50
28 Mar 2023	B14	EM2305600	<2	<2	14	-	-	<20	20	<100	<100	<100	<100	<100	20	<50	<100	<50	<50
06 Sep 2023	B14	EM2316170	<2	<2	<1	-	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
04 Aug 2016	B15	EM1609217	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
15 Dec 2016	B15	EM1615347	<2	<2	5	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
01 Mar 2017	B15	EM1702335	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
14 Jun 2017	BH15	EM1707805	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
13 Sep 2017	B15	EM1712490	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
03 Aug 2016	B16	EM1609217	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
15 Dec 2016	B16	EM1615347	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
01 Mar 2017	B16	EM1702335	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
14 Jun 2017	BH16	EM1707805	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
12 Sep 2017	B16	EM1712490	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
03 Aug 2016	B17	EM1609217	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
15 Dec 2016	B17	EM1615347	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
01 Mar 2017	B17	EM1702335	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
14 Jun 2017	BH17	EM1707805	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
13 Sep 2017	B17	EM1712490	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
03 Aug 2016	B21A	EM1609217	<2	<2	<1	<5	-	<20	<20	<100	<100	<100	<100	<100	<20	<50	<100	<50	<50
14 Jun 2017	BH21A	EM1707805	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 3 - Surface Water 2023

			NA	Inorganics			Acidity & Alkalinity				Major Ions							
			Phosphorus reactive (as P)	pH (Lab)	Electrical conductivity (lab)	Total Suspended Solids	Alkalinity (Carbonate as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)	Chloride	Sulfate (filtered)	Cations Total	Anions Total
			MG/L	pH units	µS/cm	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
EQL			0.01	0.01	1	5	1	1	1	1	1	1	1	1	1	1	0.01	0.01
ADWG 2011 Recreational (v3.7 updated 2022)																**5,000**		
ANZG (2018) - FW - 95% (updated 26 July 2021)																		
ANZECC 2000 - Stock Watering											1,000					1,000		
ANZECC 2000 Irrigation - Long-term Trigger Values				6-9	2,900										350			
ANZECC 2000 Irrigation - Short-term Trigger Values																		
Date	**Field ID**	**Lab Report Number**																
17 May 2023	S1	EM2308845	<0.01	8.05	416	<5	<1	188	<1	188	80	6	1	14	21	32	5.12	5.01
29 Jun 2023		EM2311855	-	7.62	395	11	<1	114	<1	114	50	5	2	15	22	34	3.61	3.61
06 Sep 2023		EM2316173	0.02	7.96	397	7	<1	138	<1	138	65	5	2	15	28	27	4.36	4.11
12 Dec 2023		EM2322268	0.01	7.79	367	8	<1	135	<1	135	50	5	1	16	26	10	3.63	3.64
17 May 2023	S2	EM2308845	0.01	8.03	418	12	<1	186	<1	186	81	6	<1	14	21	32	5.14	4.97
29 Jun 2023		EM2311855	-	7.75	433	15	<1	136	<1	136	58	5	1	14	23	36	3.94	4.12
05 Sep 2023		EM2316088	<0.01	8.15	418	30	<1	156	<1	156	69	5	1	13	17	25	4.44	4.12
12 Dec 2023		EM2322268	0.02	6.66	187	8	<1	45	<1	45	16	3	<1	14	24	4	1.65	1.66
17 May 2023	S3	EM2308845	0.04	8.03	581	64	<1	260	<1	260	92	10	17	27	47	24	7.02	7.02
29 Jun 2023		EM2311855	-	7.49	516	29	<1	121	<1	121	36	9	28	32	46	54	4.64	4.84
05 Sep 2023		EM2316088	4.14	7.71	1,230	141	<1	381	<1	381	65	19	108	73	146	26	10.7	12.3
12 Dec 2023		EM2322268	0.03	8.63	622	51	33	238	<1	271	79	11	26	29	40	7	6.77	6.69
27 Mar 2023	S4	EM2305513	<0.01	7.35	482	8	<1	176	<1	176	73	6	1	15	20	29	4.81	4.68
29 Jun 2023		EM2311855	-	7.85	427	<5	<1	138	<1	138	57	5	1	13	21	36	3.85	4.10
06 Sep 2023		EM2316156	<0.01	7.97	412	18	<1	147	<1	147	72	5	1	13	25	28	4.60	4.22
12 Dec 2023		EM2322268	0.02	6.68	160	<5	<1	34	<1	34	10	3	<1	14	24	3	1.35	1.42
27 Mar 2023	S6	EM2305513	<0.01	7.61	500	<5	<1	184	<1	184	77	6	1	15	20	31	5.01	4.88
29 Jun 2023		EM2311855	-	7.96	435	<5	<1	142	<1	142	58	5	1	13	22	36	3.90	4.21
06 Sep 2023		EM2316156	<0.01	8.12	420	8	<1	150	<1	150	73	5	1	13	25	28	4.64	4.28
12 Dec 2023		EM2322268	0.01	7.95	457	5	<1	193	<1	193	72	6	1	14	20	15	4.72	4.73
05 Sep 2023	S7	EM2316088	9.76	7.80	1,990	225	<1	565	<1	565	40	30	211	117	211	14	15.0	17.5
27 Mar 2023	S9	EM2305513	0.01	7.40	509	8	<1	184	<1	184	78	6	1	15	22	32	5.06	4.96
29 Jun 2023		EM2311855	-	7.99	433	16	<1	142	<1	142	60	5	1	13	22	37	4.00	4.23
04 Sep 2023		EM2316088	<0.01	7.85	508	12	<1	151	<1	151	71	5	1	13	17	28	4.54	4.08

Table 3 - Surface Water 2023

				Nutrients								Organic Indicators					
			Ionic Balance	Ammonia as N	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)	Kjeldahl Nitrogen Total	Phosphorus filterable reactive (P)	Phosphorus (Total)	Phosphorus (Total) (filtered)	BOD	Arsenic	Arsenic (filtered)	Cadmium	Cadmium (filtered)	Chromium (III+VI)
			%	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
EQL			0.01	0.01	0.01	0.01	0.01	0.1	0.1	0.01	0.01	0.01	2	0.001	0.001	0.0001	0.0001	0.001
ADWG 2011 Recreational (v3.7 updated 2022)					**112.9**	**9.1**								**0.1**	**0.1**	**0.02**	**0.02**	
ANZG (2018) - FW - 95% (updated 26 July 2021)				0.9	2.4									0.013	0.013	0.0002	0.0002	0.001
ANZECC 2000 - Stock Watering					90	9.1								0.5	0.5	0.01	0.01	1
ANZECC 2000 Irrigation - Long-term Trigger Values								5			0.05	0.05		0.1	0.1	0.01	0.01	0.1
ANZECC 2000 Irrigation - Short-term Trigger Values								25			0.8	0.8		2	2	0.05	0.05	1
Date	**Field ID**	**Lab Report Number**																
17 May 2023	S1	EM2308845	1.04	0.02	0.86	<0.01	0.86	1.0	0.1	-	<0.01	-	<2	-	-	<0.0001	<0.0001	<0.001
29 Jun 2023		EM2311855	0.05	0.28	1.18	<0.01	1.18	2.6	1.4	<0.01	<0.01	-	<2	-	-	-	-	-
06 Sep 2023		EM2316173	2.94	0.02	0.83	0.01	0.84	0.9	0.1	-	0.03	-	2	<0.001	<0.001	<0.0001	<0.0001	<0.001
12 Dec 2023		EM2322268	0.15	0.04	0.04	0.01	0.05	0.2	0.2	-	0.02	-	<2	-	-	-	-	-
17 May 2023	S2	EM2308845	1.68	<0.01	0.89	<0.01	0.89	1.0	0.1	-	<0.01	-	<2	-	-	<0.0001	<0.0001	<0.001
29 Jun 2023		EM2311855	2.18	0.07	1.27	<0.01	1.27	1.6	0.3	<0.01	<0.01	-	<2	-	-	-	-	-
05 Sep 2023		EM2316088	3.84	0.01	0.86	<0.01	0.86	1.1	0.2	-	0.01	-	<2	-	-	<0.0001	<0.0001	<0.001
12 Dec 2023		EM2322268	-	0.01	0.02	<0.01	0.02	0.2	0.2	-	0.09	-	<2	-	-	-	-	-
17 May 2023	S3	EM2308845	0.02	0.39	0.77	0.02	0.79	1.6	0.8	-	0.18	-	4	-	-	<0.0001	<0.0001	<0.001
29 Jun 2023		EM2311855	2.05	0.23	2.40	0.04	2.44	4.5	2.1	0.66	0.94	-	4	-	-	-	-	-
05 Sep 2023		EM2316088	6.64	16.7	<0.01	<0.01	<0.01	31.7	31.7	-	6.57	-	62	-	-	<0.0001	<0.0001	0.006
12 Dec 2023		EM2322268	0.63	0.32	0.06	<0.01	0.06	2.6	2.5	-	0.81	-	6	-	-	-	-	-
27 Mar 2023	S4	EM2305513	1.37	<0.01	0.67	<0.01	0.67	0.9	0.2	-	<0.01	-	<2	-	-	<0.0001	<0.0001	0.001
29 Jun 2023		EM2311855	3.17	<0.01	1.28	<0.01	1.28	1.5	0.2	<0.01	<0.01	-	<2	-	-	-	-	-
06 Sep 2023		EM2316156	4.20	<0.01	0.88	<0.01	0.88	1.1	0.2	-	<0.01	-	<2	-	-	<0.0001	<0.0001	<0.001
12 Dec 2023		EM2322268	-	0.03	0.06	<0.01	0.06	0.2	0.1	-	0.02	-	2	-	-	-	-	-
27 Mar 2023	S6	EM2305513	1.30	<0.01	0.75	<0.01	0.75	1.4	0.7	-	<0.01	-	<2	-	-	<0.0001	<0.0001	<0.001
29 Jun 2023		EM2311855	3.83	0.03	1.31	<0.01	1.31	1.6	0.3	0.01	<0.01	-	<8	-	-	-	-	-
06 Sep 2023		EM2316156	4.03	<0.01	0.89	<0.01	0.89	0.9	<0.1	-	<0.01	-	<2	-	-	<0.0001	<0.0001	<0.001
12 Dec 2023		EM2322268	0.12	0.04	0.03	<0.01	0.03	0.1	0.1	-	0.01	-	<2	-	-	-	-	-
05 Sep 2023	S7	EM2316088	7.95	43.4	0.01	<0.01	0.01	59.0	59.0	-	11.8	-	160	-	-	0.0002	<0.0001	0.008
27 Mar 2023	S9	EM2305513	1.01	<0.01	0.72	<0.01	0.72	1.0	0.3	-	0.05	-	<2	-	-	<0.0001	<0.0001	<0.001
29 Jun 2023		EM2311855	2.82	<0.01	1.31	<0.01	1.31	1.5	0.2	<0.01	<0.01	-	<8	-	-	-	-	-
04 Sep 2023		EM2316088	5.40	0.04	0.94	<0.01	0.94	1.1	0.2	-	0.01	-	<2	-	-	<0.0001	<0.0001	0.001

Table 3 - Surface Water 2023

			Metals												
			Chromium (III+VI) (filtered)	Copper	Copper (filtered)	Iron	Iron (filtered)	Lead	Lead (filtered)	Manganese	Manganese (filtered)	Nickel	Nickel (filtered)	Zinc	Zinc (filtered)
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			0.001	0.001	0.001	0.05	0.05	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005
ADWG 2011 Recreational (v3.7 updated 2022)				**20**	**20**			**0.1**	**0.1**	**5**	**5**	**0.2**	**0.2**		
ANZG (2018) - FW - 95% (updated 26 July 2021)			0.001	0.0014	0.0014			0.0034	0.0034	1.9	1.9	0.011	0.011	0.008	0.008
ANZECC 2000 - Stock Watering			1	1	1			0.1	0.1			1	1	20	20
ANZECC 2000 Irrigation - Long-term Trigger Values			0.1	0.2	0.2	0.2	0.2	2	2	0.2	0.2	0.2	0.2	2	2
ANZECC 2000 Irrigation - Short-term Trigger Values			1	5	5	10	10	5	5	10	10	2	2	5	5
Date	**Field ID**	**Lab Report Number**													
17 May 2023	S1	EM2308845	<0.001	<0.001	<0.001	0.25	<0.05	<0.001	<0.001	0.028	0.008	0.001	<0.001	<0.005	<0.005
29 Jun 2023		EM2311855	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023		EM2316173	<0.001	<0.001	<0.001	0.26	0.06	<0.001	<0.001	0.018	0.009	0.001	<0.001	<0.005	<0.005
12 Dec 2023		EM2322268	-	-	-	-	-	-	-	-	-	-	-	-	-
17 May 2023	S2	EM2308845	<0.001	<0.001	<0.001	0.33	<0.05	<0.001	<0.001	0.039	0.010	0.002	<0.001	<0.005	<0.005
29 Jun 2023		EM2311855	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Sep 2023		EM2316088	<0.001	<0.001	<0.001	0.12	<0.05	<0.001	<0.001	0.013	0.008	0.001	<0.001	<0.005	<0.005
12 Dec 2023		EM2322268	-	-	-	-	-	-	-	-	-	-	-	-	-
17 May 2023	S3	EM2308845	<0.001	<0.001	<0.001	1.30	0.09	<0.001	<0.001	0.261	0.219	0.002	0.001	<0.005	<0.005
29 Jun 2023		EM2311855	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Sep 2023		EM2316088	0.002	0.008	0.003	7.47	2.76	0.004	<0.001	1.23	0.997	0.013	0.010	0.033	0.008
12 Dec 2023		EM2322268	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Mar 2023	S4	EM2305513	<0.001	<0.001	<0.001	0.12	<0.05	<0.001	<0.001	0.013	0.007	0.001	<0.001	<0.005	<0.005
29 Jun 2023		EM2311855	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023		EM2316156	<0.001	<0.001	<0.001	0.29	<0.05	<0.001	<0.001	0.017	0.007	0.002	<0.001	<0.005	<0.005
12 Dec 2023		EM2322268	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Mar 2023	S6	EM2305513	<0.001	<0.001	<0.001	0.11	<0.05	<0.001	<0.001	0.017	0.010	<0.001	<0.001	<0.005	<0.005
29 Jun 2023		EM2311855	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023		EM2316156	<0.001	<0.001	<0.001	0.12	<0.05	<0.001	<0.001	0.009	0.007	0.001	<0.001	0.006	<0.005
12 Dec 2023		EM2322268	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Sep 2023	S7	EM2316088	0.004	0.002	0.002	10.1	1.60	0.009	<0.001	1.01	0.756	0.022	0.017	0.075	0.007
27 Mar 2023	S9	EM2305513	<0.001	<0.001	<0.001	0.27	<0.05	<0.001	<0.001	0.025	0.009	0.002	<0.001	<0.005	<0.005
29 Jun 2023		EM2311855	-	-	-	-	-	-	-	-	-	-	-	-	-
04 Sep 2023		EM2316088	<0.001	<0.001	<0.001	0.28	<0.05	<0.001	<0.001	0.024	0.008	0.002	<0.001	<0.005	<0.005

Table 4 - Historical Surface Water

			NA						Acidity & Alkalinity											
			Filtered Total Phosphorus as P (filtered)	Phosphorus reactive (as P)	Phosphorus total (P2O5) (filtered)	pH (Lab)	Electrical conductivity (lab)	Total Suspended Solids	Alkalinity (Carbonate as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)	Chloride	Sulfate (filtered)	Cations Total
			mg/L	MG/L	µg/L	pH units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L
EQL			0.01	0.01	10	0.01	1	5	1	1	1	1	1	1	1	1	1	1	0.01
ADWG 2011 Recreational (v3.7 updated 2022)																		**5,000**	
ANZG (2018) - FW - 95% (updated 26 July 2021)																			
ANZECC 2000 - Stock Watering													1,000					1,000	
ANZECC 2000 Irrigation - Long-term Trigger Values						6-9	2,900										350		
ANZECC 2000 Irrigation - Short-term Trigger Values																			
Date	**Field ID**	**Lab Report Number**																	
01 Aug 2016	S1	EM1609083	<0.01	-	<10	7.83	299	18	-	-	-	-	-	-	-	-	-	-	-
23 Nov 2016	S1	EM1614219	<0.01	-	-	8.10	440	<5	-	-	-	-	-	-	-	-	-	-	-
28 Feb 2017	S1	EM1702250	-	-	-	-	-	<5	<1	181	<1	181	67	5	<1	13	23	27	4.32
14 Jun 2017	S1	EM1707805	-	-	-	8.11	506	<5	<1	185	<1	185	69	5	<1	14	22	35	4.46
11 Sep 2017	S1	EM1712490	-	-	-	-	-	<5	<1	182	<1	182	71	6	1	14	30	33	4.67
20 Mar 2018	S1	EM1804934	-	-	-	-	-	10	16	179	<1	194	72	6	2	15	24	56	4.79
25 Jun 2018	S1	EM1810261	-	-	-	-	-	<5	<1	188	<1	188	68	6	1	14	23	41	4.52
19 Sep 2018	S1	EM1815239	-	-	-	-	-	<5	<1	88	<1	88	40	4	2	17	27	21	3.12
12 Dec 2018	S1	EM1820185	-	-	-	-	-	<5	<1	162	<1	162	63	6	1	15	22	34	4.32
20 Mar 2019	S1	EM1904168	-	-	-	8.20	447	<5	<1	164	<1	164	69	6	1	15	21	31	4.61
26 Jun 2019	S1	EM1910172	-	-	-	-	-	<5	<1	196	<1	196	81	7	<1	14	21	36	5.23
11 Sep 2019	S1	EM1915222	-	-	-	7.66	399	<5	<1	145	<1	145	51	5	1	15	26	26	3.65
24 Mar 2020	S1	EM2005146	-	-	-	8.13	523	16	<1	159	<1	159	82	6	2	15	27	39	5.29
16 Jun 2020	S1	EM2010246	-	-	-	-	-	18	<1	93	<1	93	36	5	2	14	25	30	2.87
29 Sep 2020	S1	EM2017090	-	-	-	8.07	434	53	<1	146	<1	146	62	6	2	15	24	29	4.29
07 Dec 2020	S1	EM2021896	-	-	-	7.92	465	14	<1	170	<1	170	59	5	1	14	26	33	3.99
23 Mar 2021	S1	EM2105106	-	-	-	7.89	437	<5	<1	188	<1	188	79	6	1	14	28	32	5.07
22 Jun 2021	S1	EM2111910	-	-	-	8.44	502	<5	14	189	<1	203	76	6	1	16	28	33	5.01
28 Sep 2021	S1	EM2119193	-	-	-	8.22	505	<5	<1	176	<1	176	65	6	2	14	25	36	4.40
06 Dec 2021	S1	EM2124670	-	-	-	7.56	526	<5	<1	209	<1	209	63	6	1	15	31	32	4.32
07 Jun 2022	S1	EM2210920-AA	-	-	-	7.93	400	15	<1	108	<1	108	76	7	1	13	23	40	4.96
28 Sep 2022	S1	EM2219073	-	-	-	8.32	458	<5	<1	152	<1	152	67	5	2	14	23	34	4.41
14 Dec 2022	S1	EM2225250	-	-	-	8.25	461	12	<1	159	<1	159	68	6	2	17	21	26	4.68
17 May 2023	S1	EM2308845	-	<0.01	-	8.05	416	<5	<1	188	<1	188	80	6	1	14	21	32	5.12
29 Jun 2023	S1	EM2311855	-	-	-	7.62	395	11	<1	114	<1	114	50	5	2	15	22	34	3.61
06 Sep 2023	S1	EM2316173	-	0.02	-	7.96	397	7	<1	138	<1	138	65	5	2	15	28	27	4.36
12 Dec 2023	S1	EM2322268	-	0.01	-	7.79	367	8	<1	135	<1	135	50	5	1	16	26	10	3.63
01 Aug 2016	S2	EM1609083	<0.01	-	<10	7.81	308	7	-	-	-	-	-	-	-	-	-	-	-
23 Nov 2016	S2	EM1614219	<0.01	-	-	8.09	455	<5	-	-	-	-	-	-	-	-	-	-	-
28 Feb 2017	S2	EM1702250	-	-	-	-	-	8	<1	197	<1	197	70	5	<1	13	23	28	4.47
14 Jun 2017	S2	EM1707805	-	-	-	7.98	522	<5	<1	196	<1	196	69	5	<1	13	23	35	4.42
11 Sep 2017	S2	EM1712490	-	-	-	-	-	<5	<1	185	<1	185	74	6	1	13	22	26	4.78
20 Mar 2018	S2	EM1804934	-	-	-	-	-	8	<1	198	<1	198	78	6	1	13	21	38	4.98
25 Jun 2018	S2	EM1810261	-	-	-	-	-	<5	<1	196	<1	196	72	6	<1	13	22	38	4.65
18 Sep 2018	S2	EM1815239	-	-	-	-	-	<5	<1	153	<1	153	68	5	2	15	25	31	4.51
12 Dec 2018	S2	EM1820185	-	-	-	-	-	<5	<1	179	<1	179	70	6	<1	15	22	32	4.64
19 Mar 2019	S2	EM1904168	-	-	-	8.25	476	<5	<1	178	<1	178	73	6	1	14	23	32	4.77
26 Jun 2019	S2	EM1910172	-	-	-	-	-	<5	<1	195	<1	195	86	7	1	15	22	36	5.54
11 Sep 2019	S2	EM1915222	-	-	-	7.76	425	<5	<1	154	<1	154	56	5	1	15	26	26	3.89
17 Dec 2019	S2	EM1921873	-	-	-	7.29	398	<5	<1	128	<1	128	43	4	<1	15	25	20	3.13
24 Mar 2020	S2	EM2005146	-	-	-	8.19	516	<5	<1	166	<1	166	85	6	1	15	30	39	5.41
16 Jun 2020	S2	EM2010246	-	-	-	-	-	12	<1	119	<1	119	49	5	2	14	24	34	3.52
30 Sep 2020	S2	EM2017163	-	-	-	8.09	475	<5	<1	171	<1	171	66	5	1	14	28	35	4.34
07 Dec 2020	S2	EM2021896	-	-	-	7.95	474	19	<1	182	<1	182	62	5	1	13	26	32	4.10
22 Mar 2021	S2	EM2104983	-	-	-	7.92	446	<5	<1	187	<1	187	67	5	<1	14	23	30	4.36
22 Jun 2021	S2	EM2111910	-	-	-	8.42	487	8	13	186	<1	199	76	6	1	14	27	31	4.92
29 Sep 2021	S2	EM2119454	-	-	-	7.79	494	-	<1	184	<1	184	81	6	1	14	12	34	5.17

Table 4 - Historical Surface Water

			NA						Acidity & Alkalinity											
			Filtered Total Phosphorus as P (filtered)	Phosphorus reactive (as P)	Phosphorus total (P2O5) (filtered)	pH (Lab)	Electrical conductivity (lab)	Total Suspended Solids	Alkalinity (Carbonate as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)	Chloride	Sulfate (filtered)	Cations Total
			mg/L	MG/L	µg/L	pH units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L
EQL			0.01	0.01	10	0.01	1	5	1	1	1	1	1	1	1	1	1	1	0.01
ADWG 2011 Recreational (v3.7 updated 2022)																		**5,000**	
ANZG (2018) - FW - 95% (updated 26 July 2021)																			
ANZECC 2000 - Stock Watering													1,000					1,000	
ANZECC 2000 Irrigation - Long-term Trigger Values						6-9	2,900										350		
ANZECC 2000 Irrigation - Short-term Trigger Values																			
Date	**Field ID**	**Lab Report Number**																	
06 Dec 2021	S2	EM2124670	-	-	-	7.61	535	8	<1	204	<1	204	65	6	1	16	33	32	4.46
07 Jun 2022	S2	EM2210920-AA	-	-	-	8.10	502	17	<1	155	<1	155	38	14	42	48	22	50	6.21
28 Sep 2022	S2	EM2219073	-	-	-	8.29	481	<5	<1	161	<1	161	73	5	1	14	25	34	4.69
14 Dec 2022	S2	EM2225250	-	-	-	8.25	458	8	<1	152	<1	152	68	6	2	17	20	32	4.68
17 May 2023	S2	EM2308845	-	0.01	-	8.03	418	12	<1	186	<1	186	81	6	<1	14	21	32	5.14
29 Jun 2023	S2	EM2311855	-	-	-	7.75	433	15	<1	136	<1	136	58	5	1	14	23	36	3.94
05 Sep 2023	S2	EM2316088	-	<0.01	-	8.15	418	30	<1	156	<1	156	69	5	1	13	17	25	4.44
12 Dec 2023	S2	EM2322268	-	0.02	-	6.66	187	8	<1	45	<1	45	16	3	<1	14	24	4	1.65
01 Aug 2016	S3	EM1609083	0.1	-	100	7.53	375	116	-	-	-	-	-	-	-	-	-	-	-
23 Nov 2016	S3	EM1614219	0.03	-	-	7.88	660	<5	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2017	S3	EM1707805	-	-	-	7.25	678	<5	<1	189	<1	189	60	6	18	37	65	45	5.56
11 Sep 2017	S3	EM1712490	-	-	-	-	-	46	<1	245	<1	245	87	8	12	33	32	24	6.74
25 Jun 2018	S3	EM1810261	-	-	-	-	-	<5	<1	201	<1	201	68	7	24	51	93	83	6.97
18 Sep 2018	S3	EM1815239	-	-	-	-	-	9	<1	198	<1	198	75	7	18	34	61	20	6.26
26 Jun 2019	S3	EM1910172	-	-	-	-	-	<5	<1	195	<1	195	105	11	23	66	135	100	9.60
11 Sep 2019	S3	EM1915222	-	-	-	7.43	602	16	<1	185	<1	185	46	6	27	41	68	25	5.48
16 Jun 2020	S3	EM2010246	-	-	-	-	-	55	<1	162	<1	162	32	9	39	65	102	49	6.39
29 Sep 2020	S3	EM2017090	-	-	-	7.55	998	131	<1	296	<1	296	70	15	49	72	107	26	9.11
07 Dec 2020	S3	EM2021896	-	-	-	7.62	899	35	<1	260	<1	260	67	12	38	62	111	42	8.00
22 Jun 2021	S3	EM2111910	-	-	-	8.27	1,150	45	<1	287	<1	287	70	17	59	79	116	85	9.84
29 Sep 2021	S3	EM2119454	-	-	-	7.96	1,000	54	<1	280	<1	280	66	14	45	76	128	28	8.90
06 Dec 2021	S3	EM2124670	-	-	-	7.28	809	2,520	<1	296	<1	296	70	12	28	39	69	15	6.89
07 Jun 2022	S3	EM2210920-AA	-	-	-	7.72	688	279	<1	118	<1	118	38	14	41	48	67	60	6.18
28 Sep 2022	S3	EM2219073	-	-	-	7.96	708	17	<1	196	<1	196	64	11	32	40	65	38	6.66
14 Dec 2022	S3	EM2225250	-	-	-	8.26	933	28	<1	306	<1	306	93	14	44	50	83	31	9.09
17 May 2023	S3	EM2308845	-	0.04	-	8.03	581	64	<1	260	<1	260	92	10	17	27	47	24	7.02
29 Jun 2023	S3	EM2311855	-	-	-	7.49	516	29	<1	121	<1	121	36	9	28	32	46	54	4.64
05 Sep 2023	S3	EM2316088	-	4.14	-	7.71	1,230	141	<1	381	<1	381	65	19	108	73	146	26	10.7
12 Dec 2023	S3	EM2322268	-	0.03	-	8.63	622	51	33	238	<1	271	79	11	26	29	40	7	6.77
01 Aug 2016	S4	EM1609083	<0.01	-	<10	7.8	299	6	-	-	-	-	-	-	-	-	-	-	-
23 Nov 2016	S4	EM1614219	<0.01	-	-	8.03	440	<5	-	-	-	-	-	-	-	-	-	-	-
27 Feb 2017	S4	EM1702198	-	-	-	-	-	<5	<1	197	<1	197	73	5	<1	13	20	29	4.62
14 Jun 2017	S4	EM1707805	-	-	-	7.78	526	<5	<1	193	<1	193	72	5	<1	13	22	36	4.57
11 Sep 2017	S4	EM1712490	-	-	-	-	-	<5	<1	196	<1	196	79	6	1	14	22	36	5.07
13 Dec 2017	S4	EM1717302	-	-	-	-	-	<5	<1	68	<1	68	21	3	<1	14	35	7	1.90
20 Mar 2018	S4	EM1804934	-	-	-	-	-	7	<1	193	<1	193	79	6	1	13	20	38	5.03
25 Jun 2018	S4	EM1810261	-	-	-	-	-	<5	<1	202	<1	202	72	6	1	13	22	42	4.68
18 Sep 2018	S4	EM1815239	-	-	-	-	-	8	<1	159	<1	159	73	5	2	15	21	27	4.76
12 Dec 2018	S4	EM1820185	-	-	-	-	-	<5	<1	182	<1	182	69	6	<1	15	20	32	4.59
18 Mar 2019	S4	EM1904168	-	-	-	7.24	174	<5	<1	37	<1	37	11	3	<1	13	22	3	1.36
26 Jun 2019	S4	EM1910172	-	-	-	-	-	<5	<1	197	<1	197	82	7	<1	14	21	37	5.28
10 Sep 2019	S4	EM1915222	-	-	-	7.76	499	<5	<1	193	<1	193	76	5	1	14	29	35	4.84
17 Dec 2019	S4	EM1921873	-	-	-	7.15	255	<5	<1	68	<1	68	19	3	<1	14	28	8	1.80
23 Mar 2020	S4	EM2005146	-	-	-	8.11	528	<5	<1	162	<1	162	84	6	2	15	24	42	5.39
16 Jun 2020	S4	EM2010246	-	-	-	-	-	9	<1	126	<1	126	52	5	2	14	24	35	3.67
28 Sep 2020	S4	EM2017090	-	-	-	7.76	431	8	<1	149	<1	149	65	6	1	13	22	34	4.33
07 Dec 2020	S4	EM2021896	-	-	-	7.89	449	6	<1	181	<1	181	61	5	1	13	24	32	4.05
23 Mar 2021	S4	EM2105106	-	-	-	7.91	444	<5	<1	187	<1	187	78	6	1	14	26	30	5.02
22 Jun 2021	S4	EM2111910	-	-	-	8.27	405	6	<1	150	<1	150	56	5	1	15	27	23	3.88

Table 4 - Historical Surface Water

			NA						Acidity & Alkalinity											
			Filtered Total Phosphorus as P (filtered)	Phosphorus reactive (as P)	Phosphorus total (P2O5) (filtered)	pH (Lab)	Electrical conductivity (lab)	Total Suspended Solids	Alkalinity (Carbonate as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)	Chloride	Sulfate (filtered)	Cations Total
			mg/L	MG/L	µg/L	pH units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L
EQL			0.01	0.01	10	0.01	1	5	1	1	1	1	1	1	1	1	1	1	0.01
ADWG 2011 Recreational (v3.7 updated 2022)																		**5,000**	
ANZG (2018) - FW - 95% (updated 26 July 2021)																			
ANZECC 2000 - Stock Watering													1,000					1,000	
ANZECC 2000 Irrigation - Long-term Trigger Values						6-9	2,900										350		
ANZECC 2000 Irrigation - Short-term Trigger Values																			
Date	**Field ID**	**Lab Report Number**																	
28 Sep 2021	S4	EM2119193	-	-	-	8.27	609	<5	<1	190	<1	190	71	5	2	14	27	38	4.61
06 Dec 2021	S4	EM2124670	-	-	-	7.46	515	<5	<1	197	<1	197	63	6	1	14	32	30	4.27
28 Mar 2022	S4	EM2205592	-	-	-	8.07	489	<5	<1	186	<1	186	69	6	<1	15	22	36	4.59
07 Jun 2022	S4	EM2210920-AA	-	-	-	8.09	515	12	<1	156	<1	156	78	7	1	13	22	51	5.06
27 Sep 2022	S4	EM2218964	-	<0.01	-	8.22	617	6	<1	160	<1	160	67	5	2	13	23	35	4.37
14 Dec 2022	S4	EM2225250	-	-	-	8.21	461	<5	<1	151	<1	151	67	6	2	17	29	33	4.63
27 Mar 2023	S4	EM2305513	-	<0.01	-	7.35	482	8	<1	176	<1	176	73	6	1	15	20	29	4.81
29 Jun 2023	S4	EM2311855	-	-	-	7.85	427	<5	<1	138	<1	138	57	5	1	13	21	36	3.85
06 Sep 2023	S4	EM2316156	-	<0.01	-	7.97	412	18	<1	147	<1	147	72	5	1	13	25	28	4.60
12 Dec 2023	S4	EM2322268	-	0.02	-	6.68	160	<5	<1	34	<1	34	10	3	<1	14	24	3	1.35
01 Aug 2016	S6	EM1609083	<0.01	-	<10	7.84	315	8	-	-	-	-	-	-	-	-	-	-	-
23 Nov 2016	S6	EM1614219	<0.01	-	-	8.08	460	<5	-	-	-	-	-	-	-	-	-	-	-
27 Feb 2017	S6	EM1702198	-	-	-	-	-	<5	<1	204	<1	204	75	6	<1	13	21	30	4.80
14 Jun 2017	S6	EM1707805	-	-	-	8.14	522	<5	<1	198	<1	198	77	6	<1	13	22	36	4.90
11 Sep 2017	S6	EM1712490	-	-	-	-	-	<5	<1	199	<1	199	80	6	1	13	23	35	5.08
13 Dec 2017	S6	EM1717302	-	-	-	-	-	<5	<1	203	<1	203	75	6	1	13	31	29	4.83
20 Mar 2018	S6	EM1804934	-	-	-	-	-	8	<1	196	<1	196	81	6	1	12	21	41	5.08
25 Jun 2018	S6	EM1810261	-	-	-	-	-	<5	<1	204	<1	204	75	6	<1	13	22	42	4.80
18 Sep 2018	S6	EM1815239	-	-	-	-	-	10	<1	177	<1	177	76	5	2	15	22	34	4.91
12 Dec 2018	S6	EM1820185	-	-	-	-	-	<5	<1	191	<1	191	74	6	<1	14	22	30	4.80
26 Jun 2019	S6	EM1910172	-	-	-	-	-	<5	<1	206	<1	206	90	7	<1	14	21	39	5.68
24 Mar 2020	S6	EM2005146	-	-	-	8.14	524	<5	<1	172	<1	172	90	6	1	14	25	40	5.62
16 Jun 2020	S6	EM2010246	-	-	-	-	-	38	<1	132	<1	132	50	6	5	19	29	38	3.94
28 Sep 2020	S6	EM2017090	-	-	-	8.14	466	<5	<1	163	<1	163	70	6	2	14	24	33	4.65
07 Dec 2020	S6	EM2021896	-	-	-	8.06	443	15	<1	198	<1	198	65	5	1	13	24	34	4.25
22 Mar 2021	S6	EM2104983	-	-	-	7.89	484	<5	<1	196	<1	196	70	6	<1	14	23	32	4.60
28 Sep 2021	S6	EM2119193	-	-	-	8.20	525	<5	<1	186	<1	186	74	6	2	14	23	38	4.85
06 Dec 2021	S6	EM2124670	-	-	-	7.65	541	9	<1	209	<1	209	66	6	1	15	34	34	4.46
29 Mar 2022	S6	EM2205592	-	-	-	8.01	508	9	<1	197	<1	197	70	6	1	15	20	35	4.66
07 Jun 2022	S6	EM2210920-AA	-	-	-	8.17	532	23	<1	162	<1	162	78	7	2	14	21	51	5.13
27 Sep 2022	S6	EM2218964	-	<0.01	-	8.20	-	10	<1	162	<1	162	69	5	2	14	25	34	4.51
14 Dec 2022	S6	EM2225250	-	-	-	8.24	473	8	<1	161	<1	161	75	6	2	18	33	32	5.07
27 Mar 2023	S6	EM2305513	-	<0.01	-	7.61	500	<5	<1	184	<1	184	77	6	1	15	20	31	5.01
29 Jun 2023	S6	EM2311855	-	-	-	7.96	435	<5	<1	142	<1	142	58	5	1	13	22	36	3.90
06 Sep 2023	S6	EM2316156	-	<0.01	-	8.12	420	8	<1	150	<1	150	73	5	1	13	25	28	4.64
12 Dec 2023	S6	EM2322268	-	0.01	-	7.95	457	5	<1	193	<1	193	72	6	1	14	20	15	4.72
02 Aug 2016	S7	EM1609083	0.18	-	180	7.42	351	45	-	-	-	-	-	-	-	-	-	-	-
23 Nov 2016	S7	EM1614219	2.19	-	-	7.05	270	737	-	-	-	-	-	-	-	-	-	-	-
27 Feb 2017	S7	EM1702198	-	-	-	-	-	35	<1	957	<1	957	43	30	382	406	638	<10	32.0
14 Jun 2017	S7	EM1707805	-	-	-	7.39	2,020	266	<1	391	<1	391	12	7	118	185	398	<1	12.2
12 Sep 2017	S7	EM1712490	-	-	-	-	-	134	<1	111	<1	111	12	6	30	44	64	14	3.77
25 Jun 2018	S7	EM1810261	-	-	-	-	-	120	<1	171	<1	171	24	7	63	80	157	48	8.21
19 Sep 2018	S7	EM1815239	-	-	-	-	-	430	<1	158	<1	158	16	7	62	84	139	25	6.61
10 Sep 2019	S7	EM1915222	-	-	-	6.96	1,220	529	<1	175	<1	175	24	8	85	109	251	58	9.76
16 Jun 2020	S7	EM2010246	-	-	-	-	-	215	<1	258	<1	258	44	22	110	141	251	129	13.0
30 Sep 2020	S7	EM2017163	-	-	-	4.78	2,540	201	<1	76	<1	76	88	40	222	245	411	152	24.0
22 Jun 2021	S7	EM2111910	-	-	-	8.35	2,320	315	8	558	<1	566	88	47	197	181	273	212	21.2
29 Sep 2021	S7	EM2119454	-	-	-	8.05	1,460	132	<1	385	<1	385	40	26	133	124	182	64	12.9
07 Jun 2022	S7	EM2210920-AA	-	-	-	7.86	1,240	82	<1	210	<1	210	52	29	86	79	106	125	10.6

Table 4 - Historical Surface Water

			NA						Acidity & Alkalinity											
			Filtered Total Phosphorus as P (filtered)	Phosphorus reactive (as P)	Phosphorus total (P2O5) (filtered)	pH (Lab)	Electrical conductivity (lab)	Total Suspended Solids	Alkalinity (Carbonate as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)	Chloride	Sulfate (filtered)	Cations Total
			mg/L	MG/L	µg/L	pH units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L
EQL			0.01	0.01	10	0.01	1	5	1	1	1	1	1	1	1	1	1	1	0.01
ADWG 2011 Recreational (v3.7 updated 2022)																		**5,000**	
ANZG (2018) - FW - 95% (updated 26 July 2021)																			
ANZECC 2000 - Stock Watering													1,000					1,000	
ANZECC 2000 Irrigation - Long-term Trigger Values						6-9	2,900										350		
ANZECC 2000 Irrigation - Short-term Trigger Values																			
Date	**Field ID**	**Lab Report Number**																	
26 Sep 2022	S7	EM2218842	-	-	-	7.72	896	-	<1	237	<1	237	29	18	74	65	98	56	7.65
05 Sep 2023	S7	EM2316088	-	9.76	-	7.80	1,990	225	<1	565	<1	565	40	30	211	117	211	14	15.0
02 Aug 2016	S8	EM1609083	0.23	-	230	7.38	350	16	-	-	-	-	-	-	-	-	-	-	-
23 Nov 2016	S8	EM1614219	3.99	-	-	7.31	365	1,110	-	-	-	-	-	-	-	-	-	-	-
02 Aug 2016	S9	EM1609083	<0.01	-	<10	7.76	286	30	-	-	-	-	-	-	-	-	-	-	-
23 Nov 2016	S9	EM1614219	<0.01	-	-	8.03	430	267	-	-	-	-	-	-	-	-	-	-	-
27 Feb 2017	S9	EM1702198	-	-	-	-	-	91	<1	208	<1	208	73	6	<1	13	22	30	4.70
14 Jun 2017	S9	EM1707805	-	-	-	8.11	536	<5	<1	200	<1	200	75	5	<1	13	22	36	4.72
12 Sep 2017	S9	EM1712490	-	-	-	-	-	9	<1	194	<1	194	77	6	1	13	42	33	4.93
13 Dec 2017	S9	EM1717302	-	-	-	-	-	<5	<1	188	<1	188	72	6	<1	12	32	32	4.61
21 Mar 2018	S9	EM1805110	-	-	-	-	-	<5	<1	183	<1	183	82	6	1	13	20	38	5.18
25 Jun 2018	S9	EM1810261	-	-	-	-	-	<5	<1	201	<1	201	77	6	1	14	23	43	4.97
18 Sep 2018	S9	EM1815239	-	-	-	-	-	6	<1	172	<1	172	77	5	2	14	21	34	4.91
12 Dec 2018	S9	EM1820185	-	-	-	-	-	<5	<1	180	<1	180	72	6	<1	14	21	32	4.70
18 Mar 2019	S9	EM1904168	-	-	-	8.26	492	<5	<1	183	<1	183	76	6	1	14	20	33	4.92
26 Jun 2019	S9	EM1910172	-	-	-	-	-	<5	<1	206	<1	206	93	7	<1	14	21	38	5.82
23 Mar 2020	S9	EM2005146	-	-	-	8.07	509	<5	<1	164	<1	164	87	6	2	15	26	41	5.54
16 Jun 2020	S9	EM2010246	-	-	-	-	-	11	<1	131	<1	131	54	5	2	13	22	37	3.72
07 Dec 2020	S9	EM2021896	-	-	-	8.09	420	24	<1	178	<1	178	62	5	1	13	24	35	4.10
27 Sep 2021	S9	EM2119193	-	-	-	8.27	586	<5	<1	171	<1	171	73	5	1	13	23	37	4.64
06 Dec 2021	S9	EM2124670	-	-	-	7.90	514	<5	<1	210	<1	210	65	6	1	15	32	32	4.42
28 Mar 2022	S9	EM2205592	-	-	-	8.15	509	<5	<1	199	<1	199	73	6	<1	14	22	36	4.74
07 Jun 2022	S9	EM2210920-AA	-	-	-	8.04	514	31	<1	160	<1	160	76	6	2	13	22	54	4.90
26 Sep 2022	S9	EM2218842	-	-	-	8.09	489	-	<1	180	<1	180	72	6	2	14	24	34	4.75
27 Mar 2023	S9	EM2305513	-	0.01	-	7.40	509	8	<1	184	<1	184	78	6	1	15	22	32	5.06
29 Jun 2023	S9	EM2311855	-	-	-	7.99	433	16	<1	142	<1	142	60	5	1	13	22	37	4.00
04 Sep 2023	S9	EM2316088	-	<0.01	-	7.85	508	12	<1	151	<1	151	71	5	1	13	17	28	4.54

Table 4 - Historical Surface Water

			Anions Total	Ionic Balance	Ammonia as N	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)	Kjeldahl Nitrogen Total	Reactive Phosphorus as P	Phosphorus filterable reactive (P)	Phosphorus (Total)	Phosphorus (Total) (filtered)	BOD	Cadmium	Cadmium (filtered)	Chromium (III+VI)	Chromium (III+VI) (filtered)
			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
EQL			0.01	0.01	0.01	0.01	0.01	0.01	0.1	0.1	0.01	0.01	0.01	0.01	2	0.0001	0.0001	0.001	0.001
ADWG 2011 Recreational (v3.7 updated 2022)						**112.9**	**9.1**									**0.02**	**0.02**		
ANZG (2018) - FW - 95% (updated 26 July 2021)					0.9	2.4										0.0002	0.0002	0.001	0.001
ANZECC 2000 - Stock Watering						90	9.1									0.01	0.01	1	1
ANZECC 2000 Irrigation - Long-term Trigger Values									5				0.05	0.05		0.01	0.01	0.1	0.1
ANZECC 2000 Irrigation - Short-term Trigger Values									25				0.8	0.8		0.05	0.05	1	1
Date	**Field ID**	**Lab Report Number**																	
01 Aug 2016	S1	EM1609083	-	-	0.77	1.31	0.01	1.32	2.1	0.8	-	-	0.03	-	<2	-	-	-	-
23 Nov 2016	S1	EM1614219	-	-	0.02	0.83	<0.01	0.83	1.2	0.4	-	-	<0.01	-	10	-	-	-	-
28 Feb 2017	S1	EM1702250	4.83	5.54	0.07	0.57	<0.01	0.57	0.9	0.3	-	-	<0.01	<0.01	<2	-	-	-	-
14 Jun 2017	S1	EM1707805	5.04	6.12	0.02	1.01	<0.01	1.01	1.0	<0.1	<0.01	-	<0.01	-	3	-	<0.0001	-	<0.001
11 Sep 2017	S1	EM1712490	5.17	5.06	0.02	0.92	0.01	0.93	0.9	<0.1	<0.01	-	<0.01	<0.01	<2	-	<0.0001	-	<0.001
20 Mar 2018	S1	EM1804934	5.72	8.84	0.09	0.29	<0.01	0.29	0.3	<0.1	0.02	0.02	0.08	-	3	-	<0.0001	-	0.002
25 Jun 2018	S1	EM1810261	5.26	7.54	0.03	1.20	<0.01	1.20	1.7	0.5	0.01	0.01	0.01	-	7	-	-	-	-
19 Sep 2018	S1	EM1815239	2.96	2.61	0.06	0.39	<0.01	0.39	0.5	0.1	<0.01	-	0.04	0.02	4	<0.0001	<0.0001	0.002	<0.001
12 Dec 2018	S1	EM1820185	4.56	2.81	0.04	0.52	<0.01	0.52	0.8	0.3	<0.01	-	0.11	0.03	6	-	-	-	-
20 Mar 2019	S1	EM1904168	4.51	1.10	0.04	0.44	<0.01	0.44	0.4	<0.1	-	0.01	0.05	-	3	<0.0001	<0.0001	<0.001	<0.001
26 Jun 2019	S1	EM1910172	5.26	0.30	<0.01	0.99	0.01	1.00	1.0	<0.1	0.08	-	0.09	-	2	-	-	-	-
11 Sep 2019	S1	EM1915222	4.17	6.63	0.03	0.66	<0.01	0.66	0.7	<0.1	-	<0.01	0.02	-	<2	<0.0001	<0.0001	0.002	<0.001
24 Mar 2020	S1	EM2005146	4.75	5.37	0.04	0.69	<0.01	0.69	1.2	0.5	-	<0.01	0.02	-	<2	<0.0001	<0.0001	<0.001	<0.001
16 Jun 2020	S1	EM2010246	3.19	5.28	0.12	1.00	<0.01	1.00	1.5	0.5	0.01	0.01	0.06	-	2	-	-	-	-
29 Sep 2020	S1	EM2017090	4.20	1.10	0.06	1.27	<0.01	1.27	1.7	0.4	-	0.06	0.08	-	<8	<0.0001	<0.0001	0.001	<0.001
07 Dec 2020	S1	EM2021896	4.82	9.39	<0.01	0.65	<0.01	0.65	0.6	<0.1	-	<0.01	<0.01	-	<10	-	-	-	-
23 Mar 2021	S1	EM2105106	5.21	1.38	0.08	0.56	<0.01	0.56	0.7	0.1	-	<0.01	0.03	-	<2	<0.0001	<0.0001	<0.001	<0.001
22 Jun 2021	S1	EM2111910	5.53	4.98	<0.01	1.00	<0.01	1.00	1.2	0.2	-	0.02	0.01	-	<2	-	-	-	-
28 Sep 2021	S1	EM2119193	4.97	6.12	0.09	1.11	<0.01	1.11	1.4	0.3	-	<0.01	<0.01	-	<10	<0.0001	<0.0001	<0.001	<0.001
06 Dec 2021	S1	EM2124670	5.72	14.0	0.10	0.68	<0.01	0.68	0.9	0.2	-	<0.01	0.02	-	<2	-	-	-	-
07 Jun 2022	S1	EM2210920-AA	3.64	-	0.37	1.92	0.03	1.95	2.8	0.9	-	0.02	0.03	-	<2	-	-	-	-
28 Sep 2022	S1	EM2219073	4.39	0.24	<0.01	0.83	0.04	0.87	1.0	0.1	-	<0.01	0.02	-	<10	<0.0001	<0.0001	0.001	<0.001
14 Dec 2022	S1	EM2225250	4.31	4.08	<0.01	0.65	<0.01	0.65	1.2	0.6	-	0.01	0.02	-	<2	-	-	-	-
17 May 2023	S1	EM2308845	5.01	1.04	0.02	0.86	<0.01	0.86	1.0	0.1	-	-	<0.01	-	<2	<0.0001	<0.0001	<0.001	<0.001
29 Jun 2023	S1	EM2311855	3.61	0.05	0.28	1.18	<0.01	1.18	2.6	1.4	-	<0.01	<0.01	-	<2	-	-	-	-
06 Sep 2023	S1	EM2316173	4.11	2.94	0.02	0.83	0.01	0.84	0.9	0.1	-	-	0.03	-	2	<0.0001	<0.0001	<0.001	<0.001
12 Dec 2023	S1	EM2322268	3.64	0.15	0.04	0.04	0.01	0.05	0.2	0.2	-	-	0.02	-	<2	-	-	-	-
01 Aug 2016	S2	EM1609083	-	-	0.03	1.14	<0.01	1.14	1.1	<0.1	-	-	0.02	-	4	-	-	-	-
23 Nov 2016	S2	EM1614219	-	-	0.02	0.88	<0.01	0.88	1.0	0.1	-	-	<0.01	-	8	-	-	-	-
28 Feb 2017	S2	EM1702250	5.17	7.24	0.17	0.72	<0.01	0.72	1.1	0.4	-	-	0.01	<0.01	<2	-	-	-	-
14 Jun 2017	S2	EM1707805	5.29	8.99	0.03	1.06	<0.01	1.06	1.1	<0.1	<0.01	-	<0.01	-	2	-	<0.0001	-	<0.001
11 Sep 2017	S2	EM1712490	4.86	0.84	0.01	1.13	0.01	1.14	1.1	<0.1	<0.01	-	0.01	<0.01	3	-	<0.0001	-	<0.001
20 Mar 2018	S2	EM1804934	5.34	3.51	0.04	1.03	<0.01	1.03	1.2	0.2	<0.01	<0.01	0.03	-	4	-	<0.0001	-	<0.001
25 Jun 2018	S2	EM1810261	5.33	6.77	0.03	1.20	<0.01	1.20	1.4	0.2	0.01	0.01	0.03	-	7	-	-	-	-
18 Sep 2018	S2	EM1815239	4.41	1.13	0.08	0.86	<0.01	0.86	1.1	0.2	<0.01	-	0.08	0.02	4	<0.0001	<0.0001	<0.001	<0.001
12 Dec 2018	S2	EM1820185	4.86	2.36	0.06	0.67	0.01	0.68	0.7	<0.1	<0.01	-	0.09	<0.01	3	-	-	-	-
19 Mar 2019	S2	EM1904168	4.87	1.04	0.03	0.55	<0.01	0.55	0.8	0.3	-	<0.01	0.22	-	4	<0.0001	<0.0001	0.002	<0.001
26 Jun 2019	S2	EM1910172	5.27	2.58	0.02	1.11	<0.01	1.11	1.1	<0.1	0.02	-	0.04	-	3	-	-	-	-
11 Sep 2019	S2	EM1915222	4.35	5.55	0.02	0.66	<0.01	0.66	0.8	0.1	-	0.01	0.04	-	<2	<0.0001	<0.0001	<0.001	<0.001
17 Dec 2019	S2	EM1921873	3.68	8.10	0.03	0.28	<0.01	0.28	0.3	<0.1	-	0.01	<0.01	-	<2	-	-	-	-
24 Mar 2020	S2	EM2005146	4.97	4.22	0.06	0.81	<0.01	0.81	0.9	0.1	-	<0.01	0.10	-	<2	<0.0001	<0.0001	<0.001	<0.001
16 Jun 2020	S2	EM2010246	3.76	3.38	0.03	1.10	<0.01	1.10	1.5	0.4	<0.01	<0.01	<0.01	-	<2	-	-	-	-
30 Sep 2020	S2	EM2017163	4.94	6.42	0.15	1.25	<0.01	1.25	1.4	0.2	-	<0.01	<0.01	-	<10	<0.0001	0.0001	<0.001	<0.001
07 Dec 2020	S2	EM2021896	5.04	10.3	<0.01	0.77	<0.01	0.77	0.8	<0.1	-	<0.01	0.01	-	<10	-	-	-	-
22 Mar 2021	S2	EM2104983	5.01	6.89	0.02	0.65	<0.01	0.65	0.6	<0.1	-	<0.01	<0.01	-	<2	<0.0001	<0.0001	<0.001	<0.001
22 Jun 2021	S2	EM2111910	5.38	4.49	<0.01	0.95	<0.01	0.95	1.2	0.2	-	<0.01	0.01	-	<2	-	-	-	-
29 Sep 2021	S2	EM2119454	4.72	4.52	<0.01	1.17	0.01	1.18	1.7	0.5	-	<0.01	<0.01	-	<10	<0.0001	<0.0001	<0.001	<0.001

Table 4 - Historical Surface Water

			Anions Total	Ionic Balance	Ammonia as N	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)	Kjeldahl Nitrogen Total	Reactive Phosphorus as P	Phosphorus filterable reactive (P)	Phosphorus (Total)	Phosphorus (Total) (filtered)	BOD	Cadmium	Cadmium (filtered)	Chromium (III+VI)	Chromium (III+VI) (filtered)
			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
EQL			0.01	0.01	0.01	0.01	0.01	0.01	0.1	0.1	0.01	0.01	0.01	0.01	2	0.0001	0.0001	0.001	0.001
ADWG 2011 Recreational (v3.7 updated 2022)						**112.9**	**9.1**									**0.02**	**0.02**		
ANZG (2018) - FW - 95% (updated 26 July 2021)					0.9	2.4										0.0002	0.0002	0.001	0.001
ANZECC 2000 - Stock Watering						90	9.1									0.01	0.01	1	1
ANZECC 2000 Irrigation - Long-term Trigger Values									5				0.05	0.05		0.01	0.01	0.1	0.1
ANZECC 2000 Irrigation - Short-term Trigger Values									25				0.8	0.8		0.05	0.05	1	1
Date	**Field ID**	**Lab Report Number**																	
06 Dec 2021	S2	EM2124670	5.67	12.0	0.09	0.69	<0.01	0.69	1.0	0.3	-	<0.01	0.03	-	<2	-	-	-	-
07 Jun 2022	S2	EM2210920-AA	4.76	-	0.38	3.41	0.03	3.44	4.1	0.7	-	<0.01	0.02	-	<2	-	-	-	-
28 Sep 2022	S2	EM2219073	4.63	0.63	<0.01	0.94	<0.01	0.94	1.5	0.6	-	<0.01	0.02	-	<10	<0.0001	<0.0001	<0.001	<0.001
14 Dec 2022	S2	EM2225250	4.27	4.59	<0.01	0.59	<0.01	0.59	1.0	0.4	-	0.01	0.04	-	<2	-	-	-	-
17 May 2023	S2	EM2308845	4.97	1.68	<0.01	0.89	<0.01	0.89	1.0	0.1	-	-	<0.01	-	<2	<0.0001	<0.0001	<0.001	<0.001
29 Jun 2023	S2	EM2311855	4.12	2.18	0.07	1.27	<0.01	1.27	1.6	0.3	-	<0.01	<0.01	-	<2	-	-	-	-
05 Sep 2023	S2	EM2316088	4.12	3.84	0.01	0.86	<0.01	0.86	1.1	0.2	-	-	0.01	-	<2	<0.0001	<0.0001	<0.001	<0.001
12 Dec 2023	S2	EM2322268	1.66	-	0.01	0.02	<0.01	0.02	0.2	0.2	-	-	0.09	-	<2	-	-	-	-
01 Aug 2016	S3	EM1609083	-	-	4.04	1.24	0.03	1.27	5.7	4.4	-	-	0.35	-	2	-	-	-	-
23 Nov 2016	S3	EM1614219	-	-	0.50	0.32	0.06	0.38	1.0	0.6	-	-	0.05	-	14	-	-	-	-
14 Jun 2017	S3	EM1707805	6.55	8.17	0.04	0.16	<0.01	0.16	0.8	0.6	0.05	-	0.09	-	2	-	<0.0001	-	<0.001
11 Sep 2017	S3	EM1712490	6.30	3.41	0.95	0.17	0.04	0.21	1.5	1.3	0.01	-	0.24	0.22	10	-	<0.0001	-	<0.001
25 Jun 2018	S3	EM1810261	8.37	9.23	2.48	0.35	0.03	0.38	4.2	3.8	0.07	0.07	0.09	-	5	-	-	-	-
18 Sep 2018	S3	EM1815239	6.09	1.33	0.30	0.45	0.01	0.46	2.3	1.8	0.05	-	0.23	0.22	8	<0.0001	<0.0001	0.003	<0.001
26 Jun 2019	S3	EM1910172	9.79	0.94	0.16	0.67	0.03	0.70	1.9	1.2	0.08	-	0.12	-	4	-	-	-	-
11 Sep 2019	S3	EM1915222	6.14	5.59	2.14	0.47	0.03	0.50	5.3	4.8	-	0.19	0.46	-	<2	<0.0001	<0.0001	0.004	0.001
16 Jun 2020	S3	EM2010246	7.13	5.46	3.30	5.39	0.16	5.55	17.6	12.1	1.54	1.54	2.71	-	12	-	-	-	-
29 Sep 2020	S3	EM2017090	9.47	1.94	6.36	0.01	<0.01	0.01	18.6	18.6	-	8.42	10.5	-	138	<0.0001	<0.0001	0.006	0.004
07 Dec 2020	S3	EM2021896	9.20	6.98	0.12	0.50	0.12	0.62	4.9	4.3	-	0.28	0.88	-	<10	-	-	-	-
22 Jun 2021	S3	EM2111910	10.8	4.55	5.94	2.90	0.20	3.10	13.7	10.6	-	0.61	0.94	-	2	-	-	-	-
29 Sep 2021	S3	EM2119454	9.79	4.74	11.2	1.14	0.05	1.19	14.0	12.8	-	0.48	0.61	-	22	<0.0001	<0.0001	0.007	0.004
06 Dec 2021	S3	EM2124670	8.17	8.49	1.16	0.15	0.06	0.21	20.2	20.0	-	0.04	16.2	-	29	-	-	-	-
07 Jun 2022	S3	EM2210920-AA	5.50	-	4.12	7.16	0.27	7.43	13.8	6.4	-	1.24	1.74	-	10	-	-	-	-
28 Sep 2022	S3	EM2219073	6.54	0.88	1.56	1.13	0.11	1.24	4.7	3.5	-	0.34	0.97	-	7	<0.0001	<0.0001	0.003	0.002
14 Dec 2022	S3	EM2225250	9.10	0.04	9.05	0.29	0.24	0.53	12.2	11.7	-	0.53	1.28	-	6	-	-	-	-
17 May 2023	S3	EM2308845	7.02	0.02	0.39	0.77	0.02	0.79	1.6	0.8	-	-	0.18	-	4	<0.0001	<0.0001	<0.001	<0.001
29 Jun 2023	S3	EM2311855	4.84	2.05	0.23	2.40	0.04	2.44	4.5	2.1	-	0.66	0.94	-	4	-	-	-	-
05 Sep 2023	S3	EM2316088	12.3	6.64	16.7	<0.01	<0.01	<0.01	31.7	31.7	-	-	6.57	-	62	<0.0001	<0.0001	0.006	0.002
12 Dec 2023	S3	EM2322268	6.69	0.63	0.32	0.06	<0.01	0.06	2.6	2.5	-	-	0.81	-	6	-	-	-	-
01 Aug 2016	S4	EM1609083	-	-	0.04	1.27	<0.01	1.27	1.3	<0.1	-	-	<0.01	-	<2	-	-	-	-
23 Nov 2016	S4	EM1614219	-	-	0.03	0.88	<0.01	0.88	1.0	0.1	-	-	<0.01	-	6	-	-	-	-
27 Feb 2017	S4	EM1702198	5.10	4.98	0.02	0.75	<0.01	0.75	1.0	0.2	-	-	<0.01	<0.01	6	-	-	-	-
14 Jun 2017	S4	EM1707805	5.23	6.70	0.02	1.11	<0.01	1.11	1.1	<0.1	<0.01	-	<0.01	-	7	-	<0.0001	-	<0.001
11 Sep 2017	S4	EM1712490	5.29	2.08	0.01	1.06	0.01	1.07	1.1	<0.1	<0.01	-	<0.01	<0.01	5	-	<0.0001	-	<0.001
13 Dec 2017	S4	EM1717302	2.49	-	0.09	0.17	<0.01	0.17	0.2	<0.1	<0.01	<0.01	<0.01	-	4	-	<0.0001	-	<0.001
20 Mar 2018	S4	EM1804934	5.21	1.80	0.08	1.02	<0.01	1.02	1.3	0.3	<0.01	<0.01	0.02	-	2	-	<0.0001	-	<0.001
25 Jun 2018	S4	EM1810261	5.53	8.36	0.12	1.29	<0.01	1.29	1.6	0.3	<0.01	<0.01	<0.01	-	5	-	-	-	-
18 Sep 2018	S4	EM1815239	4.33	4.69	0.09	0.94	<0.01	0.94	0.9	<0.1	<0.01	-	0.06	0.02	4	<0.0001	<0.0001	<0.001	<0.001
12 Dec 2018	S4	EM1820185	4.87	2.93	0.05	0.76	<0.01	0.76	0.8	<0.1	0.03	-	<0.01	<0.01	2	-	-	-	-
18 Mar 2019	S4	EM1904168	1.42	2.19	0.03	0.06	<0.01	0.06	<0.1	<0.1	-	0.01	0.02	-	3	<0.0001	<0.0001	<0.001	<0.001
26 Jun 2019	S4	EM1910172	5.30	0.21	0.02	1.11	<0.01	1.11	1.1	<0.1	0.01	-	0.06	-	<2	-	-	-	-
10 Sep 2019	S4	EM1915222	5.40	5.51	0.02	1.00	<0.01	1.00	1.1	0.1	-	0.01	0.01	-	<2	<0.0001	<0.0001	<0.001	<0.001
17 Dec 2019	S4	EM1921873	2.32	-	0.11	0.12	<0.01	0.12	0.2	0.1	-	0.01	<0.01	-	<2	-	-	-	-
23 Mar 2020	S4	EM2005146	4.79	5.90	0.22	0.77	<0.01	0.77	1.0	0.2	-	<0.01	0.03	-	<2	<0.0001	<0.0001	<0.001	<0.001
16 Jun 2020	S4	EM2010246	3.92	3.38	0.04	1.22	<0.01	1.22	1.7	0.5	<0.01	<0.01	0.01	-	<2	-	-	-	-
28 Sep 2020	S4	EM2017090	4.30	0.26	0.07	1.39	<0.01	1.39	1.8	0.4	-	0.02	0.02	-	<8	<0.0001	<0.0001	0.001	<0.001
07 Dec 2020	S4	EM2021896	4.96	10.1	<0.01	0.76	<0.01	0.76	0.8	<0.1	-	0.01	<0.01	-	<10	-	-	-	-
23 Mar 2021	S4	EM2105106	5.09	0.73	0.03	0.66	<0.01	0.66	0.9	0.2	-	<0.01	0.04	-	<2	<0.0001	<0.0001	<0.001	<0.001
22 Jun 2021	S4	EM2111910	4.24	4.35	0.01	0.67	0.01	0.68	0.8	0.1	-	0.02	<0.01	-	<2	-	-	-	-

Table 4 - Historical Surface Water

			Anions Total	Ionic Balance	Ammonia as N	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)	Kjeldahl Nitrogen Total	Reactive Phosphorus as P	Phosphorus filterable reactive (P)	Phosphorus (Total)	Phosphorus (Total) (filtered)	BOD	Cadmium	Cadmium (filtered)	Chromium (III+VI)	Chromium (III+VI) (filtered)
			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
EQL			0.01	0.01	0.01	0.01	0.01	0.01	0.1	0.1	0.01	0.01	0.01	0.01	2	0.0001	0.0001	0.001	0.001
ADWG 2011 Recreational (v3.7 updated 2022)						**112.9**	**9.1**									**0.02**	**0.02**		
ANZG (2018) - FW - 95% (updated 26 July 2021)					0.9	2.4										0.0002	0.0002	0.001	0.001
ANZECC 2000 - Stock Watering						90	9.1									0.01	0.01	1	1
ANZECC 2000 Irrigation - Long-term Trigger Values									5				0.05	0.05		0.01	0.01	0.1	0.1
ANZECC 2000 Irrigation - Short-term Trigger Values									25				0.8	0.8		0.05	0.05	1	1
Date	**Field ID**	**Lab Report Number**																	
28 Sep 2021	S4	EM2119193	5.35	7.37	1.34	1.19	<0.01	1.19	1.6	0.4	-	<0.01	<0.01	-	<10	<0.0001	<0.0001	<0.001	0.002
06 Dec 2021	S4	EM2124670	5.46	12.2	0.04	0.68	<0.01	0.68	0.8	0.1	-	0.02	0.02	-	<2	-	-	-	-
28 Mar 2022	S4	EM2205592	5.09	5.14	0.06	0.79	<0.01	0.79	0.8	<0.1	-	-	<0.01	<0.01	<2	<0.0001	<0.0001	<0.001	<0.001
07 Jun 2022	S4	EM2210920-AA	4.80	2.64	0.41	2.58	0.03	2.61	3.5	0.9	-	0.02	0.18	-	<2	-	-	-	-
27 Sep 2022	S4	EM2218964	4.57	2.27	0.10	0.92	<0.01	0.92	1.1	0.2	-	-	<0.01	-	<10	<0.0001	<0.0001	<0.001	<0.001
14 Dec 2022	S4	EM2225250	4.52	1.15	<0.01	0.66	<0.01	0.66	1.1	0.4	-	0.01	0.03	-	<2	-	-	-	-
27 Mar 2023	S4	EM2305513	4.68	1.37	<0.01	0.67	<0.01	0.67	0.9	0.2	-	-	<0.01	-	<2	<0.0001	<0.0001	0.001	<0.001
29 Jun 2023	S4	EM2311855	4.10	3.17	<0.01	1.28	<0.01	1.28	1.5	0.2	-	<0.01	<0.01	-	<2	-	-	-	-
06 Sep 2023	S4	EM2316156	4.22	4.20	<0.01	0.88	<0.01	0.88	1.1	0.2	-	-	<0.01	-	<2	<0.0001	<0.0001	<0.001	<0.001
12 Dec 2023	S4	EM2322268	1.42	-	0.03	0.06	<0.01	0.06	0.2	0.1	-	-	0.02	-	2	-	-	-	-
01 Aug 2016	S6	EM1609083	-	-	0.06	1.21	<0.01	1.21	1.2	<0.1	-	-	<0.01	-	<2	-	-	-	-
23 Nov 2016	S6	EM1614219	-	-	0.01	0.91	<0.01	0.91	1.1	0.2	-	-	<0.01	-	<2	-	-	-	-
27 Feb 2017	S6	EM1702198	5.29	4.86	0.06	0.80	<0.01	0.80	1.1	0.3	-	-	<0.01	<0.01	6	-	-	-	-
14 Jun 2017	S6	EM1707805	5.33	4.15	0.02	1.13	<0.01	1.13	1.4	0.3	<0.01	-	<0.01	-	6	-	<0.0001	-	<0.001
11 Sep 2017	S6	EM1712490	5.35	2.65	0.02	1.13	0.01	1.14	1.3	0.2	<0.01	-	<0.01	<0.01	2	-	<0.0001	-	<0.001
13 Dec 2017	S6	EM1717302	5.53	6.82	0.08	0.72	0.01	0.73	1.2	0.5	<0.01	<0.01	0.25	-	4	-	<0.0001	-	<0.001
20 Mar 2018	S6	EM1804934	5.36	2.67	0.06	1.07	<0.01	1.07	1.1	<0.1	<0.01	<0.01	0.03	-	5	-	<0.0001	-	<0.001
25 Jun 2018	S6	EM1810261	5.57	7.42	0.03	1.36	<0.01	1.36	1.7	0.3	<0.01	<0.01	0.03	-	6	-	-	-	-
18 Sep 2018	S6	EM1815239	4.86	0.44	0.11	0.95	<0.01	0.95	1.2	0.2	<0.01	-	0.05	0.02	4	<0.0001	<0.0001	<0.001	<0.001
12 Dec 2018	S6	EM1820185	5.06	2.70	0.07	0.75	<0.01	0.75	0.8	<0.1	<0.01	-	0.02	0.01	2	-	-	-	-
26 Jun 2019	S6	EM1910172	5.52	1.39	0.03	1.25	<0.01	1.25	1.2	<0.1	<0.01	-	0.04	-	<2	-	-	-	-
24 Mar 2020	S6	EM2005146	4.97	6.09	0.02	0.85	<0.01	0.85	1.0	0.1	-	<0.01	<0.01	-	<2	<0.0001	<0.0001	<0.001	<0.001
16 Jun 2020	S6	EM2010246	4.25	3.70	0.04	1.47	<0.01	1.47	2.2	0.7	0.02	0.02	0.06	-	5	-	-	-	-
28 Sep 2020	S6	EM2017090	4.62	0.28	0.06	1.39	<0.01	1.39	1.6	0.2	-	0.01	0.01	-	<8	<0.0001	<0.0001	<0.001	<0.001
07 Dec 2020	S6	EM2021896	5.34	11.4	<0.01	0.79	<0.01	0.79	0.8	<0.1	-	<0.01	<0.01	-	<10	-	-	-	-
22 Mar 2021	S6	EM2104983	5.23	6.46	0.01	0.73	<0.01	0.73	0.7	<0.1	-	<0.01	<0.01	-	<2	<0.0001	<0.0001	<0.001	<0.001
28 Sep 2021	S6	EM2119193	5.16	3.10	0.19	1.24	<0.01	1.24	1.5	0.3	-	<0.01	<0.01	-	<10	<0.0001	<0.0001	<0.001	<0.001
06 Dec 2021	S6	EM2124670	5.84	13.4	0.07	0.71	<0.01	0.71	0.8	0.1	-	<0.01	0.02	-	<2	-	-	-	-
29 Mar 2022	S6	EM2205592	5.23	5.70	0.19	0.67	<0.01	0.67	0.7	<0.1	-	-	<0.01	<0.01	<2	<0.0001	<0.0001	<0.001	<0.001
07 Jun 2022	S6	EM2210920-AA	4.89	2.37	0.30	3.59	0.04	3.63	4.4	0.8	-	0.02	0.05	-	<2	-	-	-	-
27 Sep 2022	S6	EM2218964	4.65	1.47	0.06	0.91	<0.01	0.91	1.1	0.2	-	-	<0.01	-	<10	<0.0001	<0.0001	<0.001	<0.001
14 Dec 2022	S6	EM2225250	4.81	2.60	<0.01	0.67	<0.01	0.67	0.9	0.2	-	<0.01	<0.01	-	<2	-	-	-	-
27 Mar 2023	S6	EM2305513	4.88	1.30	<0.01	0.75	<0.01	0.75	1.4	0.7	-	-	<0.01	-	<2	<0.0001	<0.0001	<0.001	<0.001
29 Jun 2023	S6	EM2311855	4.21	3.83	0.03	1.31	<0.01	1.31	1.6	0.3	-	0.01	<0.01	-	<8	-	-	-	-
06 Sep 2023	S6	EM2316156	4.28	4.03	<0.01	0.89	<0.01	0.89	0.9	<0.1	-	-	<0.01	-	<2	<0.0001	<0.0001	<0.001	<0.001
12 Dec 2023	S6	EM2322268	4.73	0.12	0.04	0.03	<0.01	0.03	0.1	0.1	-	-	0.01	-	<2	-	-	-	-
02 Aug 2016	S7	EM1609083	-	-	6.04	0.96	0.02	0.98	7	6	-	-	0.44	-	2	-	-	-	-
23 Nov 2016	S7	EM1614219	-	-	3.85	0.01	0.02	0.03	7.5	7.5	-	-	2.77	-	11	-	-	-	-
27 Feb 2017	S7	EM1702198	37.1	7.34	36.3	0.05	0.03	0.08	69.5	69.4	-	-	23.9	20.5	35	-	-	-	-
14 Jun 2017	S7	EM1707805	19.0	21.7	11.6	<0.01	<0.01	<0.01	29.0	29.0	5.08	-	7.09	-	68	-	<0.0001	-	0.004
12 Sep 2017	S7	EM1712490	4.31	6.69	5.63	0.13	0.01	0.14	7.6	7.5	0.80	-	2.49	1.47	15	-	<0.0001	-	0.002
25 Jun 2018	S7	EM1810261	9.08	5.00	18.9	3.21	0.04	3.25	30.6	27.3	0.69	0.69	1.92	-	12	-	-	-	-
19 Sep 2018	S7	EM1815239	7.60	6.93	4.90	0.73	0.08	0.81	12.6	11.8	2.76	-	3.68	3.64	19	0.0001	-	0.019	-
10 Sep 2019	S7	EM1915222	11.8	9.39	11.6	8.98	1.02	10.0	49.1	39.1	-	2.20	5.43	-	33	<0.0002	<0.0002	0.031	0.006
16 Jun 2020	S7	EM2010246	14.9	7.06	16.0	14.9	0.31	15.2	52.8	37.6	5.98	5.98	9.15	-	30	-	-	-	-
30 Sep 2020	S7	EM2017163	16.3	19.2	16.8	0.01	<0.01	0.01	76.3	76.3	-	40.5	49.5	-	1,160	0.0002	0.0001	0.015	0.005
22 Jun 2021	S7	EM2111910	23.4	5.05	33.6	19.3	0.50	19.8	76.2	56.4	-	4.90	7.62	-	11	-	-	-	-
29 Sep 2021	S7	EM2119454	14.2	4.53	14.2	3.64	0.09	3.73	39.5	35.8	-	3.86	6.77	-	19	0.0002	<0.0001	0.015	0.002
07 Jun 2022	S7	EM2210920-AA	9.79	4.06	10.7	13.3	0.77	14.1	29.8	15.7	-	3.14	4.12	-	16	-	-	-	-

Table 4 - Historical Surface Water

			Anions Total	Ionic Balance	Ammonia as N	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)	Kjeldahl Nitrogen Total	Reactive Phosphorus as P	Phosphorus filterable reactive (P)	Phosphorus (Total)	Phosphorus (Total) (filtered)	BOD	Cadmium	Cadmium (filtered)	Chromium (III+VI)	Chromium (III+VI) (filtered)
			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
EQL			0.01	0.01	0.01	0.01	0.01	0.01	0.1	0.1	0.01	0.01	0.01	0.01	2	0.0001	0.0001	0.001	0.001
ADWG 2011 Recreational (v3.7 updated 2022)						**112.9**	**9.1**									**0.02**	**0.02**		
ANZG (2018) - FW - 95% (updated 26 July 2021)					0.9	2.4										0.0002	0.0002	0.001	0.001
ANZECC 2000 - Stock Watering						90	9.1									0.01	0.01	1	1
ANZECC 2000 Irrigation - Long-term Trigger Values									5				0.05	0.05		0.01	0.01	0.1	0.1
ANZECC 2000 Irrigation - Short-term Trigger Values									25				0.8	0.8		0.05	0.05	1	1
Date	**Field ID**	**Lab Report Number**																	
26 Sep 2022	S7	EM2218842	8.66	6.23	8.42	1.84	0.15	1.99	13.2	11.2	-	1.92	3.18	-	18	0.0002	<0.0001	0.014	0.006
05 Sep 2023	S7	EM2316088	17.5	7.95	43.4	0.01	<0.01	0.01	59.0	59.0	-	-	11.8	-	160	0.0002	<0.0001	0.008	0.004
02 Aug 2016	S8	EM1609083	-	-	5.36	0.19	0.02	0.21	6.1	5.9	-	-	0.4	-	6	-	-	-	-
23 Nov 2016	S8	EM1614219	-	-	9.24	<0.01	<0.01	<0.01	12.9	12.9	-	-	5.00	-	8	-	-	-	-
02 Aug 2016	S9	EM1609083	-	-	<0.01	1.29	<0.01	1.29	1.3	<0.1	-	-	<0.01	-	4	-	-	-	-
23 Nov 2016	S9	EM1614219	-	-	0.01	0.86	<0.01	0.86	1.3	0.4	-	-	<0.01	-	<2	-	-	-	-
27 Feb 2017	S9	EM1702198	5.40	6.92	0.05	0.78	<0.01	0.78	1.3	0.5	-	-	0.04	<0.01	4	-	-	-	-
14 Jun 2017	S9	EM1707805	5.37	6.41	0.04	1.15	<0.01	1.15	1.6	0.5	0.02	-	<0.01	-	4	-	<0.0001	-	<0.001
12 Sep 2017	S9	EM1712490	5.75	7.69	0.02	1.01	0.01	1.02	1.0	<0.1	<0.01	-	<0.01	<0.01	7	-	<0.0001	-	<0.001
13 Dec 2017	S9	EM1717302	5.32	7.21	0.13	0.68	0.01	0.69	0.9	0.2	<0.01	<0.01	<0.01	-	3	-	0.0001	-	<0.001
21 Mar 2018	S9	EM1805110	5.01	1.62	0.16	0.94	<0.01	0.94	1.0	0.1	<0.01	<0.01	0.68	-	<2	-	<0.0001	-	<0.001
25 Jun 2018	S9	EM1810261	5.56	5.60	0.07	1.36	<0.01	1.36	1.6	0.2	0.02	0.02	0.05	-	6	-	-	-	-
18 Sep 2018	S9	EM1815239	4.74	1.84	0.27	0.96	<0.01	0.96	1.8	0.8	0.01	-	0.04	0.03	5	<0.0001	<0.0001	<0.001	<0.001
12 Dec 2018	S9	EM1820185	4.86	1.67	0.04	0.70	<0.01	0.70	0.7	<0.1	<0.01	-	<0.01	<0.01	2	-	-	-	-
18 Mar 2019	S9	EM1904168	4.91	0.13	0.04	0.61	<0.01	0.61	0.6	<0.1	-	<0.01	0.11	-	5	<0.0001	<0.0001	<0.001	<0.001
26 Jun 2019	S9	EM1910172	5.50	2.88	0.03	1.17	0.01	1.18	1.2	<0.1	0.01	-	0.03	-	<2	-	-	-	-
23 Mar 2020	S9	EM2005146	4.86	6.49	0.04	0.81	<0.01	0.81	1.0	0.2	-	<0.01	0.05	-	<2	<0.0001	<0.0001	<0.001	<0.001
16 Jun 2020	S9	EM2010246	4.01	3.69	0.02	1.14	<0.01	1.14	1.3	0.2	<0.01	<0.01	0.01	-	<2	-	-	-	-
07 Dec 2020	S9	EM2021896	4.96	9.56	<0.01	0.70	<0.01	0.70	0.7	<0.1	-	<0.01	<0.01	-	<10	-	-	-	-
27 Sep 2021	S9	EM2119193	4.84	2.01	<0.01	1.26	<0.01	1.26	1.5	0.2	-	<0.01	<0.01	-	<10	<0.0001	<0.0001	<0.001	<0.001
06 Dec 2021	S9	EM2124670	5.76	13.2	0.10	0.74	<0.01	0.74	0.8	0.1	-	<0.01	0.02	-	<2	-	-	-	-
28 Mar 2022	S9	EM2205592	5.35	5.95	0.11	0.77	<0.01	0.77	0.8	<0.1	-	-	<0.01	<0.01	<2	<0.0001	<0.0001	<0.001	<0.001
07 Jun 2022	S9	EM2210920-AA	4.94	0.39	0.16	2.59	0.03	2.62	3.6	1.0	-	<0.01	0.03	-	<2	-	-	-	-
26 Sep 2022	S9	EM2218842	4.98	2.41	<0.01	1.03	<0.01	1.03	1.2	0.2	-	<0.01	<0.01	-	<10	<0.0001	<0.0001	0.001	<0.001
27 Mar 2023	S9	EM2305513	4.96	1.01	<0.01	0.72	<0.01	0.72	1.0	0.3	-	-	0.05	-	<2	<0.0001	<0.0001	<0.001	<0.001
29 Jun 2023	S9	EM2311855	4.23	2.82	<0.01	1.31	<0.01	1.31	1.5	0.2	-	<0.01	<0.01	-	<8	-	-	-	-
04 Sep 2023	S9	EM2316088	4.08	5.40	0.04	0.94	<0.01	0.94	1.1	0.2	-	-	0.01	-	<2	<0.0001	<0.0001	0.001	<0.001

Table 4 - Historical Surface Water

	Copper	Copper (filtered)	Iron	Iron (filtered)	Lead	Lead (filtered)	Manganese	Manganese (filtered)	Nickel	Nickel (filtered)	Zinc	Zinc (filtered)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL	0.001	0.001	0.05	0.05	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005
ADWG 2011 Recreational (v3.7 updated 2022)	**20**	**20**			**0.1**	**0.1**	**5**	**5**	**0.2**	**0.2**		
ANZG (2018) - FW - 95% (updated 26 July 2021)	0.0014	0.0014			0.0034	0.0034	1.9	1.9	0.011	0.011	0.008	0.008
ANZECC 2000 - Stock Watering	1	1			0.1	0.1			1	1	20	20
ANZECC 2000 Irrigation - Long-term Trigger Values	0.2	0.2	0.2	0.2	2	2	0.2	0.2	0.2	0.2	2	2
ANZECC 2000 Irrigation - Short-term Trigger Values	5	5	10	10	5	5	10	10	2	2	5	5

Date	Field ID	Lab Report Number											
01 Aug 2016	S1	EM1609083	-	-	-	-	-	-	-	-	-	-	-	-
23 Nov 2016	S1	EM1614219	-	-	-	-	-	-	-	-	-	-	-	-
28 Feb 2017	S1	EM1702250	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2017	S1	EM1707805	-	<0.001	-	-	-	<0.001	-	-	-	<0.001	-	<0.005
11 Sep 2017	S1	EM1712490	-	0.003	-	-	-	<0.001	-	0.006	-	<0.001	-	<0.005
20 Mar 2018	S1	EM1804934	-	0.015	-	<0.05	-	0.002	-	0.016	-	0.006	-	0.035
25 Jun 2018	S1	EM1810261	-	-	-	-	-	-	-	-	-	-	-	-
19 Sep 2018	S1	EM1815239	0.001	<0.001	0.80	0.23	<0.001	<0.001	0.020	0.004	0.003	0.001	<0.005	<0.005
12 Dec 2018	S1	EM1820185	-	-	-	-	-	-	-	-	-	-	-	-
20 Mar 2019	S1	EM1904168	<0.001	0.010	0.06	<0.05	<0.001	<0.001	0.014	0.011	<0.001	0.010	<0.005	0.107
26 Jun 2019	S1	EM1910172	-	-	-	-	-	-	-	-	-	-	-	-
11 Sep 2019	S1	EM1915222	<0.001	0.011	0.46	0.18	<0.001	0.002	0.011	0.010	0.001	0.013	<0.005	0.042
24 Mar 2020	S1	EM2005146	<0.001	0.025	0.07	<0.05	<0.001	0.001	0.014	0.009	<0.001	0.013	<0.005	0.075
16 Jun 2020	S1	EM2010246	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	S1	EM2017090	<0.001	0.082	0.44	0.21	<0.001	0.002	0.013	0.012	0.002	0.008	<0.005	0.090
07 Dec 2020	S1	EM2021896	-	-	-	-	-	-	-	-	-	-	-	-
23 Mar 2021	S1	EM2105106	<0.001	0.104	0.06	<0.05	<0.001	0.004	0.015	0.019	<0.001	0.018	<0.005	0.213
22 Jun 2021	S1	EM2111910	-	-	-	-	-	-	-	-	-	-	-	-
28 Sep 2021	S1	EM2119193	<0.001	<0.001	0.17	<0.05	<0.001	<0.001	0.015	0.002	<0.001	<0.001	<0.005	<0.005
06 Dec 2021	S1	EM2124670	-	-	-	-	-	-	-	-	-	-	-	-
07 Jun 2022	S1	EM2210920-AA	-	-	-	-	-	-	-	-	-	-	-	-
28 Sep 2022	S1	EM2219073	<0.001	<0.001	0.35	<0.05	<0.001	<0.001	0.019	0.005	0.001	<0.001	<0.005	<0.005
14 Dec 2022	S1	EM2225250	-	-	-	-	-	-	-	-	-	-	-	-
17 May 2023	S1	EM2308845	<0.001	<0.001	0.25	<0.05	<0.001	<0.001	0.028	0.008	0.001	<0.001	<0.005	<0.005
29 Jun 2023	S1	EM2311855	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023	S1	EM2316173	<0.001	<0.001	0.26	0.06	<0.001	<0.001	0.018	0.009	0.001	<0.001	<0.005	<0.005
12 Dec 2023	S1	EM2322268	-	-	-	-	-	-	-	-	-	-	-	-
01 Aug 2016	S2	EM1609083	-	-	-	-	-	-	-	-	-	-	-	-
23 Nov 2016	S2	EM1614219	-	-	-	-	-	-	-	-	-	-	-	-
28 Feb 2017	S2	EM1702250	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2017	S2	EM1707805	-	0.001	-	-	-	<0.001	-	-	-	<0.001	-	0.007
11 Sep 2017	S2	EM1712490	-	0.043	-	-	-	<0.001	-	0.006	-	0.002	-	0.035
20 Mar 2018	S2	EM1804934	-	0.035	-	<0.05	-	0.002	-	0.009	-	0.006	-	0.063
25 Jun 2018	S2	EM1810261	-	-	-	-	-	-	-	-	-	-	-	-
18 Sep 2018	S2	EM1815239	0.001	0.048	0.23	0.06	<0.001	0.003	0.027	0.014	0.002	0.004	<0.005	0.043
12 Dec 2018	S2	EM1820185	-	-	-	-	-	-	-	-	-	-	-	-
19 Mar 2019	S2	EM1904168	<0.001	0.013	0.06	<0.05	<0.001	0.001	0.008	0.007	0.001	0.015	<0.005	0.108
26 Jun 2019	S2	EM1910172	-	-	-	-	-	-	-	-	-	-	-	-
11 Sep 2019	S2	EM1915222	<0.001	0.010	0.18	0.08	<0.001	<0.001	0.008	0.009	0.001	0.010	<0.005	0.054
17 Dec 2019	S2	EM1921873	-	-	-	-	-	-	-	-	-	-	-	-
24 Mar 2020	S2	EM2005146	<0.001	0.011	<0.05	<0.05	<0.001	<0.001	0.006	0.004	<0.001	0.004	<0.005	0.024
16 Jun 2020	S2	EM2010246	-	-	-	-	-	-	-	-	-	-	-	-
30 Sep 2020	S2	EM2017163	<0.001	0.135	0.12	0.08	<0.001	0.002	0.008	0.012	0.001	0.010	<0.005	0.172
07 Dec 2020	S2	EM2021896	-	-	-	-	-	-	-	-	-	-	-	-
22 Mar 2021	S2	EM2104983	<0.001	0.006	0.05	<0.05	<0.001	<0.001	0.004	0.003	<0.001	<0.001	<0.005	<0.005
22 Jun 2021	S2	EM2111910	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2021	S2	EM2119454	<0.001	<0.001	0.08	<0.05	<0.001	<0.001	0.009	0.004	<0.001	<0.001	<0.005	<0.005

Table 4 - Historical Surface Water

			Copper	Copper (filtered)	Iron	Iron (filtered)	Lead	Lead (filtered)	Manganese	Manganese (filtered)	Nickel	Nickel (filtered)	Zinc	Zinc (filtered)
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			0.001	0.001	0.05	0.05	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005
ADWG 2011 Recreational (v3.7 updated 2022)			**20**	**20**			**0.1**	**0.1**	**5**	**5**	**0.2**	**0.2**		
ANZG (2018) - FW - 95% (updated 26 July 2021)			0.0014	0.0014			0.0034	0.0034	1.9	1.9	0.011	0.011	0.008	0.008
ANZECC 2000 - Stock Watering			1	1			0.1	0.1			1	1	20	20
ANZECC 2000 Irrigation - Long-term Trigger Values			0.2	0.2	0.2	0.2	2	2	0.2	0.2	0.2	0.2	2	2
ANZECC 2000 Irrigation - Short-term Trigger Values			5	5	10	10	5	5	10	10	2	2	5	5
Date	**Field ID**	**Lab Report Number**												
06 Dec 2021	S2	EM2124670	-	-	-	-	-	-	-	-	-	-	-	-
07 Jun 2022	S2	EM2210920-AA	-	-	-	-	-	-	-	-	-	-	-	-
28 Sep 2022	S2	EM2219073	<0.001	<0.001	0.28	<0.05	<0.001	<0.001	0.022	0.007	0.001	<0.001	0.012	<0.005
14 Dec 2022	S2	EM2225250	-	-	-	-	-	-	-	-	-	-	-	-
17 May 2023	S2	EM2308845	<0.001	<0.001	0.33	<0.05	<0.001	<0.001	0.039	0.010	0.002	<0.001	<0.005	<0.005
29 Jun 2023	S2	EM2311855	-	-	-	-	-	-	-	-	-	-	-	-
05 Sep 2023	S2	EM2316088	<0.001	<0.001	0.12	<0.05	<0.001	<0.001	0.013	0.008	0.001	<0.001	<0.005	<0.005
12 Dec 2023	S2	EM2322268	-	-	-	-	-	-	-	-	-	-	-	-
01 Aug 2016	S3	EM1609083	-	-	-	-	-	-	-	-	-	-	-	-
23 Nov 2016	S3	EM1614219	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2017	S3	EM1707805	-	0.002	-	-	-	<0.001	-	-	-	0.003	-	<0.005
11 Sep 2017	S3	EM1712490	-	<0.001	-	-	-	<0.001	-	0.451	-	0.002	-	<0.005
25 Jun 2018	S3	EM1810261	-	-	-	-	-	-	-	-	-	-	-	-
18 Sep 2018	S3	EM1815239	0.002	0.014	1.97	<0.05	<0.001	<0.001	0.402	0.012	0.005	0.006	0.005	0.015
26 Jun 2019	S3	EM1910172	-	-	-	-	-	-	-	-	-	-	-	-
11 Sep 2019	S3	EM1915222	0.003	0.011	2.28	0.89	0.001	0.002	0.319	0.282	0.006	0.013	0.006	0.044
16 Jun 2020	S3	EM2010246	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	S3	EM2017090	0.005	0.144	5.89	3.45	0.002	0.003	1.50	1.37	0.012	0.020	0.021	0.228
07 Dec 2020	S3	EM2021896	-	-	-	-	-	-	-	-	-	-	-	-
22 Jun 2021	S3	EM2111910	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2021	S3	EM2119454	0.005	0.003	2.86	0.51	0.002	<0.001	0.385	0.316	0.009	0.007	0.014	0.009
06 Dec 2021	S3	EM2124670	-	-	-	-	-	-	-	-	-	-	-	-
07 Jun 2022	S3	EM2210920-AA	-	-	-	-	-	-	-	-	-	-	-	-
28 Sep 2022	S3	EM2219073	0.004	0.003	3.19	2.55	0.002	0.001	0.479	0.436	0.006	0.006	0.012	0.013
14 Dec 2022	S3	EM2225250	-	-	-	-	-	-	-	-	-	-	-	-
17 May 2023	S3	EM2308845	<0.001	<0.001	1.30	0.09	<0.001	<0.001	0.261	0.219	0.002	0.001	<0.005	<0.005
29 Jun 2023	S3	EM2311855	-	-	-	-	-	-	-	-	-	-	-	-
05 Sep 2023	S3	EM2316088	0.008	0.003	7.47	2.76	0.004	<0.001	1.23	0.997	0.013	0.010	0.033	0.008
12 Dec 2023	S3	EM2322268	-	-	-	-	-	-	-	-	-	-	-	-
01 Aug 2016	S4	EM1609083	-	-	-	-	-	-	-	-	-	-	-	-
23 Nov 2016	S4	EM1614219	-	-	-	-	-	-	-	-	-	-	-	-
27 Feb 2017	S4	EM1702198	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2017	S4	EM1707805	-	<0.001	-	-	-	<0.001	-	-	-	<0.001	-	<0.005
11 Sep 2017	S4	EM1712490	-	<0.001	-	-	-	<0.001	-	0.006	-	<0.001	-	<0.005
13 Dec 2017	S4	EM1717302	-	<0.001	-	-	-	<0.001	-	0.040	-	0.002	-	<0.005
20 Mar 2018	S4	EM1804934	-	0.018	-	<0.05	-	0.002	-	0.008	-	0.006	-	0.028
25 Jun 2018	S4	EM1810261	-	-	-	-	-	-	-	-	-	-	-	-
18 Sep 2018	S4	EM1815239	<0.001	0.014	0.19	<0.05	<0.001	<0.001	0.018	0.012	0.001	0.007	<0.005	0.016
12 Dec 2018	S4	EM1820185	-	-	-	-	-	-	-	-	-	-	-	-
18 Mar 2019	S4	EM1904168	<0.001	0.014	0.11	0.06	<0.001	0.001	0.037	0.034	0.002	0.008	<0.005	0.082
26 Jun 2019	S4	EM1910172	-	-	-	-	-	-	-	-	-	-	-	-
10 Sep 2019	S4	EM1915222	<0.001	0.008	0.12	<0.05	<0.001	<0.001	0.008	0.008	0.001	0.009	<0.005	0.050
17 Dec 2019	S4	EM1921873	-	-	-	-	-	-	-	-	-	-	-	-
23 Mar 2020	S4	EM2005146	<0.001	0.006	0.07	<0.05	<0.001	<0.001	0.005	0.004	<0.001	0.005	<0.005	0.027
16 Jun 2020	S4	EM2010246	-	-	-	-	-	-	-	-	-	-	-	-
28 Sep 2020	S4	EM2017090	<0.001	<0.001	0.47	0.12	<0.001	<0.001	0.011	0.006	0.002	<0.001	<0.005	<0.005
07 Dec 2020	S4	EM2021896	-	-	-	-	-	-	-	-	-	-	-	-
23 Mar 2021	S4	EM2105106	<0.001	0.005	0.07	<0.05	<0.001	<0.001	0.006	0.006	<0.001	<0.001	<0.005	<0.005
22 Jun 2021	S4	EM2111910	-	-	-	-	-	-	-	-	-	-	-	-

Table 4 - Historical Surface Water

			Copper	Copper (filtered)	Iron	Iron (filtered)	Lead	Lead (filtered)	Manganese	Manganese (filtered)	Nickel	Nickel (filtered)	Zinc	Zinc (filtered)
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			0.001	0.001	0.05	0.05	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005
ADWG 2011 Recreational (v3.7 updated 2022)			**20**	**20**			**0.1**	**0.1**	**5**	**5**	**0.2**	**0.2**		
ANZG (2018) - FW - 95% (updated 26 July 2021)			0.0014	0.0014			0.0034	0.0034	1.9	1.9	0.011	0.011	0.008	0.008
ANZECC 2000 - Stock Watering			1	1			0.1	0.1			1	1	20	20
ANZECC 2000 Irrigation - Long-term Trigger Values			0.2	0.2	0.2	0.2	2	2	0.2	0.2	0.2	0.2	2	2
ANZECC 2000 Irrigation - Short-term Trigger Values			5	5	10	10	5	5	10	10	2	2	5	5
Date	**Field ID**	**Lab Report Number**												
28 Sep 2021	S4	EM2119193	<0.001	<0.001	0.06	<0.05	<0.001	<0.001	0.006	0.002	<0.001	<0.001	<0.005	<0.005
06 Dec 2021	S4	EM2124670	-	-	-	-	-	-	-	-	-	-	-	-
28 Mar 2022	S4	EM2205592	<0.001	<0.001	-	-	<0.001	<0.001	-	-	<0.001	<0.001	<0.005	<0.005
07 Jun 2022	S4	EM2210920-AA	-	-	-	-	-	-	-	-	-	-	-	-
27 Sep 2022	S4	EM2218964	<0.001	<0.001	0.13	<0.05	<0.001	<0.001	0.016	0.009	<0.001	0.001	<0.005	<0.005
14 Dec 2022	S4	EM2225250	-	-	-	-	-	-	-	-	-	-	-	-
27 Mar 2023	S4	EM2305513	<0.001	<0.001	0.12	<0.05	<0.001	<0.001	0.013	0.007	0.001	<0.001	<0.005	<0.005
29 Jun 2023	S4	EM2311855	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023	S4	EM2316156	<0.001	<0.001	0.29	<0.05	<0.001	<0.001	0.017	0.007	0.002	<0.001	<0.005	<0.005
12 Dec 2023	S4	EM2322268	-	-	-	-	-	-	-	-	-	-	-	-
01 Aug 2016	S6	EM1609083	-	-	-	-	-	-	-	-	-	-	-	-
23 Nov 2016	S6	EM1614219	-	-	-	-	-	-	-	-	-	-	-	-
27 Feb 2017	S6	EM1702198	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2017	S6	EM1707805	-	<0.001	-	-	-	<0.001	-	-	-	<0.001	-	<0.005
11 Sep 2017	S6	EM1712490	-	<0.001	-	-	-	<0.001	-	0.004	-	<0.001	-	<0.005
13 Dec 2017	S6	EM1717302	-	0.001	-	-	-	<0.001	-	0.029	-	<0.001	-	0.006
20 Mar 2018	S6	EM1804934	-	0.018	-	<0.05	-	0.001	-	0.006	-	0.003	-	0.031
25 Jun 2018	S6	EM1810261	-	-	-	-	-	-	-	-	-	-	-	-
18 Sep 2018	S6	EM1815239	<0.001	0.022	0.36	<0.05	<0.001	0.002	0.027	0.013	0.001	0.005	<0.005	0.027
12 Dec 2018	S6	EM1820185	-	-	-	-	-	-	-	-	-	-	-	-
26 Jun 2019	S6	EM1910172	-	-	-	-	-	-	-	-	-	-	-	-
24 Mar 2020	S6	EM2005146	<0.001	0.012	0.06	<0.05	<0.001	<0.001	0.004	0.005	<0.001	0.012	<0.005	0.061
16 Jun 2020	S6	EM2010246	-	-	-	-	-	-	-	-	-	-	-	-
28 Sep 2020	S6	EM2017090	<0.001	<0.001	0.38	0.12	<0.001	<0.001	0.011	0.008	0.002	0.001	<0.005	<0.005
07 Dec 2020	S6	EM2021896	-	-	-	-	-	-	-	-	-	-	-	-
22 Mar 2021	S6	EM2104983	<0.001	0.004	0.06	<0.05	<0.001	<0.001	0.005	0.004	<0.001	<0.001	<0.005	<0.005
28 Sep 2021	S6	EM2119193	<0.001	<0.001	0.08	<0.05	<0.001	<0.001	0.006	0.002	<0.001	<0.001	<0.005	<0.005
06 Dec 2021	S6	EM2124670	-	-	-	-	-	-	-	-	-	-	-	-
29 Mar 2022	S6	EM2205592	<0.001	<0.001	-	-	<0.001	<0.001	-	-	<0.001	<0.001	<0.005	<0.005
07 Jun 2022	S6	EM2210920-AA	-	-	-	-	-	-	-	-	-	-	-	-
27 Sep 2022	S6	EM2218964	<0.001	<0.001	0.24	0.06	<0.001	<0.001	0.020	0.013	0.001	0.001	<0.005	<0.005
14 Dec 2022	S6	EM2225250	-	-	-	-	-	-	-	-	-	-	-	-
27 Mar 2023	S6	EM2305513	<0.001	<0.001	0.11	<0.05	<0.001	<0.001	0.017	0.010	<0.001	<0.001	<0.005	<0.005
29 Jun 2023	S6	EM2311855	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023	S6	EM2316156	<0.001	<0.001	0.12	<0.05	<0.001	<0.001	0.009	0.007	0.001	<0.001	0.006	<0.005
12 Dec 2023	S6	EM2322268	-	-	-	-	-	-	-	-	-	-	-	-
02 Aug 2016	S7	EM1609083	-	-	-	-	-	-	-	-	-	-	-	-
23 Nov 2016	S7	EM1614219	-	-	-	-	-	-	-	-	-	-	-	-
27 Feb 2017	S7	EM1702198	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2017	S7	EM1707805	-	0.001	-	-	-	<0.001	-	-	-	0.009	-	0.005
12 Sep 2017	S7	EM1712490	-	0.001	-	-	-	<0.001	-	0.226	-	0.004	-	<0.005
25 Jun 2018	S7	EM1810261	-	-	-	-	-	-	-	-	-	-	-	-
19 Sep 2018	S7	EM1815239	0.029	-	6.91	-	0.016	-	0.274	-	0.016	-	0.076	-
10 Sep 2019	S7	EM1915222	0.050	0.038	10.7	1.72	0.016	0.003	0.245	0.076	0.025	0.022	0.128	0.068
16 Jun 2020	S7	EM2010246	-	-	-	-	-	-	-	-	-	-	-	-
30 Sep 2020	S7	EM2017163	0.042	0.147	7.02	3.47	0.010	0.004	0.625	0.526	0.030	0.034	0.144	0.245
22 Jun 2021	S7	EM2111910	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2021	S7	EM2119454	0.031	0.016	8.36	0.57	0.010	<0.001	0.298	0.160	0.025	0.018	0.083	0.027
07 Jun 2022	S7	EM2210920-AA	-	-	-	-	-	-	-	-	-	-	-	-

Table 4 - Historical Surface Water

			Copper	Copper (filtered)	Iron	Iron (filtered)	Lead	Lead (filtered)	Manganese	Manganese (filtered)	Nickel	Nickel (filtered)	Zinc	Zinc (filtered)
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			0.001	0.001	0.05	0.05	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005
ADWG 2011 Recreational (v3.7 updated 2022)			**20**	**20**			**0.1**	**0.1**	**5**	**5**	**0.2**	**0.2**		
ANZG (2018) - FW - 95% (updated 26 July 2021)			0.0014	0.0014			0.0034	0.0034	1.9	1.9	0.011	0.011	0.008	0.008
ANZECC 2000 - Stock Watering			1	1			0.1	0.1			1	1	20	20
ANZECC 2000 Irrigation - Long-term Trigger Values			0.2	0.2	0.2	0.2	2	2	0.2	0.2	0.2	0.2	2	2
ANZECC 2000 Irrigation - Short-term Trigger Values			5	5	10	10	5	5	10	10	2	2	5	5
Date	**Field ID**	**Lab Report Number**												
26 Sep 2022	S7	EM2218842	0.021	0.016	7.70	2.83	0.009	0.004	0.316	0.199	0.018	0.015	0.080	0.026
05 Sep 2023	S7	EM2316088	0.002	0.002	10.1	1.60	0.009	<0.001	1.01	0.756	0.022	0.017	0.075	0.007
02 Aug 2016	S8	EM1609083	-	-	-	-	-	-	-	-	-	-	-	-
23 Nov 2016	S8	EM1614219	-	-	-	-	-	-	-	-	-	-	-	-
02 Aug 2016	S9	EM1609083	-	-	-	-	-	-	-	-	-	-	-	-
23 Nov 2016	S9	EM1614219	-	-	-	-	-	-	-	-	-	-	-	-
27 Feb 2017	S9	EM1702198	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2017	S9	EM1707805	-	<0.001	-	-	-	<0.001	-	-	-	<0.001	-	<0.005
12 Sep 2017	S9	EM1712490	-	<0.001	-	-	-	<0.001	-	0.006	-	<0.001	-	0.012
13 Dec 2017	S9	EM1717302	-	0.002	-	-	-	0.016	-	0.042	-	<0.001	-	0.024
21 Mar 2018	S9	EM1805110	-	0.019	-	-	-	0.001	-	0.007	-	0.006	-	0.036
25 Jun 2018	S9	EM1810261	-	-	-	-	-	-	-	-	-	-	-	-
18 Sep 2018	S9	EM1815239	<0.001	0.023	0.21	<0.05	0.006	0.003	0.022	0.013	<0.001	0.004	<0.005	0.030
12 Dec 2018	S9	EM1820185	-	-	-	-	-	-	-	-	-	-	-	-
18 Mar 2019	S9	EM1904168	<0.001	0.009	0.10	<0.05	<0.001	<0.001	0.008	0.005	0.001	0.004	<0.005	0.050
26 Jun 2019	S9	EM1910172	-	-	-	-	-	-	-	-	-	-	-	-
23 Mar 2020	S9	EM2005146	<0.001	0.022	0.07	<0.05	<0.001	0.001	0.009	0.010	<0.001	0.014	<0.005	0.078
16 Jun 2020	S9	EM2010246	-	-	-	-	-	-	-	-	-	-	-	-
07 Dec 2020	S9	EM2021896	-	-	-	-	-	-	-	-	-	-	-	-
27 Sep 2021	S9	EM2119193	<0.001	<0.001	0.10	<0.05	<0.001	<0.001	0.009	0.004	<0.001	<0.001	<0.005	<0.005
06 Dec 2021	S9	EM2124670	-	-	-	-	-	-	-	-	-	-	-	-
28 Mar 2022	S9	EM2205592	<0.001	<0.001	-	-	<0.001	<0.001	-	-	<0.001	<0.001	<0.005	<0.005
07 Jun 2022	S9	EM2210920-AA	-	-	-	-	-	-	-	-	-	-	-	-
26 Sep 2022	S9	EM2218842	<0.001	<0.001	0.58	<0.05	<0.001	<0.001	0.032	0.009	0.002	<0.001	<0.005	<0.005
27 Mar 2023	S9	EM2305513	<0.001	<0.001	0.27	<0.05	<0.001	<0.001	0.025	0.009	0.002	<0.001	<0.005	<0.005
29 Jun 2023	S9	EM2311855	-	-	-	-	-	-	-	-	-	-	-	-
04 Sep 2023	S9	EM2316088	<0.001	<0.001	0.28	<0.05	<0.001	<0.001	0.024	0.008	0.002	<0.001	<0.005	<0.005

Table 5 - Landfill Leachate 2023

			Misc.	NA	Inorganics		Cyanide	Acidity & Alkalinity				Major Ions									Minor Ions	
			Naphthalene (value used in F2 calc)	Phosphorus reactive (as P)	Total Dissolved Solids	Total Suspended Solids	Cyanide (Total)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)	Chloride	Sulfate (filtered)	Cations Total	Anions Total	Ionic Balance	Thiosulfate as S2O3 2-	Sulfide
			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
EQL			0.005	0.01	10	5	0.004	1	1	1	1	1	1	1	1	1	1	0.01	0.01	0.01	2	0.1
ADWG 2011 Recreational (v3.7 updated 2022)							**0.8**										**5,000**					
ANZG (2018) - FW - 95% (updated 26 July 2021)							0.007															
ANZECC 2000 - Stock Watering					5,000							1,000					1,000					
ANZECC 2000 Irrigation - Long-term Trigger Values																350						
ANZECC 2000 Irrigation - Short-term Trigger Values																						
Date	**Field ID**	**Lab Report Number**																				
30 Mar 2023	Landfill leachate	EM2305604	<0.005	12.5	7,460	201	<0.004	197	5,140	<1	5,340	46	32	534	915	2,120	98	157	168	3.68	<100	<0.5
29 Jun 2023		EM2311710	<0.005	6.84	5,940	204	<0.020	<1	3,590	<1	3,590	117	53	480	874	1,490	145	102	117	6.96	<40	0.1
19 Jul 2023		EM2313106	-	-	5,230	505	-	-	-	-	-	64	39	377	1,000	-	51	-	-	-	<20	<0.1
16 Aug 2023		EM2314818	-	-	10,800	825	-	-	-	-	-	104	74	772	1,830	-	117	-	-	-	<100	<2.0
06 Sep 2023		EM2316162	<0.005	4.05	2,750	4,410	0.005	<1	1,620	<1	1,620	38	24	188	489	786	33	54.1	55.2	1.06	<20	<0.5
24 Oct 2023		EM2319274	-	-	13,000	1,640	-	-	-	-	-	648	324	782	1,450	-	662	-	-	-	<40	33.8
08 Nov 2023		EM2319935	-	-	65	<5	-	-	-	-	-	8	4	1	9	-	3	-	-	-	<2	<0.1
28 Nov 2023		EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
12 Dec 2023		EM2322269	<0.005	16.8	10,400	34	0.027	310	7,260	<1	7,570	79	67	964	2,090	3,380	26	244	247	0.75	<20	13.2

Table 5 - Landfill Leachate 2023

			Nutrients								Organic Indicators									
			Ammonia as N	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)	Kjeldahl Nitrogen Total	Phosphorus (Total)	Sulfite as SO3-	Sulfur (Total Oxidised as SO4)	BOD	Dissolved Organic Carbon	Aluminium	Aluminium (filtered)	Arsenic	Arsenic (filtered)	Cadmium	Cadmium (filtered)	Chromium (III+VI)	Chromium (III+VI) (filtered)	Copper
			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
EQL			0.01	0.01	0.01	0.01	0.1	0.1	0.01	2	10	2	1	0.01	0.01	0.001	0.001	0.0001	0.0001	0.001	0.001	0.001
ADWG 2011 Recreational (v3.7 updated 2022)				**112.9**	**9.1**											**0.1**	**0.1**	**0.02**	**0.02**			**20**
ANZG (2018) - FW - 95% (updated 26 July 2021)			0.9	2.4										0.055	0.055	0.013	0.013	0.0002	0.0002	0.001	0.001	0.0014
ANZECC 2000 - Stock Watering				90	9.1									5	5	0.5	0.5	0.01	0.01	1	1	1
ANZECC 2000 Irrigation - Long-term Trigger Values							5		0.05					5	5	0.1	0.1	0.01	0.01	0.1	0.1	0.2
ANZECC 2000 Irrigation - Short-term Trigger Values							25		0.8					20	20	2	2	0.05	0.05	1	1	5
Date	**Field ID**	**Lab Report Number**																				
30 Mar 2023	Landfill leachate	EM2305604	1,370	6.64	0.06	6.70	1,380	1,370	16.6	<100	<100	119	573	4.55	1.16	**0.175**	0.090	<0.0010	0.0002	1.01	0.536	0.033
29 Jun 2023		EM2311710	576	<0.05	<0.05	0.03	1,020	1,020	12.8	<40	<100	795	895	2.00	0.78	0.072	0.060	0.0005	0.0002	0.435	0.200	0.022
19 Jul 2023		EM2313106	490	-	-	0.11	567	567	5.22	<20	<100	678	-	-	-	-	-	-	-	-	-	-
16 Aug 2023		EM2314818	1,100	-	-	0.37	1,220	1,220	9.66	<100	60	734	-	-	-	-	-	-	-	-	-	-
06 Sep 2023		EM2316162	338	0.05	<0.02	0.05	474	474	12.1	<20	<100	1,180	286	3.74	0.50	0.037	0.036	0.0002	<0.0001	0.207	0.114	0.436
24 Oct 2023		EM2319274	1,150	-	-	0.11	1,380	1,380	17.8	<40	320	8,320	-	-	-	-	-	-	-	-	-	-
08 Nov 2023		EM2319935	0.06	-	-	0.15	0.4	0.2	0.04	<2	<100	3	-	-	-	-	-	-	-	-	-	-
28 Nov 2023		EM2321393	0.02	-	-	<0.01	0.1	0.1	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023		EM2322269	1,660	0.38	<0.02	0.38	2,020	2,020	18.9	<20	<100	173	1,480	3.69	2.24	**0.193**	**0.203**	<0.0010	0.0002	1.06	0.969	0.034

Table 5 - Landfill Leachate 2023

			Metals														BTEXN				
			Copper (filtered)	Iron	Iron (filtered)	Lead	Lead (filtered)	Manganese	Manganese (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	Selenium	Selenium (filtered)	Zinc	Zinc (filtered)	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)
			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
EQL			0.001	0.05	0.05	0.001	0.001	0.001	0.001	0.0001	0.0001	0.001	0.001	0.01	0.01	0.005	0.005	1	2	2	2	2
ADWG 2011 Recreational (v3.7 updated 2022)			**20**			**0.1**	**0.1**	**5**	**5**	**0.01**	**0.01**	**0.2**	**0.2**	**0.1**	**0.1**			**10**	**8,000**	**3,000**		
ANZG (2018) - FW - 95% (updated 26 July 2021)			0.0014			0.0034	0.0034	1.9	1.9	0.0006	0.0006	0.011	0.011	0.011	0.011	0.008	0.008	950	180	80	350	
ANZECC 2000 - Stock Watering			1			0.1	0.1			0.002	0.002	1	1	0.02	0.02	20	20					
ANZECC 2000 Irrigation - Long-term Trigger Values			0.2	0.2	0.2	2	2	0.2	0.2	0.002	0.002	0.2	0.2	0.02	0.02	2	2					
ANZECC 2000 Irrigation - Short-term Trigger Values			5	10	10	5	5	10	10	0.002	0.002	2	2	0.05	0.05	5	5					
Date	**Field ID**	**Lab Report Number**																				
30 Mar 2023	Landfill leachate	EM2305604	0.017	12.4	5.19	0.029	0.008	0.430	0.171	<0.0010	<0.0001	**0.224**	0.109	<0.10	<0.01	0.323	0.164	<1	<2	<2	2	4
29 Jun 2023		EM2311710	0.004	12.1	5.00	0.024	0.003	0.860	0.725	<0.0005	<0.0001	0.113	0.098	<0.01	<0.01	0.270	0.099	<1	14	4	8	14
19 Jul 2023		EM2313106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023		EM2314818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023		EM2316162	0.056	7.42	2.36	0.018	0.005	0.341	0.294	<0.0001	<0.0001	0.047	0.043	<0.01	<0.01	0.341	0.082	3	16	6	22	42
24 Oct 2023		EM2319274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023		EM2319935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023		EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023		EM2322269	0.014	9.74	5.06	0.022	0.007	0.525	0.449	<0.0010	<0.0010	**0.236**	**0.209**	<0.10	<0.01	0.580	0.367	<1	<2	<2	2	4

						TRH - NEPM 2013							TRH - NEPM 2013 - SG Cleanup					TRH - NEPM 1999				
			Xylene Total	BTEX (Sum of Total) - Lab Calc	Naphthalene	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)	F2 (>C10-C16 minus Naphthalene) SG Cleanup	>C10-C16 SG Cleanup	>C16-C34 SG Cleanup	>C34-C40 SG Cleanup	>C10-C40 (sum) SG Cleanup	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	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			2	1	2	20	20	100	100	100	100	100	100	100	100	100	100	20	50	100	50	50
ADWG 2011 Recreational (v3.7 updated 2022)			**6,000**																			
ANZG (2018) - FW - 95% (updated 26 July 2021)					16																	
ANZECC 2000 - Stock Watering																						
ANZECC 2000 Irrigation - Long-term Trigger Values																						
ANZECC 2000 Irrigation - Short-term Trigger Values																						
Date	**Field ID**	**Lab Report Number**																				
30 Mar 2023	Landfill leachate	EM2305604	6	6	<2	30	40	1,420	1,420	3,050	<100	4,470	-	120	180	<100	300	70	1,030	3,320	200	4,550
29 Jun 2023		EM2311710	22	40	<2	150	190	1,520	1,520	2,160	170	3,850	-	<100	<100	<100	<100	200	1,220	2,320	330	3,870
19 Jul 2023		EM2313106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023		EM2314818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023		EM2316162	64	89	<8	100	190	1,680	1,680	33,600	600	35,900	100	100	810	190	1,100	200	1,040	32,400	2,660	36,100
24 Oct 2023		EM2319274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023		EM2319935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023		EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023		EM2322269	6	6	<2	90	100	3,340	3,340	7,660	860	11,900	<100	<100	2,180	660	2,840	120	2,840	7,080	1,910	11,800

			TRH - NEPM 1999 - SG Cleanup				TPH	PAHs - standard 16														
			C10-C14 SG Cleanup	C15-C28	C29-C36 SG Cleanup	C10-C36 (sum) SG Cleanup	Oil & Grease	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	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	µg/L	µg/L	µg/L
EQL			50	100	50	50	5,000	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
ADWG 2011 Recreational (v3.7 updated 2022)												**0.1**										
ANZG (2018) - FW - 95% (updated 26 July 2021)										0.4		0.2				1.4			2			
ANZECC 2000 - Stock Watering																						
ANZECC 2000 Irrigation - Long-term Trigger Values																						
ANZECC 2000 Irrigation - Short-term Trigger Values																						
Date	**Field ID**	**Lab Report Number**																				
30 Mar 2023	Landfill leachate	EM2305604	110	160	60	330	10,000	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
29 Jun 2023		EM2311710	<50	<100	<50	<50	<5,000	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<3	<3
19 Jul 2023		EM2313106	-	-	-	-	<5,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023		EM2314818	-	-	-	-	181,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023		EM2316162	<50	540	410	950	90,000	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<9	<9
24 Oct 2023		EM2319274	-	-	-	-	142,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023		EM2319935	-	-	-	-	<5,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023		EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023		EM2322269	<50	1,220	1,290	2,510	15,000	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2

			PAHs - extended				Phenols - Halogenated							Phenols - Non-Halogenated								
			2-methylnaphthalene	3-methylcholanthrene	7,12-dimethylbenz(a)anthracene	Benzo(b+j+k)fluoranthene	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	4,4'-DDE	a-BHC	Aldrin	Aldrin + Dieldrin
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			2	2	2	4	2	2	2	2	2	2	4	2	2	2	4	2	0.5	0.5	0.5	0.5
ADWG 2011 Recreational (v3.7 updated 2022)							**3,000**	**2,000**		**200**			**100**									**3**
ANZG (2018) - FW - 95% (updated 26 July 2021)							490	160		20			10	320								
ANZECC 2000 - Stock Watering																						
ANZECC 2000 Irrigation - Long-term Trigger Values																						
ANZECC 2000 Irrigation - Short-term Trigger Values																						
Date	**Field ID**	**Lab Report Number**																				
30 Mar 2023	Landfill leachate	EM2305604	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<4	<2	<2	24	<4	<2	<0.5	<0.5	<0.5	<0.5
29 Jun 2023		EM2311710	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<4	50	<2	10	112	<2	<0.5	<0.5	<0.5	<0.5
19 Jul 2023		EM2313106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023		EM2314818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023		EM2316162	<8	<8	<8	<15	<8	<8	<8	<8	<8	<8	<8	<8	<8	10	9	<8	<0.5	<0.5	<0.5	<0.5
24 Oct 2023		EM2319274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023		EM2319935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023		EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023		EM2322269	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<4	80	<2	46	109	<2	<0.5	<0.5	<0.5	<0.5

Table 5 - Landfill Leachate 2023

			OC Pesticides																		
			b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	4,4 DDD	4,4 DDT	DDT+DDE+DDD - Lab Calc	Dieldrin	Endosulfan I (alpha)	Endosulfan II (beta)	Endosulfan Sulfate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			0.5	0.5	0.5	0.5	0.5	0.5	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2
ADWG 2011 Recreational (v3.7 updated 2022)				**20**				**90**										**100**	**3**			**3,000**
ANZG (2018) - FW - 95% (updated 26 July 2021)				0.08					0.01						0.02			0.2	0.09		0.1	
ANZECC 2000 - Stock Watering																						
ANZECC 2000 Irrigation - Long-term Trigger Values																						
ANZECC 2000 Irrigation - Short-term Trigger Values																						
Date	**Field ID**	**Lab Report Number**																				
30 Mar 2023	Landfill leachate	EM2305604	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0
29 Jun 2023		EM2311710	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0
19 Jul 2023		EM2313106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023		EM2314818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023		EM2316162	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0
24 Oct 2023		EM2319274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023		EM2319935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023		EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023		EM2322269	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0

			OP Pesticides																		Pesticides
			Azinphos methyl	Bromophos-ethyl	Carbophenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenamiphos	Fenthion	Malathion	Methyl parathion	Monocrotophos	Parathion	Pirimiphos-ethyl	Prothiofos	4-Chlorophenoxy acetic acid
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2	2	2	0.5	0.5	10
ADWG 2011 Recreational (v3.7 updated 2022)			**300**	**100**	**5**	**20**	**100**			**40**	**50**	**70**	**40**	**5**	**70**	**700**	**7**	**20**	**200**	**5**		
ANZG (2018) - FW - 95% (updated 26 July 2021)			0.02				0.01			0.01		0.15				0.05			0.004			
ANZECC 2000 - Stock Watering																						
ANZECC 2000 Irrigation - Long-term Trigger Values																						
ANZECC 2000 Irrigation - Short-term Trigger Values																						
Date	**Field ID**	**Lab Report Number**																				
30 Mar 2023	Landfill leachate	EM2305604	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5	<10
29 Jun 2023		EM2311710	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5	<10
19 Jul 2023		EM2313106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023		EM2314818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023		EM2316162	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5	<10
24 Oct 2023		EM2319274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023		EM2319935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023		EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023		EM2322269	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5	<10

			Chlorinated Hydrocarbons																			
			1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,2,4-trichlorobenzene	1,2-dibromo-3-chloropropane	1,2-dichlorobenzene	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	1,4-dichlorobenzene	2,2-dichloropropane	2-chloronaphthalene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Carbon tetrachloride	Chlorobenzene
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			5	5	5	5	5	5	2	5	2	5	5	5	2	5	2	5	5	5	5	5
ADWG 2011 Recreational (v3.7 updated 2022)							**300**				**15,000**	**30**			**400**						**30**	**3,000**
ANZG (2018) - FW - 95% (updated 26 July 2021)				270	400	6,500	700		170		160	1,900	1,100		60						240	55
ANZECC 2000 - Stock Watering																						
ANZECC 2000 Irrigation - Long-term Trigger Values																						
ANZECC 2000 Irrigation - Short-term Trigger Values																						
Date	**Field ID**	**Lab Report Number**																				
30 Mar 2023	Landfill leachate	EM2305604	<5	<5	<5	<5	<5	<5	<2	<5	<2	<5	<5	<5	<2	<5	<2	<5	<5	<5	<5	<5
29 Jun 2023		EM2311710	<5	<5	<5	<5	<5	<5	<2	<5	<2	<5	<5	<5	<2	<5	<2	<5	<5	<5	<5	<5
19 Jul 2023		EM2313106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023		EM2314818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023		EM2316162	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<8	<5	<5	<5	<5	<5
24 Oct 2023		EM2319274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023		EM2319935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023		EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023		EM2322269	<5	<5	<5	<5	<5	<5	<2	<5	<2	<5	<5	<5	<2	<5	<2	<5	<5	<5	<5	<5

Table 5 - Landfill Leachate 2023

Dulverton Regional Waste Management Authority

Dulverton Environmental Monitoring

							Explosives				Halogenated										Herbicides	
			Chloroform	Chloromethane	cis-1,2-dichloroethene	Hexachlorobutadiene	Vinyl chloride	1,3,5-Trinitrobenzene	2,4-Dinitrotoluene	2,6-dinitrotoluene	Nitrobenzene	Bromomethane	Dichlorodifluoromethane	2,6-D	2,4,5-T	2,4,5-TP (Silvex)	2,4-D (Hedonal)	2,4-DP (dichlorprop)	2,4,6-Trichlorophenoxy-acetic acid	4-(2,4-Dichlorophenoxy)butyric Acid (2,4-DB)	Clopyralid	Dicamba
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			5	50	5	2	50	2	4	4	2	50	50	10	10	10	10	10	10	10	10	10
ADWG 2011 Recreational (v3.7 updated 2022)						**7**	**3**					**10**			**1,000**	**100**	**300**	**1,000**			**20,000**	**1,000**
ANZG (2018) - FW - 95% (updated 26 July 2021)			770				100		65		550				36		280					
ANZECC 2000 - Stock Watering																						
ANZECC 2000 Irrigation - Long-term Trigger Values																						
ANZECC 2000 Irrigation - Short-term Trigger Values																						
Date	**Field ID**	**Lab Report Number**																				
30 Mar 2023	Landfill leachate	EM2305604	<5	<50	<5	<2	<50	<2	<4	<4	<2	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10
29 Jun 2023		EM2311710	<5	<50	<5	<2	<50	<2	<4	<4	<2	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10
19 Jul 2023		EM2313106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023		EM2314818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023		EM2316162	<5	<50	<5	<5	<50	<8	<8	<8	<8	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10
24 Oct 2023		EM2319274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023		EM2319935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023		EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023		EM2322269	<5	<50	<5	<2	<50	<2	<4	<4	<2	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10

Table 5 - Landfill Leachate 2023

									Nitroaromatics and Keytones					Solvents	PCBs	Phthalates					
			Fluroxypyr	MCPA	MCPB	Mecoprop	Picloram	Pronamide	Triclopyr	2-Picoline	4-aminobiphenyl	Acetophenone	N-Nitrosodiphenyl & Diphenylamine	Pentachloronitrobenzene	Isophorone	PCBs (Total)	Bis(2-ethylhexyl) phthalate	Butyl benzyl phthalate	Diethylphthalate	Dimethyl phthalate	Di-n-butyl phthalate	Di-n-octyl phthalate
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			10	10	10	10	10	2	10	2	2	2	4	2	2	1	10	2	2	2	2	2
ADWG 2011 Recreational (v3.7 updated 2022)				**400**			**3,000**	**700**	**200**					**300**			**100**					
ANZG (2018) - FW - 95% (updated 26 July 2021)																			1,000	3,700	26	
ANZECC 2000 - Stock Watering																						
ANZECC 2000 Irrigation - Long-term Trigger Values																						
ANZECC 2000 Irrigation - Short-term Trigger Values																						
Date	**Field ID**	**Lab Report Number**																				
30 Mar 2023	Landfill leachate	EM2305604	<10	<10	<10	<10	<10	<2	<10	4	<2	<2	<4	<2	<2	<1	<10	<2	<2	<2	<2	<2
29 Jun 2023		EM2311710	<10	<10	<10	<10	<10	<2	<10	<2	<2	<2	<4	<2	<2	<1	<10	<2	<2	<2	<2	<2
19 Jul 2023		EM2313106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023		EM2314818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023		EM2316162	<10	<10	<10	<10	<10	<8	<10	<8	<8	<8	<8	<8	<8	<1	<20	<8	<8	<8	<8	<8
24 Oct 2023		EM2319274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023		EM2319935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023		EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023		EM2322269	<10	<10	<10	<10	<10	<2	<10	8	<2	<8	<4	<2	<2	<1	12	<2	<2	<2	<2	<2

			Surfactants	SVOCs																	
			Anionic Surfactants as MBAS	1-naphthylamine	2-(acetylamino) fluorene	2-nitroaniline	3,3-Dichlorobenzidine	3-nitroaniline	4-(dimethylamino) azobenzene	4-bromophenyl phenyl ether	4-chloroaniline	4-chlorophenyl phenyl ether	4-nitroaniline	4-Nitroquinoline-N-oxide	5-nitro-o-toluidine	Aniline	Azobenzene	Bis(2-chloroethoxy) methane	Bis(2-chloroethyl)ether	Carbazole	Chlorobenziate	Dibenzofuran
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			50	2	2	4	2	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2
ADWG 2011 Recreational (v3.7 updated 2022)																						
ANZG (2018) - FW - 95% (updated 26 July 2021)																250						
ANZECC 2000 - Stock Watering																						
ANZECC 2000 Irrigation - Long-term Trigger Values																						
ANZECC 2000 Irrigation - Short-term Trigger Values																						
Date	**Field ID**	**Lab Report Number**																				
30 Mar 2023	Landfill leachate	EM2305604	2,100	<2	<2	<4	<2	<4	<2	<2	<2	<2	<2	<2	<2	31	<2	<2	<2	<2	<2	<2
29 Jun 2023		EM2311710	600	<2	<2	<4	<2	<4	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
19 Jul 2023		EM2313106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023		EM2314818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023		EM2316162	<500	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8
24 Oct 2023		EM2319274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023		EM2319935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023		EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023		EM2322269	3,700	<2	<2	<4	<2	<4	<2	<2	<2	<2	<2	<2	<2	48	<2	<2	<2	<2	<2	<2

			Hexachlorocyclopentadiene	Hexachloroethane	Hexachloropropene	Methapyrilene	N-nitrosodiethylamine	N-nitrosodi-n-butylamine	N-nitrosodi-n-propylamine	N-Nitrosomethylethylamine	N-nitrosomorpholine	N-nitrosopiperidine	N-nitrosopyrrolidine	Pentachlorobenzene	Phenacetin	1,1-dichloroethane	1,2,3-trichlorobenzene	1,2,3-trichloropropane	1,2-dibromoethane	1,3-dichlorobenzene	Acetone	Bromodichloromethane
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			10	2	2	2	2	2	2	2	2	2	4	2	2	5	5	5	5	2	50	5
ADWG 2011 Recreational (v3.7 updated 2022)																			**10**			
ANZG (2018) - FW - 95% (updated 26 July 2021)				360										2			10			260		
ANZECC 2000 - Stock Watering																						
ANZECC 2000 Irrigation - Long-term Trigger Values																						
ANZECC 2000 Irrigation - Short-term Trigger Values																						
Date	**Field ID**	**Lab Report Number**																				
30 Mar 2023	Landfill leachate	EM2305604	<10	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<5	<5	<5	<5	<2	110	<5
29 Jun 2023		EM2311710	<10	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<5	<5	<5	<5	<2	400	<5
19 Jul 2023		EM2313106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023		EM2314818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023		EM2316162	<10	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<5	<5	<5	<5	<5	180	<5
24 Oct 2023		EM2319274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023		EM2319935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023		EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023		EM2322269	<10	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<5	<5	<5	<5	<2	1,240	<5

Table 5 - Landfill Leachate 2023

			VOCs													
			Bromoform	Chlorodibromomethane	Chloroethane	cis-1,3-dichloropropene	cis-1,4-Dichloro-2-butene	Dibromomethane	Formaldehyde	Iodomethane	Pentachloroethane	Trichloroethene	Tetrachloroethene	trans-1,3-dichloropropene	trans-1,2-dichloroethene	trans-1,4-Dichloro-2-butene	Trichlorofluoromethane
			µg/L	µg/L	µg/L	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			5	5	50	5	5	5	100	5	5	5	5	5	5	5	50
ADWG 2011 Recreational (v3.7 updated 2022)									**5,000**				**500**				
ANZG (2018) - FW - 95% (updated 26 July 2021)											80	330	70				
ANZECC 2000 - Stock Watering																	
ANZECC 2000 Irrigation - Long-term Trigger Values																	
ANZECC 2000 Irrigation - Short-term Trigger Values																	
Date	**Field ID**	**Lab Report Number**															
30 Mar 2023	Landfill leachate	EM2305604	<5	<5	<50	<5	<5	<5	<2,000	<5	<5	<5	<5	<5	<5	<5	<50
29 Jun 2023		EM2311710	<5	<5	<50	<5	<5	<5	4,900	<5	<5	<5	<5	<5	<5	<5	<50
19 Jul 2023		EM2313106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023		EM2314818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023		EM2316162	<5	<5	<50	<5	<5	<5	2,000	<5	<5	<5	<5	<5	<5	<5	<50
24 Oct 2023		EM2319274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023		EM2319935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023		EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023		EM2322269	<5	<5	<50	<5	<5	<5	<100	<5	<5	<5	<5	<5	<5	<5	<50

Table 6 - Historical Landfill Leachate

			Misc.					Cyanide	Acidity & Alkalinity																	
			Naphthalene (value used in F2 calc)	Phosphorus reactive (as P)	Total Dissolved Solids	Total Suspended Solids	COD	Cyanide (Total)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)	Chloride	Sulfate (filtered)	Cations Total	Anions Total	Ionic Balance	Thiosulfate as S2O3 2-	Sulfide	Ammonia as N	Nitrate (as N)
			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
EQL			0.005	0.01	10	5	10	0.004	1	1	1	1	1	1	1	1	1	1	0.01	0.01	0.01	2	0.1	0.01	0.01
ADWG 2011 Recreational (v3.7 updated 2022)								**0.8**										**5,000**							**112.9**
ANZG (2018) - FW - 95% (updated 26 July 2021)								0.007																0.9	2.4
ANZECC 2000 - Stock Watering					5,000								1,000					1,000							90
ANZECC 2000 Irrigation - Long-term Trigger Values																	350								
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
10 Sep 2013	LEACHATE POND 2	EM1309644	-	-	4,870	482	2,860	-	-	-	-	-	-	-	-	-	1,360	-	-	-	-	-	5	306	<0.01
10 Sep 2013	POND 1	EM1309643	-	-	4,170	205	1,930	-	-	-	-	-	-	-	-	-	1,270	-	-	-	-	-	6	216	<0.01
18 Nov 2013	Landfill leachate (quarterly)	EM1312183	-	-	3,290	189	788	-	-	-	-	-	-	-	-	-	1,210	-	-	-	-	-	3.2	141	0.02
04 Mar 2014	Landfill leachate (quarterly)	EM1401975	-	-	4,920	194	938	-	-	-	-	-	-	-	-	-	2,200	-	-	-	-	-	<0.1	52.7	<0.01
02 Jun 2014	Landfill leachate (quarterly)	EM1405379	-	-	-	-	1,260	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	236	-
17 Jun 2014	Landfill leachate (quarterly)	EM1405379	-	-	8,050	285	-	-	-	-	-	-	-	-	-	-	3,410	-	-	-	-	-	-	-	0.08
02 Sep 2014	Landfill leachate (quarterly)	EM1408979	-	-	6,070	76	2,020	-	-	-	-	-	-	-	-	-	2,510	-	-	-	-	-	12.8	683	0.27
01 Jun 2015	Landfill leachate (quarterly)	EM1510467	-	-	5,660	104	1,490	-	-	-	-	-	-	-	-	-	1,800	-	-	-	-	-	1	451	0.63
27 Jun 2016	Landfill leachate (quarterly)	EM1607483	-	-	-	-	-	-	-	-	-	-	146	36	-	525	-	138	-	-	-	-	-	-	-
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	-	-	-	84	1,380	-	-	-	-	-	118	34	-	596	909	9	-	-	-	-	7.2	250	<0.01
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	-	-	-	462	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jan 2017	Landfill leachate (quarterly)	EM1700066	-	-	-	-	-	-	-	-	-	-	103	36	-	717	-	81	-	-	-	-	-	-	-
09 Jan 2017	Weekly Leachate	EM1700104	-	-	-	82	-	-	-	-	-	-	-	-	-	633	-	68	-	-	-	25	18.0	180	0.01
18 Jan 2017	Weekly Leachate	EM1700551	-	-	-	83	-	-	-	-	-	-	-	-	-	752	-	66	-	-	-	32	8.8	158	<0.01
25 Jan 2017	Weekly Leachate	EM1700831	-	-	-	84	-	-	-	-	-	-	-	-	-	805	-	72	-	-	-	25	7.3	186	0.03
02 Feb 2017	Weekly Leachate	EM1701200	-	-	-	273	-	-	-	-	-	-	-	-	-	926	-	28	-	-	-	11	2.0	235	0.02
07 Feb 2017	Weekly Leachate	EM1701278	-	-	-	221	-	-	-	-	-	-	-	-	-	972	-	47	-	-	-	8	0.9	261	0.02
15 Feb 2017	Weekly Leachate	EM1701686	-	-	-	130	-	-	-	-	-	-	-	-	-	805	-	196	-	-	-	4	<0.1	218	0.02
20 Feb 2017	Weekly leachate	EM1701861	-	-	-	76	-	-	-	-	-	-	-	-	-	688	-	164	-	-	-	<2	<0.1	188	0.08
27 Feb 2017	Weekly leachate	EM1702391	-	-	-	243	-	-	-	-	-	-	-	-	-	828	-	199	-	-	-	3	<0.1	195	0.60
06 Mar 2017	DWM060317	EM1702567	-	-	-	84	-	-	-	-	-	-	-	-	-	708	-	223	-	-	-	6	<0.1	179	11.3
16 Mar 2017	DWM160317	EM1703065	-	-	-	261	-	-	-	-	-	-	-	-	-	1,000	-	228	-	-	-	<2	<0.1	183	11.0
23 Mar 2017	DWM230317	EM1703524	-	-	-	371	-	-	-	-	-	-	-	-	-	1,070	-	275	-	-	-	6	<0.1	241	**167**
30 Mar 2017	DWM300317	EM1703932	-	-	-	142	-	-	-	-	-	-	-	-	-	1,210	-	93	-	-	-	5	<0.1	249	43.0
03 Apr 2017	DWM030417	EM1704134	-	-	-	97	-	-	-	-	-	-	-	-	-	1,360	-	49	-	-	-	4	<0.1	304	14.8
10 Apr 2017	DWM100417	EM1704503	-	-	-	121	-	-	-	-	-	-	-	-	-	1,410	-	35	-	-	-	6	0.2	402	<0.01
20 Apr 2017	DWM200417	EM1705012	-	-	-	398	-	-	-	-	-	-	-	-	-	1,280	-	25	-	-	-	6	<0.1	412	0.13
03 May 2017	DWM030517	EM1705620	-	-	-	74	-	-	-	-	-	-	-	-	-	1,390	-	15	-	-	-	7	0.2	336	0.65
08 May 2017	Landfill leachate (quarterly)	EM1705724	-	-	-	40	2,050	-	253	2,350	<1	2,610	96	49	602	1,360	1,910	25	110	106	1.55	7	<0.1	372	<0.10
29 May 2017	Leachate	EM1706966	-	-	-	104	-	-	-	-	-	-	-	-	-	966	-	37	-	-	-	6	<0.1	327	0.74
05 Jun 2017	DWM050617	EM1707358	-	-	-	202	-	-	-	-	-	-	-	-	-	966	-	36	-	-	-	7	0.1	326	<0.01
14 Jun 2017	DWM140617	EM1707709	-	-	-	612	-	-	379	2,100	<1	2,480	48	25	476	1,070	1,610	18	90.1	95.3	2.85	6	<0.2	377	<0.10
19 Jun 2017	DWM190617	EM1707937	-	-	-	283	-	-	-	-	-	-	-	-	-	990	-	25	-	-	-	7	<0.1	323	<0.01
29 Jun 2017	DWM290617	EM1708550	-	-	-	535	-	-	-	-	-	-	-	-	-	1,070	-	4	-	-	-	6	<0.1	408	<0.20
06 Jul 2017	DWM060717	EM1708866	-	-	-	106	-	-	-	-	-	-	-	-	-	944	-	17	-	-	-	6	0.1	393	3.60
13 Jul 2017	DWM130717	EM1709240	-	-	-	177	-	-	-	-	-	-	-	-	-	1,170	-	82	-	-	-	4	<0.1	487	0.35
09 Aug 2017	DWM090817	EM1710633	-	-	-	83	-	-	-	-	-	-	-	-	-	913	-	5	-	-	-	7	<0.1	336	0.02
14 Aug 2017	DWM140817	EM1710836	-	-	-	75	-	-	-	-	-	-	-	-	-	821	-	5	-	-	-	7	0.3	410	0.02
21 Aug 2017	DWM210817	EM1711202	-	-	-	85	-	-	-	-	-	-	-	-	-	810	-	9	-	-	-	7	0.2	367	0.02
28 Aug 2017	Quarterly leachate samples	EM1711607	-	-	-	80	1,190	-	66	2,140	<1	2,200	40	21	322	734	1,160	10	75.5	76.9	0.91	6	0.5	443	<0.01
06 Sep 2017	DWM060917	EM1712174	-	-	-	855	-	-	-	-	-	-	-	-	-	711	-	66	-	-	-	4	0.2	296	<0.20
11 Sep 2017	DWM110917	EM1712414	-	-	-	170	-	-	-	-	-	-	-	-	-	2,010	-	68	-	-	-	6	<0.1	298	0.07
20 Sep 2017	DWM200917	EM1712965	-	-	-	65	-	-	-	-	-	-	-	-	-	889	-	5	-	-	-	6	0.5	446	<0.01
05 Oct 2017	DWM051017	EM1713718	-	-	-	96	-	-	-	-	-	-	-	-	-	850	-	7	-	-	-	11	12.2	458	<0.01
12 Oct 2017	DWM121017	EM1714085	-	-	-	100	-	-	-	-	-	-	-	-	-	827	-	7	-	-	-	18	3.1	392	0.01
16 Oct 2017	DWM161017	EM1714224	-	-	-	82	-	-	-	-	-	-	-	-	-	924	-	4	-	-	-	25	3.4	502	<0.01
25 Oct 2017	DWM251017	EM1714708	-	-	-	132	-	-	-	-	-	-	-	-	-	1,140	-	12	-	-	-	17	1.8	484	<0.01
31 Oct 2017	DWM311017	EM1714989	-	-	-	206	-	-	-	-	-	-	-	-	-	1,110	-	15	-	-	-	10	1.7	364	0.01
26 Apr 2018	DWM260418	EM1806971	-	-	8,870	179	-	-	-	-	-	-	-	-	-	1,680	-	<5	-	-	-	70	9.2	700	0.33
08 May 2018	DWM080518	EM1807569	-	-	10,600	590	-	-	-	-	-	-	-	-	-	2,080	-	18	-	-	-	56	6.4	1,210	0.34
04 Jun 2018	Weekly Leachate	EM1809069	-	-	9,460	55	-	-	-	-	-	-	-	-	-	1,970	-	9	-	-	-	28	4.1	881	0.44
14 Jun 2018	Weekly Leachate	EM1809582	-	-	4,870	81	-	-	-	-	-	-	-	-	-	1,030	-	<1	-	-	-	<2	0.4	532	0.05
20 Jun 2018	Weekly Leachate	EM1809922	-	-	3,500	28	-	-	-	-	-	-	-	-	-	764	-	69	-	-	-	<10	0.3	366	0.02
25 Jun 2018	Landfill Leachate	EM1810261	-	-	-	56	-	0.006	195	2,740	<1	2,930	36	17	386	876	1,470	93	95.5	102	3.28	-	-	621	0.02
02 Jul 2018	Filtered landfill leachate	EM1810597	-	-	-	2,420	-	-	-	-	-	-	-	-	-	1,200	-	567	-	-	-	<10	<0.1	556	0.06
02 Jul 2018	Weekly Leachate	EM1810596	-	-	5,200	47	-	-	-	-	-	-	-	-	-	1,140	-	<1	-	-	-	<10	0.1	624	0.03
11 Jul 2018	Weekly Leachate	EM1811134	-	-	3,590	72	-	-	-	-	-	-	-	-	-	661	-	38	-	-	-	<10	0.2	335	0.02
19 Jul 2018	Leachate	EM1811566	-	-	2,710	65	-	-	-	-	-	-	-	-	-	444	-	75	-	-	-	<10	<0.1	243	1.38
26 Jul 2018	Landfill Leachate	EM1811963	-	-	2,640	66	-	-	-	-	-	-	-	-	-	655	-	108	-	-	-	<10	0.2	246	0.02
06 Aug 2018	Landfill Leachate	EM1812536	-	-	3,240	134	-	-	-	-	-	-	-	-	-	562	-	8	-	-	-	<10	0.8	348	0.02
16 Aug 2018	Landfill Leachate	EM1813133	-	-	3,110	2,060	-	-	-	-	-	-	-	-	-	779	-	32	-	-	-	<2	<0.5	410	0.36
20 Aug 2018	Landfill Leachate	EM1813261	-	-	3,590	2,350	-	-	-	-	-	-	-	-	-	746	-	121	-	-	-	<20	0.6	439	0.03
29 Aug 2018	Landfill Leachate	EM1813826	-	-	2,720	1,490	-	-	-	-	-	-	-	-	-	508	-	112	-	-	-	<10	<0.1	235	<0.01
06 Sep 2018	Landfill Leachate	EM1814339	-	-	2,380	1,600	-	-	-	-	-	-	-	-	-	604	-	129	-	-	-	<20	0.1	353	<0.01
10 Sep 2018	Landfill Leachate	EM1814493	-	-	3,320	696	-	-	-	-	-	-	-	-	-	679	-	150	-	-	-	<10	0.1	304	0.29

Table 6 - Historical Landfill Leachate

Dulverton Regional Waste Management Authority

Dulverton Environmental Monitoring

	Misc.					Cyanide	Acidity & Alkalinity																	
	Naphthalene (value used in F2 calc)	Phosphorus reactive (as P)	Total Dissolved Solids	Total Suspended Solids	COD	Cyanide (Total)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)	Chloride	Sulfate (filtered)	Cations Total	Anions Total	Ionic Balance	Thiosulfate as S2O3 2-	Sulfide	Ammonia as N	Nitrate (as N)
	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
EQL	0.005	0.01	10	5	10	0.004	1	1	1	1	1	1	1	1	1	1	0.01	0.01	0.01	2	0.1	0.01	0.01
ADWG 2011 Recreational (v3.7 updated 2022)						**0.8**										**5,000**							**112.9**
ANZG (2018) - FW - 95% (updated 26 July 2021)						0.007																0.9	2.4
ANZECC 2000 - Stock Watering			5,000								1,000					1,000							90
ANZECC 2000 Irrigation - Long-term Trigger Values															350								
ANZECC 2000 Irrigation - Short-term Trigger Values																							

Date	Field ID	Lab Report Number																						
19 Sep 2018	Leachate	EM1815239	-	-	-	96	-	<0.004	44	2,240	<1	2,290	54	27	354	879	1,460	<1	84.4	86.9	1.49	-	-	451	<0.01
20 Sep 2018	Landfill Leachate	EM1815253	-	-	3,380	157	-	-	-	-	-	-	-	-	-	821	-	2	-	-	-	<20	0.1	442	0.02
24 Sep 2018	Landfill Leachate	EM1815378	-	-	4,690	95	-	-	-	-	-	-	-	-	-	1,000	-	<1	-	-	-	<20	0.2	489	0.02
09 Oct 2018	Landfill Leachate	EM1816257	-	-	7,170	142	-	-	-	-	-	-	-	-	-	1,580	-	<1	-	-	-	28	1.7	820	0.35
08 Nov 2018	Landfill Leachate	EM1818033	-	-	9,590	76	-	-	-	-	-	-	-	-	-	2,090	-	9	-	-	-	<40	1.2	820	0.36
15 Nov 2018	Weekly Leachate	EM1818439	-	-	9,690	46	-	-	-	-	-	-	-	-	-	1,980	-	11	-	-	-	<40	1.9	848	0.29
22 Nov 2018	Landfill Leachate	EM1818867	-	-	11,200	68	-	-	-	-	-	-	-	-	-	2,330	-	16	-	-	-	<50	1.8	778	0.34
12 Dec 2018	Landfill Leachate	EM1820185	-	-	-	48	-	0.004	418	5,540	<1	5,960	31	24	786	1,800	3,310	13	160	213	14.1	-	-	815	0.28
19 Feb 2019	Landfill Leachate	EM1902347	-	-	13,200	121	-	-	-	-	-	-	-	-	-	2,710	-	28	-	-	-	<80	3.0	751	0.58
26 Feb 2019	Landfill Leachate	EM1902762	-	-	15,000	134	-	-	-	-	-	-	-	-	-	3,100	-	<10	-	-	-	112	5.7	855	0.25
19 Mar 2019	Landfill Leachate	EM1904095	-	-	15,700	58	-	-	-	-	-	-	-	-	-	4,070	-	2,140	-	-	-	<80	40.2	2,400	0.56
20 Mar 2019	Landfill Leachate	EM1904168	-	-	-	119	-	0.008	<1	5,120	<1	5,120	53	52	1,890	3,890	6,060	<10	293	273	3.47	-	-	960	0.41
09 May 2019	Landfill Leachate - G	EM1907045	-	-	11,600	123	-	-	-	-	-	-	-	-	-	2,500	-	52	-	-	-	<80	12.3	1,480	0.45
09 May 2019	Landfill Leachate - P	EM1907034	-	-	13,700	84	-	-	-	-	-	-	-	-	-	3,140	-	931	-	-	-	<80	17.2	1,880	0.30
29 May 2019	Landfill Leachate	EM1908322	-	-	6,870	95	-	-	-	-	-	-	-	-	-	1,280	-	<1	-	-	-	<40	1.0	682	0.18
26 Jun 2019	Landfill Leachate	EM1910175	-	-	-	72	-	0.005	<1	4,300	<1	4,300	58	30	621	1,450	2,560	1	137	158	7.23	-	-	736	0.22
28 Jun 2019	DWM280619	EM1910927	-	-	7,240	5	-	-	-	-	-	-	-	-	-	1,600	-	<1	-	-	-	<100	8.7	829	0.21
10 Jul 2019	DWM1072019	EM1910930	-	-	4,560	75	-	-	-	-	-	-	-	-	-	1,010	-	<1	-	-	-	28	8.1	585	<0.01
31 Jul 2019	DWM31072019	EM1912255	-	-	3,310	12	-	-	-	-	-	-	-	-	-	610	-	74	-	-	-	<100	1.4	295	0.02
15 Aug 2019	Landfill Leachate	EM1913958	-	-	5,520	42	-	-	-	-	-	-	-	-	-	997	-	<1	-	-	-	<40	3.2	523	<0.01
27 Aug 2019	DWM270819	EM1914006	-	-	2,820	58	-	-	-	-	-	-	-	-	-	594	-	128	-	-	-	<40	0.3	307	0.08
09 Sep 2019	Landfill Leachate	EM1915222	-	-	-	37	-	0.010	<1	2,870	<1	2,870	36	20	418	1,100	1,600	40	699	103	2.25	-	-	513	0.02
11 Sep 2019	Landfill Leachate	EM1915222	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Dec 2019	Landfill Leachate	EM1921873	-	-	10,100	131	-	0.006	<1	6,170	<1	6,170	38	30	927	2,180	3,970	<1	203	235	7.41	<20	8.1	1,120	0.27
17 Dec 2019	Landfill Leachate	EM1921873	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Mar 2020	Landfill Leachate	EM2005146	-	-	9,540	152	-	-	197	3,840	<1	4,030	88	59	891	2,270	4,140	<20	170	197	7.51	<20	2.0	546	0.13
25 Mar 2020	Pomona Pump	EM2005146	-	-	10,000	134	-	-	98	3,490	<1	3,590	64	43	867	2,140	3,880	<1	163	181	5.30	28	8.3	574	-
07 Apr 2020	Pomona Pump	EM2005914	-	-	8,500	1,100	-	-	<1	5,210	<1	5,210	150	83	673	1,240	1,990	88	150	162	3.78	70	22.3	908	-
21 Apr 2020	Landfill Leachate	EM2006671	-	-	4,060	123	-	-	<1	1,870	<1	1,870	61	34	332	894	1,520	58	73.9	81.4	4.85	<20	2.2	290	-
21 Apr 2020	Leachate Pond	EM2006671	-	-	4,550	122	-	-	<1	1,880	<1	1,880	60	35	400	1,050	1,520	36	81.1	81.2	0.05	<20	2.1	271	-
21 Apr 2020	Pomona Pump	EM2006671	-	-	4,340	149	-	-	<1	1,930	<1	1,930	62	34	362	973	1,460	126	78.0	82.4	2.76	<20	<2.0	287	-
11 May 2020	Landfill Leachate	EM2007860	-	-	5,960	103	-	-	<1	2,270	<1	2,270	64	38	554	1,270	2,050	50	101	104	1.75	28	3.9	349	-
11 May 2020	Pomona Pump	EM2007860	-	-	6,760	24	-	-	197	3,640	<1	3,840	52	45	622	1,510	2,140	53	141	138	0.94	<20	<0.1	742	-
18 May 2020	Landfill Leachate	EM2008320	-	-	5,670	205	-	-	<1	2,700	<1	2,700	66	42	572	1,400	2,460	64	108	125	7.35	8	2.8	355	-
18 May 2020	Pomona Pump	EM2008320	-	-	7,620	1,570	-	-	<1	3,840	<1	3,840	66	47	686	1,770	3,440	44	144	175	9.58	7	1.2	595	-
16 Jun 2020	Landfill Leachate	EM2010246	-	-	4,740	100	-	<0.004	<1	2,430	<1	2,430	53	34	343	934	1,580	83	85.4	94.8	5.25	28	<0.5	428	2.66
16 Jun 2020	Landfill Leachate	EM2010246	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Landfill Leachate	EM2012818	-	-	4,630	42	-	-	<1	2,380	<1	2,380	47	31	378	1,040	1,660	61	85.8	95.6	5.45	<20	0.8	364	-
22 Jul 2020	Pomona Pump	EM2012818	-	-	6,890	28	-	-	<1	4,820	<1	4,820	69	59	696	2,000	2,730	59	180	174	1.49	<20	<0.5	936	-
26 Aug 2020	Dulverton Leachate	EM2014788	-	-	3,890	156	-	-	<1	1,890	<1	1,890	32	20	323	858	1,400	8	72.2	77.4	3.47	20	3.3	328	-
26 Aug 2020	Pomona Pump	EM2014788	-	-	4,970	80	-	-	<1	3,050	<1	3,050	41	29	402	1,200	1,910	57	110	116	2.23	4	0.2	617	-
29 Sep 2020	Landfill Leachate	EM2017090	-	-	3,700	136	-	<0.004	<1	2,210	<1	2,210	89	45	315	880	1,430	66	80.6	85.9	3.18	<10	<0.1	366	0.05
29 Sep 2020	Landfill Leachate	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Pomona Pump	EM2017090	-	-	4,610	51	-	-	<1	2,800	<1	2,800	54	33	378	1,040	1,790	78	92.2	108	7.96	<10	0.1	446	-
27 Oct 2020	Landfill Leachate	EM2019050	-	-	3,090	84	-	-	<1	1,690	<1	1,690	86	36	214	538	896	16	45.6	59.4	13.2	98	14.8	132	-
27 Oct 2020	Pomona Pump	EM2019050	-	-	6,310	129	-	-	<1	2,750	<1	2,750	84	44	395	983	1,630	115	80.5	103	12.5	28	0.7	275	-
07 Dec 2020	Landfill Leachate	EM2021896	-	-	4,350	71	-	<0.004	<1	2,400	<1	2,400	96	52	367	995	1,540	<5	86.2	91.4	2.96	28	2.6	342	0.02
07 Dec 2020	Landfill Leachate	EM2021896	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Mar 2021	Pomona Pump	EM2105221	-	-	9,030	54	-	-	<1	7,280	<1	7,280	77	55	855	2,220	4,150	<1	191	262	15.8	10	1.4	896	-
12 May 2021	Landfill Leachate	EM2108650	-	-	6,060	72	-	0.008	39	2,070	<1	2,110	72	58	480	1,630	2,830	7	114	122	3.56	14	0.4	311	0.02
22 Jun 2021	Landfill Leachate	EM2111910	-	-	5,080	63	-	<0.010	<1	2,620	<1	2,620	77	48	418	1,130	1,710	24	108	101	3.25	28	1.0	564	0.01
20 Jul 2021	Landfill Leachate	EM2114040	-	-	5,610	80	-	-	<1	3,380	<1	3,380	77	46	399	884	1,480	31	110	110	0.22	14	1.5	745	-
18 Aug 2021	Landfill Leachate	EM2116503	-	-	3,770	42	-	-	<1	634	<1	634	81	44	383	840	1,180	<1	54.0	46.0	8.05	560	11.9	521	-
28 Sep 2021	Pomona pump	EM2119193	-	-	-	122	-	<0.020	<1	5,720	<1	5,720	118	76	1,230	1,810	3,150	52	227	204	5.27	-	-	1,860	0.41
18 Oct 2021	Landfill Leachate	EM2120767	-	-	3,470	68	-	-	<1	2,070	<1	2,070	49	30	305	673	1,100	<1	66.6	72.4	4.22	28	0.2	344	-
17 Nov 2021	Pomona	EM2123125	-	-	3,500	24	-	-	<1	2,020	<1	2,020	58	32	321	672	1,070	<1	80.5	70.5	6.54	56	1.5	358	-
06 Dec 2021	Landfill Leachate	EM2124673	-	-	11,800	420	-	0.043	<1	10,800	<1	10,800	94	75	1,280	2,000	3,830	30	276	324	8.00	84	<0.5	2,030	0.45
08 Mar 2022	Landfill Leachate	EM2204291	-	-	9,650	182	-	0.036	<1	6,690	<1	6,690	93	66	932	1,650	2,840	129	223	216	1.42	56	<0.5	1,640	0.29
30 Mar 2022	Landfill Leachate	EM2205710	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2022	Landfill Leachate	EM2207498	-	-	8,530	31	-	-	<1	4,910	<1	4,910	101	67	717	1,770	2,950	24	189	182	1.84	56	<0.5	1,160	-
24 May 2022	Landfill Leachate	EM2209763	-	-	6,270	167	-	-	-	-	-	-	135	60	647	1,020	-	166	-	-	-	84	0.7	861	-
07 Jun 2022	Landfill Leachate	EM2210922	-	2.90	4,140	60	-	<0.010	<1	1,730	<1	1,730	88	40	298	676	1,100	52	79.3	66.7	8.61	<20	<0.1	484	1.93
07 Jun 2022	Landfill Leachate	EM2210922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2022	Landfill Leachate	EM2214400	-	-	5,500	72	-	-	-	-	-	-	59	41	579	1,330	-	58	-	-	-	<20	<0.5	874	-
27 Sep 2022	Landfill Leachate	EM2218995	<0.005	14.1	10,200	84	3,500	0.062	107	6,710	<1	6,810	98	64	873	1,630	2,980	91	219	222	0.76	84	<0.5	1,780	0.25
27 Sep 2022	Landfill Leachate	EM2218995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Oct 2022	Landfill Leachate	EM2220632	-	-	9,870	11	-	-	-	-	-	-	140	60	730	1,060	-	186	-	-	-	84	15.3	1,140	-

Table 6 - Historical Landfill Leachate

			Misc.					Cyanide	Acidity & Alkalinity																	
			Naphthalene (value used in F2 calc)	Phosphorus reactive (as P)	Total Dissolved Solids	Total Suspended Solids	COD	Cyanide (Total)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)	Chloride	Sulfate (filtered)	Cations Total	Anions Total	Ionic Balance	Thiosulfate as S2O3 2-	Sulfide	Ammonia as N	Nitrate (as N)
			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
EQL			0.005	0.01	10	5	10	0.004	1	1	1	1	1	1	1	1	1	1	0.01	0.01	0.01	2	0.1	0.01	0.01
ADWG 2011 Recreational (v3.7 updated 2022)								**0.8**										**5,000**							**112.9**
ANZG (2018) - FW - 95% (updated 26 July 2021)								0.007																0.9	2.4
ANZECC 2000 - Stock Watering					5,000								1,000					1,000							90
ANZECC 2000 Irrigation - Long-term Trigger Values																	350								
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
08 Nov 2022	Landfill Leachate	EM2222080	-	-	10,300	152	-	-	-	-	-	-	103	68	1,030	1,850	-	112	-	-	-	84	<1.0	1,560	-
15 Dec 2022	Landfill leachate	EM2225257	<0.005	8.52	11,400	343	-	0.061	<1	7,680	<1	7,680	96	73	1,090	1,880	3,150	13	228	242	3.17	<100	1.2	1,490	0.32
30 Mar 2023	Landfill leachate	EM2305604	<0.005	12.5	7,460	201	-	<0.004	197	5,140	<1	5,340	46	32	534	915	2,120	98	157	168	3.68	<100	<0.5	1,370	6.64
29 Jun 2023	Landfill leachate	EM2311710	<0.005	6.84	5,940	204	-	<0.020	<1	3,590	<1	3,590	117	53	480	874	1,490	145	102	117	6.96	<40	0.1	576	<0.05
19 Jul 2023	Landfill Leachate	EM2313106	-	-	5,230	505	-	-	-	-	-	-	64	39	377	1,000	-	51	-	-	-	<20	<0.1	490	-
16 Aug 2023	Landfill Leachate	EM2314818	-	-	10,800	825	-	-	-	-	-	-	104	74	772	1,830	-	117	-	-	-	<100	<2.0	1,100	-
06 Sep 2023	Landfill leachate	EM2316162	<0.005	4.05	2,750	4,410	-	0.005	<1	1,620	<1	1,620	38	24	188	489	786	33	54.1	55.2	1.06	<20	<0.5	338	0.05
24 Oct 2023	Landfill Leachate	EM2319274	-	-	13,000	1,640	-	-	-	-	-	-	648	324	782	1,450	-	662	-	-	-	<40	33.8	1,150	-
08 Nov 2023	Landfill Leachate	EM2319935	-	-	65	<5	-	-	-	-	-	-	8	4	1	9	-	3	-	-	-	<2	<0.1	0.06	-
28 Nov 2023	Landfill Leachate	EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	0.02	-
12 Dec 2023	Landfill leachate	EM2322269	<0.005	16.8	10,400	34	-	0.027	310	7,260	<1	7,570	79	67	964	2,090	3,380	26	244	247	0.75	<20	13.2	1,660	0.38

Table 6 - Historical Landfill Leachate

Dulverton Regional Waste Management Authority

Dulverton Environmental Monitoring

									Organic Indicators																
			Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)	Kjeldahl Nitrogen Total	Reactive Phosphorus as P	Phosphorus (Total)	Sulfite as SO3-	Sulfur (Total Oxidised as SO4)	Total Oxidised Sulfur (as S)	BOD	Dissolved Organic Carbon	Total Organic Carbon	Aluminium	Aluminium (filtered)	Arsenic	Arsenic (filtered)	Cadmium	Cadmium (filtered)	Chromium (III+VI)	Chromium (III+VI) (filtered)	Copper	Copper (filtered)	Iron
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			0.01	0.01	0.1	0.1	0.01	0.01	2	10	10	2	1	1	0.01	0.01	0.001	0.001	0.0001	0.0001	0.001	0.001	0.001	0.001	0.05
ADWG 2011 Recreational (v3.7 updated 2022)			**9.1**														**0.1**	**0.1**	**0.02**	**0.02**			**20**	**20**	
ANZG (2018) - FW - 95% (updated 26 July 2021)															0.055	0.055	0.013	0.013	0.0002	0.0002	0.001	0.001	0.0014	0.0014	
ANZECC 2000 - Stock Watering			9.1												5	5	0.5	0.5	0.01	0.01	1	1	1	1	
ANZECC 2000 Irrigation - Long-term Trigger Values					5			0.05							5	5	0.1	0.1	0.01	0.01	0.1	0.1	0.2	0.2	0.2
ANZECC 2000 Irrigation - Short-term Trigger Values					25			0.8							20	20	2	2	0.05	0.05	1	1	5	5	10
Date	**Field ID**	**Lab Report Number**																							
10 Sep 2013	LEACHATE POND 2	EM1309644	<0.01	<0.01	399	399	-	4.04	10	-	-	1,240	-	-	1.23	-	0.025	-	0.0006	-	0.081	-	0.023	-	10.9
10 Sep 2013	POND 1	EM1309643	<0.01	<0.01	417	417	-	3.42	52	-	-	588	-	-	0.59	-	0.021	-	0.0008	-	0.06	-	2.59	-	7.53
18 Nov 2013	Landfill leachate (quarterly)	EM1312183	<0.01	0.02	231	231	-	4.14	10	-	-	140	-	-	0.33	-	0.014	-	0.0002	-	0.062	-	0.558	-	2.84
04 Mar 2014	Landfill leachate (quarterly)	EM1401975	<0.01	<0.01	99.9	99.9	-	2.94	<2	-	-	74	-	-	0.26	-	0.022	-	<0.0001	-	0.066	-	0.786	-	2.09
02 Jun 2014	Landfill leachate (quarterly)	EM1405379	-	0.2	247	247	-	3.7	4	-	-	-	-	-	0.4	-	0.02	-	0.0002	-	0.11	-	0.915	-	4.76
17 Jun 2014	Landfill leachate (quarterly)	EM1405379	0.14	-	-	-	-	-	-	-	-	149	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Sep 2014	Landfill leachate (quarterly)	EM1408979	<0.01	0.27	753	753	-	9.48	29	-	-	217	-	-	1.19	-	0.062	-	0.0003	-	0.244	-	0.866	-	4.89
01 Jun 2015	Landfill leachate (quarterly)	EM1510467	<0.01	0.63	522	521	-	9.55	4	-	-	2	-	-	3.47	-	0.047	-	0.0003	-	0.334	-	1.01	-	6.01
27 Jun 2016	Landfill leachate (quarterly)	EM1607483	-	-	-	-	-	-	-	-	-	-	-	-	-	0.67	-	0.036	-	0.0006	-	0.131	-	0.664	-
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	<0.01	<0.01	403	403	-	4.42	<2	-	-	125	-	-	0.61	0.61	0.036	0.036	0.0003	0.0003	0.143	0.143	0.141	0.141	3.59
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jan 2017	Landfill leachate (quarterly)	EM1700066	-	-	-	-	-	-	-	-	-	-	-	-	-	0.54	-	0.036	-	0.0002	-	0.155	-	0.191	-
09 Jan 2017	Weekly Leachate	EM1700104	<0.01	0.01	307	307	-	4.13	2	-	-	105	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Jan 2017	Weekly Leachate	EM1700551	<0.01	<0.01	274	274	-	3.74	<2	-	-	99	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Jan 2017	Weekly Leachate	EM1700831	<0.01	0.03	286	286	-	4.45	<2	-	-	73	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Feb 2017	Weekly Leachate	EM1701200	<0.01	0.02	327	327	-	5.98	<2	-	-	117	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Feb 2017	Weekly Leachate	EM1701278	<0.01	0.02	393	393	-	6.60	<2	-	-	125	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Feb 2017	Weekly Leachate	EM1701686	0.32	0.34	307	307	-	4.22	<2	-	-	56	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Feb 2017	Weekly leachate	EM1701861	0.78	0.86	259	258	-	2.76	<2	-	-	50	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Feb 2017	Weekly leachate	EM1702391	50.4	51.0	295	244	-	<0.01	<2	-	-	110	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Mar 2017	DWM060317	EM1702567	59.0	70.3	348	278	-	3.46	<2	-	-	73	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Mar 2017	DWM160317	EM1703065	**102**	113	319	206	-	1.71	<2	-	-	229	-	-	-	-	-	-	-	-	-	-	-	-	-
23 Mar 2017	DWM230317	EM1703524	0.14	167	445	278	-	3.44	<2	-	-	157	-	-	-	-	-	-	-	-	-	-	-	-	-
30 Mar 2017	DWM300317	EM1703932	0.36	43.4	363	320	-	4.93	<2	-	-	97	-	-	-	-	-	-	-	-	-	-	-	-	-
03 Apr 2017	DWM030417	EM1704134	3.07	17.9	448	430	-	6.11	<2	-	-	129	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Apr 2017	DWM100417	EM1704503	<0.01	<0.01	432	432	-	2.00	<2	-	-	181	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Apr 2017	DWM200417	EM1705012	<0.01	0.13	416	416	-	6.77	<2	-	-	213	-	-	-	-	-	-	-	-	-	-	-	-	-
03 May 2017	DWM030517	EM1705620	1.27	1.92	454	452	-	4.84	<2	-	-	23	-	-	-	-	-	-	-	-	-	-	-	-	-
08 May 2017	Landfill leachate (quarterly)	EM1705724	2.57	2.63	468	465	-	5.89	<2	-	-	32	-	-	0.90	-	**0.104**	-	0.0002	-	0.352	-	0.609	-	8.85
29 May 2017	Leachate	EM1706966	2.38	3.12	491	488	-	4.84	<2	-	-	28	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jun 2017	DWM050617	EM1707358	2.14	2.14	351	349	-	3.41	<2	-	-	68	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2017	DWM140617	EM1707709	1.88	1.68	530	528	-	10.1	<2	-	-	89	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Jun 2017	DWM190617	EM1707937	3.72	<0.01	421	421	-	4.41	<2	-	-	71	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Jun 2017	DWM290617	EM1708550	4.65	4.10	452	448	-	4.27	<2	-	-	70	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Jul 2017	DWM060717	EM1708866	0.86	4.46	515	511	-	5.04	<2	-	-	26	-	-	-	-	-	-	-	-	-	-	-	-	-
13 Jul 2017	DWM130717	EM1709240	0.41	0.76	725	724	-	6.20	<2	-	-	35	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Aug 2017	DWM090817	EM1710633	<0.01	0.02	424	424	-	4.68	<2	-	-	68	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Aug 2017	DWM140817	EM1710836	<0.01	0.02	451	451	-	5.83	<2	-	-	102	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Aug 2017	DWM210817	EM1711202	<0.01	0.02	448	448	-	6.21	<2	-	-	118	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Aug 2017	Quarterly leachate samples	EM1711607	0.02	0.02	461	461	-	4.69	<2	-	-	92	-	-	1.16	-	0.064	-	0.0003	-	0.219	-	0.072	-	4.41
06 Sep 2017	DWM060917	EM1712174	0.59	0.68	362	361	-	5.98	<2	-	-	50	-	-	-	-	-	-	-	-	-	-	-	-	-
11 Sep 2017	DWM110917	EM1712414	0.07	0.14	313	313	-	3.16	<2	-	-	22	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Sep 2017	DWM200917	EM1712965	<0.01	<0.01	562	562	-	6.23	<2	-	-	263	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Oct 2017	DWM051017	EM1713718	<0.01	<0.01	461	461	-	6.80	2	-	-	177	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Oct 2017	DWM121017	EM1714085	<0.01	0.01	416	416	-	4.04	2	-	-	169	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Oct 2017	DWM161017	EM1714224	<0.01	<0.01	555	555	-	5.81	5	-	-	239	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Oct 2017	DWM251017	EM1714708	<0.01	<0.01	556	556	-	8.19	2	-	-	169	-	-	-	-	-	-	-	-	-	-	-	-	-
31 Oct 2017	DWM311017	EM1714989	<0.01	0.01	391	391	-	15.6	2	-	-	206	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2018	DWM260418	EM1806971	0.03	0.36	791	791	-	14.2	<20	-	-	370	-	-	-	-	-	-	-	-	-	-	-	-	-
08 May 2018	DWM080518	EM1807569	0.06	0.40	1,530	1,530	-	20.9	<20	-	-	525	-	-	-	-	-	-	-	-	-	-	-	-	-
04 Jun 2018	Weekly Leachate	EM1809069	0.02	0.46	1,450	1,450	-	25.8	<10	-	-	1,200	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2018	Weekly Leachate	EM1809582	<0.01	0.05	588	588	-	9.06	<2	-	-	370	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Jun 2018	Weekly Leachate	EM1809922	<0.01	0.02	390	390	-	4.28	<10	-	-	134	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Jun 2018	Landfill Leachate	EM1810261	<0.01	0.02	627	627	4.36	5.31	-	-	-	214	568	-	1.37	0.68	**0.105**	0.096	0.0002	0.0002	0.313	0.160	0.040	0.006	5.58
02 Jul 2018	Filtered landfill leachate	EM1810597	<0.01	0.06	730	730	-	5.23	<10	-	-	186	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Jul 2018	Weekly Leachate	EM1810596	<0.01	0.03	810	810	-	7.35	<10	-	-	290	-	-	-	-	-	-	-	-	-	-	-	-	-
11 Jul 2018	Weekly Leachate	EM1811134	<0.01	0.02	487	487	-	5.42	<10	-	-	113	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Jul 2018	Leachate	EM1811566	0.52	1.90	324	322	-	4.07	<10	-	-	86	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2018	Landfill Leachate	EM1811963	<0.01	0.02	456	456	-	5.55	<10	-	-	113	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Aug 2018	Landfill Leachate	EM1812536	<0.01	0.02	448	448	-	10.0	<10	-	-	116	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2018	Landfill Leachate	EM1813133	0.04	0.40	492	492	-	0.14	<2	-	-	64	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Aug 2018	Landfill Leachate	EM1813261	0.03	0.06	512	512	-	0.20	<20	-	-	47	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Aug 2018	Landfill Leachate	EM1813826	0.11	0.11	320	320	-	18.5	<10	-	-	32	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2018	Landfill Leachate	EM1814339	0.02	0.02	436	436	-	16.2	<20	-	-	26	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Sep 2018	Landfill Leachate	EM1814493	0.08	0.37	417	417	-	94.6	<10	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6 - Historical Landfill Leachate

									Organic Indicators																
			Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)	Kjeldahl Nitrogen Total	Reactive Phosphorus as P	Phosphorus (Total)	Sulfite as SO3-	Sulfur (Total Oxidised as SO4)	Total Oxidised Sulfur (as S)	BOD	Dissolved Organic Carbon	Total Organic Carbon	Aluminium	Aluminium (filtered)	Arsenic	Arsenic (filtered)	Cadmium	Cadmium (filtered)	Chromium (III+VI)	Chromium (III+VI) (filtered)	Copper	Copper (filtered)	Iron
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			0.01	0.01	0.1	0.1	0.01	0.01	2	10	10	2	1	1	0.01	0.01	0.001	0.001	0.0001	0.0001	0.001	0.001	0.001	0.001	0.05
ADWG 2011 Recreational (v3.7 updated 2022)			**9.1**														**0.1**	**0.1**	**0.02**	**0.02**			**20**	**20**	
ANZG (2018) - FW - 95% (updated 26 July 2021)															0.055	0.055	0.013	0.013	0.0002	0.0002	0.001	0.001	0.0014	0.0014	
ANZECC 2000 - Stock Watering			9.1												5	5	0.5	0.5	0.01	0.01	1	1	1	1	
ANZECC 2000 Irrigation - Long-term Trigger Values					5			0.05							5	5	0.1	0.1	0.01	0.01	0.1	0.1	0.2	0.2	0.2
ANZECC 2000 Irrigation - Short-term Trigger Values					25			0.8							20	20	2	2	0.05	0.05	1	1	5	5	10
Date	**Field ID**	**Lab Report Number**																							
19 Sep 2018	Leachate	EM1815239	<0.01	<0.01	531	531	4.15	4.68	-	-	-	112	426	-	0.88	0.64	0.100	0.096	0.0004	0.0003	0.281	0.140	0.471	0.165	6.73
20 Sep 2018	Landfill Leachate	EM1815253	<0.01	0.02	655	655	-	13.5	<20	-	-	148	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Sep 2018	Landfill Leachate	EM1815378	<0.01	0.02	922	922	-	15.7	<20	-	-	139	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Oct 2018	Landfill Leachate	EM1816257	<0.01	0.35	1,330	1,330	-	12.6	<20	-	-	264	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2018	Landfill Leachate	EM1818033	0.05	0.41	1,510	1,510	-	21.5	<40	-	-	266	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Nov 2018	Weekly Leachate	EM1818439	0.02	0.31	1,560	1,560	-	195	<40	-	-	370	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Nov 2018	Landfill Leachate	EM1818867	<0.01	0.34	1,670	1,670	-	19.5	<50	-	-	433	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2018	Landfill Leachate	EM1820185	<0.05	0.28	1,030	1,030	10.6	24.7	-	-	-	700	1,290	-	2.12	2.22	**0.241**	**0.200**	0.0004	0.0003	0.637	0.573	0.706	0.072	5.96
19 Feb 2019	Landfill Leachate	EM1902347	<0.05	0.58	1,520	1,520	-	20.5	<80	-	-	544	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Feb 2019	Landfill Leachate	EM1902762	0.16	0.41	1,460	1,460	-	20.2	<80	-	-	656	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Mar 2019	Landfill Leachate	EM1904095	<0.01	0.56	2,880	2,880	-	22.3	<80	-	-	1,370	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Mar 2019	Landfill Leachate	EM1904168	0.09	0.50	1,550	1,550	13.6	42.7	-	-	-	753	2,880	-	4.09	3.70	**0.422**	**0.409**	<0.0010	<0.0005	1.41	1.30	0.035	0.014	9.07
09 May 2019	Landfill Leachate - G	EM1907045	<0.01	0.45	2,210	2,210	-	28.1	<80	-	-	950	-	-	-	-	-	-	-	-	-	-	-	-	-
09 May 2019	Landfill Leachate - P	EM1907034	<0.01	0.30	2,580	2,580	-	26.3	<80	-	-	780	-	-	-	-	-	-	-	-	-	-	-	-	-
29 May 2019	Landfill Leachate	EM1908322	<0.01	0.18	1,230	1,230	-	10.5	<40	-	-	326	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jun 2019	Landfill Leachate	EM1910175	<0.01	0.22	1,020	1,020	6.15	8.34	-	-	-	335	951	-	2.54	1.13	**0.133**	**0.119**	0.0004	<0.0002	0.387	0.392	4.14	0.220	5.96
28 Jun 2019	DWM280619	EM1910927	<0.01	0.21	957	957	-	7.94	<100	-	-	330	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Jul 2019	DWM1072019	EM1910930	<0.01	<0.01	659	659	-	6.02	<20	-	-	150	-	-	-	-	-	-	-	-	-	-	-	-	-
31 Jul 2019	DWM31072019	EM1912255	<0.01	0.02	421	421	-	2.83	<100	-	-	91	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Aug 2019	Landfill Leachate	EM1913958	<0.01	<0.01	620	620	-	4.76	<40	-	-	99	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Aug 2019	DWM270819	EM1914006	<0.01	0.08	388	388	-	2.97	<40	-	-	73	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Sep 2019	Landfill Leachate	EM1915222	<0.01	0.02	543	543	4.02	4.99	-	-	-	-	250	-	0.64	0.60	0.073	0.072	<0.0002	<0.0002	0.240	0.250	0.049	0.029	1.73
11 Sep 2019	Landfill Leachate	EM1915222	-	-	-	-	-	-	-	-	-	109	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Dec 2019	Landfill Leachate	EM1921873	<0.01	0.27	1,280	1,280	10.4	12.4	<20	-	20	406	1,100	-	1.37	1.40	**0.152**	**0.150**	0.0001	<0.0005	0.481	0.563	0.362	0.146	5.09
17 Dec 2019	Landfill Leachate	EM1921873	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Mar 2020	Landfill Leachate	EM2005146	<0.01	0.13	747	747	8.34	14.8	<20	-	20	206	518	-	1.44	1.41	**0.164**	**0.178**	<0.0005	<0.0005	0.538	0.601	0.637	0.047	6.08
25 Mar 2020	Pomona Pump	EM2005146	-	0.04	784	784	-	15.4	<20	-	30	306	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Apr 2020	Pomona Pump	EM2005914	-	0.16	1,270	1,270	-	43.5	30	410	-	1,800	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Landfill Leachate	EM2006671	-	<0.01	356	356	-	6.20	<20	180	-	160	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Leachate Pond	EM2006671	-	<0.01	345	345	-	6.52	<20	180	-	138	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Pomona Pump	EM2006671	-	<0.01	350	350	-	6.08	<20	180	-	151	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Landfill Leachate	EM2007860	-	0.02	380	380	-	6.80	<20	130	-	105	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Pomona Pump	EM2007860	-	0.07	766	766	-	4.52	<20	90	-	198	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Landfill Leachate	EM2008320	-	0.07	403	403	-	7.28	4	170	-	174	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Pomona Pump	EM2008320	-	0.09	657	657	-	12.7	4	180	-	208	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Jun 2020	Landfill Leachate	EM2010246	0.76	3.42	501	498	3.00	4.75	<20	120	-	138	318	-	0.46	0.42	0.055	0.055	0.0003	<0.0002	0.177	0.139	0.115	0.108	5.80
16 Jun 2020	Landfill Leachate	EM2010246	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Landfill Leachate	EM2012818	-	0.03	429	429	-	5.39	<20	110	-	126	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Pomona Pump	EM2012818	-	0.23	1,120	1,120	-	7.22	<20	100	-	230	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Dulverton Leachate	EM2014788	-	<0.01	413	413	-	5.57	5	90	-	105	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Pomona Pump	EM2014788	-	0.78	761	760	-	6.00	<2	90	-	144	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Landfill Leachate	EM2017090	<0.01	0.05	430	430	2.56	3.94	<10	100	-	138	264	-	0.82	0.32	0.037	0.032	<0.0005	<0.0005	0.122	0.099	0.205	0.418	8.82
29 Sep 2020	Landfill Leachate	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Pomona Pump	EM2017090	-	0.30	630	630	-	5.47	<10	100	-	213	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Landfill Leachate	EM2019050	-	<0.01	278	278	-	8.13	30	100	-	418	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Pomona Pump	EM2019050	-	2.55	564	562	-	9.58	<20	130	-	916	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Dec 2020	Landfill Leachate	EM2021896	<0.01	0.02	419	419	5.35	8.03	<20	80	-	322	454	-	0.67	0.49	0.062	0.052	0.0009	0.0002	0.184	0.122	0.704	0.276	4.06
07 Dec 2020	Landfill Leachate	EM2021896	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Mar 2021	Pomona Pump	EM2105221	-	0.13	1,180	1,180	-	9.35	12	-	20	308	-	-	-	-	-	-	-	-	-	-	-	-	-
12 May 2021	Landfill Leachate	EM2108650	<0.01	0.02	370	370	1.93	3.94	<10	80	-	72	416	-	0.35	0.27	0.055	0.054	<0.0001	<0.0001	0.170	0.097	0.001	0.001	7.26
22 Jun 2021	Landfill Leachate	EM2111910	<0.01	0.01	558	558	3.28	5.78	10	90	-	89	353	-	0.66	0.44	0.057	0.049	0.0001	<0.0001	0.213	0.157	0.604	0.031	3.71
20 Jul 2021	Landfill Leachate	EM2114040	-	2.41	790	788	-	7.85	<10	80	-	298	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Aug 2021	Landfill Leachate	EM2116503	-	<0.01	614	614	-	9.42	175	<100	-	154	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Sep 2021	Pomona pump	EM2119193	<0.05	0.41	2,370	2,370	25.0	22.1	-	-	-	508	209	-	4.17	3.17	**0.214**	**0.175**	<0.0010	<0.0010	1.11	1.01	0.142	0.022	13.0
18 Oct 2021	Landfill Leachate	EM2120767	-	<0.01	400	400	-	5.56	<20	<100	-	91	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Nov 2021	Pomona	EM2123125	-	<0.01	404	404	-	5.52	20	60	-	56	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Dec 2021	Landfill Leachate	EM2124673	<0.10	0.45	2,170	2,170	15.8	16.6	35	310	-	508	2,030	-	4.22	4.00	**0.256**	**0.258**	<0.0010	<0.0010	1.24	1.12	0.427	0.378	82.0
08 Mar 2022	Landfill Leachate	EM2204291	0.05	0.34	1,640	1,640	11.1	18.0	<40	80	-	260	-	1,680	3.07	1.96	**0.165**	**0.146**	<0.0005	<0.0005	0.966	0.420	0.208	0.062	14.3
30 Mar 2022	Landfill Leachate	EM2205710	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2022	Landfill Leachate	EM2207498	-	0.17	1,460	1,460	-	9.93	<40	70	-	146	-	-	-	-	-	-	-	-	-	-	-	-	-
24 May 2022	Landfill Leachate	EM2209763	-	0.07	908	908	-	12.5	<40	210	-	198	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Jun 2022	Landfill Leachate	EM2210922	0.10	2.03	622	620	-	6.74	<20	30	-	75	209	-	0.79	0.33	0.047	0.035	<0.0001	<0.0001	0.202	0.084	0.059	0.004	30.3
07 Jun 2022	Landfill Leachate	EM2210922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2022	Landfill Leachate	EM2214400	-	2.41	930	928	-	7.32	<20	30	-	120	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Sep 2022	Landfill Leachate	EM2218995	<0.10	0.25	1,970	1,970	-	22.6	<40	<100	-	252	1,240	-	2.38	2.63	**0.172**	**0.201**	0.0002	<0.0002	0.874	1.04	0.205	0.063	17.8
27 Sep 2022	Landfill Leachate	EM2218995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Oct 2022	Landfill Leachate	EM2220632	-	0.23	1,310	1,310	-	27.7	<40	40	-	406	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6 - Historical Landfill Leachate

									Organic Indicators																
			Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)	Kjeldahl Nitrogen Total	Reactive Phosphorus as P	Phosphorus (Total)	Sulfite as SO3-	Sulfur (Total Oxidised as SO4)	Total Oxidised Sulfur (as S)	BOD	Dissolved Organic Carbon	Total Organic Carbon	Aluminium	Aluminium (filtered)	Arsenic	Arsenic (filtered)	Cadmium	Cadmium (filtered)	Chromium (III+VI)	Chromium (III+VI) (filtered)	Copper	Copper (filtered)	Iron
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			0.01	0.01	0.1	0.1	0.01	0.01	2	10	10	2	1	1	0.01	0.01	0.001	0.001	0.0001	0.0001	0.001	0.001	0.001	0.001	0.05
ADWG 2011 Recreational (v3.7 updated 2022)			**9.1**														**0.1**	**0.1**	**0.02**	**0.02**			**20**	**20**	
ANZG (2018) - FW - 95% (updated 26 July 2021)															0.055	0.055	0.013	0.013	0.0002	0.0002	0.001	0.001	0.0014	0.0014	
ANZECC 2000 - Stock Watering			9.1												5	5	0.5	0.5	0.01	0.01	1	1	1	1	
ANZECC 2000 Irrigation - Long-term Trigger Values					5			0.05							5	5	0.1	0.1	0.01	0.01	0.1	0.1	0.2	0.2	0.2
ANZECC 2000 Irrigation - Short-term Trigger Values					25			0.8							20	20	2	2	0.05	0.05	1	1	5	5	10
Date	**Field ID**	**Lab Report Number**																							
08 Nov 2022	Landfill Leachate	EM2222080	-	0.03	2,310	2,310	-	23.5	<40	<100	-	315	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Dec 2022	Landfill leachate	EM2225257	<0.05	0.32	1,740	1,740	-	20.9	<100	40	-	280	1,330	-	12.0	2.51	**0.201**	**0.191**	0.0012	<0.0005	0.908	0.997	0.206	0.114	46.4
30 Mar 2023	Landfill leachate	EM2305604	0.06	6.70	1,380	1,370	-	16.6	<100	<100	-	119	573	-	4.55	1.16	**0.175**	0.090	<0.0010	0.0002	1.01	0.536	0.033	0.017	12.4
29 Jun 2023	Landfill leachate	EM2311710	<0.05	0.03	1,020	1,020	-	12.8	<40	<100	-	795	895	-	2.00	0.78	0.072	0.060	0.0005	0.0002	0.435	0.200	0.022	0.004	12.1
19 Jul 2023	Landfill Leachate	EM2313106	-	0.11	567	567	-	5.22	<20	<100	-	678	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023	Landfill Leachate	EM2314818	-	0.37	1,220	1,220	-	9.66	<100	60	-	734	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023	Landfill leachate	EM2316162	<0.02	0.05	474	474	-	12.1	<20	<100	-	1,180	286	-	3.74	0.50	0.037	0.036	0.0002	<0.0001	0.207	0.114	0.436	0.056	7.42
24 Oct 2023	Landfill Leachate	EM2319274	-	0.11	1,380	1,380	-	17.8	<40	320	-	8,320	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023	Landfill Leachate	EM2319935	-	0.15	0.4	0.2	-	0.04	<2	<100	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023	Landfill Leachate	EM2321393	-	<0.01	0.1	0.1	-	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023	Landfill leachate	EM2322269	<0.02	0.38	2,020	2,020	-	18.9	<20	<100	-	173	1,480	-	3.69	2.24	**0.193**	**0.203**	<0.0010	0.0002	1.06	0.969	0.034	0.014	9.74

Table 6 - Historical Landfill Leachate

			Metals												BTEXN									
			Iron (filtered)	Lead	Lead (filtered)	Manganese	Manganese (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	Selenium	Selenium (filtered)	Zinc	Zinc (filtered)	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	BTEX (Sum of Total) - Lab Calc	Naphthalene	F1 (C6-C10 minus BTEX)	C6-C10 Fraction
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			0.05	0.001	0.001	0.001	0.001	0.0001	0.0001	0.001	0.001	0.01	0.01	0.005	0.005	1	2	2	2	2	2	1	1	20	20
ADWG 2011 Recreational (v3.7 updated 2022)				**0.1**	**0.1**	**5**	**5**	**0.01**	**0.01**	**0.2**	**0.2**	**0.1**	**0.1**			**10**	**8,000**	**3,000**			**6,000**				
ANZG (2018) - FW - 95% (updated 26 July 2021)				0.0034	0.0034	1.9	1.9	0.0006	0.0006	0.011	0.011	0.011	0.011	0.008	0.008	950	180	80	350				16		
ANZECC 2000 - Stock Watering				0.1	0.1			0.002	0.002	1	1	0.02	0.02	20	20										
ANZECC 2000 Irrigation - Long-term Trigger Values			0.2	2	2	0.2	0.2	0.002	0.002	0.2	0.2	0.02	0.02	2	2										
ANZECC 2000 Irrigation - Short-term Trigger Values			10	5	5	10	10	0.002	0.002	2	2	0.05	0.05	5	5										
Date	**Field ID**	**Lab Report Number**																							
10 Sep 2013	LEACHATE POND 2	EM1309644	-	0.016	-	0.726	-	<0.0001	-	0.066	-	<0.01	-	0.864	-	<1	2	<2	<2	<2	<2	2	<5	420	420
10 Sep 2013	POND 1	EM1309643	-	0.016	-	0.945	-	<0.0001	-	0.064	-	<0.01	-	1.37	-	<1	12	5	2	6	8	25	<5	460	490
18 Nov 2013	Landfill leachate (quarterly)	EM1312183	-	0.036	-	0.22	-	<0.0001	-	0.044	-	<0.01	-	0.977	-	<1	4	<2	<2	<2	<2	4	<1	<20	<20
04 Mar 2014	Landfill leachate (quarterly)	EM1401975	-	0.011	-	0.088	-	<0.0001	-	0.075	-	<0.01	-	1.31	-	<1	<2	<2	<2	<2	<2	<1	<1	<20	<20
02 Jun 2014	Landfill leachate (quarterly)	EM1405379	-	0.014	-	0.343	-	<0.001	-	0.067	-	<0.01	-	1.18	-	2	28	9	10	22	32	71	<10	120	190
17 Jun 2014	Landfill leachate (quarterly)	EM1405379	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Sep 2014	Landfill leachate (quarterly)	EM1408979	-	0.014	-	0.516	-	<0.0001	-	0.093	-	<0.01	-	0.456	-	<1	6	2	5	10	15	23	<1	50	70
01 Jun 2015	Landfill leachate (quarterly)	EM1510467	-	0.014	-	0.311	-	<0.0001	-	0.1	-	<0.01	-	0.839	-	<1	<2	<2	<2	<2	<2	<1	<1	<20	<20
27 Jun 2016	Landfill leachate (quarterly)	EM1607483	4.40	-	0.028	-	0.583	-	<0.0001	-	0.048	-	<0.01	-	2.34	-	-	-	-	-	-	-	-	-	-
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	3.59	0.011	0.011	0.456	0.456	<0.0001	<0.0001	0.051	0.051	<0.01	<0.01	0.237	0.237	<1	<2	<2	<2	<2	<2	<1	<1	<20	<20
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jan 2017	Landfill leachate (quarterly)	EM1700066	3.83	-	0.012	-	0.354	-	<0.0001	-	0.050	-	<0.01	-	0.161	-	-	-	-	-	-	-	-	-	-
09 Jan 2017	Weekly Leachate	EM1700104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Jan 2017	Weekly Leachate	EM1700551	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Jan 2017	Weekly Leachate	EM1700831	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Feb 2017	Weekly Leachate	EM1701200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Feb 2017	Weekly Leachate	EM1701278	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Feb 2017	Weekly Leachate	EM1701686	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Feb 2017	Weekly leachate	EM1701861	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Feb 2017	Weekly leachate	EM1702391	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Mar 2017	DWM060317	EM1702567	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Mar 2017	DWM160317	EM1703065	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23 Mar 2017	DWM230317	EM1703524	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30 Mar 2017	DWM300317	EM1703932	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03 Apr 2017	DWM030417	EM1704134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Apr 2017	DWM100417	EM1704503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Apr 2017	DWM200417	EM1705012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03 May 2017	DWM030517	EM1705620	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 May 2017	Landfill leachate (quarterly)	EM1705724	-	0.025	-	0.347	-	<0.0001	-	0.122	-	<0.01	-	0.545	-	<1	<2	<2	<2	<2	<2	<1	<1.0	<20	<20
29 May 2017	Leachate	EM1706966	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jun 2017	DWM050617	EM1707358	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2017	DWM140617	EM1707709	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Jun 2017	DWM190617	EM1707937	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Jun 2017	DWM290617	EM1708550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Jul 2017	DWM060717	EM1708866	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13 Jul 2017	DWM130717	EM1709240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Aug 2017	DWM090817	EM1710633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Aug 2017	DWM140817	EM1710836	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Aug 2017	DWM210817	EM1711202	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Aug 2017	Quarterly leachate samples	EM1711607	-	0.030	-	0.326	-	<0.0001	-	0.055	-	<0.01	-	0.573	-	<1	<2	<2	<2	2	2	2	<1.3	<20	20
06 Sep 2017	DWM060917	EM1712174	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 Sep 2017	DWM110917	EM1712414	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Sep 2017	DWM200917	EM1712965	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Oct 2017	DWM051017	EM1713718	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Oct 2017	DWM121017	EM1714085	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Oct 2017	DWM161017	EM1714224	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Oct 2017	DWM251017	EM1714708	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31 Oct 2017	DWM311017	EM1714989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2018	DWM260418	EM1806971	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 May 2018	DWM080518	EM1807569	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04 Jun 2018	Weekly Leachate	EM1809069	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2018	Weekly Leachate	EM1809582	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Jun 2018	Weekly Leachate	EM1809922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Jun 2018	Landfill Leachate	EM1810261	3.12	0.010	0.002	0.312	0.298	<0.0001	<0.0001	0.064	0.052	<0.01	<0.01	0.266	0.152	-	-	-	-	-	-	-	-	-	-
02 Jul 2018	Filtered landfill leachate	EM1810597	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Jul 2018	Weekly Leachate	EM1810596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 Jul 2018	Weekly Leachate	EM1811134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Jul 2018	Leachate	EM1811566	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2018	Landfill Leachate	EM1811963	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Aug 2018	Landfill Leachate	EM1812536	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2018	Landfill Leachate	EM1813133	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Aug 2018	Landfill Leachate	EM1813261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Aug 2018	Landfill Leachate	EM1813826	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2018	Landfill Leachate	EM1814339	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Sep 2018	Landfill Leachate	EM1814493	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6 - Historical Landfill Leachate

Dulverton Regional Waste Management Authority

Dulverton Environmental Monitoring

			Metals												BTEXN									
			Iron (filtered)	Lead	Lead (filtered)	Manganese	Manganese (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	Selenium	Selenium (filtered)	Zinc	Zinc (filtered)	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	BTEX (Sum of Total) - Lab Calc	Naphthalene	F1 (C6-C10 minus BTEX)	C6-C10 Fraction
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			0.05	0.001	0.001	0.001	0.001	0.0001	0.0001	0.001	0.001	0.01	0.01	0.005	0.005	1	2	2	2	2	2	1	1	20	20
ADWG 2011 Recreational (v3.7 updated 2022)				**0.1**	**0.1**	**5**	**5**	**0.01**	**0.01**	**0.2**	**0.2**	**0.1**	**0.1**			**10**	**8,000**	**3,000**			**6,000**				
ANZG (2018) - FW - 95% (updated 26 July 2021)				0.0034	0.0034	1.9	1.9	0.0006	0.0006	0.011	0.011	0.011	0.011	0.008	0.008	950	180	80	350				16		
ANZECC 2000 - Stock Watering				0.1	0.1			0.002	0.002	1	1	0.02	0.02	20	20										
ANZECC 2000 Irrigation - Long-term Trigger Values			0.2	2	2	0.2	0.2	0.002	0.002	0.2	0.2	0.02	0.02	2	2										
ANZECC 2000 Irrigation - Short-term Trigger Values			10	5	5	10	10	0.002	0.002	2	2	0.05	0.05	5	5										
Date	**Field ID**	**Lab Report Number**																							
19 Sep 2018	Leachate	EM1815239	5.39	0.049	0.028	0.316	0.303	<0.0001	<0.0001	0.072	0.062	<0.01	<0.01	0.690	0.560	-	-	-	-	-	-	-	-	-	-
20 Sep 2018	Landfill Leachate	EM1815253	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Sep 2018	Landfill Leachate	EM1815378	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Oct 2018	Landfill Leachate	EM1816257	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2018	Landfill Leachate	EM1818033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Nov 2018	Weekly Leachate	EM1818439	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Nov 2018	Landfill Leachate	EM1818867	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2018	Landfill Leachate	EM1820185	3.52	0.076	0.007	0.322	0.335	<0.0001	<0.0001	0.145	0.167	<0.01	<0.01	0.927	0.262	<1	2	<2	<2	<2	<2	2	<5	<20	<20
19 Feb 2019	Landfill Leachate	EM1902347	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Feb 2019	Landfill Leachate	EM1902762	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Mar 2019	Landfill Leachate	EM1904095	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Mar 2019	Landfill Leachate	EM1904168	4.18	0.011	0.006	0.460	0.353	<0.0001	<0.0001	**0.265**	**0.260**	<0.10	<0.05	0.366	0.132	1	4	<2	<2	<2	<2	5	<2	40	40
09 May 2019	Landfill Leachate - G	EM1907045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 May 2019	Landfill Leachate - P	EM1907034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 May 2019	Landfill Leachate	EM1908322	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jun 2019	Landfill Leachate	EM1910175	2.00	0.025	0.004	0.415	0.419	<0.0001	<0.0001	0.100	0.106	<0.02	<0.02	0.781	0.342	<1	3	<2	<2	2	2	5	<2	40	40
28 Jun 2019	DWM280619	EM1910927	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Jul 2019	DWM1072019	EM1910930	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31 Jul 2019	DWM31072019	EM1912255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Aug 2019	Landfill Leachate	EM1913958	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Aug 2019	DWM270819	EM1914006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Sep 2019	Landfill Leachate	EM1915222	2.04	0.003	0.002	0.356	0.348	<0.0001	<0.0001	0.079	0.074	<0.02	<0.02	0.199	0.089	<1	3	<2	<2	3	3	6	<2	<20	<20
11 Sep 2019	Landfill Leachate	EM1915222	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Dec 2019	Landfill Leachate	EM1921873	2.75	0.016	<0.005	0.522	0.466	<0.0001	<0.0001	0.139	0.155	<0.01	<0.05	0.373	0.331	5	9	<2	5	5	10	24	<1.0	110	130
17 Dec 2019	Landfill Leachate	EM1921873	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Mar 2020	Landfill Leachate	EM2005146	3.97	0.028	0.010	0.785	0.727	<0.0001	<0.0001	0.149	0.176	<0.05	<0.05	0.663	0.278	<1	10	4	5	10	15	29	<4	30	60
25 Mar 2020	Pomona Pump	EM2005146	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Apr 2020	Pomona Pump	EM2005914	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Landfill Leachate	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Leachate Pond	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Pomona Pump	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Landfill Leachate	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Pomona Pump	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Landfill Leachate	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Pomona Pump	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Jun 2020	Landfill Leachate	EM2010246	3.71	0.019	0.016	0.507	0.499	<0.0001	<0.0001	0.062	0.063	<0.02	<0.02	0.285	0.312	<1	4	3	5	9	16	23	<2	40	60
16 Jun 2020	Landfill Leachate	EM2010246	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	10	-	-	-	-	-
22 Jul 2020	Landfill Leachate	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Pomona Pump	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Dulverton Leachate	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Pomona Pump	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Landfill Leachate	EM2017090	5.99	0.007	0.009	0.515	0.454	<0.0001	<0.0001	0.049	0.060	<0.05	<0.05	0.163	0.309	1	3	5	16	31	49	58	<2	50	110
29 Sep 2020	Landfill Leachate	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	33	-	-	-	-	-
29 Sep 2020	Pomona Pump	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Landfill Leachate	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Pomona Pump	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Dec 2020	Landfill Leachate	EM2021896	1.96	0.021	0.005	0.708	0.632	<0.0001	<0.0001	0.074	0.073	<0.01	<0.01	0.417	0.309	<1	<2	<2	<2	<2	<2	<1	<2	30	30
07 Dec 2020	Landfill Leachate	EM2021896	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Mar 2021	Pomona Pump	EM2105221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 May 2021	Landfill Leachate	EM2108650	4.28	0.001	<0.001	0.246	0.229	<0.0001	<0.0001	0.082	0.069	<0.01	<0.01	0.023	0.016	<1	<2	<2	<2	<2	<2	<1	<4	<20	<20
22 Jun 2021	Landfill Leachate	EM2111910	0.98	0.023	0.002	0.342	0.282	<0.0001	<0.0001	0.072	0.064	<0.01	<0.01	0.368	0.065	<1	6	<2	<2	3	3	9	<4	20	30
20 Jul 2021	Landfill Leachate	EM2114040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Aug 2021	Landfill Leachate	EM2116503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Sep 2021	Pomona pump	EM2119193	9.27	0.030	<0.010	0.817	0.833	<0.0010	<0.0001	**0.241**	**0.232**	<0.10	<0.10	0.458	0.162	<1	4	<2	6	10	16	20	<5	180	200
18 Oct 2021	Landfill Leachate	EM2120767	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Nov 2021	Pomona	EM2123125	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Dec 2021	Landfill Leachate	EM2124673	17.7	0.027	0.012	0.830	0.602	<0.0010	<0.0010	**0.256**	**0.231**	<0.10	<0.10	0.533	0.340	<1	2	4	5	6	11	17	<2	170	190
08 Mar 2022	Landfill Leachate	EM2204291	7.88	0.022	0.007	0.541	0.512	<0.0005	<0.0010	0.190	0.148	<0.05	0.05	0.397	0.231	<1	<2	<2	3	4	7	7	<2	120	130
30 Mar 2022	Landfill Leachate	EM2205710	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2022	Landfill Leachate	EM2207498	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 May 2022	Landfill Leachate	EM2209763	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Jun 2022	Landfill Leachate	EM2210922	12.6	0.010	0.001	0.517	0.463	<0.0010	<0.0001	0.055	0.045	<0.01	<0.01	0.133	0.043	3	3	11	9	23	32	49	<2	50	100
07 Jun 2022	Landfill Leachate	EM2210922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2022	Landfill Leachate	EM2214400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Sep 2022	Landfill Leachate	EM2218995	12.2	0.016	0.013	0.556	0.607	<0.0010	<0.0001	0.177	**0.206**	<0.01	<0.02	0.365	0.273	<1	<2	<2	5	8	13	13	-	50	60
27 Sep 2022	Landfill Leachate	EM2218995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<2	-	-
18 Oct 2022	Landfill Leachate	EM2220632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6 - Historical Landfill Leachate

			Metals												BTEXN									
			Iron (filtered)	Lead	Lead (filtered)	Manganese	Manganese (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	Selenium	Selenium (filtered)	Zinc	Zinc (filtered)	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	BTEX (Sum of Total) - Lab Calc	Naphthalene	F1 (C6-C10 minus BTEX)	C6-C10 Fraction
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			0.05	0.001	0.001	0.001	0.001	0.0001	0.0001	0.001	0.001	0.01	0.01	0.005	0.005	1	2	2	2	2	2	1	1	20	20
ADWG 2011 Recreational (v3.7 updated 2022)				**0.1**	**0.1**	**5**	**5**	**0.01**	**0.01**	**0.2**	**0.2**	**0.1**	**0.1**			**10**	**8,000**	**3,000**			**6,000**				
ANZG (2018) - FW - 95% (updated 26 July 2021)				0.0034	0.0034	1.9	1.9	0.0006	0.0006	0.011	0.011	0.011	0.011	0.008	0.008	950	180	80	350				16		
ANZECC 2000 - Stock Watering				0.1	0.1			0.002	0.002	1	1	0.02	0.02	20	20										
ANZECC 2000 Irrigation - Long-term Trigger Values			0.2	2	2	0.2	0.2	0.002	0.002	0.2	0.2	0.02	0.02	2	2										
ANZECC 2000 Irrigation - Short-term Trigger Values			10	5	5	10	10	0.002	0.002	2	2	0.05	0.05	5	5										
Date	**Field ID**	**Lab Report Number**																							
08 Nov 2022	Landfill Leachate	EM2222080	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Dec 2022	Landfill leachate	EM2225257	16.6	**0.288**	0.014	0.802	0.554	<0.0005	<0.0001	**0.232**	0.200	<0.01	<0.05	1.04	0.271	1	3	4	6	13	19	27	<2	40	70
30 Mar 2023	Landfill leachate	EM2305604	5.19	0.029	0.008	0.430	0.171	<0.0010	<0.0001	**0.224**	0.109	<0.10	<0.01	0.323	0.164	<1	<2	<2	2	4	6	6	<2	30	40
29 Jun 2023	Landfill leachate	EM2311710	5.00	0.024	0.003	0.860	0.725	<0.0005	<0.0001	0.113	0.098	<0.01	<0.01	0.270	0.099	<1	14	4	8	14	22	40	<2	150	190
19 Jul 2023	Landfill Leachate	EM2313106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023	Landfill Leachate	EM2314818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023	Landfill leachate	EM2316162	2.36	0.018	0.005	0.341	0.294	<0.0001	<0.0001	0.047	0.043	<0.01	<0.01	0.341	0.082	3	16	6	22	42	64	89	<8	100	190
24 Oct 2023	Landfill Leachate	EM2319274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023	Landfill Leachate	EM2319935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023	Landfill Leachate	EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023	Landfill leachate	EM2322269	5.06	0.022	0.007	0.525	0.449	<0.0010	<0.0010	**0.236**	**0.209**	<0.10	<0.01	0.580	0.367	<1	<2	<2	2	4	6	6	<2	90	100

Table 6 - Historical Landfill Leachate

Dulverton Regional Waste Management Authority

Dulverton Environmental Monitoring

			TRH - NEPM 2013					TRH - NEPM 2013 - SG Cleanup					TRH - NEPM 1999					TRH - NEPM 1999 - SG Cleanup				TPH			
			F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	F2 (>C10-C16 minus Naphthalene) SG Cleanup	>C10-C16 SG Cleanup	>C16-C34 SG Cleanup	>C34-C40 SG Cleanup	>C10-C40 (sum) SG Cleanup	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 (Sum of Total)	C10-C14 SG Cleanup	C15-C28	C29-C36 SG Cleanup	C10-C36 (sum) SG Cleanup	Oil & Grease	Acenaphthene	Acenaphthylene	Anthracene
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			100	100	100	100	100	100	100	100	100	100	20	50	100	50	50	50	100	50	50	5,000	1	1	1
ADWG 2011 Recreational (v3.7 updated 2022)																									
ANZG (2018) - FW - 95% (updated 26 July 2021)																									0.4
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
10 Sep 2013	LEACHATE POND 2	EM1309644	8,090	8,090	1,470	<100	9,560	-	-	-	-	-	450	9,200	1,870	100	11,200	-	-	-	-	<5,000	<5	<5	<5
10 Sep 2013	POND 1	EM1309643	15,800	15,800	1,400	<100	17,200	-	-	-	-	-	530	19,100	1,980	60	21,100	-	-	-	-	11,000	<5	<5	<5
18 Nov 2013	Landfill leachate (quarterly)	EM1312183	<100	<100	<100	<100	<100	-	-	-	-	-	<20	<50	<100	<50	<50	-	-	-	-	<5,000	<1	<1	<1
04 Mar 2014	Landfill leachate (quarterly)	EM1401975	350	350	1,200	<100	1,550	-	-	-	-	-	<20	220	1,080	180	1,480	-	-	-	-	9,000	<1	<1	<1
02 Jun 2014	Landfill leachate (quarterly)	EM1405379	1,620	1,620	1,300	<100	2,920	-	-	-	-	-	200	1,280	1,630	<50	2,910	-	-	-	-	<5,000	<10	<10	<10
17 Jun 2014	Landfill leachate (quarterly)	EM1405379	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Sep 2014	Landfill leachate (quarterly)	EM1408979	2,390	2,390	2,700	<100	5,090	-	-	-	-	-	110	1,880	2,920	260	5,060	-	-	-	-	<5,000	<1	<1	<1
01 Jun 2015	Landfill leachate (quarterly)	EM1510467	530	530	850	<100	1,380	-	-	-	-	-	<20	380	950	<50	1,330	-	-	-	-	12,000	<1	<1	<1
27 Jun 2016	Landfill leachate (quarterly)	EM1607483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	400	400	680	<100	1,080	-	-	-	-	-	<20	270	740	100	1,110	-	-	-	-	12,000	<1	<1	<1
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jan 2017	Landfill leachate (quarterly)	EM1700066	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Jan 2017	Weekly Leachate	EM1700104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,000	-	-	-
18 Jan 2017	Weekly Leachate	EM1700551	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7,000	-	-	-
25 Jan 2017	Weekly Leachate	EM1700831	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9,000	-	-	-
02 Feb 2017	Weekly Leachate	EM1701200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8,000	-	-	-
07 Feb 2017	Weekly Leachate	EM1701278	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8,000	-	-	-
15 Feb 2017	Weekly Leachate	EM1701686	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
20 Feb 2017	Weekly leachate	EM1701861	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Feb 2017	Weekly leachate	EM1702391	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
06 Mar 2017	DWM060317	EM1702567	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
16 Mar 2017	DWM160317	EM1703065	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23 Mar 2017	DWM230317	EM1703524	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8,000	-	-	-
30 Mar 2017	DWM300317	EM1703932	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55,000	-	-	-
03 Apr 2017	DWM030417	EM1704134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7,000	-	-	-
10 Apr 2017	DWM100417	EM1704503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
20 Apr 2017	DWM200417	EM1705012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19,000	-	-	-
03 May 2017	DWM030517	EM1705620	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
08 May 2017	Landfill leachate (quarterly)	EM1705724	570	570	810	<100	1,380	-	-	-	-	-	<20	390	1,000	<50	1,390	-	-	-	-	<5,000	<1.0	<1.0	<1.0
29 May 2017	Leachate	EM1706966	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
05 Jun 2017	DWM050617	EM1707358	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
14 Jun 2017	DWM140617	EM1707709	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
19 Jun 2017	DWM190617	EM1707937	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
29 Jun 2017	DWM290617	EM1708550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
06 Jul 2017	DWM060717	EM1708866	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
13 Jul 2017	DWM130717	EM1709240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
09 Aug 2017	DWM090817	EM1710633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
14 Aug 2017	DWM140817	EM1710836	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
21 Aug 2017	DWM210817	EM1711202	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
28 Aug 2017	Quarterly leachate samples	EM1711607	940	940	2,240	300	3,480	-	-	-	-	-	40	900	2,180	490	3,570	-	-	-	-	<5,000	<1.3	<1.3	<1.3
06 Sep 2017	DWM060917	EM1712174	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,000	-	-	-
11 Sep 2017	DWM110917	EM1712414	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
20 Sep 2017	DWM200917	EM1712965	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
05 Oct 2017	DWM051017	EM1713718	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
12 Oct 2017	DWM121017	EM1714085	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
16 Oct 2017	DWM161017	EM1714224	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,000	-	-	-
25 Oct 2017	DWM251017	EM1714708	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
31 Oct 2017	DWM311017	EM1714989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5,000	-	-	-
26 Apr 2018	DWM260418	EM1806971	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,000	-	-	-
08 May 2018	DWM080518	EM1807569	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29,000	-	-	-
04 Jun 2018	Weekly Leachate	EM1809069	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9,000	-	-	-
14 Jun 2018	Weekly Leachate	EM1809582	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
20 Jun 2018	Weekly Leachate	EM1809922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13,000	-	-	-
25 Jun 2018	Landfill Leachate	EM1810261	-	1,260	3,410	110	4,780	-	-	-	-	-	-	950	3,820	240	5,010	-	-	-	-	-	-	-	-
02 Jul 2018	Filtered landfill leachate	EM1810597	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5,000	-	-	-
02 Jul 2018	Weekly Leachate	EM1810596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9,000	-	-	-
11 Jul 2018	Weekly Leachate	EM1811134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9,000	-	-	-
19 Jul 2018	Leachate	EM1811566	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,000	-	-	-
26 Jul 2018	Landfill Leachate	EM1811963	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8,000	-	-	-
06 Aug 2018	Landfill Leachate	EM1812536	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10,000	-	-	-
16 Aug 2018	Landfill Leachate	EM1813133	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5,000	-	-	-
20 Aug 2018	Landfill Leachate	EM1813261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7,000	-	-	-
29 Aug 2018	Landfill Leachate	EM1813826	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
06 Sep 2018	Landfill Leachate	EM1814339	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
10 Sep 2018	Landfill Leachate	EM1814493	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-

Table 6 - Historical Landfill Leachate

Dulverton Regional Waste Management Authority

Dulverton Environmental Monitoring

			TRH - NEPM 2013					TRH - NEPM 2013 - SG Cleanup					TRH - NEPM 1999					TRH - NEPM 1999 - SG Cleanup				TPH			
			F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	F2 (>C10-C16 minus Naphthalene) SG Cleanup	>C10-C16 SG Cleanup	>C16-C34 SG Cleanup	>C34-C40 SG Cleanup	>C10-C40 (sum) SG Cleanup	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 (Sum of Total)	C10-C14 SG Cleanup	C15-C28	C29-C36 SG Cleanup	C10-C36 (sum) SG Cleanup	Oil & Grease	Acenaphthene	Acenaphthylene	Anthracene
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			100	100	100	100	100	100	100	100	100	100	20	50	100	50	50	50	100	50	50	5,000	1	1	1
ADWG 2011 Recreational (v3.7 updated 2022)																									
ANZG (2018) - FW - 95% (updated 26 July 2021)																									0.4
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
19 Sep 2018	Leachate	EM1815239	-	510	1,470	<100	1,980	-	-	-	-	-	-	380	1,500	120	2,000	-	-	-	-	-	-	-	-
20 Sep 2018	Landfill Leachate	EM1815253	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,000	-	-	-
24 Sep 2018	Landfill Leachate	EM1815378	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9,000	-	-	-
09 Oct 2018	Landfill Leachate	EM1816257	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9,000	-	-	-
08 Nov 2018	Landfill Leachate	EM1818033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,000	-	-	-
15 Nov 2018	Weekly Leachate	EM1818439	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11,000	-	-	-
22 Nov 2018	Landfill Leachate	EM1818867	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7,000	-	-	-
12 Dec 2018	Landfill Leachate	EM1820185	2,570	2,570	6,590	140	9,300	-	-	-	-	-	30	1,950	7,190	310	9,450	-	-	-	-	-	-	-	-
19 Feb 2019	Landfill Leachate	EM1902347	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	69,000	-	-	-
26 Feb 2019	Landfill Leachate	EM1902762	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8,000	-	-	-
19 Mar 2019	Landfill Leachate	EM1904095	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17,000	-	-	-
20 Mar 2019	Landfill Leachate	EM1904168	3,370	3,370	10,000	270	13,600	-	-	-	-	-	30	2,590	10,600	610	13,800	-	-	-	-	-	<2	<2	<2
09 May 2019	Landfill Leachate - G	EM1907045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20,000	-	-	-
09 May 2019	Landfill Leachate - P	EM1907034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18,000	-	-	-
29 May 2019	Landfill Leachate	EM1908322	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14,000	-	-	-
26 Jun 2019	Landfill Leachate	EM1910175	1,330	1,330	3,650	<100	4,980	-	-	-	-	-	40	980	4,170	90	5,240	-	-	-	-	-	<2	<2	<2
28 Jun 2019	DWM280619	EM1910927	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7,000	-	-	-
10 Jul 2019	DWM1072019	EM1910930	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,000	-	-	-
31 Jul 2019	DWM31072019	EM1912255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
15 Aug 2019	Landfill Leachate	EM1913958	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5,000	-	-	-
27 Aug 2019	DWM270819	EM1914006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,000	-	-	-
09 Sep 2019	Landfill Leachate	EM1915222	960	960	2,650	<100	3,610	-	-	-	-	-	<20	750	2,880	180	3,810	-	-	-	-	-	<2	<2	<2
11 Sep 2019	Landfill Leachate	EM1915222	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Dec 2019	Landfill Leachate	EM1921873	2,290	2,290	5,130	170	7,590	-	-	-	-	-	170	1,670	5,710	380	7,760	-	-	-	-	6,000	<1.0	<1.0	<1.0
17 Dec 2019	Landfill Leachate	EM1921873	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Mar 2020	Landfill Leachate	EM2005146	1,260	1,260	3,260	170	4,690	-	-	-	-	-	70	900	3,440	370	4,710	-	-	-	-	10,000	<4	<4	<4
25 Mar 2020	Pomona Pump	EM2005146	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7,000	-	-	-
07 Apr 2020	Pomona Pump	EM2005914	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
21 Apr 2020	Landfill Leachate	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14,000	-	-	-
21 Apr 2020	Leachate Pond	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13,000	-	-	-
21 Apr 2020	Pomona Pump	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12,000	-	-	-
11 May 2020	Landfill Leachate	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15,000	-	-	-
11 May 2020	Pomona Pump	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
18 May 2020	Landfill Leachate	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8,000	-	-	-
18 May 2020	Pomona Pump	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,000	-	-	-
16 Jun 2020	Landfill Leachate	EM2010246	680	680	1,820	<100	2,500	-	-	-	-	-	90	500	1,840	260	2,600	-	-	-	-	5,000	<2	<2	<2
16 Jun 2020	Landfill Leachate	EM2010246	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Landfill Leachate	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7,000	-	-	-
22 Jul 2020	Pomona Pump	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,000	-	-	-
26 Aug 2020	Dulverton Leachate	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9,000	-	-	-
26 Aug 2020	Pomona Pump	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16,000	-	-	-
29 Sep 2020	Landfill Leachate	EM2017090	480	480	1,060	<100	1,540	-	-	-	-	-	140	380	1,100	110	1,590	-	-	-	-	5,000	<2	<2	<2
29 Sep 2020	Landfill Leachate	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Pomona Pump	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8,000	-	-	-
27 Oct 2020	Landfill Leachate	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15,000	-	-	-
27 Oct 2020	Pomona Pump	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
07 Dec 2020	Landfill Leachate	EM2021896	1,260	1,260	2,590	150	4,000	-	-	-	-	-	40	850	2,860	300	4,010	-	-	-	-	<5,000	<2	<2	<2
07 Dec 2020	Landfill Leachate	EM2021896	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Mar 2021	Pomona Pump	EM2105221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24,000	-	-	-
12 May 2021	Landfill Leachate	EM2108650	420	420	1,180	<100	1,600	-	-	-	-	-	<20	290	1,240	140	1,670	-	-	-	-	<5,000	<4	<4	<4
22 Jun 2021	Landfill Leachate	EM2111910	730	730	1,530	<100	2,260	-	-	-	-	-	50	560	1,670	140	2,370	-	-	-	-	7,000	<4	<4	<4
20 Jul 2021	Landfill Leachate	EM2114040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
18 Aug 2021	Landfill Leachate	EM2116503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,000	-	-	-
28 Sep 2021	Pomona pump	EM2119193	5,510	5,510	9,830	360	15,700	-	-	-	-	-	190	4,530	11,000	710	16,200	-	-	-	-	-	<7	<7	<7
18 Oct 2021	Landfill Leachate	EM2120767	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
17 Nov 2021	Pomona	EM2123125	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,000	-	-	-
06 Dec 2021	Landfill Leachate	EM2124673	2,120	2,120	4,420	150	6,690	-	-	-	-	-	210	1,730	4,800	340	6,870	-	-	-	-	5,000	<2	<2	<2
08 Mar 2022	Landfill Leachate	EM2204291	3,330	3,330	6,420	150	9,900	-	<100	180	<100	180	130	2,330	7,300	470	10,100	<50	130	70	200	6,000	<2	<2	<2
30 Mar 2022	Landfill Leachate	EM2205710	-	3,850	7,460	280	11,600	-	-	-	-	-	-	3,140	8,220	610	12,000	-	-	-	-	-	-	-	-
26 Apr 2022	Landfill Leachate	EM2207498	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11,000	-	-	-
24 May 2022	Landfill Leachate	EM2209763	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5,000	-	-	-
07 Jun 2022	Landfill Leachate	EM2210922	850	850	1,560	<100	2,410	-	-	-	-	-	120	670	1,650	110	2,430	-	-	-	-	<5,000	<2	<2	<2
07 Jun 2022	Landfill Leachate	EM2210922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2022	Landfill Leachate	EM2214400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14,000	-	-	-
27 Sep 2022	Landfill Leachate	EM2218995	3,670	3,670	7,160	370	11,200	-	-	-	-	-	100	2,710	7,620	680	11,000	-	-	-	-	<5,000	-	-	-
27 Sep 2022	Landfill Leachate	EM2218995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<2	<2	<2
18 Oct 2022	Landfill Leachate	EM2220632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-

Table 6 - Historical Landfill Leachate

			TRH - NEPM 2013					TRH - NEPM 2013 - SG Cleanup					TRH - NEPM 1999					TRH - NEPM 1999 - SG Cleanup				TPH			
			F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	F2 (>C10-C16 minus Naphthalene) SG Cleanup	>C10-C16 SG Cleanup	>C16-C34 SG Cleanup	>C34-C40 SG Cleanup	>C10-C40 (sum) SG Cleanup	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 (Sum of Total)	C10-C14 SG Cleanup	C15-C28	C29-C36 SG Cleanup	C10-C36 (sum) SG Cleanup	Oil & Grease	Acenaphthene	Acenaphthylene	Anthracene
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			100	100	100	100	100	100	100	100	100	100	20	50	100	50	50	50	100	50	50	5,000	1	1	1
ADWG 2011 Recreational (v3.7 updated 2022)																									
ANZG (2018) - FW - 95% (updated 26 July 2021)																									0.4
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
08 Nov 2022	Landfill Leachate	EM2222080	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10,000	-	-	-
15 Dec 2022	Landfill leachate	EM2225257	3,070	3,070	7,010	300	10,400	-	<100	730	190	920	130	2,330	6,680	810	9,820	<50	400	370	770	22,000	<2	<2	<2
30 Mar 2023	Landfill leachate	EM2305604	1,420	1,420	3,050	<100	4,470	-	120	180	<100	300	70	1,030	3,320	200	4,550	110	160	60	330	10,000	<2	<2	<2
29 Jun 2023	Landfill leachate	EM2311710	1,520	1,520	2,160	170	3,850	-	<100	<100	<100	<100	200	1,220	2,320	330	3,870	<50	<100	<50	<50	<5,000	<2	<2	<2
19 Jul 2023	Landfill Leachate	EM2313106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
16 Aug 2023	Landfill Leachate	EM2314818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	181,000	-	-	-
06 Sep 2023	Landfill leachate	EM2316162	1,680	1,680	33,600	600	35,900	100	100	810	190	1,100	200	1,040	32,400	2,660	36,100	<50	540	410	950	90,000	<8	<8	<8
24 Oct 2023	Landfill Leachate	EM2319274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	142,000	-	-	-
08 Nov 2023	Landfill Leachate	EM2319935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5,000	-	-	-
28 Nov 2023	Landfill Leachate	EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023	Landfill leachate	EM2322269	3,340	3,340	7,660	860	11,900	<100	<100	2,180	660	2,840	120	2,840	7,080	1,910	11,800	<50	1,220	1,290	2,510	15,000	<2	<2	<2

Table 6 - Historical Landfill Leachate

			PAHs - standard 16											PAHs - extended				Phenols - Halogenated						
			Benz(a)anthracene	Benzo(a)pyrene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	2-methylnaphthalene	3-methylcholanthrene	7,12-dimethylbenz(a)anthracene	Benzo(b+j+k)fluoranthene	2-Chlorophenol	2,4-Dichlorophenol	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,6-Dichlorophenol	4-Chloro-3-methylphenol	Pentachlorophenol
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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	0.5	1	1	1	1	1	1	1	1	0.5	0.5	2	2	2	4	1	1	1	1	1	1	2
ADWG 2011 Recreational (v3.7 updated 2022)				**0.1**															**3,000**	**2,000**		**200**			**100**
ANZG (2018) - FW - 95% (updated 26 July 2021)				0.2				1.4			2								490	160		20			10
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
10 Sep 2013	LEACHATE POND 2	EM1309644	<5	<2.5	<5	<5	<5	<5	<5	<5	<5	<5	-	<2.5	-	-	-	-	<5	<5	<5	<5	<5	<5	<10
10 Sep 2013	POND 1	EM1309643	<5	<2.5	<5	<5	<5	<5	<5	<5	<5	<5	-	<2.5	-	-	-	-	<5	<5	<5	<5	<5	<5	<10
18 Nov 2013	Landfill leachate (quarterly)	EM1312183	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	-	-	-	-	<1	<1	<1	<1	<1	8.2	<2
04 Mar 2014	Landfill leachate (quarterly)	EM1401975	<1	<0.6	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.6	-	-	-	-	<1	<1	<1	<1	<1	<1	<2
02 Jun 2014	Landfill leachate (quarterly)	EM1405379	<10	<5	<10	<10	<10	<10	<10	<10	<10	<10	-	<5	-	-	-	-	<10	<10	<10	<10	<10	<10	<20
17 Jun 2014	Landfill leachate (quarterly)	EM1405379	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Sep 2014	Landfill leachate (quarterly)	EM1408979	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.6	-	-	-	-	<1	<1	<1	<1	<1	<1	<2
01 Jun 2015	Landfill leachate (quarterly)	EM1510467	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.5	-	-	-	-	<1	<1	<1	<1	<1	<1	<2
27 Jun 2016	Landfill leachate (quarterly)	EM1607483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<2
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jan 2017	Landfill leachate (quarterly)	EM1700066	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Jan 2017	Weekly Leachate	EM1700104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Jan 2017	Weekly Leachate	EM1700551	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Jan 2017	Weekly Leachate	EM1700831	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Feb 2017	Weekly Leachate	EM1701200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Feb 2017	Weekly Leachate	EM1701278	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Feb 2017	Weekly Leachate	EM1701686	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Feb 2017	Weekly leachate	EM1701861	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Feb 2017	Weekly leachate	EM1702391	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Mar 2017	DWM060317	EM1702567	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Mar 2017	DWM160317	EM1703065	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23 Mar 2017	DWM230317	EM1703524	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30 Mar 2017	DWM300317	EM1703932	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03 Apr 2017	DWM030417	EM1704134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Apr 2017	DWM100417	EM1704503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Apr 2017	DWM200417	EM1705012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03 May 2017	DWM030517	EM1705620	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 May 2017	Landfill leachate (quarterly)	EM1705724	<1.0	<0.5	<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
29 May 2017	Leachate	EM1706966	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jun 2017	DWM050617	EM1707358	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2017	DWM140617	EM1707709	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Jun 2017	DWM190617	EM1707937	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Jun 2017	DWM290617	EM1708550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Jul 2017	DWM060717	EM1708866	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13 Jul 2017	DWM130717	EM1709240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Aug 2017	DWM090817	EM1710633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Aug 2017	DWM140817	EM1710836	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Aug 2017	DWM210817	EM1711202	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Aug 2017	Quarterly leachate samples	EM1711607	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<2.6	<2.6	-	-	-	-	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<2.6
06 Sep 2017	DWM060917	EM1712174	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 Sep 2017	DWM110917	EM1712414	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Sep 2017	DWM200917	EM1712965	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Oct 2017	DWM051017	EM1713718	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Oct 2017	DWM121017	EM1714085	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Oct 2017	DWM161017	EM1714224	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Oct 2017	DWM251017	EM1714708	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31 Oct 2017	DWM311017	EM1714989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2018	DWM260418	EM1806971	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 May 2018	DWM080518	EM1807569	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04 Jun 2018	Weekly Leachate	EM1809069	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2018	Weekly Leachate	EM1809582	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Jun 2018	Weekly Leachate	EM1809922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Jun 2018	Landfill Leachate	EM1810261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Jul 2018	Filtered landfill leachate	EM1810597	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Jul 2018	Weekly Leachate	EM1810596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 Jul 2018	Weekly Leachate	EM1811134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Jul 2018	Leachate	EM1811566	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2018	Landfill Leachate	EM1811963	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Aug 2018	Landfill Leachate	EM1812536	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2018	Landfill Leachate	EM1813133	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Aug 2018	Landfill Leachate	EM1813261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Aug 2018	Landfill Leachate	EM1813826	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2018	Landfill Leachate	EM1814339	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Sep 2018	Landfill Leachate	EM1814493	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6 - Historical Landfill Leachate

Dulverton Regional Waste Management Authority

Dulverton Environmental Monitoring

			PAHs - standard 16												PAHs - extended				Phenols - Halogenated						
			Benz(a)anthracene	Benzo(a)pyrene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	2-methylnaphthalene	3-methylcholanthrene	7,12-dimethylbenz(a)anthracene	Benzo(b+j+k)fluoranthene	2-Chlorophenol	2,4-Dichlorophenol	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,6-Dichlorophenol	4-Chloro-3-methylphenol	Pentachlorophenol
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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	0.5	1	1	1	1	1	1	1	1	0.5	0.5	2	2	2	4	1	1	1	1	1	1	2
ADWG 2011 Recreational (v3.7 updated 2022)				**0.1**															**3,000**	**2,000**		**200**			**100**
ANZG (2018) - FW - 95% (updated 26 July 2021)				0.2				1.4			2								490	160		20			10
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
19 Sep 2018	Leachate	EM1815239	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Sep 2018	Landfill Leachate	EM1815253	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Sep 2018	Landfill Leachate	EM1815378	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Oct 2018	Landfill Leachate	EM1816257	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2018	Landfill Leachate	EM1818033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Nov 2018	Weekly Leachate	EM1818439	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Nov 2018	Landfill Leachate	EM1818867	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2018	Landfill Leachate	EM1820185	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Feb 2019	Landfill Leachate	EM1902347	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Feb 2019	Landfill Leachate	EM1902762	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Mar 2019	Landfill Leachate	EM1904095	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Mar 2019	Landfill Leachate	EM1904168	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<4
09 May 2019	Landfill Leachate - G	EM1907045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 May 2019	Landfill Leachate - P	EM1907034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 May 2019	Landfill Leachate	EM1908322	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jun 2019	Landfill Leachate	EM1910175	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	-	-	-	-	-	-	-
28 Jun 2019	DWM280619	EM1910927	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Jul 2019	DWM1072019	EM1910930	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31 Jul 2019	DWM31072019	EM1912255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Aug 2019	Landfill Leachate	EM1913958	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Aug 2019	DWM270819	EM1914006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Sep 2019	Landfill Leachate	EM1915222	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<4
11 Sep 2019	Landfill Leachate	EM1915222	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Dec 2019	Landfill Leachate	EM1921873	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2	<0.5	<2	<2	<2	<4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
17 Dec 2019	Landfill Leachate	EM1921873	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Mar 2020	Landfill Leachate	EM2005146	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<7	<4	<4	<4	<4	<4	<4	<4
25 Mar 2020	Pomona Pump	EM2005146	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Apr 2020	Pomona Pump	EM2005914	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Landfill Leachate	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Leachate Pond	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Pomona Pump	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Landfill Leachate	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Pomona Pump	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Landfill Leachate	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Pomona Pump	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Jun 2020	Landfill Leachate	EM2010246	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	14	<4
16 Jun 2020	Landfill Leachate	EM2010246	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Landfill Leachate	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Pomona Pump	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Dulverton Leachate	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Pomona Pump	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Landfill Leachate	EM2017090	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<4
29 Sep 2020	Landfill Leachate	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Pomona Pump	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Landfill Leachate	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Pomona Pump	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Dec 2020	Landfill Leachate	EM2021896	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<4
07 Dec 2020	Landfill Leachate	EM2021896	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Mar 2021	Pomona Pump	EM2105221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 May 2021	Landfill Leachate	EM2108650	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<7	<4	<4	<4	<4	<4	<4	<4
22 Jun 2021	Landfill Leachate	EM2111910	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<5	<5	<4	<4	<4	<8	<4	<4	<4	<4	<4	<4
20 Jul 2021	Landfill Leachate	EM2114040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Aug 2021	Landfill Leachate	EM2116503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Sep 2021	Pomona pump	EM2119193	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<9	<9	<7	<7	<7	<15	<7	<7	<7	<7	<7	<7	<7
18 Oct 2021	Landfill Leachate	EM2120767	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Nov 2021	Pomona	EM2123125	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Dec 2021	Landfill Leachate	EM2124673	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<4
08 Mar 2022	Landfill Leachate	EM2204291	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<4
30 Mar 2022	Landfill Leachate	EM2205710	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2022	Landfill Leachate	EM2207498	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 May 2022	Landfill Leachate	EM2209763	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Jun 2022	Landfill Leachate	EM2210922	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<4
07 Jun 2022	Landfill Leachate	EM2210922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2022	Landfill Leachate	EM2214400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Sep 2022	Landfill Leachate	EM2218995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Sep 2022	Landfill Leachate	EM2218995	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<4
18 Oct 2022	Landfill Leachate	EM2220632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6 - Historical Landfill Leachate

Dulverton Regional Waste Management Authority

Dulverton Environmental Monitoring

			PAHs - standard 16												PAHs - extended				Phenols - Halogenated						
			Benz(a)anthracene	Benzo(a)pyrene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	2-methylnaphthalene	3-methylcholanthrene	7,12-dimethylbenz(a)anthracene	Benzo(b+j+k)fluoranthene	2-Chlorophenol	2,4-Dichlorophenol	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,6-Dichlorophenol	4-Chloro-3-methylphenol	Pentachlorophenol
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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	0.5	1	1	1	1	1	1	1	1	0.5	0.5	2	2	2	4	1	1	1	1	1	1	2
ADWG 2011 Recreational (v3.7 updated 2022)				**0.1**															**3,000**	**2,000**		**200**			**100**
ANZG (2018) - FW - 95% (updated 26 July 2021)				0.2				1.4			2								490	160		20			10
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
08 Nov 2022	Landfill Leachate	EM2222080	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Dec 2022	Landfill leachate	EM2225257	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<3	<3	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<4
30 Mar 2023	Landfill leachate	EM2305604	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<4
29 Jun 2023	Landfill leachate	EM2311710	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<3	<3	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<4
19 Jul 2023	Landfill Leachate	EM2313106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023	Landfill Leachate	EM2314818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023	Landfill leachate	EM2316162	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<9	<9	<8	<8	<8	<15	<8	<8	<8	<8	<8	<8	<8
24 Oct 2023	Landfill Leachate	EM2319274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023	Landfill Leachate	EM2319935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023	Landfill Leachate	EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023	Landfill leachate	EM2322269	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<4

Table 6 - Historical Landfill Leachate

			Phenols - Non-Halogenated																							
			Phenol	2-Nitrophenol	2-Methylphenol (o-Cresol)	3,4-Methylphenol (m,p-cresol)	2,4-Dimethylphenol	2,4-Dimethylphenol (filtered)	4,4'-DDE	4,4'-DDE (filtered)	a-BHC	a-BHC (filtered)	Aldrin	Aldrin (filtered)	Aldrin + Dieldrin	Aldrin + Dieldrin (filtered)	b-BHC	b-BHC (filtered)	Chlordane	Chlordane (filtered)	Chlordane (cis)	Chlordane (cis) (filtered)	Chlordane (trans)	Chlordane (trans) (filtered)	d-BHC
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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	2	1	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
ADWG 2011 Recreational (v3.7 updated 2022)															**3**	**3**			**20**	**20**						
ANZG (2018) - FW - 95% (updated 26 July 2021)			320																0.08	0.08						
ANZECC 2000 - Stock Watering																										
ANZECC 2000 Irrigation - Long-term Trigger Values																										
ANZECC 2000 Irrigation - Short-term Trigger Values																										
Date	**Field ID**	**Lab Report Number**																								
10 Sep 2013	LEACHATE POND 2	EM1309644	121	<5	<8	707	<5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	
10 Sep 2013	POND 1	EM1309643	82.5	<5	<9	655	<5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	
18 Nov 2013	Landfill leachate (quarterly)	EM1312183	1.7	<1	<1	132	<1	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	
04 Mar 2014	Landfill leachate (quarterly)	EM1401975	<1	<1	<1	<2	<1	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	
02 Jun 2014	Landfill leachate (quarterly)	EM1405379	100	<10	<10	311	<10	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	
17 Jun 2014	Landfill leachate (quarterly)	EM1405379	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
02 Sep 2014	Landfill leachate (quarterly)	EM1408979	14.6	<1	15.7	11.4	1.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	
01 Jun 2015	Landfill leachate (quarterly)	EM1510467	<1	<1	<1	<2	<1	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	
27 Jun 2016	Landfill leachate (quarterly)	EM1607483	-	-	-	-	-	<1.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	2.6	<1	2.5	<2	<1	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
05 Jan 2017	Landfill leachate (quarterly)	EM1700066	-	-	-	-	-	<1.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	
09 Jan 2017	Weekly Leachate	EM1700104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
18 Jan 2017	Weekly Leachate	EM1700551	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
25 Jan 2017	Weekly Leachate	EM1700831	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
02 Feb 2017	Weekly Leachate	EM1701200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
07 Feb 2017	Weekly Leachate	EM1701278	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
15 Feb 2017	Weekly Leachate	EM1701686	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
20 Feb 2017	Weekly leachate	EM1701861	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
27 Feb 2017	Weekly leachate	EM1702391	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
06 Mar 2017	DWM060317	EM1702567	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
16 Mar 2017	DWM160317	EM1703065	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
23 Mar 2017	DWM230317	EM1703524	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
30 Mar 2017	DWM300317	EM1703932	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
03 Apr 2017	DWM030417	EM1704134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
10 Apr 2017	DWM100417	EM1704503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
20 Apr 2017	DWM200417	EM1705012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
03 May 2017	DWM030517	EM1705620	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
08 May 2017	Landfill leachate (quarterly)	EM1705724	<1.0	<1.0	<1.0	<2.0	<1.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	
29 May 2017	Leachate	EM1706966	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
05 Jun 2017	DWM050617	EM1707358	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
14 Jun 2017	DWM140617	EM1707709	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
19 Jun 2017	DWM190617	EM1707937	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
29 Jun 2017	DWM290617	EM1708550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
06 Jul 2017	DWM060717	EM1708866	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
13 Jul 2017	DWM130717	EM1709240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
09 Aug 2017	DWM090817	EM1710633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
14 Aug 2017	DWM140817	EM1710836	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
21 Aug 2017	DWM210817	EM1711202	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
28 Aug 2017	Quarterly leachate samples	EM1711607	5.0	<1.3	9.2	4.5	<1.3	-	<1.3	-	<1.3	-	<1.3	-	<1.3	-	<1.3	-	<1.3	-	<1.3	-	<1.3	-	<1.3	
06 Sep 2017	DWM060917	EM1712174	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
11 Sep 2017	DWM110917	EM1712414	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
20 Sep 2017	DWM200917	EM1712965	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
05 Oct 2017	DWM051017	EM1713718	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
12 Oct 2017	DWM121017	EM1714085	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
16 Oct 2017	DWM161017	EM1714224	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
25 Oct 2017	DWM251017	EM1714708	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
31 Oct 2017	DWM311017	EM1714989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
26 Apr 2018	DWM260418	EM1806971	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
08 May 2018	DWM080518	EM1807569	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
04 Jun 2018	Weekly Leachate	EM1809069	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
14 Jun 2018	Weekly Leachate	EM1809582	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
20 Jun 2018	Weekly Leachate	EM1809922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
25 Jun 2018	Landfill Leachate	EM1810261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
02 Jul 2018	Filtered landfill leachate	EM1810597	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
02 Jul 2018	Weekly Leachate	EM1810596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
11 Jul 2018	Weekly Leachate	EM1811134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
19 Jul 2018	Leachate	EM1811566	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
26 Jul 2018	Landfill Leachate	EM1811963	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
06 Aug 2018	Landfill Leachate	EM1812536	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
16 Aug 2018	Landfill Leachate	EM1813133	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
20 Aug 2018	Landfill Leachate	EM1813261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
29 Aug 2018	Landfill Leachate	EM1813826	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
06 Sep 2018	Landfill Leachate	EM1814339	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
10 Sep 2018	Landfill Leachate	EM1814493	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Table 6 - Historical Landfill Leachate

Dulverton Regional Waste Management Authority

Dulverton Environmental Monitoring

			Phenols - Non-Halogenated																							
			Phenol	2-Nitrophenol	2-Methylphenol (o-Cresol)	3,4-Methylphenol (m,p-cresol)	2,4-Dimethylphenol	2,4-Dimethylphenol (filtered)	4,4'-DDE	4,4'-DDE (filtered)	a-BHC	a-BHC (filtered)	Aldrin	Aldrin (filtered)	Aldrin + Dieldrin	Aldrin + Dieldrin (filtered)	b-BHC	b-BHC (filtered)	Chlordane	Chlordane (filtered)	Chlordane (cis)	Chlordane (cis) (filtered)	Chlordane (trans)	Chlordane (trans) (filtered)	d-BHC
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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	2	1	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
ADWG 2011 Recreational (v3.7 updated 2022)															**3**	**3**			**20**	**20**					
ANZG (2018) - FW - 95% (updated 26 July 2021)			320																0.08	0.08					
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
19 Sep 2018	Leachate	EM1815239	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Sep 2018	Landfill Leachate	EM1815253	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Sep 2018	Landfill Leachate	EM1815378	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Oct 2018	Landfill Leachate	EM1816257	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2018	Landfill Leachate	EM1818033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Nov 2018	Weekly Leachate	EM1818439	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Nov 2018	Landfill Leachate	EM1818867	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2018	Landfill Leachate	EM1820185	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Feb 2019	Landfill Leachate	EM1902347	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Feb 2019	Landfill Leachate	EM1902762	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Mar 2019	Landfill Leachate	EM1904095	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Mar 2019	Landfill Leachate	EM1904168	100	<2	13	449	<2	-	<0.8	-	<0.8	-	<0.8	-	<0.8	-	<0.8	-	<0.8	-	<0.8	-	<0.8	-	<0.8
09 May 2019	Landfill Leachate - G	EM1907045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 May 2019	Landfill Leachate - P	EM1907034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 May 2019	Landfill Leachate	EM1908322	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jun 2019	Landfill Leachate	EM1910175	-	-	-	-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
28 Jun 2019	DWM280619	EM1910927	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Jul 2019	DWM1072019	EM1910930	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31 Jul 2019	DWM31072019	EM1912255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Aug 2019	Landfill Leachate	EM1913958	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Aug 2019	DWM270819	EM1914006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Sep 2019	Landfill Leachate	EM1915222	<2	<2	<2	<4	<2	-	<0.9	-	<0.9	-	<0.9	-	<0.9	-	<0.9	-	<0.9	-	<0.9	-	<0.9	-	<0.9
11 Sep 2019	Landfill Leachate	EM1915222	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Dec 2019	Landfill Leachate	EM1921873	10	<1.0	13	36.4	1.8	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
17 Dec 2019	Landfill Leachate	EM1921873	14.4	-	15.0	50	<2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Mar 2020	Landfill Leachate	EM2005146	<4	<4	5	12	<4	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
25 Mar 2020	Pomona Pump	EM2005146	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Apr 2020	Pomona Pump	EM2005914	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Landfill Leachate	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Leachate Pond	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Pomona Pump	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Landfill Leachate	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Pomona Pump	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Landfill Leachate	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Pomona Pump	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Jun 2020	Landfill Leachate	EM2010246	<2	<2	2	<4	<2	-	<2	-	<2	-	<2	-	<0.9	-	<2	-	<0.9	-	<2.8	-	<2.8	-	<2
16 Jun 2020	Landfill Leachate	EM2010246	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Landfill Leachate	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Pomona Pump	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Dulverton Leachate	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Pomona Pump	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Landfill Leachate	EM2017090	3	<2	4	4	<2	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
29 Sep 2020	Landfill Leachate	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Pomona Pump	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Landfill Leachate	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Pomona Pump	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Dec 2020	Landfill Leachate	EM2021896	29	<2	5	121	<2	-	<0.5	-	<0.5	-	<0.5	-	0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
07 Dec 2020	Landfill Leachate	EM2021896	-	-	-	-	-	-	-	-	-	-	-	-	<4	-	-	-	-	-	-	-	-	-	-
24 Mar 2021	Pomona Pump	EM2105221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 May 2021	Landfill Leachate	EM2108650	<4	<4	<4	9	<4	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
22 Jun 2021	Landfill Leachate	EM2111910	<4	<4	5	8	<4	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
20 Jul 2021	Landfill Leachate	EM2114040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Aug 2021	Landfill Leachate	EM2116503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Sep 2021	Pomona pump	EM2119193	50	<7	71	121	<7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7
18 Oct 2021	Landfill Leachate	EM2120767	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Nov 2021	Pomona	EM2123125	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Dec 2021	Landfill Leachate	EM2124673	5	<2	52	38	<2	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
08 Mar 2022	Landfill Leachate	EM2204291	<2	<2	50	<4	<2	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
30 Mar 2022	Landfill Leachate	EM2205710	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2022	Landfill Leachate	EM2207498	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 May 2022	Landfill Leachate	EM2209763	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Jun 2022	Landfill Leachate	EM2210922	<2	<2	7	<4	<2	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7
07 Jun 2022	Landfill Leachate	EM2210922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2022	Landfill Leachate	EM2214400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Sep 2022	Landfill Leachate	EM2218995	-	-	-	-	-	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7
27 Sep 2022	Landfill Leachate	EM2218995	<2	<2	44	<4	<2	-	<2	-	<2	-	<2	-	<4	-	<2	-	-	-	-	-	-	-	<2
18 Oct 2022	Landfill Leachate	EM2220632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6 - Historical Landfill Leachate

			Phenols - Non-Halogenated																						
			Phenol	2-Nitrophenol	2-Methylphenol (o-Cresol)	3,4-Methylphenol (m,p-cresol)	2,4-Dimethylphenol	2,4-Dimethylphenol (filtered)	4,4'-DDE	4,4'-DDE (filtered)	a-BHC	a-BHC (filtered)	Aldrin	Aldrin (filtered)	Aldrin + Dieldrin	Aldrin + Dieldrin (filtered)	b-BHC	b-BHC (filtered)	Chlordane	Chlordane (filtered)	Chlordane (cis)	Chlordane (cis) (filtered)	Chlordane (trans)	Chlordane (trans) (filtered)	d-BHC
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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	2	1	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
ADWG 2011 Recreational (v3.7 updated 2022)															**3**	**3**			**20**	**20**					
ANZG (2018) - FW - 95% (updated 26 July 2021)			320																0.08	0.08					
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
08 Nov 2022	Landfill Leachate	EM2222080	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Dec 2022	Landfill leachate	EM2225257	44	<2	36	32	<2	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
30 Mar 2023	Landfill leachate	EM2305604	<2	<2	24	<4	<2	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
29 Jun 2023	Landfill leachate	EM2311710	50	<2	10	112	<2	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
19 Jul 2023	Landfill Leachate	EM2313106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023	Landfill Leachate	EM2314818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023	Landfill leachate	EM2316162	<8	<8	10	9	<8	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
24 Oct 2023	Landfill Leachate	EM2319274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023	Landfill Leachate	EM2319935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023	Landfill Leachate	EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023	Landfill leachate	EM2322269	80	<2	46	109	<2	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5

Table 6 - Historical Landfill Leachate

			OC Pesticides																					
			d-BHC (filtered)	4,4 DDD	4,4 DDD (filtered)	4,4 DDT	4,4 DDT (filtered)	DDT+DDE+DDD - Lab Calc	DDT+DDE+DDD - Lab Calc (filtered)	Dieldrin	Dieldrin (filtered)	Endosulfan I (alpha)	Endosulfan I (alpha) (filtered)	Endosulfan II (beta)	Endosulfan II (beta) (filtered)	Endosulfan Sulfate	Endosulfan Sulfate (filtered)	Endrin	Endrin (filtered)	Endrin aldehyde	Endrin aldehyde (filtered)	Endrin ketone	Endrin ketone (filtered)	g-BHC (Lindane)	g-BHC (Lindane) (filtered)
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			0.5	0.5	0.5	2	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
ADWG 2011 Recreational (v3.7 updated 2022)						**90**	**90**																	**100**	**100**
ANZG (2018) - FW - 95% (updated 26 July 2021)						0.01	0.01											0.02	0.02					0.2	0.2
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
10 Sep 2013	LEACHATE POND 2	EM1309644	-	<0.5	-	<2	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-
10 Sep 2013	POND 1	EM1309643	-	<0.5	-	<2	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-
18 Nov 2013	Landfill leachate (quarterly)	EM1312183	-	<0.5	-	<2	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-
04 Mar 2014	Landfill leachate (quarterly)	EM1401975	-	<0.5	-	<2	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-
02 Jun 2014	Landfill leachate (quarterly)	EM1405379	-	<0.5	-	<2	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-
17 Jun 2014	Landfill leachate (quarterly)	EM1405379	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Sep 2014	Landfill leachate (quarterly)	EM1408979	-	0.6	-	<2	-	0.6	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-
01 Jun 2015	Landfill leachate (quarterly)	EM1510467	-	<0.5	-	<2	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-
27 Jun 2016	Landfill leachate (quarterly)	EM1607483	<0.5	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	<0.5	<0.5	<0.5	<2	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jan 2017	Landfill leachate (quarterly)	EM1700066	<0.5	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
09 Jan 2017	Weekly Leachate	EM1700104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Jan 2017	Weekly Leachate	EM1700551	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Jan 2017	Weekly Leachate	EM1700831	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Feb 2017	Weekly Leachate	EM1701200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Feb 2017	Weekly Leachate	EM1701278	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Feb 2017	Weekly Leachate	EM1701686	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Feb 2017	Weekly leachate	EM1701861	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Feb 2017	Weekly leachate	EM1702391	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Mar 2017	DWM060317	EM1702567	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Mar 2017	DWM160317	EM1703065	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23 Mar 2017	DWM230317	EM1703524	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30 Mar 2017	DWM300317	EM1703932	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03 Apr 2017	DWM030417	EM1704134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Apr 2017	DWM100417	EM1704503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Apr 2017	DWM200417	EM1705012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03 May 2017	DWM030517	EM1705620	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 May 2017	Landfill leachate (quarterly)	EM1705724	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-
29 May 2017	Leachate	EM1706966	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jun 2017	DWM050617	EM1707358	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2017	DWM140617	EM1707709	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Jun 2017	DWM190617	EM1707937	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Jun 2017	DWM290617	EM1708550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Jul 2017	DWM060717	EM1708866	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13 Jul 2017	DWM130717	EM1709240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Aug 2017	DWM090817	EM1710633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Aug 2017	DWM140817	EM1710836	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Aug 2017	DWM210817	EM1711202	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Aug 2017	Quarterly leachate samples	EM1711607	-	<1.3	-	<2.0	-	<1.3	-	<1.3	-	<1.3	-	<1.3	-	<1.3	-	<1.3	-	<1.3	-	<1.3	-	<1.3	-
06 Sep 2017	DWM060917	EM1712174	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 Sep 2017	DWM110917	EM1712414	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Sep 2017	DWM200917	EM1712965	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Oct 2017	DWM051017	EM1713718	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Oct 2017	DWM121017	EM1714085	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Oct 2017	DWM161017	EM1714224	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Oct 2017	DWM251017	EM1714708	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31 Oct 2017	DWM311017	EM1714989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2018	DWM260418	EM1806971	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 May 2018	DWM080518	EM1807569	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04 Jun 2018	Weekly Leachate	EM1809069	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2018	Weekly Leachate	EM1809582	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Jun 2018	Weekly Leachate	EM1809922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Jun 2018	Landfill Leachate	EM1810261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Jul 2018	Filtered landfill leachate	EM1810597	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Jul 2018	Weekly Leachate	EM1810596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 Jul 2018	Weekly Leachate	EM1811134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Jul 2018	Leachate	EM1811566	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2018	Landfill Leachate	EM1811963	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Aug 2018	Landfill Leachate	EM1812536	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2018	Landfill Leachate	EM1813133	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Aug 2018	Landfill Leachate	EM1813261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Aug 2018	Landfill Leachate	EM1813826	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2018	Landfill Leachate	EM1814339	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Sep 2018	Landfill Leachate	EM1814493	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6 - Historical Landfill Leachate

Dulverton Regional Waste Management Authority

Dulverton Environmental Monitoring

	OC Pesticides																						
	d-BHC (filtered)	4,4 DDD	4,4 DDD (filtered)	4,4 DDT	4,4 DDT (filtered)	DDT+DDE+DDD - Lab Calc	DDT+DDE+DDD - Lab Calc (filtered)	Dieldrin	Dieldrin (filtered)	Endosulfan I (alpha)	Endosulfan I (alpha) (filtered)	Endosulfan II (beta)	Endosulfan II (beta) (filtered)	Endosulfan Sulfate	Endosulfan Sulfate (filtered)	Endrin	Endrin (filtered)	Endrin aldehyde	Endrin aldehyde (filtered)	Endrin ketone	Endrin ketone (filtered)	g-BHC (Lindane)	g-BHC (Lindane) (filtered)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.5	0.5	0.5	2	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
ADWG 2011 Recreational (v3.7 updated 2022)				**90**	**90**																	**100**	**100**
ANZG (2018) - FW - 95% (updated 26 July 2021)				0.01	0.01											0.02	0.02					0.2	0.2
ANZECC 2000 - Stock Watering																							
ANZECC 2000 Irrigation - Long-term Trigger Values																							
ANZECC 2000 Irrigation - Short-term Trigger Values																							

Date	Field ID	Lab Report Number																						
19 Sep 2018	Leachate	EM1815239	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Sep 2018	Landfill Leachate	EM1815253	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Sep 2018	Landfill Leachate	EM1815378	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Oct 2018	Landfill Leachate	EM1816257	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2018	Landfill Leachate	EM1818033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Nov 2018	Weekly Leachate	EM1818439	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Nov 2018	Landfill Leachate	EM1818867	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2018	Landfill Leachate	EM1820185	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Feb 2019	Landfill Leachate	EM1902347	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Feb 2019	Landfill Leachate	EM1902762	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Mar 2019	Landfill Leachate	EM1904095	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Mar 2019	Landfill Leachate	EM1904168	-	<0.8	-	<2.0	-	<0.8	-	<0.8	-	<0.8	-	<0.8	-	<0.8	-	<0.8	-	<0.8	-	<0.8	-	<0.8	-
09 May 2019	Landfill Leachate - G	EM1907045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 May 2019	Landfill Leachate - P	EM1907034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 May 2019	Landfill Leachate	EM1908322	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jun 2019	Landfill Leachate	EM1910175	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-
28 Jun 2019	DWM280619	EM1910927	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Jul 2019	DWM1072019	EM1910930	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31 Jul 2019	DWM31072019	EM1912255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Aug 2019	Landfill Leachate	EM1913958	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Aug 2019	DWM270819	EM1914006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Sep 2019	Landfill Leachate	EM1915222	-	<0.9	-	<2.0	-	<0.9	-	<0.9	-	<0.9	-	<0.9	-	<0.9	-	<0.9	-	<0.9	-	<0.9	-	<0.9	-
11 Sep 2019	Landfill Leachate	EM1915222	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Dec 2019	Landfill Leachate	EM1921873	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-
17 Dec 2019	Landfill Leachate	EM1921873	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Mar 2020	Landfill Leachate	EM2005146	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-
25 Mar 2020	Pomona Pump	EM2005146	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Apr 2020	Pomona Pump	EM2005914	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Landfill Leachate	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Leachate Pond	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Pomona Pump	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Landfill Leachate	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Pomona Pump	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Landfill Leachate	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Pomona Pump	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Jun 2020	Landfill Leachate	EM2010246	-	<2	-	<4	-	<0.9	-	<2	-	<2	-	<2	-	<2	-	<2	-	<2.8	-	<2.8	-	<2	-
16 Jun 2020	Landfill Leachate	EM2010246	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Landfill Leachate	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Pomona Pump	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Dulverton Leachate	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Pomona Pump	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Landfill Leachate	EM2017090	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-
29 Sep 2020	Landfill Leachate	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Pomona Pump	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Landfill Leachate	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Pomona Pump	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Dec 2020	Landfill Leachate	EM2021896	-	<0.5	-	<2.0	-	<0.5	-	0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-
07 Dec 2020	Landfill Leachate	EM2021896	-	-	-	-	-	-	-	<2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Mar 2021	Pomona Pump	EM2105221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 May 2021	Landfill Leachate	EM2108650	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-
22 Jun 2021	Landfill Leachate	EM2111910	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-
20 Jul 2021	Landfill Leachate	EM2114040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Aug 2021	Landfill Leachate	EM2116503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Sep 2021	Pomona pump	EM2119193	-	<0.7	-	<2.0	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-
18 Oct 2021	Landfill Leachate	EM2120767	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Nov 2021	Pomona	EM2123125	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Dec 2021	Landfill Leachate	EM2124673	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-
08 Mar 2022	Landfill Leachate	EM2204291	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-
30 Mar 2022	Landfill Leachate	EM2205710	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2022	Landfill Leachate	EM2207498	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 May 2022	Landfill Leachate	EM2209763	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Jun 2022	Landfill Leachate	EM2210922	-	<0.7	-	<2.0	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-
07 Jun 2022	Landfill Leachate	EM2210922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2022	Landfill Leachate	EM2214400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Sep 2022	Landfill Leachate	EM2218995	-	<0.7	-	<2.0	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-
27 Sep 2022	Landfill Leachate	EM2218995	-	<2	-	<4	-	<4	-	<2	-	<2	-	<2	-	<2	-	<2	-	-	-	-	-	<2	-
18 Oct 2022	Landfill Leachate	EM2220632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6 - Historical Landfill Leachate

			OC Pesticides																					
			d-BHC (filtered)	4,4 DDD	4,4 DDD (filtered)	4,4 DDT	4,4 DDT (filtered)	DDT+DDE+DDD - Lab Calc	DDT+DDE+DDD - Lab Calc (filtered)	Dieldrin	Dieldrin (filtered)	Endosulfan I (alpha)	Endosulfan I (alpha) (filtered)	Endosulfan II (beta)	Endosulfan II (beta) (filtered)	Endosulfan Sulfate	Endosulfan Sulfate (filtered)	Endrin	Endrin (filtered)	Endrin aldehyde	Endrin aldehyde (filtered)	Endrin ketone	Endrin ketone (filtered)	g-BHC (Lindane)	g-BHC (Lindane) (filtered)
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			0.5	0.5	0.5	2	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
ADWG 2011 Recreational (v3.7 updated 2022)						**90**	**90**																	**100**	**100**
ANZG (2018) - FW - 95% (updated 26 July 2021)						0.01	0.01											0.02	0.02					0.2	0.2
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
08 Nov 2022	Landfill Leachate	EM2222080	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Dec 2022	Landfill leachate	EM2225257	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-
30 Mar 2023	Landfill leachate	EM2305604	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-
29 Jun 2023	Landfill leachate	EM2311710	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-
19 Jul 2023	Landfill Leachate	EM2313106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023	Landfill Leachate	EM2314818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023	Landfill leachate	EM2316162	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-
24 Oct 2023	Landfill Leachate	EM2319274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023	Landfill Leachate	EM2319935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023	Landfill Leachate	EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023	Landfill leachate	EM2322269	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-

Table 6 - Historical Landfill Leachate

																										OP Pesticides
			Heptachlor	Heptachlor (filtered)	Heptachlor epoxide	Heptachlor epoxide (filtered)	Hexachlorobenzene	Hexachlorobenzene (filtered)	Methoxychlor	Methoxychlor (filtered)	Azinphos methyl	Azinphos methyl (filtered)	Bromophos-ethyl	Bromophos-ethyl (filtered)	Carbophenothion	Carbophenothion (filtered)	Chlorfenvinphos	Chlorfenvinphos (filtered)	Chlorpyrifos	Chlorpyrifos (filtered)	Chlorpyrifos-methyl	Chlorpyrifos-methyl (filtered)	Demeton-S-methyl	Demeton-S-methyl (filtered)	Diazinon
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			0.5	0.5	0.5	0.5	0.5	0.5	2	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
ADWG 2011 Recreational (v3.7 updated 2022)			**3**	**3**					**3,000**	**3,000**	**300**	**300**	**100**	**100**	**5**	**5**	**20**	**20**	**100**	**100**						**40**
ANZG (2018) - FW - 95% (updated 26 July 2021)			0.09	0.09			0.1	0.1			0.02	0.02							0.01	0.01						0.01
ANZECC 2000 - Stock Watering																										
ANZECC 2000 Irrigation - Long-term Trigger Values																										
ANZECC 2000 Irrigation - Short-term Trigger Values																										
Date	**Field ID**	**Lab Report Number**																								
10 Sep 2013	LEACHATE POND 2	EM1309644	<0.5	-	<0.5	-	<0.5	-	<2	-	<0.5	-	<0.5	-	<0.5	-	1.2	-	<0.5	-	<0.5	-	<0.5	-	<0.5	
10 Sep 2013	POND 1	EM1309643	<0.5	-	<0.5	-	<0.5	-	<2	-	<0.5	-	<0.5	-	<0.5	-	1.2	-	<0.5	-	<0.5	-	<0.5	-	<0.5	
18 Nov 2013	Landfill leachate (quarterly)	EM1312183	<0.5	-	<0.5	-	<0.5	-	<2	-	<0.5	-	<0.5	-	<0.5	-	1.1	-	<0.5	-	<0.5	-	<0.5	-	<0.5	
04 Mar 2014	Landfill leachate (quarterly)	EM1401975	<0.5	-	<0.5	-	<0.5	-	<2	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	
02 Jun 2014	Landfill leachate (quarterly)	EM1405379	<0.5	-	<0.5	-	<0.5	-	<2	-	<0.5	-	<0.5	-	<0.5	-	0.8	-	<0.5	-	<0.5	-	<0.5	-	<0.5	
17 Jun 2014	Landfill leachate (quarterly)	EM1405379	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
02 Sep 2014	Landfill leachate (quarterly)	EM1408979	<0.5	-	<0.5	-	<0.5	-	<2	-	<0.5	-	<0.5	-	<0.5	-	14.8	-	<0.5	-	<0.5	-	<0.5	-	<0.5	
01 Jun 2015	Landfill leachate (quarterly)	EM1510467	<0.5	-	<0.5	-	<0.5	-	<2	-	<0.5	-	<0.5	-	<0.5	-	3.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	
27 Jun 2016	Landfill leachate (quarterly)	EM1607483	-	<0.5	-	<0.5	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jan 2017	Landfill leachate (quarterly)	EM1700066	-	<0.5	-	<0.5	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-
09 Jan 2017	Weekly Leachate	EM1700104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Jan 2017	Weekly Leachate	EM1700551	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Jan 2017	Weekly Leachate	EM1700831	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Feb 2017	Weekly Leachate	EM1701200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Feb 2017	Weekly Leachate	EM1701278	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Feb 2017	Weekly Leachate	EM1701686	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Feb 2017	Weekly leachate	EM1701861	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Feb 2017	Weekly leachate	EM1702391	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Mar 2017	DWM060317	EM1702567	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Mar 2017	DWM160317	EM1703065	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23 Mar 2017	DWM230317	EM1703524	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30 Mar 2017	DWM300317	EM1703932	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03 Apr 2017	DWM030417	EM1704134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Apr 2017	DWM100417	EM1704503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Apr 2017	DWM200417	EM1705012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03 May 2017	DWM030517	EM1705620	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 May 2017	Landfill leachate (quarterly)	EM1705724	<0.5	-	<0.5	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	
29 May 2017	Leachate	EM1706966	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jun 2017	DWM050617	EM1707358	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2017	DWM140617	EM1707709	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Jun 2017	DWM190617	EM1707937	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Jun 2017	DWM290617	EM1708550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Jul 2017	DWM060717	EM1708866	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13 Jul 2017	DWM130717	EM1709240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Aug 2017	DWM090817	EM1710633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Aug 2017	DWM140817	EM1710836	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Aug 2017	DWM210817	EM1711202	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Aug 2017	Quarterly leachate samples	EM1711607	<1.3	-	<1.3	-	<1.3	-	<2.0	-	<1.3	-	<1.3	-	<1.3	-	<1.3	-	<1.3	-	<1.3	-	<1.3	-	<1.3	
06 Sep 2017	DWM060917	EM1712174	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 Sep 2017	DWM110917	EM1712414	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Sep 2017	DWM200917	EM1712965	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Oct 2017	DWM051017	EM1713718	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Oct 2017	DWM121017	EM1714085	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Oct 2017	DWM161017	EM1714224	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Oct 2017	DWM251017	EM1714708	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31 Oct 2017	DWM311017	EM1714989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2018	DWM260418	EM1806971	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 May 2018	DWM080518	EM1807569	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04 Jun 2018	Weekly Leachate	EM1809069	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2018	Weekly Leachate	EM1809582	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Jun 2018	Weekly Leachate	EM1809922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Jun 2018	Landfill Leachate	EM1810261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Jul 2018	Filtered landfill leachate	EM1810597	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Jul 2018	Weekly Leachate	EM1810596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 Jul 2018	Weekly Leachate	EM1811134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Jul 2018	Leachate	EM1811566	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2018	Landfill Leachate	EM1811963	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Aug 2018	Landfill Leachate	EM1812536	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2018	Landfill Leachate	EM1813133	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Aug 2018	Landfill Leachate	EM1813261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Aug 2018	Landfill Leachate	EM1813826	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2018	Landfill Leachate	EM1814339	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Sep 2018	Landfill Leachate	EM1814493	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6 - Historical Landfill Leachate

																										OP Pesticides
			Heptachlor	Heptachlor (filtered)	Heptachlor epoxide	Heptachlor epoxide (filtered)	Hexachlorobenzene	Hexachlorobenzene (filtered)	Methoxychlor	Methoxychlor (filtered)	Azinphos methyl	Azinphos methyl (filtered)	Bromophos-ethyl	Bromophos-ethyl (filtered)	Carbophenothion	Carbophenothion (filtered)	Chlorfenvinphos	Chlorfenvinphos (filtered)	Chlorpyrifos	Chlorpyrifos (filtered)	Chlorpyrifos-methyl	Chlorpyrifos-methyl (filtered)	Demeton-S-methyl	Demeton-S-methyl (filtered)	Diazinon
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			0.5	0.5	0.5	0.5	0.5	0.5	2	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
ADWG 2011 Recreational (v3.7 updated 2022)			**3**	**3**					**3,000**	**3,000**	**300**	**300**	**100**	**100**	**5**	**5**	**20**	**20**	**100**	**100**						**40**
ANZG (2018) - FW - 95% (updated 26 July 2021)			0.09	0.09			0.1	0.1			0.02	0.02							0.01	0.01						0.01
ANZECC 2000 - Stock Watering																										
ANZECC 2000 Irrigation - Long-term Trigger Values																										
ANZECC 2000 Irrigation - Short-term Trigger Values																										
Date	**Field ID**	**Lab Report Number**																								
19 Sep 2018	Leachate	EM1815239	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Sep 2018	Landfill Leachate	EM1815253	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Sep 2018	Landfill Leachate	EM1815378	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Oct 2018	Landfill Leachate	EM1816257	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2018	Landfill Leachate	EM1818033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Nov 2018	Weekly Leachate	EM1818439	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Nov 2018	Landfill Leachate	EM1818867	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2018	Landfill Leachate	EM1820185	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Feb 2019	Landfill Leachate	EM1902347	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Feb 2019	Landfill Leachate	EM1902762	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Mar 2019	Landfill Leachate	EM1904095	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Mar 2019	Landfill Leachate	EM1904168	<0.8	-	<0.8	-	<0.8	-	<2.0	-	<0.8	-	<0.8	-	<0.8	-	<0.8	-	<0.8	-	<0.8	-	<0.8	-	<0.8	-	<0.8
09 May 2019	Landfill Leachate - G	EM1907045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 May 2019	Landfill Leachate - P	EM1907034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 May 2019	Landfill Leachate	EM1908322	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jun 2019	Landfill Leachate	EM1910175	<0.5	-	<0.5	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
28 Jun 2019	DWM280619	EM1910927	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Jul 2019	DWM1072019	EM1910930	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31 Jul 2019	DWM31072019	EM1912255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Aug 2019	Landfill Leachate	EM1913958	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Aug 2019	DWM270819	EM1914006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Sep 2019	Landfill Leachate	EM1915222	<0.9	-	<0.9	-	<0.9	-	<2.0	-	<0.9	-	<0.9	-	<0.9	-	<0.9	-	<0.9	-	<0.9	-	<0.9	-	<0.9	-	<0.9
11 Sep 2019	Landfill Leachate	EM1915222	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Dec 2019	Landfill Leachate	EM1921873	<0.5	-	<0.5	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
17 Dec 2019	Landfill Leachate	EM1921873	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Mar 2020	Landfill Leachate	EM2005146	<0.5	-	<0.5	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
25 Mar 2020	Pomona Pump	EM2005146	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Apr 2020	Pomona Pump	EM2005914	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Landfill Leachate	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Leachate Pond	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Pomona Pump	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Landfill Leachate	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Pomona Pump	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Landfill Leachate	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Pomona Pump	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Jun 2020	Landfill Leachate	EM2010246	<2	-	<2	-	<2.8	-	<11.2	-	<2.8	-	<2.8	-	<2.8	-	<2	-	<2	-	<2	-	<2.8	-	<2	-	<2
16 Jun 2020	Landfill Leachate	EM2010246	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Landfill Leachate	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Pomona Pump	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Dulverton Leachate	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Pomona Pump	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Landfill Leachate	EM2017090	<0.5	-	<0.5	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
29 Sep 2020	Landfill Leachate	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Pomona Pump	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Landfill Leachate	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Pomona Pump	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Dec 2020	Landfill Leachate	EM2021896	<0.5	-	<0.5	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
07 Dec 2020	Landfill Leachate	EM2021896	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Mar 2021	Pomona Pump	EM2105221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 May 2021	Landfill Leachate	EM2108650	<0.5	-	<0.5	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
22 Jun 2021	Landfill Leachate	EM2111910	<0.5	-	<0.5	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
20 Jul 2021	Landfill Leachate	EM2114040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Aug 2021	Landfill Leachate	EM2116503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Sep 2021	Pomona pump	EM2119193	<0.7	-	<0.7	-	<0.7	-	<2.0	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7
18 Oct 2021	Landfill Leachate	EM2120767	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Nov 2021	Pomona	EM2123125	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Dec 2021	Landfill Leachate	EM2124673	<0.5	-	<0.5	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
08 Mar 2022	Landfill Leachate	EM2204291	<0.5	-	<0.5	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
30 Mar 2022	Landfill Leachate	EM2205710	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2022	Landfill Leachate	EM2207498	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 May 2022	Landfill Leachate	EM2209763	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Jun 2022	Landfill Leachate	EM2210922	<0.7	-	<0.7	-	<0.7	-	<2.0	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7
07 Jun 2022	Landfill Leachate	EM2210922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2022	Landfill Leachate	EM2214400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Sep 2022	Landfill Leachate	EM2218995	<0.7	-	<0.7	-	<0.7	-	<2.0	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7	-	<0.7
27 Sep 2022	Landfill Leachate	EM2218995	<2	-	<2	-	<4	-	-	-	-	-	-	-	-	-	<2	-	<2	-	<2	-	-	-	-	-	<2
18 Oct 2022	Landfill Leachate	EM2220632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6 - Historical Landfill Leachate

																										OP Pesticides
			Heptachlor	Heptachlor (filtered)	Heptachlor epoxide	Heptachlor epoxide (filtered)	Hexachlorobenzene	Hexachlorobenzene (filtered)	Methoxychlor	Methoxychlor (filtered)	Azinphos methyl	Azinphos methyl (filtered)	Bromophos-ethyl	Bromophos-ethyl (filtered)	Carbophenothion	Carbophenothion (filtered)	Chlorfenvinphos	Chlorfenvinphos (filtered)	Chlorpyrifos	Chlorpyrifos (filtered)	Chlorpyrifos-methyl	Chlorpyrifos-methyl (filtered)	Demeton-S-methyl	Demeton-S-methyl (filtered)	Diazinon
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			0.5	0.5	0.5	0.5	0.5	0.5	2	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
ADWG 2011 Recreational (v3.7 updated 2022)			**3**	**3**					**3,000**	**3,000**	**300**	**300**	**100**	**100**	**5**	**5**	**20**	**20**	**100**	**100**					**40**
ANZG (2018) - FW - 95% (updated 26 July 2021)			0.09	0.09			0.1	0.1			0.02	0.02							0.01	0.01					0.01
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
08 Nov 2022	Landfill Leachate	EM2222080	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Dec 2022	Landfill leachate	EM2225257	<0.5	-	<0.5	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
30 Mar 2023	Landfill leachate	EM2305604	<0.5	-	<0.5	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
29 Jun 2023	Landfill leachate	EM2311710	<0.5	-	<0.5	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
19 Jul 2023	Landfill Leachate	EM2313106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023	Landfill Leachate	EM2314818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023	Landfill leachate	EM2316162	<0.5	-	<0.5	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5
24 Oct 2023	Landfill Leachate	EM2319274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023	Landfill Leachate	EM2319935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023	Landfill Leachate	EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023	Landfill leachate	EM2322269	<0.5	-	<0.5	-	<0.5	-	<2.0	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5

Table 6 - Historical Landfill Leachate

																Pesticides									
			Diazinon (filtered)	Dichlorvos	Dichlorvos (filtered)	Dimethoate	Dimethoate (filtered)	Ethion	Fenamiphos	Fenthion	Malathion	Methyl parathion	Monocrotophos	Parathion	Pirimiphos-ethyl	Prothiofos	4-Chlorophenoxy acetic acid	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,2,4-trichlorobenzene	1,2-dibromo-3-chloropropane
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2	2	2	0.5	0.5	10	5	5	5	5	5	5	2	5
ADWG 2011 Recreational (v3.7 updated 2022)			**40**	**50**	**50**	**70**	**70**	**40**	**5**	**70**	**700**	**7**	**20**	**200**	**5**							**300**			
ANZG (2018) - FW - 95% (updated 26 July 2021)			0.01			0.15	0.15				0.05			0.004					270	400	6,500	700		170	
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
10 Sep 2013	LEACHATE POND 2	EM1309644	-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<2	<2	<2	<0.5	<0.5	<10	<5	<5	<5	<5	<5	<5	<5	<5
10 Sep 2013	POND 1	EM1309643	-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<2	<2	<2	<0.5	<0.5	<10	<5	<5	<5	<5	<5	<5	<5	<5
18 Nov 2013	Landfill leachate (quarterly)	EM1312183	-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<2	<2	<2	<0.5	<0.5	<10	<5	<5	<5	<5	<5	<5	<2	<5
04 Mar 2014	Landfill leachate (quarterly)	EM1401975	-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<2	<2	<2	<0.5	<0.5	<10	<5	<5	<5	<5	<5	<5	<2	<5
02 Jun 2014	Landfill leachate (quarterly)	EM1405379	-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<2	<2	<2	<0.5	<0.5	<10	<5	<5	<5	<5	<5	<5	<2	<5
17 Jun 2014	Landfill leachate (quarterly)	EM1405379	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Sep 2014	Landfill leachate (quarterly)	EM1408979	-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<2	<2	<2	<0.5	<0.5	<10	<5	<5	<5	<5	<5	<5	<2	<5
01 Jun 2015	Landfill leachate (quarterly)	EM1510467	-	<0.5	-	<0.5	-	<0.5	**5.1**	<0.5	<0.5	<2	<2	<2	<0.5	<0.5	<20	<5	<5	<5	<5	<5	<5	<2	<5
27 Jun 2016	Landfill leachate (quarterly)	EM1607483	<0.5	-	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<2	<2	<0.5	<0.5	<10	<5	<5	<5	<5	<5	<5	<2	<5
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jan 2017	Landfill leachate (quarterly)	EM1700066	<0.5	-	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Jan 2017	Weekly Leachate	EM1700104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Jan 2017	Weekly Leachate	EM1700551	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Jan 2017	Weekly Leachate	EM1700831	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Feb 2017	Weekly Leachate	EM1701200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Feb 2017	Weekly Leachate	EM1701278	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Feb 2017	Weekly Leachate	EM1701686	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Feb 2017	Weekly leachate	EM1701861	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Feb 2017	Weekly leachate	EM1702391	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Mar 2017	DWM060317	EM1702567	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Mar 2017	DWM160317	EM1703065	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23 Mar 2017	DWM230317	EM1703524	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30 Mar 2017	DWM300317	EM1703932	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03 Apr 2017	DWM030417	EM1704134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Apr 2017	DWM100417	EM1704503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Apr 2017	DWM200417	EM1705012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03 May 2017	DWM030517	EM1705620	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 May 2017	Landfill leachate (quarterly)	EM1705724	-	<0.5	-	<0.5	-	<0.5	1.3	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5	<10	<5	<5	<5	<5	<5	<5	<2	<5
29 May 2017	Leachate	EM1706966	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jun 2017	DWM050617	EM1707358	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2017	DWM140617	EM1707709	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Jun 2017	DWM190617	EM1707937	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Jun 2017	DWM290617	EM1708550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Jul 2017	DWM060717	EM1708866	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13 Jul 2017	DWM130717	EM1709240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Aug 2017	DWM090817	EM1710633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Aug 2017	DWM140817	EM1710836	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Aug 2017	DWM210817	EM1711202	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Aug 2017	Quarterly leachate samples	EM1711607	-	<1.3	-	<1.3	-	<1.3	<1.3	<1.3	<1.3	<2.0	<2.0	<2.0	<1.3	<1.3	<10	<5	<5	<5	<5	<5	<5	<2	<5
06 Sep 2017	DWM060917	EM1712174	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 Sep 2017	DWM110917	EM1712414	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Sep 2017	DWM200917	EM1712965	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Oct 2017	DWM051017	EM1713718	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Oct 2017	DWM121017	EM1714085	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Oct 2017	DWM161017	EM1714224	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Oct 2017	DWM251017	EM1714708	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31 Oct 2017	DWM311017	EM1714989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2018	DWM260418	EM1806971	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 May 2018	DWM080518	EM1807569	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04 Jun 2018	Weekly Leachate	EM1809069	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2018	Weekly Leachate	EM1809582	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Jun 2018	Weekly Leachate	EM1809922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Jun 2018	Landfill Leachate	EM1810261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Jul 2018	Filtered landfill leachate	EM1810597	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Jul 2018	Weekly Leachate	EM1810596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 Jul 2018	Weekly Leachate	EM1811134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Jul 2018	Leachate	EM1811566	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2018	Landfill Leachate	EM1811963	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Aug 2018	Landfill Leachate	EM1812536	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2018	Landfill Leachate	EM1813133	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Aug 2018	Landfill Leachate	EM1813261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Aug 2018	Landfill Leachate	EM1813826	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2018	Landfill Leachate	EM1814339	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Sep 2018	Landfill Leachate	EM1814493	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6 - Historical Landfill Leachate

																Pesticides									
			Diazinon (filtered)	Dichlorvos	Dichlorvos (filtered)	Dimethoate	Dimethoate (filtered)	Ethion	Fenamiphos	Fenthion	Malathion	Methyl parathion	Monocrotophos	Parathion	Pirimiphos-ethyl	Prothiofos	4-Chlorophenoxy acetic acid	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,2,4-trichlorobenzene	1,2-dibromo-3-chloropropane
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2	2	2	0.5	0.5	10	5	5	5	5	5	5	2	5
ADWG 2011 Recreational (v3.7 updated 2022)			**40**	**50**	**50**	**70**	**70**	**40**	**5**	**70**	**700**	**7**	**20**	**200**	**5**							**300**			
ANZG (2018) - FW - 95% (updated 26 July 2021)			0.01			0.15	0.15				0.05			0.004					270	400	6,500	700		170	
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
19 Sep 2018	Leachate	EM1815239	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Sep 2018	Landfill Leachate	EM1815253	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Sep 2018	Landfill Leachate	EM1815378	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Oct 2018	Landfill Leachate	EM1816257	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2018	Landfill Leachate	EM1818033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Nov 2018	Weekly Leachate	EM1818439	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Nov 2018	Landfill Leachate	EM1818867	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2018	Landfill Leachate	EM1820185	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Feb 2019	Landfill Leachate	EM1902347	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Feb 2019	Landfill Leachate	EM1902762	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Mar 2019	Landfill Leachate	EM1904095	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Mar 2019	Landfill Leachate	EM1904168	-	<0.8	-	<0.8	-	<0.8	<0.8	<0.8	<0.8	<2.0	<2.0	<2.0	<0.8	<0.8	<10	<5	<5	<5	<5	<5	<5	<2	<5
09 May 2019	Landfill Leachate - G	EM1907045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 May 2019	Landfill Leachate - P	EM1907034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 May 2019	Landfill Leachate	EM1908322	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jun 2019	Landfill Leachate	EM1910175	-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5	12	<5	<5	<5	<5	<5	<5	<2	<5
28 Jun 2019	DWM280619	EM1910927	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Jul 2019	DWM1072019	EM1910930	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31 Jul 2019	DWM31072019	EM1912255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Aug 2019	Landfill Leachate	EM1913958	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Aug 2019	DWM270819	EM1914006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Sep 2019	Landfill Leachate	EM1915222	-	<0.9	-	<0.9	-	<0.9	<0.9	<0.9	<0.9	<2.0	<2.0	<2.0	<0.9	<0.9	<10	<5	<5	<5	<5	<5	<5	<2	<5
11 Sep 2019	Landfill Leachate	EM1915222	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Dec 2019	Landfill Leachate	EM1921873	-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5	<20	<5	<5	<5	<5	<5	<5	<2	<5
17 Dec 2019	Landfill Leachate	EM1921873	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Mar 2020	Landfill Leachate	EM2005146	-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5	<10	-	-	-	-	-	-	<4	-
25 Mar 2020	Pomona Pump	EM2005146	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Apr 2020	Pomona Pump	EM2005914	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Landfill Leachate	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Leachate Pond	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Pomona Pump	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Landfill Leachate	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Pomona Pump	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Landfill Leachate	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Pomona Pump	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Jun 2020	Landfill Leachate	EM2010246	-	<2	-	<2	-	<2	<2.8	<2	<2	<11.2	<11.2	<11.2	<2	<2	<10	<5	<5	<5	<5	<5	<5	<2	<5
16 Jun 2020	Landfill Leachate	EM2010246	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Landfill Leachate	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Pomona Pump	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Dulverton Leachate	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Pomona Pump	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Landfill Leachate	EM2017090	-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5	<10	<5	<5	<5	<5	<5	<5	<2	<5
29 Sep 2020	Landfill Leachate	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Pomona Pump	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Landfill Leachate	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Pomona Pump	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Dec 2020	Landfill Leachate	EM2021896	-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5	<10	<5	<5	<5	<5	<5	<5	<2	<5
07 Dec 2020	Landfill Leachate	EM2021896	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Mar 2021	Pomona Pump	EM2105221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 May 2021	Landfill Leachate	EM2108650	-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5	<10	<5	<5	<5	<5	<5	<5	<4	<5
22 Jun 2021	Landfill Leachate	EM2111910	-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5	<10	<5	<5	<5	<5	<5	<5	<4	<5
20 Jul 2021	Landfill Leachate	EM2114040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Aug 2021	Landfill Leachate	EM2116503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Sep 2021	Pomona pump	EM2119193	-	<0.7	-	<0.7	-	<0.7	<0.7	<0.7	<0.7	<2.0	<2.0	<2.0	<0.7	<0.7	<10	<5	<5	<5	<5	<5	<5	<5	<5
18 Oct 2021	Landfill Leachate	EM2120767	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Nov 2021	Pomona	EM2123125	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Dec 2021	Landfill Leachate	EM2124673	-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5	<10	<5	<5	<5	<5	<5	<5	<2	<5
08 Mar 2022	Landfill Leachate	EM2204291	-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5	<19	<5	<5	<5	<5	<5	<5	<2	<5
30 Mar 2022	Landfill Leachate	EM2205710	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2022	Landfill Leachate	EM2207498	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 May 2022	Landfill Leachate	EM2209763	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Jun 2022	Landfill Leachate	EM2210922	-	<0.7	-	<0.7	-	<0.7	<0.7	<0.7	<0.7	<2.0	<2.0	<2.0	<0.7	<0.7	<10	<5	<5	<5	<5	<5	<5	<2	<5
07 Jun 2022	Landfill Leachate	EM2210922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2022	Landfill Leachate	EM2214400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Sep 2022	Landfill Leachate	EM2218995	-	<0.7	-	<0.7	-	<0.7	<0.7	<0.7	<0.7	<2.0	<2.0	<2.0	<0.7	<0.7	<20	<5	<5	<5	<5	<5	<5	<5	<5
27 Sep 2022	Landfill Leachate	EM2218995	-	<2	-	<2	-	<2	-	<2	<2	-	-	-	<2	<2	-	-	-	-	-	-	-	<2	-
18 Oct 2022	Landfill Leachate	EM2220632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6 - Historical Landfill Leachate

																Pesticides									
				Diazinon (filtered)	Dichlorvos	Dichlorvos (filtered)	Dimethoate	Dimethoate (filtered)	Ethion	Fenamiphos	Fenthion	Malathion	Methyl parathion	Monocrotophos	Parathion	Pirimiphos-ethyl	Prothiofos	4-Chlorophenoxy acetic acid	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,2,4-trichlorobenzene	1,2-dibromo-3-chloropropane
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2	2	2	0.5	0.5	10	5	5	5	5	5	5	2	5
ADWG 2011 Recreational (v3.7 updated 2022)				**40**	**50**	**50**	**70**	**70**	**40**	**5**	**70**	**700**	**7**	**20**	**200**	**5**								**300**			
ANZG (2018) - FW - 95% (updated 26 July 2021)				0.01			0.15	0.15				0.05			0.004					270	400	6,500	700		170	
ANZECC 2000 - Stock Watering																										
ANZECC 2000 Irrigation - Long-term Trigger Values																										
ANZECC 2000 Irrigation - Short-term Trigger Values																										
Date	**Field ID**	**Lab Report Number**																								
08 Nov 2022	Landfill Leachate	EM2222080		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Dec 2022	Landfill leachate	EM2225257		-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5	<19	<5	<5	<5	<5	<5	<5	<2	<5
30 Mar 2023	Landfill leachate	EM2305604		-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5	<10	<5	<5	<5	<5	<5	<5	<2	<5
29 Jun 2023	Landfill leachate	EM2311710		-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5	<10	<5	<5	<5	<5	<5	<5	<2	<5
19 Jul 2023	Landfill Leachate	EM2313106		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023	Landfill Leachate	EM2314818		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023	Landfill leachate	EM2316162		-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5	<10	<5	<5	<5	<5	<5	<5	<5	<5
24 Oct 2023	Landfill Leachate	EM2319274		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023	Landfill Leachate	EM2319935		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023	Landfill Leachate	EM2321393		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023	Landfill leachate	EM2322269		-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5	<10	<5	<5	<5	<5	<5	<5	<2	<5

Table 6 - Historical Landfill Leachate

			Chlorinated Hydrocarbons																Explosives				Halogenated	
			1,2-dichlorobenzene	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	1,4-dichlorobenzene	2,2-dichloropropane	2-chloronaphthalene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Carbon tetrachloride	Chlorobenzene	Chloroform	Chloromethane	cis-1,2-dichloroethene	Hexachlorobutadiene	Vinyl chloride	1,3,5-Trinitrobenzene	2,4-Dinitrotoluene	2,6-dinitrotoluene	Nitrobenzene	Bromomethane	Dichlorodifluoromethane
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			2	5	5	5	2	5	2	5	5	5	5	5	5	50	5	2	50	2	4	4	2	50	50
ADWG 2011 Recreational (v3.7 updated 2022)			**15,000**	**30**			**400**						**30**	**3,000**				**7**	**3**					**10**	
ANZG (2018) - FW - 95% (updated 26 July 2021)			160	1,900	1,100		60						240	55	770				100		65		550		
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
10 Sep 2013	LEACHATE POND 2	EM1309644	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<5	<5	<50	<5	<5	<50	-	-	-	-	<50	<50
10 Sep 2013	POND 1	EM1309643	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<5	<5	<50	<5	<5	<50	-	-	-	-	<50	<50
18 Nov 2013	Landfill leachate (quarterly)	EM1312183	<2	<5	<5	<5	<2	<5	-	<5	<5	<5	<5	<5	<5	<50	<5	<2	<50	-	-	-	-	<50	<50
04 Mar 2014	Landfill leachate (quarterly)	EM1401975	<2	<5	<5	<5	<2	<5	-	<5	<5	<5	<5	<5	<5	<50	<5	<2	<50	-	-	-	-	<50	<50
02 Jun 2014	Landfill leachate (quarterly)	EM1405379	<2	<5	<5	<5	<2	<5	-	<5	<5	<5	<5	<5	<5	<50	<5	<2	<50	-	-	-	-	<50	<50
17 Jun 2014	Landfill leachate (quarterly)	EM1405379	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Sep 2014	Landfill leachate (quarterly)	EM1408979	<2	<5	<5	<5	<2	<5	-	<5	<5	<5	<5	<5	<5	<50	<5	<2	<50	-	-	-	-	<50	<50
01 Jun 2015	Landfill leachate (quarterly)	EM1510467	<2	<5	<5	<5	<2	<5	-	<5	<5	<5	<5	<5	<5	<50	<5	<2	<50	-	-	-	-	<50	<50
27 Jun 2016	Landfill leachate (quarterly)	EM1607483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	<2	<5	<5	<5	<2	<5	-	<5	<5	<5	<5	<5	<5	<50	<5	<2	<50	-	-	-	-	<50	<50
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jan 2017	Landfill leachate (quarterly)	EM1700066	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Jan 2017	Weekly Leachate	EM1700104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Jan 2017	Weekly Leachate	EM1700551	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Jan 2017	Weekly Leachate	EM1700831	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Feb 2017	Weekly Leachate	EM1701200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Feb 2017	Weekly Leachate	EM1701278	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Feb 2017	Weekly Leachate	EM1701686	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Feb 2017	Weekly leachate	EM1701861	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Feb 2017	Weekly leachate	EM1702391	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Mar 2017	DWM060317	EM1702567	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Mar 2017	DWM160317	EM1703065	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23 Mar 2017	DWM230317	EM1703524	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30 Mar 2017	DWM300317	EM1703932	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03 Apr 2017	DWM030417	EM1704134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Apr 2017	DWM100417	EM1704503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Apr 2017	DWM200417	EM1705012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03 May 2017	DWM030517	EM1705620	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 May 2017	Landfill leachate (quarterly)	EM1705724	<2	<5	<5	<5	<2	<5	-	<5	<5	<5	<5	<5	<5	<50	<5	<2	<50	-	-	-	-	<50	<50
29 May 2017	Leachate	EM1706966	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jun 2017	DWM050617	EM1707358	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2017	DWM140617	EM1707709	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Jun 2017	DWM190617	EM1707937	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Jun 2017	DWM290617	EM1708550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Jul 2017	DWM060717	EM1708866	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13 Jul 2017	DWM130717	EM1709240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Aug 2017	DWM090817	EM1710633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Aug 2017	DWM140817	EM1710836	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Aug 2017	DWM210817	EM1711202	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Aug 2017	Quarterly leachate samples	EM1711607	<2	<5	<5	<5	<2	<5	-	<5	<5	<5	<5	<5	<5	<50	<5	<2	<50	-	-	-	-	<50	<50
06 Sep 2017	DWM060917	EM1712174	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 Sep 2017	DWM110917	EM1712414	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Sep 2017	DWM200917	EM1712965	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Oct 2017	DWM051017	EM1713718	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Oct 2017	DWM121017	EM1714085	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Oct 2017	DWM161017	EM1714224	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Oct 2017	DWM251017	EM1714708	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31 Oct 2017	DWM311017	EM1714989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2018	DWM260418	EM1806971	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 May 2018	DWM080518	EM1807569	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04 Jun 2018	Weekly Leachate	EM1809069	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2018	Weekly Leachate	EM1809582	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Jun 2018	Weekly Leachate	EM1809922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Jun 2018	Landfill Leachate	EM1810261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Jul 2018	Filtered landfill leachate	EM1810597	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Jul 2018	Weekly Leachate	EM1810596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 Jul 2018	Weekly Leachate	EM1811134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Jul 2018	Leachate	EM1811566	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2018	Landfill Leachate	EM1811963	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Aug 2018	Landfill Leachate	EM1812536	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2018	Landfill Leachate	EM1813133	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Aug 2018	Landfill Leachate	EM1813261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Aug 2018	Landfill Leachate	EM1813826	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2018	Landfill Leachate	EM1814339	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Sep 2018	Landfill Leachate	EM1814493	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6 - Historical Landfill Leachate

Dulverton Regional Waste Management Authority

Dulverton Environmental Monitoring

			Chlorinated Hydrocarbons																Explosives				Halogenated	
			1,2-dichlorobenzene	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	1,4-dichlorobenzene	2,2-dichloropropane	2-chloronaphthalene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Carbon tetrachloride	Chlorobenzene	Chloroform	Chloromethane	cis-1,2-dichloroethene	Hexachlorobutadiene	Vinyl chloride	1,3,5-Trinitrobenzene	2,4-Dinitrotoluene	2,6-dinitrotoluene	Nitrobenzene	Bromomethane	Dichlorodifluoromethane
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			2	5	5	5	2	5	2	5	5	5	5	5	5	50	5	2	50	2	4	4	2	50	50
ADWG 2011 Recreational (v3.7 updated 2022)			**15,000**	**30**			**400**						**30**	**3,000**				**7**	**3**					**10**	
ANZG (2018) - FW - 95% (updated 26 July 2021)			160	1,900	1,100		60						240	55	770				100		65		550		
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
19 Sep 2018	Leachate	EM1815239	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Sep 2018	Landfill Leachate	EM1815253	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Sep 2018	Landfill Leachate	EM1815378	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Oct 2018	Landfill Leachate	EM1816257	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2018	Landfill Leachate	EM1818033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Nov 2018	Weekly Leachate	EM1818439	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Nov 2018	Landfill Leachate	EM1818867	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2018	Landfill Leachate	EM1820185	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Feb 2019	Landfill Leachate	EM1902347	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Feb 2019	Landfill Leachate	EM1902762	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Mar 2019	Landfill Leachate	EM1904095	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Mar 2019	Landfill Leachate	EM1904168	<2	<5	<5	<5	<2	<5	<2	<5	<5	<5	<5	<5	<5	<50	<5	<2	<50	<2	<4	<4	<2	<50	<50
09 May 2019	Landfill Leachate - G	EM1907045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 May 2019	Landfill Leachate - P	EM1907034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 May 2019	Landfill Leachate	EM1908322	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jun 2019	Landfill Leachate	EM1910175	<2	<5	<5	<5	<2	<5	<2	<5	<5	<5	<5	<5	<5	<50	<5	<2	<50	-	-	-	-	<50	<50
28 Jun 2019	DWM280619	EM1910927	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Jul 2019	DWM1072019	EM1910930	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31 Jul 2019	DWM31072019	EM1912255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Aug 2019	Landfill Leachate	EM1913958	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Aug 2019	DWM270819	EM1914006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Sep 2019	Landfill Leachate	EM1915222	<2	<5	<5	<5	<2	<5	<2	<5	<5	<5	<5	<5	<5	<50	<5	<2	<50	<2	<4	<4	<2	<50	<50
11 Sep 2019	Landfill Leachate	EM1915222	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Dec 2019	Landfill Leachate	EM1921873	<2	7	<5	<5	<2	<5	<2	<5	<5	<5	<5	<5	<5	<50	<5	<2	<50	<2	<4	<4	<2	<50	<50
17 Dec 2019	Landfill Leachate	EM1921873	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Mar 2020	Landfill Leachate	EM2005146	<4	-	-	-	<4	-	<4	-	-	-	-	-	-	-	-	<4	-	<4	<4	<4	<4	-	-
25 Mar 2020	Pomona Pump	EM2005146	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Apr 2020	Pomona Pump	EM2005914	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Landfill Leachate	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Leachate Pond	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Pomona Pump	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Landfill Leachate	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Pomona Pump	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Landfill Leachate	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Pomona Pump	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Jun 2020	Landfill Leachate	EM2010246	<2	<5	<5	<5	<2	<5	<2	<5	<5	<5	<5	<5	<5	<50	<5	<2	<50	<2	<4	<4	<2	<50	<50
16 Jun 2020	Landfill Leachate	EM2010246	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Landfill Leachate	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Pomona Pump	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Dulverton Leachate	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Pomona Pump	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Landfill Leachate	EM2017090	<2	<5	<5	<5	<2	<5	<2	<5	<5	<5	<5	<5	<5	<50	<5	<2	<50	<2	<4	<4	<2	<50	<50
29 Sep 2020	Landfill Leachate	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Pomona Pump	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Landfill Leachate	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Pomona Pump	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Dec 2020	Landfill Leachate	EM2021896	<2	<5	<5	<5	<2	<5	<2	<5	<5	<5	<5	<5	<5	<50	<5	<2	<50	<2	<4	<4	<2	<50	<50
07 Dec 2020	Landfill Leachate	EM2021896	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Mar 2021	Pomona Pump	EM2105221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 May 2021	Landfill Leachate	EM2108650	<4	<5	<5	<5	<4	<5	<4	<5	<5	<5	<5	<5	<5	<50	<5	<4	<50	<4	<4	<4	<4	<50	<50
22 Jun 2021	Landfill Leachate	EM2111910	<4	<5	<5	<5	<4	<5	<4	<5	<5	<5	<5	<5	<5	<50	<5	<4	<50	<4	<4	<4	<4	<50	<50
20 Jul 2021	Landfill Leachate	EM2114040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Aug 2021	Landfill Leachate	EM2116503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Sep 2021	Pomona pump	EM2119193	<5	<5	<5	<5	<5	<5	<7	<5	<5	<5	<5	<5	<5	<50	<5	<5	<50	<7	<7	<7	<7	<50	<50
18 Oct 2021	Landfill Leachate	EM2120767	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Nov 2021	Pomona	EM2123125	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Dec 2021	Landfill Leachate	EM2124673	<2	<5	<5	<5	<2	<5	<2	<5	<5	<5	<5	<5	<5	<50	<5	<2	<50	<2	<4	<4	<2	<50	<50
08 Mar 2022	Landfill Leachate	EM2204291	<2	<5	<5	<5	<2	<5	<2	<5	<5	<5	<5	<5	<5	<50	<5	<2	<50	<2	<4	<4	<2	<50	<50
30 Mar 2022	Landfill Leachate	EM2205710	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2022	Landfill Leachate	EM2207498	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 May 2022	Landfill Leachate	EM2209763	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Jun 2022	Landfill Leachate	EM2210922	<2	<5	<5	<5	2	<5	<2	<5	<5	<5	<5	<5	<5	<50	<5	<2	<50	<2	<4	<4	<2	<50	<50
07 Jun 2022	Landfill Leachate	EM2210922	-	-	-	-	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2022	Landfill Leachate	EM2214400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Sep 2022	Landfill Leachate	EM2218995	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<5	<5	<50	<5	<5	<50	-	-	-	-	<50	<50
27 Sep 2022	Landfill Leachate	EM2218995	<2	-	-	-	<2	-	<2	-	-	-	-	-	-	-	-	<2	-	<2	<4	<4	<2	-	-
18 Oct 2022	Landfill Leachate	EM2220632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6 - Historical Landfill Leachate

			Chlorinated Hydrocarbons																	Explosives				Halogenated	
			1,2-dichlorobenzene	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	1,4-dichlorobenzene	2,2-dichloropropane	2-chloronaphthalene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Carbon tetrachloride	Chlorobenzene	Chloroform	Chloromethane	cis-1,2-dichloroethene	Hexachlorobutadiene	Vinyl chloride	1,3,5-Trinitrobenzene	2,4-Dinitrotoluene	2,6-dinitrotoluene	Nitrobenzene	Bromomethane	Dichlorodifluoromethane
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			2	5	5	5	2	5	2	5	5	5	5	5	5	50	5	2	50	2	4	4	2	50	50
ADWG 2011 Recreational (v3.7 updated 2022)			**15,000**	**30**			**400**						**30**	**3,000**				**7**	**3**					**10**	
ANZG (2018) - FW - 95% (updated 26 July 2021)			160	1,900	1,100		60						240	55	770				100		65		550		
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
08 Nov 2022	Landfill Leachate	EM2222080	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Dec 2022	Landfill leachate	EM2225257	<2	<5	<5	<5	<2	<5	<2	<5	<5	<5	<5	<5	<5	<50	<5	<2	<50	<2	<4	<4	<2	<50	<50
30 Mar 2023	Landfill leachate	EM2305604	<2	<5	<5	<5	<2	<5	<2	<5	<5	<5	<5	<5	<5	<50	<5	<2	<50	<2	<4	<4	<2	<50	<50
29 Jun 2023	Landfill leachate	EM2311710	<2	<5	<5	<5	<2	<5	<2	<5	<5	<5	<5	<5	<5	<50	<5	<2	<50	<2	<4	<4	<2	<50	<50
19 Jul 2023	Landfill Leachate	EM2313106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023	Landfill Leachate	EM2314818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023	Landfill leachate	EM2316162	<5	<5	<5	<5	<5	<5	<8	<5	<5	<5	<5	<5	<5	<50	<5	<5	<50	<8	<8	<8	<8	<50	<50
24 Oct 2023	Landfill Leachate	EM2319274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023	Landfill Leachate	EM2319935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023	Landfill Leachate	EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023	Landfill leachate	EM2322269	<2	<5	<5	<5	<2	<5	<2	<5	<5	<5	<5	<5	<5	<50	<5	<2	<50	<2	<4	<4	<2	<50	<50

Table 6 - Historical Landfill Leachate

			Herbicides															Nitroaromatics and Ketones					Solv	
			2,6-D	2,4,5-T	2,4,5-TP (Silvex)	2,4-D (Hedonal)	2,4-DP (dichlorprop)	2,4,6-Trichlorophenoxy-acetic acid	4-(2,4-Dichlorophenoxy)butyric Acid (2,4-DB)	Clopyralid	Dicamba	Fluroxypyr	MCPA	MCPB	Mecoprop	Picloram	Pronamide	Triclopyr	2-Picoline	4-aminobiphenyl	Acetophenone	N-Nitrosodiphenyl & Diphenylamine	Pentachloronitrobenzene	2-hexanone (MBK)	Carbon disulfide
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			10	10	10	10	10	10	10	10	10	10	10	10	10	10	2	10	2	2	2	4	2	50	5
ADWG 2011 Recreational (v3.7 updated 2022)				**1,000**	**100**	**300**	**1,000**			**20,000**	**1,000**		**400**			**3,000**	**700**	**200**					**300**		
ANZG (2018) - FW - 95% (updated 26 July 2021)				36		280																			
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
10 Sep 2013	LEACHATE POND 2	EM1309644	-	<10	<10	<10	<10	-	-	<10	<10	<10	26	<10	<10	<10	-	<10	-	-	-	-	-	-	-
10 Sep 2013	POND 1	EM1309643	-	<10	<10	<10	<10	-	-	<10	<10	<10	11	<10	<10	<10	-	<10	-	-	-	-	-	-	-
18 Nov 2013	Landfill leachate (quarterly)	EM1312183	-	<10	<10	<10	<10	-	-	<10	<10	<10	<10	<10	<10	<10	-	<10	-	-	-	-	-	-	-
04 Mar 2014	Landfill leachate (quarterly)	EM1401975	-	<10	<10	<10	<10	<10	-	<10	<10	<10	<10	<10	<10	<10	-	<10	-	-	-	-	-	-	-
02 Jun 2014	Landfill leachate (quarterly)	EM1405379	-	<10	<10	<10	<10	<10	-	<10	<10	<10	<10	<10	<10	<10	-	<10	-	-	-	-	-	-	-
17 Jun 2014	Landfill leachate (quarterly)	EM1405379	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Sep 2014	Landfill leachate (quarterly)	EM1408979	-	<10	<10	<10	<10	<10	-	<10	<10	<10	<10	<10	<10	<10	-	<10	-	-	-	-	-	-	-
01 Jun 2015	Landfill leachate (quarterly)	EM1510467	-	<20	<20	<20	<20	<20	-	<20	<20	<20	<20	<20	<20	<20	-	<20	-	-	-	-	-	-	-
27 Jun 2016	Landfill leachate (quarterly)	EM1607483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	-	<10	<10	<10	<10	<10	-	<10	<10	<10	<10	<10	<10	-	-	<10	-	-	-	-	-	-	-
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jan 2017	Landfill leachate (quarterly)	EM1700066	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Jan 2017	Weekly Leachate	EM1700104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Jan 2017	Weekly Leachate	EM1700551	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Jan 2017	Weekly Leachate	EM1700831	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Feb 2017	Weekly Leachate	EM1701200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Feb 2017	Weekly Leachate	EM1701278	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Feb 2017	Weekly Leachate	EM1701686	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Feb 2017	Weekly leachate	EM1701861	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Feb 2017	Weekly leachate	EM1702391	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Mar 2017	DWM060317	EM1702567	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Mar 2017	DWM160317	EM1703065	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23 Mar 2017	DWM230317	EM1703524	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30 Mar 2017	DWM300317	EM1703932	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03 Apr 2017	DWM030417	EM1704134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Apr 2017	DWM100417	EM1704503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Apr 2017	DWM200417	EM1705012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03 May 2017	DWM030517	EM1705620	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 May 2017	Landfill leachate (quarterly)	EM1705724	<10	<10	<10	<10	<10	<10	-	<10	<10	<10	<10	<10	<10	<10	-	<10	-	-	-	-	-	-	-
29 May 2017	Leachate	EM1706966	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jun 2017	DWM050617	EM1707358	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2017	DWM140617	EM1707709	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Jun 2017	DWM190617	EM1707937	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Jun 2017	DWM290617	EM1708550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Jul 2017	DWM060717	EM1708866	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13 Jul 2017	DWM130717	EM1709240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Aug 2017	DWM090817	EM1710633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Aug 2017	DWM140817	EM1710836	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Aug 2017	DWM210817	EM1711202	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Aug 2017	Quarterly leachate samples	EM1711607	<10	<10	<10	<10	<10	<10	-	<10	<10	<10	<10	<10	<10	<10	-	<10	-	-	-	-	-	-	-
06 Sep 2017	DWM060917	EM1712174	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 Sep 2017	DWM110917	EM1712414	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Sep 2017	DWM200917	EM1712965	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Oct 2017	DWM051017	EM1713718	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Oct 2017	DWM121017	EM1714085	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Oct 2017	DWM161017	EM1714224	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Oct 2017	DWM251017	EM1714708	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31 Oct 2017	DWM311017	EM1714989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2018	DWM260418	EM1806971	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 May 2018	DWM080518	EM1807569	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04 Jun 2018	Weekly Leachate	EM1809069	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2018	Weekly Leachate	EM1809582	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Jun 2018	Weekly Leachate	EM1809922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Jun 2018	Landfill Leachate	EM1810261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Jul 2018	Filtered landfill leachate	EM1810597	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Jul 2018	Weekly Leachate	EM1810596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 Jul 2018	Weekly Leachate	EM1811134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Jul 2018	Leachate	EM1811566	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2018	Landfill Leachate	EM1811963	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Aug 2018	Landfill Leachate	EM1812536	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2018	Landfill Leachate	EM1813133	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Aug 2018	Landfill Leachate	EM1813261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Aug 2018	Landfill Leachate	EM1813826	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2018	Landfill Leachate	EM1814339	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Sep 2018	Landfill Leachate	EM1814493	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6 - Historical Landfill Leachate

Dulverton Regional Waste Management Authority

Dulverton Environmental Monitoring

			Herbicides																Nitroaromatics and Ketones					Solv	
			2,6-D	2,4,5-T	2,4,5-TP (Silvex)	2,4-D (Hedonal)	2,4-DP (dichlorprop)	2,4,6-Trichlorophenoxy-aceltic acid	4-(2,4-Dichlorophenoxy)butyric Acid (2,4-DB)	Clopyralid	Dicamba	Fluroxypyr	MCPA	MCPB	Mecoprop	Picloram	Pronamide	Triclopyr	2-Picoline	4-aminobiphenyl	Acetophenone	N-Nitrosodiphenyl & Diphenylamine	Pentachloronitrobenzene	2-hexanone (MBK)	Carbon disulfide
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			10	10	10	10	10	10	10	10	10	10	10	10	10	10	2	10	2	2	2	4	2	50	5
ADWG 2011 Recreational (v3.7 updated 2022)				**1,000**	**100**	**300**	**1,000**			**20,000**	**1,000**		**400**			**3,000**	**700**	**200**					**300**		
ANZG (2018) - FW - 95% (updated 26 July 2021)				36		280																			
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
19 Sep 2018	Leachate	EM1815239	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Sep 2018	Landfill Leachate	EM1815253	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Sep 2018	Landfill Leachate	EM1815378	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Oct 2018	Landfill Leachate	EM1816257	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2018	Landfill Leachate	EM1818033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Nov 2018	Weekly Leachate	EM1818439	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Nov 2018	Landfill Leachate	EM1818867	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2018	Landfill Leachate	EM1820185	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Feb 2019	Landfill Leachate	EM1902347	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Feb 2019	Landfill Leachate	EM1902762	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Mar 2019	Landfill Leachate	EM1904095	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Mar 2019	Landfill Leachate	EM1904168	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<2	<10	2	<2	3	<4	<2	<50	6
09 May 2019	Landfill Leachate - G	EM1907045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 May 2019	Landfill Leachate - P	EM1907034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 May 2019	Landfill Leachate	EM1908322	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jun 2019	Landfill Leachate	EM1910175	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	<10	-	-	-	-	-	<50	-
28 Jun 2019	DWM280619	EM1910927	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Jul 2019	DWM1072019	EM1910930	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31 Jul 2019	DWM31072019	EM1912255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Aug 2019	Landfill Leachate	EM1913958	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Aug 2019	DWM270819	EM1914006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Sep 2019	Landfill Leachate	EM1915222	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<2	<10	<2	<2	<2	<4	<2	<50	<5
11 Sep 2019	Landfill Leachate	EM1915222	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Dec 2019	Landfill Leachate	EM1921873	<20	<20	<20	<20	<20	<20	<20	<19	<20	<20	<20	<20	<20	<20	<2	<20	7	<2	5	<4	<2	-	-
17 Dec 2019	Landfill Leachate	EM1921873	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Mar 2020	Landfill Leachate	EM2005146	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<4	<10	<4	<4	<4	<4	<4	-	-
25 Mar 2020	Pomona Pump	EM2005146	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Apr 2020	Pomona Pump	EM2005914	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Landfill Leachate	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Leachate Pond	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Pomona Pump	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Landfill Leachate	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Pomona Pump	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Landfill Leachate	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Pomona Pump	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Jun 2020	Landfill Leachate	EM2010246	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<2	<10	<2	<2	<2	<4	<2	<50	<5
16 Jun 2020	Landfill Leachate	EM2010246	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Landfill Leachate	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Pomona Pump	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Dulverton Leachate	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Pomona Pump	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Landfill Leachate	EM2017090	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<2	<10	<2	<2	<2	<4	<2	<50	<5
29 Sep 2020	Landfill Leachate	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Pomona Pump	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Landfill Leachate	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Pomona Pump	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Dec 2020	Landfill Leachate	EM2021896	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<2	<10	<2	<2	<2	<4	<2	<50	-
07 Dec 2020	Landfill Leachate	EM2021896	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Mar 2021	Pomona Pump	EM2105221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 May 2021	Landfill Leachate	EM2108650	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<4	<10	<4	<4	<4	<4	<4	-	-
22 Jun 2021	Landfill Leachate	EM2111910	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<4	<10	<4	<4	<4	<4	<4	<50	-
20 Jul 2021	Landfill Leachate	EM2114040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Aug 2021	Landfill Leachate	EM2116503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Sep 2021	Pomona pump	EM2119193	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<7	<10	13	<7	<7	<7	<7	-	-
18 Oct 2021	Landfill Leachate	EM2120767	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Nov 2021	Pomona	EM2123125	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Dec 2021	Landfill Leachate	EM2124673	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<2	<10	9	<2	6	<4	<2	<50	-
08 Mar 2022	Landfill Leachate	EM2204291	<19	<19	<19	<19	<19	<19	<19	<20	<20	<19	<19	<19	<19	<19	<2	<19	6	<2	3	<4	<2	<50	-
30 Mar 2022	Landfill Leachate	EM2205710	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2022	Landfill Leachate	EM2207498	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 May 2022	Landfill Leachate	EM2209763	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Jun 2022	Landfill Leachate	EM2210922	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<2	<10	2	<2	<2	<4	<2	-	-
07 Jun 2022	Landfill Leachate	EM2210922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2022	Landfill Leachate	EM2214400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Sep 2022	Landfill Leachate	EM2218995	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	<20	-	-	-	-	-	-	-
27 Sep 2022	Landfill Leachate	EM2218995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<2	-	6	<2	4	<4	<2	-	-
18 Oct 2022	Landfill Leachate	EM2220632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6 - Historical Landfill Leachate

			Herbicides																Nitroaromatics and Keytones					Solv	
			2,6-D	2,4,5-T	2,4,5-TP (Silvex)	2,4-D (Hedonal)	2,4-DP (dichlorprop)	2,4,6-Trichlorophenoxy-aceitc acid	4-(2,4-Dichlorophenoxy)butyric Acid (2,4-DB)	Clopyralid	Dicamba	Fluroxypyr	MCPA	MCPB	Mecoprop	Picloram	Pronamide	Triclopyr	2-Picoline	4-aminobiphenyl	Acetophenone	N-Nitrosodiphenyl & Diphenylamine	Pentachloronitrobenzene	2-hexanone (MBK)	Carbon disulfide
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			10	10	10	10	10	10	10	10	10	10	10	10	10	10	2	10	2	2	2	4	2	50	5
ADWG 2011 Recreational (v3.7 updated 2022)				**1,000**	**100**	**300**	**1,000**			**20,000**	**1,000**		**400**			**3,000**	**700**	**200**					**300**		
ANZG (2018) - FW - 95% (updated 26 July 2021)				36		280																			
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
08 Nov 2022	Landfill Leachate	EM2222080	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Dec 2022	Landfill leachate	EM2225257	<19	<19	<19	<19	<19	<19	<19	<20	<20	<19	<19	<19	<19	<19	<2	<19	4	<2	<2	<4	<2	-	-
30 Mar 2023	Landfill leachate	EM2305604	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<2	<10	4	<2	<2	<4	<2	-	-
29 Jun 2023	Landfill leachate	EM2311710	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<2	<10	<2	<2	<2	<4	<2	-	-
19 Jul 2023	Landfill Leachate	EM2313106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023	Landfill Leachate	EM2314818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023	Landfill leachate	EM2316162	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<8	<10	<8	<8	<8	<8	<8	-	-
24 Oct 2023	Landfill Leachate	EM2319274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023	Landfill Leachate	EM2319935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023	Landfill Leachate	EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023	Landfill leachate	EM2322269	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<2	<10	8	<2	<8	<4	<2	-	-

Table 6 - Historical Landfill Leachate

			ents		PCBs	Phthalates					Surfactants														
			Isophorone	Vinyl acetate	PCBs (Total)	Bis(2-ethylhexyl) phthalate	Butyl benzyl phthalate	Diethylphthalate	Dimethyl phthalate	Di-n-butyl phthalate	Di-n-octyl phthalate	Anionic Surfactants as MBAS	1-naphthylamine	2-(acetylamino) fluorene	2-nitroaniline	3,3-Dichlorobenzidine	3-nitroaniline	4-(dimethylamino) azobenzene	4-bromophenyl phenyl ether	4-chloroaniline	4-chlorophenyl phenyl ether	4-nitroaniline	4-Nitroquinoline-N-oxide	5-nitro-o-toluidine	Aniline
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			2	50	1	10	2	2	2	2	2	50	2	2	4	2	4	2	2	2	2	2	2	2	2
ADWG 2011 Recreational (v3.7 updated 2022)						**100**																			
ANZG (2018) - FW - 95% (updated 26 July 2021)								1,000	3,700	26															250
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
10 Sep 2013	LEACHATE POND 2	EM1309644	-	-	<1	-	-	-	-	-	-	300	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Sep 2013	POND 1	EM1309643	-	-	<1	-	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Nov 2013	Landfill leachate (quarterly)	EM1312183	-	-	<1	-	-	-	-	-	-	200	-	-	-	-	-	-	-	-	-	-	-	-	-
04 Mar 2014	Landfill leachate (quarterly)	EM1401975	-	-	<1	-	-	-	-	-	-	400	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Jun 2014	Landfill leachate (quarterly)	EM1405379	-	-	<1	-	-	-	-	-	-	200	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Jun 2014	Landfill leachate (quarterly)	EM1405379	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Sep 2014	Landfill leachate (quarterly)	EM1408979	-	-	<1	-	-	-	-	-	-	300	-	-	-	-	-	-	-	-	-	-	-	-	-
01 Jun 2015	Landfill leachate (quarterly)	EM1510467	-	-	<1	-	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Jun 2016	Landfill leachate (quarterly)	EM1607483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jan 2017	Landfill leachate (quarterly)	EM1700066	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Jan 2017	Weekly Leachate	EM1700104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Jan 2017	Weekly Leachate	EM1700551	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Jan 2017	Weekly Leachate	EM1700831	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Feb 2017	Weekly Leachate	EM1701200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Feb 2017	Weekly Leachate	EM1701278	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Feb 2017	Weekly Leachate	EM1701686	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Feb 2017	Weekly leachate	EM1701861	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Feb 2017	Weekly leachate	EM1702391	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Mar 2017	DWM060317	EM1702567	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Mar 2017	DWM160317	EM1703065	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23 Mar 2017	DWM230317	EM1703524	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30 Mar 2017	DWM300317	EM1703932	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03 Apr 2017	DWM030417	EM1704134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Apr 2017	DWM100417	EM1704503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Apr 2017	DWM200417	EM1705012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03 May 2017	DWM030517	EM1705620	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 May 2017	Landfill leachate (quarterly)	EM1705724	-	-	<1	-	-	-	-	-	-	700	-	-	-	-	-	-	-	-	-	-	-	-	-
29 May 2017	Leachate	EM1706966	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jun 2017	DWM050617	EM1707358	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2017	DWM140617	EM1707709	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Jun 2017	DWM190617	EM1707937	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Jun 2017	DWM290617	EM1708550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Jul 2017	DWM060717	EM1708866	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13 Jul 2017	DWM130717	EM1709240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Aug 2017	DWM090817	EM1710633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Aug 2017	DWM140817	EM1710836	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Aug 2017	DWM210817	EM1711202	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Aug 2017	Quarterly leachate samples	EM1711607	-	-	<3	-	-	-	-	-	-	800	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2017	DWM060917	EM1712174	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 Sep 2017	DWM110917	EM1712414	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Sep 2017	DWM200917	EM1712965	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Oct 2017	DWM051017	EM1713718	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Oct 2017	DWM121017	EM1714085	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Oct 2017	DWM161017	EM1714224	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Oct 2017	DWM251017	EM1714708	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31 Oct 2017	DWM311017	EM1714989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2018	DWM260418	EM1806971	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 May 2018	DWM080518	EM1807569	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04 Jun 2018	Weekly Leachate	EM1809069	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2018	Weekly Leachate	EM1809582	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Jun 2018	Weekly Leachate	EM1809922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Jun 2018	Landfill Leachate	EM1810261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Jul 2018	Filtered landfill leachate	EM1810597	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Jul 2018	Weekly Leachate	EM1810596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 Jul 2018	Weekly Leachate	EM1811134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Jul 2018	Leachate	EM1811566	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2018	Landfill Leachate	EM1811963	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Aug 2018	Landfill Leachate	EM1812536	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2018	Landfill Leachate	EM1813133	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Aug 2018	Landfill Leachate	EM1813261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Aug 2018	Landfill Leachate	EM1813826	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2018	Landfill Leachate	EM1814339	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Sep 2018	Landfill Leachate	EM1814493	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6 - Historical Landfill Leachate

Dulverton Regional Waste Management Authority

Dulverton Environmental Monitoring

	ents		PCBs	Phthalates						Surfactants													
	Isophorone	Vinyl acetate	PCBs (Total)	Bis(2-ethylhexyl) phthalate	Butyl benzyl phthalate	Diethylphthalate	Dimethyl phthalate	Di-n-butyl phthalate	Di-n-octyl phthalate	Anionic Surfactants as MBAS	1-naphthylamine	2-(acetylamino) fluorene	2-nitroaniline	3,3-Dichlorobenzidine	3-nitroaniline	4-(dimethylamino) azobenzene	4-bromophenyl phenyl ether	4-chloroaniline	4-chlorophenyl phenyl ether	4-nitroaniline	4-Nitroquinoline-N-oxide	5-nitro-o-toluidine	Aniline
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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	2	50	1	10	2	2	2	2	2	50	2	2	4	2	4	2	2	2	2	2	2	2	2
ADWG 2011 Recreational (v3.7 updated 2022)				**100**																			
ANZG (2018) - FW - 95% (updated 26 July 2021)						1,000	3,700	26															250
ANZECC 2000 - Stock Watering																							
ANZECC 2000 Irrigation - Long-term Trigger Values																							
ANZECC 2000 Irrigation - Short-term Trigger Values																							
Date	**Field ID**	**Lab Report Number**																					
19 Sep 2018	Leachate	EM1815239	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Sep 2018	Landfill Leachate	EM1815253	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Sep 2018	Landfill Leachate	EM1815378	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Oct 2018	Landfill Leachate	EM1816257	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2018	Landfill Leachate	EM1818033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Nov 2018	Weekly Leachate	EM1818439	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Nov 2018	Landfill Leachate	EM1818867	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2018	Landfill Leachate	EM1820185	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Feb 2019	Landfill Leachate	EM1902347	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Feb 2019	Landfill Leachate	EM1902762	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Mar 2019	Landfill Leachate	EM1904095	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Mar 2019	Landfill Leachate	EM1904168	<2	<50	<1	<10	<2	<2	<2	<2	<2	1,200	<2	<2	<4	<2	<4	<2	<2	<2	<2	<2	<2	24
09 May 2019	Landfill Leachate - G	EM1907045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 May 2019	Landfill Leachate - P	EM1907034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 May 2019	Landfill Leachate	EM1908322	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jun 2019	Landfill Leachate	EM1910175	-	<50	<1	-	-	-	-	-	-	400	-	<2	-	-	-	-	-	-	-	-	-	-
28 Jun 2019	DWM280619	EM1910927	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Jul 2019	DWM1072019	EM1910930	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31 Jul 2019	DWM31072019	EM1912255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Aug 2019	Landfill Leachate	EM1913958	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Aug 2019	DWM270819	EM1914006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Sep 2019	Landfill Leachate	EM1915222	<2	<50	<2	<10	<2	<2	<2	<2	<2	1,000	<2	<2	<4	<2	<4	<2	<2	<2	<2	<2	<2	<2
11 Sep 2019	Landfill Leachate	EM1915222	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Dec 2019	Landfill Leachate	EM1921873	<2	-	<1	<10	<2	<2	<2	<2	<2	2,700	<2	<2	<4	<2	<4	<2	<2	<2	<2	<2	<2	27
17 Dec 2019	Landfill Leachate	EM1921873	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Mar 2020	Landfill Leachate	EM2005146	<4	-	<1	<10	<4	<4	<4	<4	<4	1,900	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
25 Mar 2020	Pomona Pump	EM2005146	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Apr 2020	Pomona Pump	EM2005914	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Landfill Leachate	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Leachate Pond	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Pomona Pump	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Landfill Leachate	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Pomona Pump	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Landfill Leachate	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Pomona Pump	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Jun 2020	Landfill Leachate	EM2010246	<2	<50	<1	<10	<2	<2	<2	<2	<2	800	<2	<2	<4	<2	<4	<2	<2	<2	<2	<2	<2	4
16 Jun 2020	Landfill Leachate	EM2010246	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Landfill Leachate	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Pomona Pump	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Dulverton Leachate	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Pomona Pump	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Landfill Leachate	EM2017090	<2	<50	<1	<10	<2	<2	<2	<2	<2	500	<2	<2	<4	<2	<4	<2	<2	<2	<2	<2	<2	3
29 Sep 2020	Landfill Leachate	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Pomona Pump	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Landfill Leachate	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Pomona Pump	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Dec 2020	Landfill Leachate	EM2021896	<2	<50	<1	<10	<2	<2	<2	<2	<2	1,500	<2	<2	<4	<2	<4	<2	<2	<2	<2	<2	<2	3
07 Dec 2020	Landfill Leachate	EM2021896	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Mar 2021	Pomona Pump	EM2105221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 May 2021	Landfill Leachate	EM2108650	<4	-	<1	<10	<4	<4	<4	<4	<4	1,000	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
22 Jun 2021	Landfill Leachate	EM2111910	<4	<50	<1	<10	<4	<4	<4	<4	<4	700	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	6
20 Jul 2021	Landfill Leachate	EM2114040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Aug 2021	Landfill Leachate	EM2116503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Sep 2021	Pomona pump	EM2119193	<7	-	<1	<10	<7	<7	<7	<7	<7	4,300	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	90
18 Oct 2021	Landfill Leachate	EM2120767	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Nov 2021	Pomona	EM2123125	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Dec 2021	Landfill Leachate	EM2124673	<2	<50	<1	<10	<2	<2	<2	<2	<2	2,700	<2	<2	<4	<2	<4	<2	<2	<2	<2	<2	<2	59
08 Mar 2022	Landfill Leachate	EM2204291	<2	<50	<1	<10	<2	<2	<2	<2	<2	6,900	<2	<2	<4	<2	<4	<2	<2	<4	<2	<2	<2	58
30 Mar 2022	Landfill Leachate	EM2205710	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2022	Landfill Leachate	EM2207498	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 May 2022	Landfill Leachate	EM2209763	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Jun 2022	Landfill Leachate	EM2210922	<2	-	<1	<10	<2	<2	<2	<2	<2	320	<2	<2	<4	<2	<4	<2	<2	<2	<2	<2	<2	14
07 Jun 2022	Landfill Leachate	EM2210922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2022	Landfill Leachate	EM2214400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Sep 2022	Landfill Leachate	EM2218995	-	-	<1	-	-	-	-	-	-	2,900	-	-	-	-	-	-	-	-	-	-	-	-
27 Sep 2022	Landfill Leachate	EM2218995	<2	-	-	<10	<2	<2	<2	<2	<2	-	<2	<2	<4	<2	<4	<2	<2	<2	<2	<2	<2	54
18 Oct 2022	Landfill Leachate	EM2220632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6 - Historical Landfill Leachate

	ents		PCBs	Phthalates						Surfactants														
	Isophorone	Vinyl acetate	PCBs (Total)	Bis(2-ethylhexyl) phthalate	Butyl benzyl phthalate	Diethylphthalate	Dimethyl phthalate	Di-n-butyl phthalate	Di-n-octyl phthalate	Anionic Surfactants as MBAS	1-naphthylamine	2-(acetylamino) fluorene	2-nitroaniline	3,3-Dichlorobenzidine	3-nitroaniline	4-(dimethylamino) azobenzene	4-bromophenyl phenyl ether	4-chloroaniline	4-chlorophenyl phenyl ether	4-nitroaniline	4-Nitroquinoline-N-oxide	5-nitro-o-toluidine	Aniline
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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	2	50	1	10	2	2	2	2	2	50	2	2	4	2	4	2	2	2	2	2	2	2	2
ADWG 2011 Recreational (v3.7 updated 2022)				**100**																			
ANZG (2018) - FW - 95% (updated 26 July 2021)						1,000	3,700	26															250
ANZECC 2000 - Stock Watering																							
ANZECC 2000 Irrigation - Long-term Trigger Values																							
ANZECC 2000 Irrigation - Short-term Trigger Values																							

Date	Field ID	Lab Report Number																						
08 Nov 2022	Landfill Leachate	EM2222080	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Dec 2022	Landfill leachate	EM2225257	<2	-	<1	<10	<2	<2	<2	<2	<2	1,800	<2	<2	<4	<2	<4	<2	<2	<2	<2	<2	<2	43
30 Mar 2023	Landfill leachate	EM2305604	<2	-	<1	<10	<2	<2	<2	<2	<2	2,100	<2	<2	<4	<2	<4	<2	<2	<2	<2	<2	<2	31
29 Jun 2023	Landfill leachate	EM2311710	<2	-	<1	<10	<2	<2	<2	<2	<2	600	<2	<2	<4	<2	<4	<2	<2	<2	<2	<2	<2	<2
19 Jul 2023	Landfill Leachate	EM2313106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023	Landfill Leachate	EM2314818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023	Landfill leachate	EM2316162	<8	-	<1	<20	<8	<8	<8	<8	<8	<500	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8
24 Oct 2023	Landfill Leachate	EM2319274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023	Landfill Leachate	EM2319935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023	Landfill Leachate	EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023	Landfill leachate	EM2322269	<2	-	<1	12	<2	<2	<2	<2	<2	3,700	<2	<2	<4	<2	<4	<2	<2	<2	<2	<2	<2	48

Table 6 - Historical Landfill Leachate

			SVOCs																					
			Azobenzene	Bis(2-chloroethoxy) methane	Bis(2-chloroethyl)ether	Carbazole	Chlorobenzilate	Dibenzofuran	Hexachlorocyclopentadiene	Hexachlorocyclopentadiene (filtered)	Hexachloroethane	Hexachloroethane (filtered)	Hexachloropropene	Hexachloropropene (filtered)	Methapyrilene	N-nitrosodiethylamine	N-nitrosodi-n-butylamine	N-nitrosodi-n-propylamine	N-Nitrosomethylethylamine	N-nitrosomorpholine	N-nitrosopiperidine	N-nitrosopyrroloidine	Pentachlorobenzene	Phenacetin	1,1-dichloroethane
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			2	2	2	2	2	2	10	10	2	2	2	2	2	2	2	2	2	2	2	4	2	2	5
ADWG 2011 Recreational (v3.7 updated 2022)																									
ANZG (2018) - FW - 95% (updated 26 July 2021)											360	360											2		
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
10 Sep 2013	LEACHATE POND 2	EM1309644	-	-	-	-	-	-	<100	-	<20	-	<20	-	-	-	-	-	-	-	-	-	<20	-	<5
10 Sep 2013	POND 1	EM1309643	-	-	-	-	-	-	<100	-	<20	-	<20	-	-	-	-	-	-	-	-	-	<20	-	<5
18 Nov 2013	Landfill leachate (quarterly)	EM1312183	-	-	-	-	-	-	<10	-	<2	-	<2	-	-	-	-	-	-	-	-	-	<2	-	<5
04 Mar 2014	Landfill leachate (quarterly)	EM1401975	-	-	-	-	-	-	<10	-	<2	-	<2	-	-	-	-	-	-	-	-	-	<2	-	<5
02 Jun 2014	Landfill leachate (quarterly)	EM1405379	-	-	-	-	-	-	<10	-	<2	-	<2	-	-	-	-	-	-	-	-	-	<2	-	<5
17 Jun 2014	Landfill leachate (quarterly)	EM1405379	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Sep 2014	Landfill leachate (quarterly)	EM1408979	-	-	-	-	-	-	<10	-	<2	-	<2	-	-	-	-	-	-	-	-	-	<2	-	<5
01 Jun 2015	Landfill leachate (quarterly)	EM1510467	-	-	-	-	-	-	<10	-	<2	-	<2	-	-	-	-	-	-	-	-	-	<2	-	<5
27 Jun 2016	Landfill leachate (quarterly)	EM1607483	-	-	-	-	-	-	-	<10	-	<2	-	<2	-	-	-	-	-	-	-	-	-	-	-
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	-	-	-	-	-	-	<10	<10	<2	<2	<2	<2	-	-	-	-	-	-	-	-	<2	-	<5
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jan 2017	Landfill leachate (quarterly)	EM1700066	-	-	-	-	-	-	-	<10	-	<2	-	<2	-	-	-	-	-	-	-	-	-	-	-
09 Jan 2017	Weekly Leachate	EM1700104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Jan 2017	Weekly Leachate	EM1700551	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Jan 2017	Weekly Leachate	EM1700831	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Feb 2017	Weekly Leachate	EM1701200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Feb 2017	Weekly Leachate	EM1701278	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Feb 2017	Weekly Leachate	EM1701686	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Feb 2017	Weekly leachate	EM1701861	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Feb 2017	Weekly leachate	EM1702391	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Mar 2017	DWM060317	EM1702567	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Mar 2017	DWM160317	EM1703065	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23 Mar 2017	DWM230317	EM1703524	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30 Mar 2017	DWM300317	EM1703932	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03 Apr 2017	DWM030417	EM1704134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Apr 2017	DWM100417	EM1704503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Apr 2017	DWM200417	EM1705012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03 May 2017	DWM030517	EM1705620	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 May 2017	Landfill leachate (quarterly)	EM1705724	-	-	-	-	-	-	<10	-	<2	-	<2	-	-	-	-	-	-	-	-	-	<2	-	<5
29 May 2017	Leachate	EM1706966	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jun 2017	DWM050617	EM1707358	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2017	DWM140617	EM1707709	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Jun 2017	DWM190617	EM1707937	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Jun 2017	DWM290617	EM1708550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Jul 2017	DWM060717	EM1708866	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13 Jul 2017	DWM130717	EM1709240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Aug 2017	DWM090817	EM1710633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Aug 2017	DWM140817	EM1710836	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Aug 2017	DWM210817	EM1711202	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Aug 2017	Quarterly leachate samples	EM1711607	-	-	-	-	-	-	<10	-	<2	-	<2	-	-	-	-	-	-	-	-	-	<2	-	<5
06 Sep 2017	DWM060917	EM1712174	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 Sep 2017	DWM110917	EM1712414	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Sep 2017	DWM200917	EM1712965	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Oct 2017	DWM051017	EM1713718	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Oct 2017	DWM121017	EM1714085	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Oct 2017	DWM161017	EM1714224	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Oct 2017	DWM251017	EM1714708	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31 Oct 2017	DWM311017	EM1714989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2018	DWM260418	EM1806971	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 May 2018	DWM080518	EM1807569	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04 Jun 2018	Weekly Leachate	EM1809069	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2018	Weekly Leachate	EM1809582	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Jun 2018	Weekly Leachate	EM1809922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Jun 2018	Landfill Leachate	EM1810261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Jul 2018	Filtered landfill leachate	EM1810597	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Jul 2018	Weekly Leachate	EM1810596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 Jul 2018	Weekly Leachate	EM1811134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Jul 2018	Leachate	EM1811566	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2018	Landfill Leachate	EM1811963	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Aug 2018	Landfill Leachate	EM1812536	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2018	Landfill Leachate	EM1813133	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Aug 2018	Landfill Leachate	EM1813261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Aug 2018	Landfill Leachate	EM1813826	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2018	Landfill Leachate	EM1814339	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Sep 2018	Landfill Leachate	EM1814493	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6 - Historical Landfill Leachate

Dulverton Regional Waste Management Authority

Dulverton Environmental Monitoring

			SVOCs																						
			Azobenzene	Bis(2-chloroethoxy) methane	Bis(2-chloroethyl)ether	Carbazole	Chlorobenziate	Dibenzofuran	Hexachlorocyclopentadiene	Hexachlorocyclopentadiene (filtered)	Hexachloroethane	Hexachloroethane (filtered)	Hexachloropropene	Hexachloropropene (filtered)	Methapyrilene	N-nitrosodiethylamine	N-nitrosodi-n-butylamine	N-nitrosodi-n-propylamine	N-Nitrosomethylethylamine	N-nitrosomorpholine	N-nitrosopiperidine	N-nitrosopyrrolidine	Pentachlorobenzene	Phenacetin	1,1-dichloroethane
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			2	2	2	2	2	2	10	10	2	2	2	2	2	2	2	2	2	2	2	4	2	2	5
ADWG 2011 Recreational (v3.7 updated 2022)																									
ANZG (2018) - FW - 95% (updated 26 July 2021)											360	360											2		
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
19 Sep 2018	Leachate	EM1815239	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Sep 2018	Landfill Leachate	EM1815253	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Sep 2018	Landfill Leachate	EM1815378	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Oct 2018	Landfill Leachate	EM1816257	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2018	Landfill Leachate	EM1818033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Nov 2018	Weekly Leachate	EM1818439	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Nov 2018	Landfill Leachate	EM1818867	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2018	Landfill Leachate	EM1820185	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Feb 2019	Landfill Leachate	EM1902347	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Feb 2019	Landfill Leachate	EM1902762	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Mar 2019	Landfill Leachate	EM1904095	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Mar 2019	Landfill Leachate	EM1904168	<2	<2	<2	<2	<2	<2	<10	-	<2	-	<2	-	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<5
09 May 2019	Landfill Leachate - G	EM1907045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 May 2019	Landfill Leachate - P	EM1907034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 May 2019	Landfill Leachate	EM1908322	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jun 2019	Landfill Leachate	EM1910175	-	-	-	-	-	-	<10	-	<2	-	<2	-	-	-	-	-	-	-	-	-	<2	-	<5
28 Jun 2019	DWM280619	EM1910927	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Jul 2019	DWM1072019	EM1910930	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31 Jul 2019	DWM31072019	EM1912255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Aug 2019	Landfill Leachate	EM1913958	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Aug 2019	DWM270819	EM1914006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Sep 2019	Landfill Leachate	EM1915222	<2	<2	<2	<2	<2	<2	<10	-	<2	-	<2	-	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<5
11 Sep 2019	Landfill Leachate	EM1915222	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Dec 2019	Landfill Leachate	EM1921873	<2	<2	<2	<2	<2	<2	<10	-	<2	-	<2	-	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<5
17 Dec 2019	Landfill Leachate	EM1921873	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Mar 2020	Landfill Leachate	EM2005146	<4	<4	<4	<4	<4	<4	<10	-	<4	-	<4	-	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	-
25 Mar 2020	Pomona Pump	EM2005146	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Apr 2020	Pomona Pump	EM2005914	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Landfill Leachate	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Leachate Pond	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Pomona Pump	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Landfill Leachate	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Pomona Pump	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Landfill Leachate	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Pomona Pump	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Jun 2020	Landfill Leachate	EM2010246	<2	<2	<2	<2	<2	<2	<10	-	<2	-	<2	-	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<5
16 Jun 2020	Landfill Leachate	EM2010246	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Landfill Leachate	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Pomona Pump	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Dulverton Leachate	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Pomona Pump	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Landfill Leachate	EM2017090	<2	<2	<2	<2	<2	<2	<10	-	<2	-	<2	-	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<5
29 Sep 2020	Landfill Leachate	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Pomona Pump	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Landfill Leachate	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Pomona Pump	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Dec 2020	Landfill Leachate	EM2021896	<2	<2	<2	<2	<2	<2	<10	-	<2	-	<2	-	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<5
07 Dec 2020	Landfill Leachate	EM2021896	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Mar 2021	Pomona Pump	EM2105221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 May 2021	Landfill Leachate	EM2108650	<4	<4	<4	<4	<4	<4	<10	-	<4	-	<4	-	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<5
22 Jun 2021	Landfill Leachate	EM2111910	<4	<4	<4	<4	<4	<4	<10	-	<4	-	<4	-	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<5
20 Jul 2021	Landfill Leachate	EM2114040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Aug 2021	Landfill Leachate	EM2116503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Sep 2021	Pomona pump	EM2119193	<7	<7	<7	<7	<7	<7	<10	-	<7	-	<7	-	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<5
18 Oct 2021	Landfill Leachate	EM2120767	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Nov 2021	Pomona	EM2123125	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Dec 2021	Landfill Leachate	EM2124673	<2	<2	<2	<2	<2	<2	<10	-	<2	-	<2	-	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<5
08 Mar 2022	Landfill Leachate	EM2204291	<2	<2	<2	<2	<2	<2	<10	-	<2	-	<2	-	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<5
30 Mar 2022	Landfill Leachate	EM2205710	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2022	Landfill Leachate	EM2207498	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 May 2022	Landfill Leachate	EM2209763	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Jun 2022	Landfill Leachate	EM2210922	<2	<2	<2	<2	<2	<2	<10	-	<2	-	<2	-	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<5
07 Jun 2022	Landfill Leachate	EM2210922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2022	Landfill Leachate	EM2214400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Sep 2022	Landfill Leachate	EM2218995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5
27 Sep 2022	Landfill Leachate	EM2218995	<2	<2	<2	<2	<2	<2	<10	-	<2	-	<2	-	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	-
18 Oct 2022	Landfill Leachate	EM2220632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6 - Historical Landfill Leachate

			SVOCs																						
			Azobenzene	Bis(2-chloroethoxy) methane	Bis(2-chloroethyl)ether	Carbazole	Chlorobenziate	Dibenzofuran	Hexachlorocyclopentadiene	Hexachlorocyclopentadiene (filtered)	Hexachloroethane	Hexachloroethane (filtered)	Hexachloropropene	Hexachloropropene (filtered)	Methapyrilene	N-nitrosodiethylamine	N-nitrosodi-n-butylamine	N-nitrosodi-n-propylamine	N-Nitrosomethylethylamine	N-nitrosomorpholine	N-nitrosopiperidine	N-nitrosopyrrolidine	Pentachlorobenzene	Phenacetin	1, 1-dichloroethane
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			2	2	2	2	2	2	10	10	2	2	2	2	2	2	2	2	2	2	2	4	2	2	5
ADWG 2011 Recreational (v3.7 updated 2022)																									
ANZG (2018) - FW - 95% (updated 26 July 2021)											360	360											2		
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
08 Nov 2022	Landfill Leachate	EM2222080	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Dec 2022	Landfill leachate	EM2225257	<2	<2	<2	<2	<2	<2	<10	-	<2	-	<2	-	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<5
30 Mar 2023	Landfill leachate	EM2305604	<2	<2	<2	<2	<2	<2	<10	-	<2	-	<2	-	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<5
29 Jun 2023	Landfill leachate	EM2311710	<2	<2	<2	<2	<2	<2	<10	-	<2	-	<2	-	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<5
19 Jul 2023	Landfill Leachate	EM2313106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023	Landfill Leachate	EM2314818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023	Landfill leachate	EM2316162	<8	<8	<8	<8	<8	<8	<10	-	<8	-	<8	-	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<5
24 Oct 2023	Landfill Leachate	EM2319274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023	Landfill Leachate	EM2319935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023	Landfill Leachate	EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023	Landfill leachate	EM2322269	<2	<2	<2	<2	<2	<2	<10	-	<2	-	<2	-	<2	<2	<2	<2	<2	<2	<2	<4	<2	<2	<5

Table 6 - Historical Landfill Leachate

			VOCs																					
			1,2,3-trichlorobenzene	1,2,3-trichloropropane	1,2-dibromoethane	1,3-dichlorobenzene	2-butanone (MEK)	4-methyl-2-pentanone (MIBK)	Acetone	Bromodichloromethane	Bromoform	Chlorodibromomethane	Chloroethane	cis-1,3-dichloropropene	cis-1,4-Dichloro-2-butene	Dibromomethane	Formaldehyde	Iodomethane	Pentachloroethane	Trichloroethene	Tetrachloroethene	trans-1,3-dichloropropene	trans-1,2-dichloroethene	trans-1,4-Dichloro-2-butene	Trichlorofluoromethane
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			5	5	5	2	50	50	50	5	5	5	50	5	5	5	100	5	5	5	5	5	5	5	50
ADWG 2011 Recreational (v3.7 updated 2022)					**10**												**5,000**				**500**				
ANZG (2018) - FW - 95% (updated 26 July 2021)			10			260													80	330	70				
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
10 Sep 2013	LEACHATE POND 2	EM1309644	<5	<5	-	<5	-	-	1,270	<5	<5	<5	<50	<5	<5	<5	2,000	<5	<5	<5	<5	<5	<5	<5	<50
10 Sep 2013	POND 1	EM1309643	<5	<5	-	<5	-	-	590	<5	<5	<5	<50	<5	<5	<5	1,800	<5	<5	<5	<5	<5	<5	<5	<50
18 Nov 2013	Landfill leachate (quarterly)	EM1312183	<5	<5	-	<2	-	-	<50	<5	<5	<5	<50	<5	<5	<5	700	<5	<5	<5	<5	<5	<5	<5	<50
04 Mar 2014	Landfill leachate (quarterly)	EM1401975	<5	<5	-	<2	-	-	<50	<5	<5	<5	<50	<5	<5	<5	600	<5	<5	<5	<5	<5	<5	<5	<50
02 Jun 2014	Landfill leachate (quarterly)	EM1405379	<5	<5	-	<2	-	-	560	<5	<5	<5	<50	<5	<5	<5	-	<5	<5	<5	<5	<5	<5	<5	<50
17 Jun 2014	Landfill leachate (quarterly)	EM1405379	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,700	-	-	-	-	-	-	-	-
02 Sep 2014	Landfill leachate (quarterly)	EM1408979	<5	<5	-	<2	-	-	290	<5	<5	<5	<50	<5	<5	<5	900	<5	<5	<5	<5	<5	<5	<5	<50
01 Jun 2015	Landfill leachate (quarterly)	EM1510467	<5	<5	-	<2	-	-	<100	<5	<5	<5	<50	<5	<5	<5	2,600	<5	<5	<5	<5	<5	<5	<5	<50
27 Jun 2016	Landfill leachate (quarterly)	EM1607483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	<5	<5	-	<2	-	-	240	<5	<5	<5	<50	<5	<5	<5	600	<5	<5	<5	<5	<5	<5	<5	<50
22 Sep 2016	Landfill leachate (quarterly)	EM1611287	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jan 2017	Landfill leachate (quarterly)	EM1700066	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Jan 2017	Weekly Leachate	EM1700104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Jan 2017	Weekly Leachate	EM1700551	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Jan 2017	Weekly Leachate	EM1700831	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Feb 2017	Weekly Leachate	EM1701200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Feb 2017	Weekly Leachate	EM1701278	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Feb 2017	Weekly Leachate	EM1701686	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Feb 2017	Weekly leachate	EM1701861	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Feb 2017	Weekly leachate	EM1702391	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Mar 2017	DWM060317	EM1702567	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Mar 2017	DWM160317	EM1703065	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23 Mar 2017	DWM230317	EM1703524	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30 Mar 2017	DWM300317	EM1703932	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03 Apr 2017	DWM030417	EM1704134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Apr 2017	DWM100417	EM1704503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Apr 2017	DWM200417	EM1705012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03 May 2017	DWM030517	EM1705620	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 May 2017	Landfill leachate (quarterly)	EM1705724	<5	<5	-	<2	-	-	<50	<5	<5	<5	<50	<5	<5	<5	1,100	<5	<5	<5	<5	<5	<5	<5	<50
29 May 2017	Leachate	EM1706966	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Jun 2017	DWM050617	EM1707358	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2017	DWM140617	EM1707709	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Jun 2017	DWM190617	EM1707937	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Jun 2017	DWM290617	EM1708550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Jul 2017	DWM060717	EM1708866	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13 Jul 2017	DWM130717	EM1709240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Aug 2017	DWM090817	EM1710633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Aug 2017	DWM140817	EM1710836	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Aug 2017	DWM210817	EM1711202	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Aug 2017	Quarterly leachate samples	EM1711607	<5	<5	-	<2	-	-	80	<5	<5	<5	<50	<5	<5	<5	800	<5	<5	<5	<5	<5	<5	<5	<50
06 Sep 2017	DWM060917	EM1712174	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 Sep 2017	DWM110917	EM1712414	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Sep 2017	DWM200917	EM1712965	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05 Oct 2017	DWM051017	EM1713718	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Oct 2017	DWM121017	EM1714085	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Oct 2017	DWM161017	EM1714224	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Oct 2017	DWM251017	EM1714708	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31 Oct 2017	DWM311017	EM1714989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2018	DWM260418	EM1806971	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 May 2018	DWM080518	EM1807569	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04 Jun 2018	Weekly Leachate	EM1809069	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 Jun 2018	Weekly Leachate	EM1809582	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Jun 2018	Weekly Leachate	EM1809922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Jun 2018	Landfill Leachate	EM1810261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Jul 2018	Filtered landfill leachate	EM1810597	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02 Jul 2018	Weekly Leachate	EM1810596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 Jul 2018	Weekly Leachate	EM1811134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Jul 2018	Leachate	EM1811566	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2018	Landfill Leachate	EM1811963	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Aug 2018	Landfill Leachate	EM1812536	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2018	Landfill Leachate	EM1813133	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Aug 2018	Landfill Leachate	EM1813261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Aug 2018	Landfill Leachate	EM1813826	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2018	Landfill Leachate	EM1814339	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Sep 2018	Landfill Leachate	EM1814493	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6 - Historical Landfill Leachate

Dulverton Regional Waste Management Authority

Dulverton Environmental Monitoring

	VOCs																						
	1,2,3-trichlorobenzene	1,2,3-trichloropropane	1,2-dibromoethane	1,3-dichlorobenzene	2-butanone (MEK)	4-methyl-2-pentanone (MIBK)	Acetone	Bromodichloromethane	Bromoform	Chlorodibromomethane	Chloroethane	cis-1,3-dichloropropene	cis-1,4-Dichloro-2-butene	Dibromomethane	Formaldehyde	Iodomethane	Pentachloroethane	Trichloroethene	Tetrachloroethene	trans-1,3-dichloropropene	trans-1,2-dichloroethene	trans-1,4-Dichloro-2-butene	Trichlorofluoromethane
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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	5	5	5	2	50	50	50	5	5	5	50	5	5	5	100	5	5	5	5	5	5	5	50
ADWG 2011 Recreational (v3.7 updated 2022)			**10**												**5,000**				**500**				
ANZG (2018) - FW - 95% (updated 26 July 2021)	10			260													80	330	70				
ANZECC 2000 - Stock Watering																							
ANZECC 2000 Irrigation - Long-term Trigger Values																							
ANZECC 2000 Irrigation - Short-term Trigger Values																							

Date	Field ID	Lab Report Number																						
19 Sep 2018	Leachate	EM1815239	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Sep 2018	Landfill Leachate	EM1815253	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Sep 2018	Landfill Leachate	EM1815378	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Oct 2018	Landfill Leachate	EM1816257	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2018	Landfill Leachate	EM1818033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Nov 2018	Weekly Leachate	EM1818439	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Nov 2018	Landfill Leachate	EM1818867	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2018	Landfill Leachate	EM1820185	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Feb 2019	Landfill Leachate	EM1902347	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Feb 2019	Landfill Leachate	EM1902762	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Mar 2019	Landfill Leachate	EM1904095	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Mar 2019	Landfill Leachate	EM1904168	<5	<5	<5	<2	90	<50	170	<5	<5	<5	<50	<5	<5	<5	<500	<5	<5	<5	<5	<5	<5	<50
09 May 2019	Landfill Leachate - G	EM1907045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 May 2019	Landfill Leachate - P	EM1907034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 May 2019	Landfill Leachate	EM1908322	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jun 2019	Landfill Leachate	EM1910175	<5	<5	<5	<2	<50	<50	120	<5	<5	<5	<50	<5	<5	<5	700	<5	<5	<5	<5	<5	<5	<50
28 Jun 2019	DWM280619	EM1910927	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10 Jul 2019	DWM1072019	EM1910930	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31 Jul 2019	DWM31072019	EM1912255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Aug 2019	Landfill Leachate	EM1913958	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Aug 2019	DWM270819	EM1914006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Sep 2019	Landfill Leachate	EM1915222	<5	<5	<5	<2	<50	<50	<50	<5	<5	<5	<50	<5	<5	<5	1,800	<5	<5	<5	<5	<5	<5	<50
11 Sep 2019	Landfill Leachate	EM1915222	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Dec 2019	Landfill Leachate	EM1921873	<5	<5	<5	<2	-	<50	-	<5	<5	<5	<50	<5	<5	<5	200	<5	<5	<5	<5	<5	<5	<50
17 Dec 2019	Landfill Leachate	EM1921873	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 Mar 2020	Landfill Leachate	EM2005146	-	-	-	<4	-	-	130	-	-	-	-	-	-	-	2,100	-	-	-	-	-	-	-
25 Mar 2020	Pomona Pump	EM2005146	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Apr 2020	Pomona Pump	EM2005914	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Landfill Leachate	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Leachate Pond	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Apr 2020	Pomona Pump	EM2006671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Landfill Leachate	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 May 2020	Pomona Pump	EM2007860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Landfill Leachate	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 May 2020	Pomona Pump	EM2008320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Jun 2020	Landfill Leachate	EM2010246	<5	<5	<5	<2	<50	<50	90	<5	<5	<5	<50	<5	<5	<5	800	<5	<5	<5	<5	<5	<5	<50
16 Jun 2020	Landfill Leachate	EM2010246	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Landfill Leachate	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Jul 2020	Pomona Pump	EM2012818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Dulverton Leachate	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Aug 2020	Pomona Pump	EM2014788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Landfill Leachate	EM2017090	<5	<5	<5	<2	<50	<50	50	<5	<5	<5	<50	<5	<5	<5	1,200	<5	<5	<5	<5	<5	<5	<50
29 Sep 2020	Landfill Leachate	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29 Sep 2020	Pomona Pump	EM2017090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Landfill Leachate	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Oct 2020	Pomona Pump	EM2019050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Dec 2020	Landfill Leachate	EM2021896	<5	<5	<5	<2	220	<50	140	<5	<5	<5	<50	<5	<5	<5	300	<5	<5	<5	<5	<5	<5	<50
07 Dec 2020	Landfill Leachate	EM2021896	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 Mar 2021	Pomona Pump	EM2105221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 May 2021	Landfill Leachate	EM2108650	<5	<5	<5	<4	-	-	<50	<5	<5	<5	<50	<5	<5	<5	1,000	<5	<5	<5	<5	<5	<5	<50
22 Jun 2021	Landfill Leachate	EM2111910	<5	<5	<5	<4	<50	<50	<50	<5	<5	<5	<50	<5	<5	<5	600	<5	<5	<5	<5	<5	<5	<50
20 Jul 2021	Landfill Leachate	EM2114040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Aug 2021	Landfill Leachate	EM2116503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Sep 2021	Pomona pump	EM2119193	<5	<5	<5	<5	-	-	100	<5	<5	<5	<50	<5	<5	<5	<1,000	<5	<5	<5	<5	<5	<5	<50
18 Oct 2021	Landfill Leachate	EM2120767	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Nov 2021	Pomona	EM2123125	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Dec 2021	Landfill Leachate	EM2124673	<5	<5	<5	<2	350	<50	510	<5	<5	<5	<50	<5	<5	<5	**6,600**	<5	<5	<5	<5	<5	<5	<50
08 Mar 2022	Landfill Leachate	EM2204291	<5	<5	<5	<2	<50	<50	<50	<5	<5	<5	<50	<5	<5	<5	3,000	<5	<5	<5	<5	<5	<5	<50
30 Mar 2022	Landfill Leachate	EM2205710	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Apr 2022	Landfill Leachate	EM2207498	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24 May 2022	Landfill Leachate	EM2209763	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07 Jun 2022	Landfill Leachate	EM2210922	<5	<5	<5	<2	-	-	<50	<5	<5	<5	<50	<5	<5	<5	2,600	<5	<5	<5	<5	<5	<5	<50
07 Jun 2022	Landfill Leachate	EM2210922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26 Jul 2022	Landfill Leachate	EM2214400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27 Sep 2022	Landfill Leachate	EM2218995	<5	<5	<5	<5	-	-	<50	<5	<5	<5	<50	<5	<5	<5	600	<5	<5	<5	<5	<5	<5	<50
27 Sep 2022	Landfill Leachate	EM2218995	-	-	-	<2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Oct 2022	Landfill Leachate	EM2220632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6 - Historical Landfill Leachate

			VOCs																						
			1,2,3-trichlorobenzene	1,2,3-trichloropropane	1,2-dibromoethane	1,3-dichlorobenzene	2-butanone (MEK)	4-methyl-2-pentanone (MIBK)	Acetone	Bromodichloromethane	Bromoform	Chlorodibromomethane	Chloroethane	cis-1,3-dichloropropene	cis-1,4-Dichloro-2-butene	Dibromomethane	Formaldehyde	Iodomethane	Pentachloroethane	Trichloroethene	Tetrachloroethene	trans-1,3-dichloropropene	trans-1,2-dichloroethene	trans-1,4-Dichloro-2-butene	Trichlorofluoromethane
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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			5	5	5	2	50	50	50	5	5	5	50	5	5	5	100	5	5	5	5	5	5	5	50
ADWG 2011 Recreational (v3.7 updated 2022)					**10**												**5,000**				**500**				
ANZG (2018) - FW - 95% (updated 26 July 2021)			10			260													80	330	70				
ANZECC 2000 - Stock Watering																									
ANZECC 2000 Irrigation - Long-term Trigger Values																									
ANZECC 2000 Irrigation - Short-term Trigger Values																									
Date	**Field ID**	**Lab Report Number**																							
08 Nov 2022	Landfill Leachate	EM2222080	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15 Dec 2022	Landfill leachate	EM2225257	<5	<5	<5	<2	-	-	110	<5	<5	<5	<50	<5	<5	<5	1,400	<5	<5	<5	<5	<5	<5	<5	<50
30 Mar 2023	Landfill leachate	EM2305604	<5	<5	<5	<2	-	-	110	<5	<5	<5	<50	<5	<5	<5	<2,000	<5	<5	<5	<5	<5	<5	<5	<50
29 Jun 2023	Landfill leachate	EM2311710	<5	<5	<5	<2	-	-	400	<5	<5	<5	<50	<5	<5	<5	4,900	<5	<5	<5	<5	<5	<5	<5	<50
19 Jul 2023	Landfill Leachate	EM2313106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16 Aug 2023	Landfill Leachate	EM2314818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06 Sep 2023	Landfill leachate	EM2316162	<5	<5	<5	<5	-	-	180	<5	<5	<5	<50	<5	<5	<5	2,000	<5	<5	<5	<5	<5	<5	<5	<50
24 Oct 2023	Landfill Leachate	EM2319274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
08 Nov 2023	Landfill Leachate	EM2319935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Nov 2023	Landfill Leachate	EM2321393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Dec 2023	Landfill leachate	EM2322269	<5	<5	<5	<2	-	-	1,240	<5	<5	<5	<50	<5	<5	<5	<100	<5	<5	<5	<5	<5	<5	<5	<50

						NA	Inorganics			Acidity & Alkalinity						
						Phosphorus reactive (as P)	pH (Lab)	Electrical conductivity (lab)	Total Suspended Solids	Alkalinity (Carbonate as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Calcium (filtered)	Magnesium (filtered)
						MG/L	pH units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL						0.01	0.01	1	5	1	1	1	1	1	1
Location Code	**Date**	**Field ID**	**Matrix Type**	**Sample Type**	**Lab Report Number**										
S4	29 Jun 2023	S4	Water	Normal	EM2311855	-	7.85	427	<5	<1	138	<1	138	57	5
	29 Jun 2023	QC1	Water	Field_D	EM2311855	-	8.00	427	10	<1	139	<1	139	57	5
RPD						-	2	0	**67**	0	1	0	1	0	0
S4	29 Jun 2023	S4	Water	Normal	EM2311855	-	7.85	427	<5	<1	138	<1	138	57	5
	29 Jun 2023	QQC1	Water	Interlab_D	ES2322157	-	7.31	402	9	<1	137	<1	137	67	5
RPD						-	7	6	**57**	0	1	0	1	16	0
S4	06 Sep 2023	S4	Water	Normal	EM2316156	<0.01	7.97	412	18	<1	147	<1	147	72	5
	06 Sep 2023	QC1	Water	Field_D	EM2316156	<0.01	8.03	421	8	<1	148	<1	148	72	5
RPD						0	1	2	**77**	0	1	0	1	0	0
S4	06 Sep 2023	S4	Water	Normal	EM2316156	<0.01	7.97	412	18	<1	147	<1	147	72	5
	06 Sep 2023	QQC1	Water	Interlab_D	ES2331006	-	7.90	404	11	<1	155	<1	155	59	4
RPD						-	1	2	**48**	0	5	0	5	20	22
S4	12 Dec 2023	S4	Water	Normal	EM2322268	0.02	6.68	160	<5	<1	34	<1	34	10	3
	12 Dec 2023	QC01	Water	Field_D	EM2322268	0.02	6.48	162	6	<1	33	<1	33	10	3
RPD						0	3	1	18	0	3	0	3	0	0

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

Table 7 - QC Summary

						Major Ions									
						Potassium (filtered)	Sodium (filtered)	Chloride	Sulfate (filtered)	Cations Total	Anions Total	Ionic Balance	Ammonia as N	Nitrate (as N)	Nitrite (as N)
						mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	%	mg/L	mg/L	mg/L
EQL						1	1	1	1	0.01	0.01	0.01	0.01	0.01	0.01
Location Code	**Date**	**Field ID**	**Matrix Type**	**Sample Type**	**Lab Report Number**										
S4	29 Jun 2023	S4	Water	Normal	EM2311855	1	13	21	36	3.85	4.10	3.17	<0.01	1.28	<0.01
	29 Jun 2023	QC1	Water	Field_D	EM2311855	1	13	22	36	3.85	4.15	3.76	<0.01	1.26	<0.01
RPD						0	0	5	0	0	1	17	0	2	0
S4	29 Jun 2023	S4	Water	Normal	EM2311855	1	13	21	36	3.85	4.10	3.17	<0.01	1.28	<0.01
	29 Jun 2023	QQC1	Water	Interlab_D	ES2322157	1	14	25	33	4.39	4.13	3.05	0.02	1.40	<0.01
RPD						0	7	17	9	13	1	4	**67**	9	0
S4	06 Sep 2023	S4	Water	Normal	EM2316156	1	13	25	28	4.60	4.22	4.20	<0.01	0.88	<0.01
	06 Sep 2023	QC1	Water	Field_D	EM2316156	1	13	25	28	4.60	4.24	3.96	<0.01	0.88	<0.01
RPD						0	0	0	0	0	0	6	0	0	0
S4	06 Sep 2023	S4	Water	Normal	EM2316156	1	13	25	28	4.60	4.22	4.20	<0.01	0.88	<0.01
	06 Sep 2023	QQC1	Water	Interlab_D	ES2331006	<1	12	23	27	3.80	4.31	6.32	0.03	0.92	<0.01
RPD						0	8	8	4	19	2	**40**	**100**	4	0
S4	12 Dec 2023	S4	Water	Normal	EM2322268	<1	14	24	3	1.35	1.42	-	0.03	0.06	<0.01
	12 Dec 2023	QC01	Water	Field_D	EM2322268	<1	14	23	3	1.35	1.37	-	0.02	0.06	<0.01
RPD						0	0	4	0	0	4	-	**40**	0	0

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

Table 7 - QC Summary

						Nutrients						Organic Indicators			
						Nitrogen (Total Oxidised) (as N)	Nitrogen (Total)	Kjeldahl Nitrogen Total	Phosphorus filterable reactive (P)	Phosphorus (Total)	Phosphorus (Total) (filtered)	BOD	Cadmium	Cadmium (filtered)	Chromium (III+VI)
						mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL						0.01	0.1	0.1	0.01	0.01	0.01	2	0.0001	0.0001	0.001
Location Code	**Date**	**Field ID**	**Matrix Type**	**Sample Type**	**Lab Report Number**										
S4	29 Jun 2023	S4	Water	Normal	EM2311855	1.28	1.5	0.2	<0.01	<0.01	-	<2	-	-	-
	29 Jun 2023	QC1	Water	Field_D	EM2311855	1.26	1.5	0.2	<0.01	0.01	-	<2	-	-	-
RPD						2	0	0	0	0	-	0	-	-	-
S4	29 Jun 2023	S4	Water	Normal	EM2311855	1.28	1.5	0.2	<0.01	<0.01	-	<2	-	-	-
	29 Jun 2023	QQC1	Water	Interlab_D	ES2322157	1.40	1.7	0.3	-	<0.01	<0.01	<2	-	-	-
RPD						9	12	**40**	-	0	-	0	-	-	-
S4	06 Sep 2023	S4	Water	Normal	EM2316156	0.88	1.1	0.2	-	<0.01	-	<2	<0.0001	<0.0001	<0.001
	06 Sep 2023	QC1	Water	Field_D	EM2316156	0.88	0.9	<0.1	-	<0.01	-	<2	<0.0001	<0.0001	<0.001
RPD						0	20	**67**	-	0	-	0	0	0	0
S4	06 Sep 2023	S4	Water	Normal	EM2316156	0.88	1.1	0.2	-	<0.01	-	<2	<0.0001	<0.0001	<0.001
	06 Sep 2023	QQC1	Water	Interlab_D	ES2331006	0.92	1.1	0.2	-	<0.01	<0.01	<2	<0.0001	<0.0001	<0.001
RPD						4	0	0	-	0	-	0	0	0	0
S4	12 Dec 2023	S4	Water	Normal	EM2322268	0.06	0.2	0.1	-	0.02	-	2	-	-	-
	12 Dec 2023	QC01	Water	Field_D	EM2322268	0.06	0.2	0.1	-	0.02	-	<2	-	-	-
RPD						0	0	0	-	0	-	0	-	-	-

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

Table 7 - QC Summary

						Metals									
						Chromium (III+VI) (filtered)	Copper	Copper (filtered)	Iron	Iron (filtered)	Lead	Lead (filtered)	Manganese	Manganese (filtered)	Nickel
						mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL						0.001	0.001	0.001	0.05	0.05	0.001	0.001	0.001	0.001	0.001
Location Code	**Date**	**Field ID**	**Matrix Type**	**Sample Type**	**Lab Report Number**										
S4	29 Jun 2023	S4	Water	Normal	EM2311855	-	-	-	-	-	-	-	-	-	-
	29 Jun 2023	QC1	Water	Field_D	EM2311855	-	-	-	-	-	-	-	-	-	-
RPD						-	-	-	-	-	-	-	-	-	-
S4	29 Jun 2023	S4	Water	Normal	EM2311855	-	-	-	-	-	-	-	-	-	-
	29 Jun 2023	QQC1	Water	Interlab_D	ES2322157	-	-	-	-	-	-	-	-	-	-
RPD						-	-	-	-	-	-	-	-	-	-
S4	06 Sep 2023	S4	Water	Normal	EM2316156	<0.001	<0.001	<0.001	0.29	<0.05	<0.001	<0.001	0.017	0.007	0.002
	06 Sep 2023	QC1	Water	Field_D	EM2316156	<0.001	<0.001	<0.001	0.34	<0.05	<0.001	<0.001	0.021	0.008	0.002
RPD						0	0	0	16	0	0	0	21	13	0
S4	06 Sep 2023	S4	Water	Normal	EM2316156	<0.001	<0.001	<0.001	0.29	<0.05	<0.001	<0.001	0.017	0.007	0.002
	06 Sep 2023	QQC1	Water	Interlab_D	ES2331006	<0.001	<0.001	<0.001	0.16	<0.05	<0.001	<0.001	0.014	0.007	0.001
RPD						0	0	0	**58**	0	0	0	19	0	**67**
S4	12 Dec 2023	S4	Water	Normal	EM2322268	-	-	-	-	-	-	-	-	-	-
	12 Dec 2023	QC01	Water	Field_D	EM2322268	-	-	-	-	-	-	-	-	-	-
RPD						-	-	-	-	-	-	-	-	-	-

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

Table 7 - QC Summary

						Nickel (filtered)	Zinc	Zinc (filtered)
						mg/L	mg/L	mg/L
EQL						0.001	0.005	0.005
Location Code	**Date**	**Field ID**	**Matrix Type**	**Sample Type**	**Lab Report Number**			
S4	29 Jun 2023	S4	Water	Normal	EM2311855	-	-	-
	29 Jun 2023	QC1	Water	Field_D	EM2311855	-	-	-
RPD						-	-	-
S4	29 Jun 2023	S4	Water	Normal	EM2311855	-	-	-
	29 Jun 2023	QQC1	Water	Interlab_D	ES2322157	-	-	-
RPD						-	-	-
S4	06 Sep 2023	S4	Water	Normal	EM2316156	<0.001	<0.005	<0.005
	06 Sep 2023	QC1	Water	Field_D	EM2316156	<0.001	<0.005	<0.005
RPD						0	0	0
S4	06 Sep 2023	S4	Water	Normal	EM2316156	<0.001	<0.005	<0.005
	06 Sep 2023	QQC1	Water	Interlab_D	ES2331006	<0.001	<0.005	<0.005
RPD						0	0	0
S4	12 Dec 2023	S4	Water	Normal	EM2322268	-	-	-
	12 Dec 2023	QC01	Water	Field_D	EM2322268	-	-	-
RPD						-	-	-

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

Appendix D

Field notes

Surface Water

Purging and Sampling Record

Bore ID: [redacted]

Job Information	Sampling Information	Bore Information
Client: Pulvertaft	Purge Method:	SWL(mbTOC): [redacted] m
Project: 12564388	Sample Method:	Screen: From: to: m
Proj. No.:	WQ Meter Type:	NAPL Check:
Sampler: RS, MB	Flow Cell: Y / N Pump Depth: m	Ref.datum:
Date: 27/3/22	WLevel Meter Type: Dip / Fox / Int.Fce / Gge	Bore Depth: [redacted] m
Round	Field Filtered? Y / N (filter vessel, disposable filter/syringe) TDS	Logic Check: / Stick Up: m / Bore Diam.: mm / Well Cap Secure?

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µS/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m TOC)	NTU (Turbidity)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		-	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*		
S9 11:20		14.9	6.05	395.1	10.92	58.3		316.3	Slightly cloudy
LL 12:00		15.9	8.00	5418	6.55	-247.3		425.5	Dark brown foul odour, no sheen
S4 13:33		14.9	7.53	372.3	[redacted]	103.2		300.6	Slightly cloudy
S6 13:44		14.9	7.33	395.2	7.10	79.3		318.5	Clear colour, nil odour, no Sheen
LL 28/3/22 13:11		15.8	8.49	9340	2.16	11.7		738.4	Dark brown, foul odour, dipped from pit
[redacted]									

Field QA Checks:
Air bubbles in vials? Y / N Any violent reactions? Y / N
Decontamination as per GHD procedure? Y / N
Was sampling equipment pre-cleaned? Y / N
COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

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

S9- Sample collected from main stream 20m downstream from original sampling point as presented completely dry

S10- no flowing water, modified S6- a bit slower stream

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

Purging and Sampling Record

Bore ID: BH2

Job Information

Client: DWM
Project:
Proj. No.: 12564388
Sampler: RS, MB
Date: 28/3/23
Round

Sampling Information

Purge Method:
Sample Method:
WQ Meter Type:
Flow Cell: Y / N Pump Depth:.....m
WLevel Meter Type: Dip / Fox / Int.Fce / Gge
Field Filtered? Y / N (filter vessel, disposable filter/syringe)

Bore Information

SWL(mbTOC): 4.70 m Logic Check:
Screen: From:.....to..... m Stick Up: ..... m
NAPL Check: Bore Diam.: ..... mm
Ref.datum: Well Cap Secure?
Bore Depth: 10.72 m

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (.....)	Dis.Oxygen (.....)	Ox-Red Pt. (± mV)	SWL (m TOC)	NTU (.....)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):	-	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*			
10.00	10	15.1	5.36	158.3	6.35	175.9		126.5	Cloudy brown
10.12	15	15.1	5.49	160.1	6.62	171.0		128.4	Cloudy brown, no change Purged dry at 15L

Field QA Checks:

Air bubbles in vials? Y / N Any violent reactions? Y / N
Decontamination as per GHD procedure? Y / N
Was sampling equipment pre-cleaned? Y / N
COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

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

*Double for gravel pack

Purging and Sampling Record

Bore ID: B6

Job Information	Sampling Information	Bore Information
Client: DWM	Purge Method:	SWL(mbTOC): 2.24 m
Project:	Sample Method:	Logic Check:
Proj. No.: 12564388	WQ Meter Type:	Screen: From: to: m
Sampler: RS, MB	Flow Cell: Y / N Pump Depth: m	Stick Up: m
Date: 28/3/23	WLevel Meter Type: Dip / Fox / Int.Fce / Gge	NAPL Check: Bore Diam.: mm
Round	Field Filtered? Y / N (filter vessel, disposable filter/syringe)	Ref.datum: Well Cap Secure?
		Bore Depth: 6.89 m

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (.....)	Dis.Oxygen (.....)	Ox-Red Pt. (± mV)	SWL (m TOC)	NTU (.....)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):	-	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*			
10.40	10	13.4	6.86	345.4	4.62	-97.4		288.3	Clear, sulphuric scent
10.42	20	13.5	6.93	349	3.58	-94.3		291.3	"
10.45	30	13.4	6.96	347	3.37	-87.1		290	"

Field QA Checks:

Air bubbles in vials? Y / N Any violent reactions? Y / N
Decontamination as per GHD procedure? Y / N
Was sampling equipment pre-cleaned? Y / N
COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

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

27 L

Purge Volumes

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

*Double for gravel pack

Purging and Sampling Record

Bore ID: B7

Job Information

Client: DWM
Project:
Proj. No.: 12364386
Sampler:
Date: 28/3/2023
Round

Sampling Information

Purge Method:
Sample Method:
WQ Meter Type:
Flow Cell: Y / N Pump Depth:.....m
WLevel Meter Type: Dip / Fox / Int.Fce / Gge
Field Filtered? Y / N (filter vessel, disposable filter/syringe)

Bore Information

SWL(mbTOC): 2.96 m Logic Check:
Screen: From:.....to..... m Stick Up: ..... m
NAPL Check: Bore Diam.: ..... mm
Ref.datum: Well Cap Secure?.....
Bore Depth: 21.37 m

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (.....)	Dis.Oxygen (.....)	Ox-Red Pt. (± mV)	SWL (m TOC)	NTU (.....)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):	-	+/- 0.05 pH	+/- 3%	+/- 10%	+/- 10 mV	stable			
12.00	20	13.3	7.12	392.2	3.18	-20.7		328.	Clear, foul odour
12.05	40	13.1	7.07	392.6	2.21	-7.1		329.7	Clear, no odour
12.08	60	13.1	7.07	391.3	1.9	7.6		328.6	"
12.11	70	13.2	7.11	391.8	2.42	10.6		328.7	"
2.15	80	13.2	7.1	392.3	2.12	13.4		328.9	"
12.18	90	13.2	7.08	392.1	1.9	21.2		328.5	"
12.22	100	13.3	7.01	392.1	2.72	28.9		328.7	"
12.24	110	13.2	7.03	391.2	2.06	31.2		328.6	"

Field QA Checks:

Air bubbles in vials? Y / N Any violent reactions? Y / N
Decontamination as per GHD procedure? Y / N
Was sampling equipment pre-cleaned? Y / N
COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

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

110L

Purge Volumes

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

*Double for gravel pack

Purging and Sampling Record

Bore ID: B14

Job Information	Sampling Information	Bore Information
Client: DWM	Purge Method:	SWL(mbTOC): 1.2 m
Project:	Sample Method:	Logic Check:
Proj. No.: 12564588	WQ Meter Type:	Screen: From: to: m
Sampler: MS	Flow Cell: Y / N Pump Depth: m	Stick Up: m
Date: 28/3/23	WLevel Meter Type: Dip / Fox / Int.Fce / Gge	NAPL Check:
Round	Field Filtered? Y / N (filter vessel, disposable filter/syringe)	Bore Diam.: mm
		Ref.datum:
		Well Cap Secure?
		Bore Depth: 4.72 m

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (.....)	Dis.Oxygen (.....)	Ox-Red Pt. (± mV)	SWL (m TOC)	(NTU)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):	-	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*			
11.04	5	14.6	6.99	644	2.13	-56.9		523	Cloudy brown, no odour
11.09	10	14.6	6.98	654	1.78	-51.7		531	"
11.13	20	14.4	7.0	647	4.19	-45.2		527	"

Field QA Checks:

Air bubbles in vials? Y / N Any violent reactions? Y / N
Decontamination as per GHD procedure? Y / N
Was sampling equipment pre-cleaned? Y / N
COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

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

2 1L

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

Purging and Sampling Record

Bore ID: BH9

Job Information
Client: 12564386 - Dilverton
Project:
Proj. No.: 12564388
Sampler: RS/MB
Date: 27-03-23
Round

Sampling Information
Purge Method:
Sample Method: hydrasleeve
WQ Meter Type:
Flow Cell: Y / N Pump Depth: m
WLevel Meter Type: Dip / Fox / Int.Fce / Gge
Field Filtered? Y / N (filter vessel, disposable filter/syringe)

Bore Information
SWL(mbTOC): 36.77 m Logic Check:
Screen: From: to: m Stick Up: m
NAPL Check: Bore Diam.: mm
Ref.datum: Well Cap Secure?
Bore Depth: 70.01 m

Time (hh:mm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µS/cm)	Dis.Oxygen (.....)	Ox-Red Pt. (± mV)	SWL (m TOC)	TDS (mg/L)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		-	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*		
13:05		13.2	7.43	330.7	3.96	97.0		277.7	yellow cloudy, nl sheen and odour

Field QA Checks:
Air bubbles in vials? Y / N Any violent reactions? Y / N
Decontamination as per GHD procedure? Y / N
Was sampling equipment pre-cleaned? Y / N
COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

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
*Double for gravel pack

Purging and Sampling Record

Bore ID: B2

Job Information
Client: DW
Project:
Proj. No.: 12564388
Sampler: MB
Date: 29/03/23
Round

Sampling Information
Purge Method: Waterra
Sample Method: Waterra
WQ Meter Type: YSI
Flow Cell: Y / (N) Pump Depth: 21.97 m
WLevel Meter Type: Dip / Fox / Int.Fce / Gge
Field Filtered? Y / N (filter vessel, disposable filter/syringe)

Bore Information
SWL(mbTOC): 6.92 m Logic Check:
Screen: From: to: m Stick Up: m
NAPL Check: Bore Diam.: mm
Ref.datum: Well Cap Secure? yes
Bore Depth: 22.97 m

Time (hhmm)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µS/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m TOC)	TDS (mg/L)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		-	+/- 0.05 pH	+/- 3%	+/- 10%	+/- 10 mV	stable		
14:37	20	14.2	6.91	1429	2.21	-88.8		1169	yellow Cloudy earthy odour
14:43	40	14.1	6.97	1447	2.23	-88.0		1184	" " Slightly sewage odour
14:48	60	14.2	6.93	1441	1.64	-84.2		1178	yellow slightly cloudy, fairly sewage odour
14:52	70	14.1	6.93	1476	1.27	-84.1		1175	" " " " " "
14:55	80	14.1	6.95	1431	1.54	-84.2		1174	" " " " " "
14:58	90	14.1	6.91	1430	1.53	-82.5		1171	" " " " " "
15:03	96	14.3	6.92	1431	1.75	-82.9		1172	" " " " " "

Field QA Checks:
Air bubbles in vials? Y / (N) Any violent reactions? Y / (N)
Decontamination as per GHD procedure? (Y) / N
Was sampling equipment pre-cleaned? Y / N
COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

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

96L purged.

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

Purging and Sampling Record

Bore ID: B4

Job Information
Client: DWM
Project:
Proj. No.: 12564388
Sampler: MB
Date: 29-03-23
Round

Sampling Information
Purge Method: Waterra
Sample Method:
WQ Meter Type: YSI
Flow Cell: Y / N Pump Depth: 19.08 m
WLevel Meter Type: Dip / Fox / Int.Fce / Gge
Field Filtered? Y / N (filter vessel, disposable filter/syringe)

Bore Information
SWL(mbTOC): 6.10 m Logic Check:
Screen: From: to: m Stick Up: m
NAPL Check: Bore Diam.: mm
Ref.datum: Well Cap Secure? yes
Bore Depth: 20.08 m

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (mS/cm)	Dis.Oxygen (.....)	Ox-Red Pt. (± mV)	SWL (m TOC)	TDS (mg/L)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		-	+/- 0.05 pH	+/- 3%	+/- 10%	+/- 10 mV	stable		
13:25	20	14.5	6.61	1125	0.69	-44.7		913	First 10L yellow cloudy, 20L clear colour, nil odour
13:30	40	14.5	6.75	1116	0.64	-77.6		907	Clear colour, nil odour
13:35	60	14.6	6.79	1075	0.65	-79.9		872	" "
13:40	80	14.4	6.83	991	0.86	-77.6		805	" "
13:43	90	14.4	6.84	1058	0.78	-88.5		862	" "
13:45	100	14.3	6.91	1035	0.68	-89.3		844	" "
13:48	110	14.4	6.84	1013	0.57	-86.0		825	" "

Field QA Checks:
Air bubbles in vials? Y / N Any violent reactions? Y / N
Decontamination as per GHD procedure? Y / N
Was sampling equipment pre-cleaned? Y / N
COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

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

Purged 110L

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

Purging and Sampling Record

Bore ID: B11

Job Information
Client: Dulverton DUC
Project: 125643586
Proj. No.:
Sampler: MB
Date: 29-03-23
Round

Sampling Information
Purge Method: Waterra
Sample Method:
WQ Meter Type: YSI
Flow Cell: Y / (N) Pump Depth: 8.0 m
WLevel Meter Type: (Dip) / Fox / Int.Fce / Gge
Field Filtered? Y / N (filter vessel, disposable filter/syringe)

Bore Information
SWL(mbTOC): 5.35 m
Screen: From:.....to..... m
NAPL Check:
Ref.datum:
Bore Depth: 8.67 m
Logic Check:
Stick Up: m
Bore Diam.: mm
Well Cap Secure? NO

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µS/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m TOC)	TDS (mg/L)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):	-	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*			
12:12	5	13.3	3.82	622	3.18	256.6		519	yellow rusty, nil odour, nil sheen
12:17	10	12.9	4.65	644	2.70	174.0		543	becoming clear, light yellow, nil odour
12:16	15	13.8	4.62	664	2.95	182.4		554	yellow cloudy - purged dry at 13.5 L
	20								

Field QA Checks:
Air bubbles in vials? Y / (N) Any violent reactions? Y / (N)
Decontamination as per GHD procedure? (Y) / N
Was sampling equipment pre-cleaned? (Y) / N
COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

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

B11 = Well cap found ~~open~~ 13.5L

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

Surface Water Monitoring

Job number:	12564388	Date:	29-Jun-23
Location:	Dalvorton WMC	Sampled by:	MB
Site ID:	S7	Site used for QA sample:	

Field data and observations

GPS co-ordinates	

FIELD Physico-	Results:
pH	
Redox (mV)	
EC (uS/cm)	
Temperature (°C)	
DO (% satn)	
Turbidity (NTU)	
Time of sampling	

FIELD

Photos taken (tick and No.)	✓
Flow rate	[ ] Ponded [ ] Seeping/trickling [ ] Slight [ ] Moderate [ ] Fast
Floating litter, debris, scum, foam, objectionable matter	
Oil/petrochem (film/odour) Specify amount and intensity	
Objectionable odour	
Algal blooms or floating vegetation mats etc	
Dead fauna/flora	
Sources of suspended solids/colour of water	
Aquatic fauna life (list observed)	
Other observations/notes	No Sampled, excavations occurring on the north-east corner from the Sediment Pond line very close to the drainage line
Rain in past week	[✓] Yes [ ] No
Weather	[✓] No rain [ ] Showers Some [ ] Heavy rain [ ] Sunny [ ] Cloud [ ] Over cast [ ] Calm [ ] Breeze [ ] Strong Wind

Generic describing words key:	No detect	Trace	Mild	Moderate	High
	0%	<25%	25-50%	50-80%	>80%

Surface Water Monitoring

Job number: 12561388		Date:	29-Jun-2023
Location: Dalverton WMC		Sampled by:	Miguel Bermudez
Site ID: S3		Site used for QA sample:	

Field data and observations

GPS co-ordinates	

FIELD Physico-	Results:
pH	7.51
Redox (mV)	118.6
EC (uS/cm)	338.0
Temperature (°C)	7.5
DO (% sath.) mg/L	7.40
Turbidity (NTU)	
Time of sampling	13:53

FIELD

Photos taken (tick and No.)	
Flow rate	[ ] Ponded [ ] Seeping/trickling [ ] Slight [X] Moderate [ ] Fast
Floating litter, debris, scum, foam, objectionable matter	Grassed surface, no floating matter
Oil/petrochem (film/odour) Specify amount and intensity	nil seen
Objectionable odour	nil odour
Algal blooms or floating vegetation mats etc	Grass along the banks
Dead fauna/flora	dead logs and branches
Sources of suspended solids/colour of water	Clays setting at the bottom, yellow very cloudy
Aquatic fauna life (list observed)	
Other observations/notes	Sample collected after the culvert downstream
Rain in past week	[✓] Yes [ ] No
Weather	[✓] No rain [ ] Showers Some [ ] Heavy rain [ ] Sunny [ ] Cloud [ ] Over cast [ ] Calm [ ] Breeze [ ] Strong Wind

Generic describing words key:	No detect	Trace	Mild	Moderate	High
	0%	<25%	25-50%	50-80%	>80%

Surface Water Monitoring

Job number: 12564388		Date:	29-Jan-23
Location: Dalvinton WMC		Sampled by:	MB
Site ID: S2		Site used for QA sample:	yes

Field data and observations

GPS co-ordinates	

FIELD Physico-	Results:
pH	7.77
Redox (mV)	136.8
EC (uS/cm)	303.4
Temperature (°C)	10.0
DO (% satn) mg/L	10.88
Turbidity (NTU)	
Time of sampling	13:35

FIELD

Photos taken (tick and No.)	
Flow rate	[ ] Ponded [ ] Seeping/trickling [ ] Slight [ ] Moderate [/] Fast
Floating litter, debris, scum, foam, objectionable matter	foam accumulated in one of the depth log suspended leaves floating occasionally
Oil/petrochem (film/odour) Specify amount and intensity	nil sheen
Objectionable odour	nil odour
Algal blooms or floating vegetation mats etc	
Dead fauna/flora	Shrubs along the banks
Sources of suspended solids/colour of water	clay banks / Green cloudy
Aquatic fauna life (list observed)	
Other observations/notes	
Rain in past week	[ ] Yes [/] No
Weather	[/] No rain [ ] Showers Some [ ] Heavy rain [/] Sunny [ ] Cloud [ ] Over cast [ ] Calm [ ] Breeze [ ] Strong Wind

Generic describing words key:	No detect	Trace	Mild	Moderate	High
	0%	<25%	25-50%	50-80%	>80%

Surface Water Monitoring

Job number:	12564388	Date:	29-Jun-23
Location:	Dalveiton WMC	Sampled by:	MB
Site ID:	S6	Site used for QA sample:	

Field data and observations

GPS co-ordinates	

FIELD Physico-	Results:
pH	7.77
Redox (mV)	120.7
EC (uS/cm)	307.8
Temperature (°C)	8.0
DO (% satn.) mg/L	12.31
Turbidity (NTU)	
Time of sampling	12:56

FIELD

Photos taken (tick and No.)	
Flow rate	[ ] Ponded [ ] Seeping/trickling [ ] Slight [ ] Moderate [X] Fast
Floating litter, debris, scum, foam, objectionable matter	traces of organic matter ocasionally
Oil/petrochem (film/odour) Specify amount and intensity	nil Sheen
Objectionable odour	nil odour
Algal blooms or floating vegetation mats etc	
Dead fauna/flora	trunks and branches along the watercouse
Sources of suspended solids/colour of water	Cobbles and clay at the banks / Clear water
Aquatic fauna life (list observed)	
Other observations/notes	
Rain in past week	[√] Yes [ ] No
Weather	[X] No rain [ ] Showers Some [ ] Heavy rain [ ] Sunny [ ] Cloud [ ] Over cast [ ] Calm [ ] Breeze [ ] Strong Wind

Generic describing words key:	No detect	Trace	Mild	Moderate	High
	0%	<25%	25-50%	50-80%	>80%

Surface Water Monitoring

Job number:	12564388	Date:	29-JUN-23
Location:	Dolverton WMC	Sampled by	MTB
Site ID:	S4	Site used for QA sample:	

Field data and observations

GPS co-ordinates	

FIELD Physico-	Results:
pH	7.6 ~~10.2~~
Redox (mV)	120.8
EC (uS/cm)	304.65 TDS 278.5
Temperature (°C)	6.5
DO (% satn.) mg/L	14.32
Turbidity (NTU)	
Time of sampling	12:20

FIELD

Photos taken (tick and No.)	
Flow rate	[ ] Ponded [ ] Seeping/trickling [ ] Slight [ ] Moderate [X] Fast
Floating litter, debris, scum, foam, objectionable matter	traces of organic bubbles
Oil/petrochem (film/odour) Specify amount and intensity	nil sheen
Objectionable odour	nil odour
Algal blooms or floating vegetation mats etc-	
Dead fauna/flora	no
Sources of suspended solids/colour of water	Green cloudy, [illegible]
Aquatic fauna life (list observed)	
Other observations/notes	Clay layer setting at the bottom
Rain in past week	[√] Yes [ ] No
Weather	[√] No rain [ ] Showers Some [ ] Heavy rain [ ] Sunny [ ] Cloud [ ] Over cast [ ] Calm [ ] Breeze [ ] Strong Wind

Generic describing words key:	No detect	Trace	Mild	Moderate	High
	0%	<25%	25-50%	50-80%	>80%

Surface Water Monitoring

GHD

Job number: 12564388		Date:	29-Jan-23
Location: Dalvaton WMC		Sampled by:	MB
Site ID: 51		Site used for QA sample:	

Field data and observations

GPS co-ordinates	

FIELD Physico-	Results:
pH	7.77
Redox (mV)	111.8
EC (uS/cm)	249.60
Temperature (°C)	9.2
DO (% satn.) mg/L	11.02
Turbidity (NTU)	
Time of sampling	14:20

FIELD

Photos taken (tick and No.)	
Flow rate	[ ] Ponded [ ] Seeping/trickling [ ] Slight [ ] Moderate [√] Fast
Floating litter, debris, scum, foam, objectionable matter	no foam, leaves floating ocasionally
Oil/petrochem (film/odour) Specify amount and intensity	nil sheen
Objectionable odour	nil odour
Algal blooms or floating vegetation mats etc	grassed banks and some srubs
Dead fauna/flora	
Sources of suspended solids/colour of water	Gravel a pebbles, decomposed plant material light yellow/clear
Aquatic fauna life (list observed)	
Other observations/notes	
Rain in past week	[√] Yes [ ] No
Weather	[√] No rain [ ] Sunny [ ] Calm [ ] Showers Some [ ] Cloud [ ] Breeze [ ] Heavy rain [ ] Over cast [ ] Strong Wind

Generic describing words key:	No detect	Trace	Mild	Moderate	High
	0%	<25%	25-50%	50-80%	>80%

Surface Water Monitoring

Job number:	12564388	Date:	29/06/23
Location:	Dolveton landfill	Sampled by:	MB
Site ID:	SW	Site used for QA sample:	

Field data and observations

GPS co-ordinates	

FIELD Physico-	Results:
pH	7.88
Redox (mV)	82.3
EC (uS/cm)	306.4
Temperature (°C)	9.9
DO (% satn.) mg/L	10.82
Turbidity (NTU)	
Time of sampling	09:37

FIELD

Photos taken (tick and No.)	
Flow rate	[ ] Ponded [ ] Seeping/trickling [ ] Slight [ ] Moderate [✓] Fast
Floating litter, debris, scum, foam, objectionable matter	Some organic elements floating
Oil/petrochem (film/odour) Specify amount and intensity	nil sheen
Objectionable odour	Earthy odour
Algal blooms or floating vegetation mats etc	
Dead fauna/flora	NO
Sources of suspended solids/colour of water	Yellow cloudy
Aquatic fauna life (list observed)	
Other observations/notes	Clay sediments good flow, clay banks
Rain in past week	[✓] Yes [ ] No
Weather	[✓] No rain [ ] Showers Some [ ] Heavy rain [ ] Sunny [ ] Cloud [ ] Over cast [ ] Calm [ ] Breeze [ ] Strong Wind

Generic describing words key:	No detect	Trace	Mild	Moderate	High
	0%	<25%	25-50%	50-80%	>80%

CHAIN OF CUSTODY RECORD

GHD Launceston
23 Paterson St Launceston TAS 7250
Telephone: 61 3 6332 5500 Facsimile: 61 3 6210 0601
Email: lstmail@ghd.com.au

Job Number	12564388	GHD Office	Launceston
Project	Dulverton Landfill Water Monitoring		
GHD Project Manager	Sam King	GHD Contact	Sam King 0418 530 446 sam.king@ghd.com
Requested Completion Date	STT	Purchase Order Number	12564388

Laboratory:	ALS Scoresby
Address:	2-4 Westall Road, Springvale VIC 3171
Laboratory Contact:	Peter Ravlic

Sample ID	Date	Time	Composite Sample	Sample Matrix S: Soil SL: Sludge W: Water A: Air GW: Groundwater	Preservative	Container Type J: soil jar B: bag V: vial G: glass bottle P: plastic bottle	Number of items	Volume (mL)	TSS, TDS, Chloride, Orthophosphate	Metals - Dissolved (Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Mn, Ni, Se, Zn)	Metals - Total (Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Mn, Ni, Se, Zn)	Total N, ammonia, nitrite, nitrate, total P	Major Ions (chloride, sulphate, sodium, potassium, magenesium, calcium), Bicarbonate alkalinity, carbonate alkalinity	TRH/TPH	TPH silica gel clean up required if TPH is detected	BTEX, PAHs, Total Chlorinated Hydrocarbons, SVOC, Formaldehyde, Acetone derivaties, OC/OP, Phenoxyacetic Acid Herbicides, PCBs, MBAS, Phenols	DOC	BOD	Total cyanide	Oil & Grease	Sulfide (EK085)	Sulphite / Thiosulphate (IN-3)	Total Oxidised Sulfur (ED043)	Remarks
Landfill leachate	29-6-23			W					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Sampled by	~~Sam King~~ Miyod B	Date/Time	~~6/12/2021~~ 29-6-23	Relinquished by:	Sam King
Received by		Date/Time		Relinquished by:	7/12/2021
Received by Courier		Date/Time		Relinquished by:	
Received by Lab		Date/Time		Relinquished by:	

Remarks: ~~Logged through Compass - if there are any discrepancies~~, please accept this COC as the most accurant information, thank you. Quote # ME/770/21

CHAIN OF CUSTODY RECORD

GHD Launceston
23 Paterson St Launceston TAS 7250
Telephone: 61 3 6332 5500 Facsimile: 61 3 6210 0601
Email: lstmail@ghd.com.au

of

Job Number 12564388	**GHD Office** Launceston	**Laboratory:**	ALS Scoresby
		Address:	2-4 Westall Road, Springvale VIC 3171
Project Dulverton Landfill Water Monitoring		**Laboratory Contact:**	Peter Ravlic
GHD Project Manager Sam King	**GHD Contact** Sam King 0418 530 446 sam.king@ghd.com		
Requested Completion Date STT	**Purchase Order Number** 12564388		

PLEASE NOTE:

Sample ID	Date	Time	Composite Sample	Sample Matrix S: Soil SL: Sludge W: Water A: Air GW: Groundwater	Preservative	Container Type J: soil jar B: bag V: vial G: glass bottle P: plastic bottle	Number of items	Volume (mL)	Total N, ammonia, nitrite, nitrate, total P	Major Ions (chloride, sulphate, sodium, potassium, magenesium, calcium), Bicarbonate alkalinity, carbonate alkalinity	BOD	pH, EC, Dissolved Free P, TSS	Remarks
S1	29/06/2023			W					X	X	X	X	
S2	29/06/2023			W					X	X	X	X	
S3	29/06/2023			W					X	X	X	X	
S4	29/06/2023			W					X	X	X	X	
~~S5~~	~~29/06/2023~~			~~W~~					~~X~~	~~X~~	~~X~~	~~X~~	
S6	29/06/2023			W					X	X	X	X	
~~[redacted]~~	~~[redacted]~~			~~[redacted]~~					~~X~~	~~X~~	~~X~~	~~X~~	
~~[redacted]~~	~~[redacted]~~			~~[redacted]~~					~~X~~	~~X~~	~~X~~	~~X~~	
S9	29/06/2023			W					X	X	X	X	
QC1	29106123			W					X	X	X	X	
QQC1	29106123			W					X	X	X	X	
													forward to ALS Sydney

Sampled by:	Miguel Benavides	Date/Time:	29-6-23
Received by:		Date/Time:	
Received by Courier:		Date/Time:	
Received by Lab:		Date/Time:	

Remarks: **Logged through Compass - if there are any discrepancies, please accept COC as the most accurant information, thank you.** Quote # ME/770/21

Purging and Sampling Record

Bore ID: B14

Job Information		Sampling Information		Bore Information	
Client:	Dolverton	Purge Method:	Twister pump (waterra)	SWL(mbTOC):	0.56 m
Project:	DWM	Sample Method:	" " "	Screen:	From: ... to: ... m
Proj. No.:	12564388	WQ Meter Type:	YSI Pro	NAPL Check:	
Sampler:	MB	Flow Cell: Y / N	N	Ref.datum:	
Date:	6-Sep-23	Pump Depth:	3.76 m	Bore Depth:	4.76 m
Round		WLevel Meter Type:	Dip / Fox / Int.Fce / Gge	Logic Check:	
		Field Filtered? Y / N	(filter vessel, disposable filter/syringe)	Stick Up:	m
				Bore Diam.:	50 mm
				Well Cap Secure?	yes

Time (........)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (..............)	Dis.Oxygen (..............)	Ox-Red Pt. (± mV)	SWL (m TOC)	(..............)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		-	+/- 0.05 pH	+/- 3%	+/- 10%	+/- 10 mV	stable		
14:20	5	9.9	7.08	663	22.71 / 2.37	112.0			High content of sediments, yellow, very cloudy, nil
14:23	10	10.2	7.04	667	13.81 / 1.52	28.1			odour → less cloudy, high sed load
14:26	15	10.1	7.07	666	22.71 / 2.41	1.9			less cloudy, high content of fines
14:29	20	10.1	7.15	663	34.61 / 3.65	-8.9			no change.
14:31	25	10.3	7.06	696	23.5 / 2.62	3.4			yellow, cloudy, high content of
									fines, nil odour.

Field QA Checks:
Air bubbles in vials? Y / N (N) Any violent reactions? Y / N (N)
Decontamination as per GHD procedure? Y / N (Y)
Was sampling equipment pre-cleaned? Y / N (Y)
COC updated? Y / N (Y)

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

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

*Double for gravel pack

Purging and Sampling Record

Bore ID: B6

Job Information		Sampling Information		Bore Information	
Client:	Oliverton	Purge Method:	Twister pump (waterra)	SWL(mbTOC): 1.87 m	Logic Check:
Project:	DWM	Sample Method:	" "	Screen: From: ... to ... m	Stick Up: ... m
Proj. No.:	12564388	WQ Meter Type:	YSI PRO	NAPL Check:	Bore Diam.: 50 mm
Sampler:	MB	Flow Cell: Y / N (N)	Pump Depth: 5.93 m	Ref.datum:	Well Cap Secure? yes
Date:	6-Sep-23	WLevel Meter Type:	Dip / Fox / Int.Fce / Gge	Bore Depth: 6.93 m	
Round		Field Filtered? Y / N (filter vessel, disposable filter/syringe)			

Time (..........)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (..............)	Dis.Oxygen (..............)	Ox-Red Pt. (± mV)	SWL (m TOC)	(..............)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		-	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*		
12:57	5	11.4	6.97	376.6	4.48 / 40.2	-94.7			yellow very cloudy, nil odour
13:00	10	11.4	6.88	385.1	4.12 / 37.6	-53.3			light yellow cloudy, earthy odour
13:02	15	11.4	6.86	384.8	2.44 / 22.1	-53.5			Clear colour, earthy odour
13:04	20	11.6	6.84	384.9	1.53 / 13.9	-54.9			no change
13:06	25	11.5	6.89	388.4	2.86 / 26.37	-51.3			No change
13:08	30	11.6	6.97	390.4	3.8 / 34.5	-43.3			Earthy odour clear colour

Field QA Checks:

Air bubbles in vials? Y / N (N) Any violent reactions? Y / N (N)
Decontamination as per GHD procedure? Y / N (Y)
Was sampling equipment pre-cleaned? Y / N (Y)
COC updated? Y / N (Y)

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

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

External lock case missing (normal cap)

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

Purging and Sampling Record

Bore ID: B4

Job Information	Sampling Information	Bore Information
Client: Ouverton	Purge Method: Submersible pump (waterra)	SWL(mbTOC): 5.40 m
Project: DWMC	Sample Method:	Logic Check:
Proj. No.: 12564388	WQ Meter Type: YSI Pro	Screen: From: to: m
Sampler: MR	Flow Cell: Y / N Pump Depth: m	Stick Up: 0 m
Date: 6-Sep-23	WLevel Meter Type: Dip / Fox / Int.Fce / Gge	NAPL Check:
Round	Field Filtered? Y / N (filter vessel, disposable filter/syringe)	Ref.datum:
		Bore Depth: 20.08 m
		Bore Diam.: 100 mm
		Well Cap Secure? Yes

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (.....)	Dis.Oxygen (.....)	Ox-Red Pt. (± mV)	SWL (m TOC)	(.....)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):	-	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*			
10:49	20	13.6	7.02	883	23.11/2.11	-88.7			Clear colour, nil odour, nil sediment load
10:52	40	13.7	6.97	887	9.47/0.91	-64.5			no change
10:56	60	13.7	6.97	897	7.81/0.78	-61.8			No change
10:59	80	13.7	7.02	890	7.81/0.80	-70.6			No change
11:03	100	13.3	6.96	894	6.41/0.66	-60.5			Clear colour, nil odour.

Field QA Checks:

Air bubbles in vials? Y / N Any violent reactions? Y / N

Decontamination as per GHD procedure? Y / N

Was sampling equipment pre-cleaned? Y / N

COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

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

*Double for gravel pack

Purging and Sampling Record

Bore ID: B2

Job Information

Client: Colverton
Project: DWM
Proj. No.: 12564388
Sampler: MB
Date: 6-Sep-23
Round

Sampling Information

Purge Method: Twister pump / waterra
Sample Method:
WQ Meter Type: YSI PRO
Flow Cell: Y / (N) Pump Depth: 21.3 m
WLevel Meter Type: Dip / Fox / Int.Fce / Gge
Field Filtered? Y / N (filter vessel, disposable filter/syringe)

Bore Information

SWL(mbTOC): 6.46 m Logic Check:
Screen: From: to: m Stick Up: 0.15 m
NAPL Check: Bore Diam.: 100 mm
Ref.datum: Well Cap Secure? yes
Bore Depth: 22.23 m

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (.....)	Dis.Oxygen (.....)	Ox-Red Pt. (± mV)	SWL (m TOC)	(.....)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):	-	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*			
09:26	20	13.3	7.12	1108	4.75	-42.6			yellow v.org cloudy, nil odour
09:29	40	13.5	7.06	1119	27.61/2.86	-42.5			forming less cloudy, nil odour
09:31	60	13.5	7.09	1150	24.51/2.59	-54.4			forming light yellow slightly cloudy
09:33	80	13.5	7.07	1163	24.31/2.5	-56.3			light yellow clear, nil odour
09:36	100	13.5	7.06	1174	22.41/2.33	-57.7			No change
09:39	120	13.5	7.05	1173	22.1/2.28	-57.4			No change / Sample collected

Field QA Checks:

Air bubbles in vials? Y / (N) Any violent reactions? Y / (N)
Decontamination as per GHD procedure? (Y) / N
Was sampling equipment pre-cleaned? (Y) / N
COC updated? (Y) / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

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

Purged 120L

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

Purging and Sampling Record

Bore ID: B11

Job Information	*Sampling Information*	*Bore Information*
Client: Alverton	Purge Method: Twister pump (watera)	SWL(mbTOC): 3.43 m — Logic Check:
Project: 6-monthly GW	Sample Method: Twister pump (watera)	Screen: From: ... to: ... m — Stick Up: 0.3 m
Proj. No.: 12564388	WQ Meter Type:	NAPL Check: — Bore Diam.: 50 mm
Sampler: MB	Flow Cell: Y / N — Pump Depth: 7.67 m	Ref.datum: — Well Cap Secure? yes
Date: 5-Sep-23	WLevel Meter Type: Dip / Fox / Int.Fce / Gge	Bore Depth: 8.62 m
Round	Field Filtered? Y / N (filter vessel, disposable filter/syringe)	

Time (.........)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (.........)	Dis.Oxygen (.........)	Ox-Red Pt. (± mV)	SWL (m TOC)	(.........)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		-	+/- 0.05 pH	+/- 3%	+/- 10%	+/- 10 mV	stable		
13:44	10	12.3	4.04	858	34.4%/3.69	210.6			from yellow cloudy to clear Colour in later
14:00	Sample	11.8	4.09	901	41.7/4.50	247.8			Purged dry at VOL
									→ clear colour, nil odour

Field QA Checks:
Air bubbles in vials? Y / N Any violent reactions? Y / N
Decontamination as per GHD procedure? Y / N
Was sampling equipment pre-cleaned? Y / N
COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

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.[illegible]
*Double for [illegible]

Purging and Sampling Record

Bore ID: B7

Job Information		Sampling Information		Bore Information	
Client:	Dolverton	Purge Method:	tanster pump (Hydrant)	SWL(mbTOC):	1.64 m
Project:	DWMC	Sample Method:	" "	Screen: From:...to...	m
Proj. No.:	12564388	WQ Meter Type:	YSI PRO	NAPL Check:	
Sampler:	MB	Flow Cell: Y / N (N circled)	Pump Depth: 5.81 m	Ref.datum:	
Date:	5-Sep-23	WLevel Meter Type:	Dip / Fox / Int.Fce / Gge	Bore Depth:	6.81 m
Round		Field Filtered? Y / N (filter vessel, disposable filter/syringe)			

Logic Check: .... Stick Up: .... m Bore Diam.: 100 mm Well Cap Secure?: yes

Time (.........)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (..........)	Dis.Oxygen (..........)	Ox-Red Pt. (± mV)	SWL (m TOC)	(..........)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		-	+/- 0.05 pH	+/- 3%	+/- 10%	+/- 10 mV	stable		
12:19	10	12.5	6.90	378.3	23.7 / 2.46	193.4			Clear odour, nil odour, nil sediment load
12:22	20	12.5	7.04	397.6	51.9 / 3.52	176.3			Clear colour, nil odour, nil sediment load
12:27	30	12.6	7.06	392.3	31.0 / 3.14	167.0			Clear colour nil odour
12:30	40	12.7	7.08	394.9	18.3 / 1.96	162.2			No change

Field QA Checks:

Air bubbles in vials? Y / N Any violent reactions? Y / N

Decontamination as per GHD procedure? Y / N

Was sampling equipment pre-cleaned? Y / N

COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

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

40L purged

Purge Volumes

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

*Double for gravel pack

Purging and Sampling Record

Bore ID: B17

Job Information	Sampling Information	Bore Information
Client: Dulverton	Purge Method: twister Pump (Waterra)	SWL(mbTOC): 3.75 m; Logic Check: ....
Project: Groundwater 6 monthly	Sample Method: Waterra	Screen: From:........to........ m; Stick Up: .... m
Proj. No.: 12564386	WQ Meter Type: YSI Pro	NAPL Check: ....; Bore Diam.: 50 mm
Sampler: MB	Flow Cell: Y / N; Pump Depth:..........m	Ref.datum: ....; Well Cap Secure? yes
Date: 5-Sep-23	WLevel Meter Type: Dip / Fox / Int.Fce / Gge	Bore Depth: 10.68 m
Round	Field Filtered? Y / N (filter vessel, disposable filter/syringe)	

Time (..........)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (..........)	Dis.Oxygen (..........)	Ox-Red Pt. (± mV)	SWL (m TOC)	(..........)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		-	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*		
11:30	10	13.6	4.97	176.3	38.51/4.00%	209.6			Very cloudy, nil sediment load, nil odour
11:33	15	13.9	5.00	173.6	39.47/4.05%	236.4			yellow very cloudy yellow fine sediment
									nil odour
									Purged dry at 15L
									Collected at 3:45pm

Field QA Checks:
Air bubbles in vials? Y / N (N circled) Any violent reactions? Y / N (N circled)
Decontamination as per GHD procedure? Y / N
Was sampling equipment pre-cleaned? Y / N (Y circled)
COC updated? Y / N (Y circled)

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc
External Cap on monument broken

Purge Volumes

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

*Double for gravel pack

Purging and Sampling Record

Bore ID: B9

Job Information		Sampling Information		Bore Information	
Client:	Ouverton	Purge Method:	hydrasleeve	SWL(mbTOC):	34.93 m
Project:		Sample Method:	hydrasleeve	Screen: From: to	m
Proj. No.:	12564388	WQ Meter Type:	YSI Pro	NAPL Check:	
Sampler:	MB	Flow Cell: Y / N	Pump Depth: m	Ref.datum:	
Date:	4-5 Sep-23	WLevel Meter Type:	Dip / Fox / Int.Fce / Gge	Bore Depth:	69.41 m
Round		Field Filtered? Y / N (filter vessel, disposable filter/syringe)		Logic Check:	
				Stick Up:	m
				Bore Diam.:	50 mm
				Well Cap Secure?	yes

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (.....)	Dis.Oxygen (.....)	Ox-Red Pt. (± mV)	SWL (m TOC)	(.....)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		-	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*		
4 Sep 11:31									Installed hydrasleeve
Sep 10:10									Hydrasleeve Collected
10:10		13.7	7.70	228.7	40.6 (3.98mg/L)	131.9			yellow tainted clear, nil odour - fine brown sediments at the bottom

Field QA Checks:
Air bubbles in vials? Y / N Any violent reactions? Y / N
Decontamination as per GHD procedure? Y / N
Was sampling equipment pre-cleaned? Y / N
COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

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

Extreme air sound coming inside the bore casing

Purge Volumes

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

*Double for gravel pack

Surface Water Monitoring

Job number:	12564388	Date:	6-Sep-23
Location:	DWM	Sampled by:	MB
Site ID:	S4	Site used for QA sample:	yes

Field data and observations

GPS co-ordinates	

FIELD Physico-	Results:
pH	7.89
Redox (mV)	91.0
EC (uS/cm)	349.9
Temperature (°C)	12.0
DO (% satn.)	57.5% / 6.21mg/L
Turbidity (NTU)	
Time of sampling	13:40

FIELD

Photos taken (tick and No.)	
Flow rate	[ ] Ponded [ ] Seeping/trickling [ ] Slight [ ] Moderate [X] Fast
Floating litter, debris, scum, foam, objectionable matter	floating leaves and yellow flowers, nil foam, some branches on the watercourse
Oil/petrochem (film/odour) Specify amount and intensity	nil sheen
Objectionable odour	nil odour
Algal blooms or floating vegetation mats etc	no vegetation mats
Dead fauna/flora	nil
Sources of suspended solids/colour of water	Clay sediments on fill material (bricks)
Aquatic fauna life (list observed)	
Other observations/notes	QC and QQC collected from this location
Rain in past week	[X] Yes [ ] No
Weather	[ ] No rain [X] Showers Some [ ] Heavy rain [ ] Sunny [ ] Cloud [ ] Over cast [ ] Calm [ ] Breeze [ ] Strong Wind

Generic describing words key:	No detect	Trace	Mild	Moderate	High
	0%	<25%	25-50%	50-80%	>80%

Surface Water Monitoring

Job number: 12560236		Date:	4-Sep-23
Location: Dolverton WMC		Sampled by:	MB
Site ID: 59		Site used for QA sample:	

Field data and observations

GPS co-ordinates	

FIELD Physico-	Results:
pH	8.06
Redox (mV)	118.13
EC (uS/cm)	353.9
Temperature (°C)	13.2
DO (% satn.)	79.4%
Turbidity (NTU)	
Time of sampling	12:05

FIELD

Photos taken (tick and No.)	
Flow rate	[ ] Ponded [ ] Seeping/trickling [ ] Slight [ ] Moderate [X] Fast
Floating litter, debris, scum, foam, objectionable matter	floating leaves, branches
Oil/petrochem (film/odour) Specify amount and intensity	Nil Oil Sheen, earthy odour
Objectionable odour	Earthy odour
Algal blooms or floating vegetation mats etc	no vegetable mats
Dead fauna/flora	NO
Sources of suspended solids/colour of water	Clays odour setting at the bottom light yellow
Aquatic fauna life (list observed)	
Other observations/notes	Running fast, clay banks
Rain in past week	[ ] Yes [X] No
Weather	[X] No rain [ ] Showers Some [ ] Heavy rain [ ] Sunny [ ] Cloud [ ] Over cast [ ] Calm [ ] Breeze [ ] Strong Wind

Generic describing words key:	No detect	Trace	Mild	Moderate	High
	0%	<25%	25-50%	50-80%	>80%

Surface Water Monitoring

Job number: 12564388		Date:	5-Sep-23
Location:	Ulverton	Sampled by:	MB
Site ID:	S3	Site used for QA sample:	

Field data and observations

GPS co-ordinates	

FIELD Physico-	Results:
pH	7.52
Redox (mV)	-70.3
EC (uS/cm)	1001
Temperature (°C)	11.1
DO (% satn.)	9.71 / 1.06mg/L
Turbidity (NTU)	
Time of sampling	16:53

FIELD

Photos taken (tick and No.)	
Flow rate	[ ] Ponded [ ] Seeping/trickling [ ] Slight [ ] Moderate [✓] Fast
Floating litter, debris, scum, foam, *objectionable matter*	traces of foam, leaves floating
Oil/petrochem (film/odour) Specify amount and intensity	nil green
Objectionable odour	nil odour
Algal blooms or floating vegetation mats etc	Perennial grass, wide leave aqcatic plants
Dead fauna/flora	Nil
Sources of suspended solids/colour of water	Clay bottom, dark brown, md cloudy
Aquatic fauna life (list observed)	
Other observations/notes	Collected during showers
Rain in past week	[X] Yes [ ] No
Weather	[ ] No rain [X] Showers Some [ ] Heavy rain [ ] Sunny [ ] Cloud [ ] Over cast [ ] Calm [ ] Breeze [ ] Strong Wind

Generic describing words key:	No detect	Trace	Mild	Moderate	High
	0%	<25%	25-50%	50-80%	>80%

Surface Water Monitoring

Job number: 12564386		Date:	5-Sep-23
Location: Dulverton WMC.		Sampled by:	MB
Site ID: S7		Site used for QA sample:	

Field data and observations

GPS co-ordinates	

FIELD Physico-	Results:
pH	7.64
Redox (mV)	-105.7
EC (uS/cm)	1460
Temperature (°C)	10.8
DO (% satn.)	5.1 (0.56mg/L)
Turbidity (NTU)	
Time of sampling	10:55

FIELD

Photos taken (tick and No.)	yes
Flow rate	[ ] Ponded [ ] Seeping/trickling [ ] Slight [X] Moderate [ ] Fast
Floating litter, debris, scum, foam, objectionable matter	No floating material
Oil/petrochem (film/odour) Specify amount and intensity	Sl. of sheen particularly near the banks
Objectionable odour	slightly sewage odour
Algal blooms or floating vegetation mats etc	
Dead fauna/flora	
Sources of suspended solids/colour of water	black colour, Collected from Rocky drain
Aquatic fauna life (list observed)	
Other observations/notes	drain outlet from stormwater lagoon, is flowing because the lagoon reached the highes level, night before there was rain
Rain in past week	[✓] Yes [ ] No
Weather	[ ] No rain [ ] Showers Some [ ] Heavy rain [✓] Sunny [ ] Cloud [ ] Over cast [✓] Calm [ ] Breeze [ ] Strong Wind

Generic describing words key:	No detect	Trace	Mild	Moderate	High
	0%	<25%	25-50%	50-80%	>80%

Surface Water Monitoring

Job number:	12564388	Date:	5-Sep-23
Location:	Ocverton	Sampled by:	MB
Site ID:	S2	Site used for QA sample:	

Field data and observations

GPS co-ordinates	

FIELD Physico-	Results:
pH	7.38
Redox (mV)	104.6
EC (uS/cm)	351.7
Temperature (°C)	12.7
DO (% satn.)	67.3 | 7.14mg/l
Turbidity (NTU)	1
Time of sampling	16:33

FIELD

Photos taken (tick and No.)	
Flow rate	[ ] Ponded [ ] Seeping/trickling [ ] Slight [ ] Moderate [✓] Fast
Floating litter, debris, scum, foam, objectionable matter	foam likely coming from death trunk
Oil/petrochem (film/odour) Specify amount and intensity	Nil sheen
Objectionable odour	Nil odour
Algal blooms or floating vegetation mats etc	Grassed banks. Rocky bottom
Dead fauna/flora	death tree near bank
Sources of suspended solids/colour of water	Clear colour
Aquatic fauna life (list observed)	
Other observations/notes	flowing fast shrubs and trees at the banks
Rain in past week	[✓] Yes [ ] No
Weather	[ ] No rain [✓] Showers Some [ ] Heavy rain [ ] Sunny [ ] Cloud [ ] Over cast [ ] Calm [ ] Breeze [ ] Strong Wind

Generic describing words key:	No detect	Trace	Mild	Moderate	High
	0%	<25%	25-50%	50-80%	>80%

Surface Water Monitoring

Job number:	12564388	Date:	6-Sep-23
Location:	DWM	Sampled by:	MB
Site ID:	S1	Site used for QA sample:	

Field data and observations

GPS co-ordinates	

FIELD Physico-	Results:
pH	8.17
Redox (mV)	118.1
EC (uS/cm)	328.7
Temperature (°C)	11.6
DO (% satn.)	73.3 1.8.39
Turbidity (NTU)	
Time of sampling	16:32

FIELD

Photos taken (tick and No.)	
Flow rate	[ ] Ponded [ ] Seeping/trickling [ ] Slight [ ] Moderate [✓] Fast
Floating litter, debris, scum, foam, objectionable matter	leaves and branches floating
Oil/petrochem (film/odour) Specify amount and intensity	nil Sheen
Objectionable odour	Nil odour
Algal blooms or floating vegetation mats etc	No vegetation mats, grassed area on the bank
Dead fauna/flora	no dead flora
Sources of suspended solids/colour of water	River Rocks
Aquatic fauna life (list observed)	no noticeable aquatic fauna
Other observations/notes	Slightly cloudy
Rain in past week	[✓] Yes [ ] No
Weather	[ ] No rain [X] Showers Some [ ] Heavy rain [ ] Sunny [✓] Cloud [ ] Over cast [ ] Calm [ ] Breeze [ ] Strong Wind

Generic describing words key:	No detect	Trace	Mild	Moderate	High
	0%	<25%	25-50%	50-80%	>80%

Surface Water Monitoring

Job number: 12964388		Date:	6-Sep-23
Location: Dalgarton		Sampled by:	MB
Site ID: S6		Site used for QA sample:	

Field data and observations

GPS co-ordinates	

FIELD Physico-	Results:
pH	8.14
Redox (mV)	70.0
EC (uS/cm)	362.1
Temperature (°C)	12.1
DO (% satn.)	67.81.7.28
Turbidity (NTU)	
Time of sampling	15:01

FIELD

Photos taken (tick and No.)	
Flow rate	[ ] Ponded [ ] Seeping/trickling [ ] Slight [ ] Moderate [X] Fast
Floating litter, debris, scum, foam, objectionable matter	NO
Oil/petrochem (film/odour) Specify amount and intensity	Nil sheen
Objectionable odour	Nil odour
Algal blooms or floating vegetation mats etc	no vegetable mats
Dead fauna/flora	barks on the water course
Sources of suspended solids/colour of water	Clay with cobbles and coarse gravel
Aquatic fauna life (list observed)	
Other observations/notes	Collected afte small Cascade
Rain in past week	[X] Yes [ ] No
Weather	[ ] No rain [X] Showers Some [ ] Heavy rain [ ] Sunny [X] Cloud [ ] Over cast [ ] Calm [ ] Breeze [ ] Strong Wind

Generic describing words key:	No detect	Trace	Mild	Moderate	High
	0%	<25%	25-50%	50-80%	>80%

Surface Water Monitoring

Job number:	12564388	Date:	12-DEC-23
Location:	Dolverton WHC	Sampled by:	MB
Site ID:	S1	Site used for QA sample:	

Field data and observations

GPS co-ordinates	-41.261209 146.4122°

FIELD Physico-	Results:
pH	8.16
Redox (mV)	52.46
EC (uS/cm)	390.33
Temperature (°C)	20.98
DO (% satn.) mg/L	8.97
Turbidity (NTU)	
Time of sampling	15:34

FIELD

Photos taken (tick and No.)	
Flow rate	[ ] Ponded [ ] Seeping/trickling [ ] Slight [X] Moderate [ ] Fast
Floating litter, debris, scum, foam, objectionable matter	traces of leaves floating
Oil/petrochem (film/odour) Specify amount and intensity	nil sheen
Objectionable odour	nil odour
Algal blooms or floating vegetation mats etc	grassed area over the banks
Dead fauna/flora	no
Sources of suspended solids/colour of water	Pebbles and some organic matter
Aquatic fauna life (list observed)	high content of bugs on the surface
Other observations/notes	Shallow moderate flow stream
Rain in past week	[ ] Yes [X] No
Weather	[X] No rain [ ] Showers Some [ ] Heavy rain [ ] Sunny [ ] Cloud [ ] Over cast [ ] Calm [ ] Breeze [ ] Strong Wind

Generic describing words key:	No detect	Trace	Mild	Moderate	High
	0%	<25%	25-50%	50-80%	>80%

Surface Water Monitoring

Job number:	12564388	Date:	12-DEC-23
Location:	Dolverton WMC	Sampled by:	MB
Site ID:	S2	Site used for QA sample:	

Field data and observations

GPS co-ordinates	

FIELD Physico-	Results:
pH	9.0
Redox (mV)	42.25
EC (uS/cm)	704.06
Temperature (°C)	24.43
DO (% satn.)	8.62
Turbidity (NTU)	
Time of sampling	15:15

FIELD

Photos taken (tick and No.)	
Flow rate	[ ] Ponded [ ] Seeping/trickling [X] Slight [ ] Moderate [ ] Fast
Floating litter, debris, scum, foam, objectionable matter	Leaves floating, small branches floating
Oil/petrochem (film/odour) Specify amount and intensity	Nil sheen
Objectionable odour	nil odour
Algal blooms or floating vegetation mats etc	some perenial grass on the banks
Dead fauna/flora	no
Sources of suspended solids/colour of water	slightly yellow dooby, clay and pebbles at the bottom
Aquatic fauna life (list observed)	Nil
Other observations/notes	low flow on the stream.
Rain in past week	[ ] Yes [X] No
Weather	[X] No rain [ ] Showers Some [ ] Heavy rain [/] Sunny [ ] Cloud [ ] Over cast [ ] Calm [ ] Breeze [ ] Strong Wind

Generic describing words key:	No detect	Trace	Mild	Moderate	High
	0%	<25%	25-50%	50-80%	>80%

Surface Water Monitoring

Job number: 12564388		Date:	12-DEC-23
Location: Dalveton WMC		Sampled by:	HB
Site ID: S3		Site used for QA sample:	

Field data and observations

GPS co-ordinates	-41.280409°
	146.397448°

FIELD Physico-	Results:
pH	7.27
Redox (mV)	3.98
EC (uS/cm)	711.52
Temperature (°C)	23.73
DO (% satn.) mg/L	12.20
Turbidity (NTU)	
Time of sampling	14:53

FIELD

Photos taken (tick and No.)	
Flow rate	[X] Ponded [ ] Seeping/trickling [ ] Slight [ ] Moderate [ ] Fast
Floating litter, debris, scum, foam, objectionable matter	high content of vegetation floating
Oil/petrochem (film/odour) Specify amount and intensity	nil Sheen
Objectionable odour	nil odour
Algal blooms or floating vegetation mats etc	high content of algae and vegetation mats
Dead fauna/flora	NO
Sources of suspended solids/colour of water	Green cloudy
Aquatic fauna life (list observed)	Aquatic bugs
Other observations/notes	Ponded before going through the Pipe, high content of algae
Rain in past week	[ ] Yes [X] No
Weather	[X] No rain [ ] Showers Some [ ] Heavy rain [ ] Sunny [ ] Cloud [ ] Over cast [ ] Calm [ ] Breeze [ ] Strong Wind

Generic describing words key:	No detect	Trace	Mild	Moderate	High
	0%	<25%	25-50%	50-80%	>80%

Surface Water Monitoring

Job number:	12564388	Date:	12-DEC-23
Location:	Ulverton WMC	Sampled by:	MB
Site ID:	S4	Site used for QA sample:	QC01 (QS1)

Field data and observations

GPS co-ordinates	-41.2842° 146.4000

FIELD Physico-	Results:
pH	6.67
Redox (mV)	111.70
EC (uS/cm)	169.05
Temperature (°C)	17.81
DO (% ~~satn.~~) mg/L	7.81
Turbidity (NTU)	
Time of sampling	14:10

FIELD

Photos taken (tick and No.)	
Flow rate	[X] Ponded [ ] Seeping/trickling [X] Slight [ ] Moderate [ ] Fast
Floating litter, debris, scum, foam, objectionable matter	high Content of organic matter floating
Oil/petrochem (film/odour) Specify amount and intensity	Some organic grease film
Objectionable odour	nil odour
Algal blooms or floating vegetation mats etc	no
Dead fauna/flora	no
Sources of suspended solids/colour of water	Debris and Clays
Aquatic fauna life (list observed)	Spiny Crayfish
Other observations/notes	Ponded to slightly flow. bot tis running along the stream.
Rain in past week	[ ] Yes [X] No
Weather	[X] No rain [ ] Showers Some [ ] Heavy rain [ ] Sunny [ ] Cloud [ ] Over cast [ ] Calm [ ] Breeze [ ] Strong Wind

Generic describing words key:	No detect	Trace	Mild	Moderate	High
	0%	<25%	25-50%	50-80%	>80%

Surface Water Monitoring

Job number:	12564388	Date:	12-DEC-23
Location:		Sampled by:	HB
Site ID:	S6	Site used for QA sample:	

Field data and observations

GPS co-ordinates	-41.286° 146-39890

FIELD Physico-	Results:
pH	7.41
Redox (mV)	106.27
EC (uS/cm)	434.39
Temperature (°C)	22.37
DO (% satn.)	9.15
Turbidity (NTU)	N.A
Time of sampling	13:30

FIELD

Photos taken (tick and No.)	
Flow rate	[ ] Ponded [X] Seeping/trickling [ ] Slight [ ] Moderate [ ] Fast
Floating litter, debris, scum, foam, objectionable matter	floating debris, scum, some organic matter
Oil/petrochem (film/odour) Specify amount and intensity	nil Sheen
Objectionable odour	nil odour
Algal blooms or floating vegetation mats etc	no vegetation mats, some leaves floating
Dead fauna/flora	no
Sources of suspended solids/colour of water	Cobbles and pebbles bed
Aquatic fauna life (list observed)	Aquatic bugs
Other observations/notes	Very slow flow, in some parts downstream the water is ponded, clear colour.
Rain in past week	[ ] Yes [X] No
Weather	[X] No rain [ ] Showers Some [ ] Heavy rain [ ] Sunny [ ] Cloud [ ] Over cast [ ] Calm [ ] Breeze [ ] Strong Wind

Generic describing words key:	No detect	Trace	Mild	Moderate	High
	0%	<25%	25-50%	50-80%	>80%

Surface Water Monitoring

Job number:	12564368	Date:	12-Dec-22
Location:	Dolverton WMC	Sampled by:	M.B.
Site ID:	59	Site used for QA sample:	

Field data and observations

GPS co-ordinates	

FIELD Physico-	Results:
pH	
Redox (mV)	
EC (uS/cm)	
Temperature (°C)	
DO (% satn.)	
Turbidity (NTU)	
Time of sampling	11:43

FIELD

Photos taken (tick and No.)	
Flow rate	[ ] Ponded [ ] Seeping/trickling [ ] Slight [ ] Moderate [ ] Fast
Floating litter, debris, scum, foam, objectionable matter	
Oil/petrochem (film/odour) Specify amount and intensity	
Objectionable odour	
Algal blooms or floating vegetation mats etc	
Dead fauna/flora	
Sources of suspended solids/colour of water	
Aquatic fauna life (list observed)	
Other observations/notes	Dry stream, down 50m downstream there are a ponded area with dry surroundings not representative. Sample has not been collected
Rain in past week	[ ] Yes [ ] No
Weather	[✓] No rain [ ] Showers Some [ ] Heavy rain [ ] Sunny [ ] Cloud [ ] Over cast [ ] Calm [ ] Breeze [ ] Strong Wind

Generic describing words key:	No detect	Trace	Mild	Moderate	High
	0%	<25%	25-50%	50-80%	>80%

Surface Water Monitoring

Job number:		Date:	
Location:		Sampled by:	
Site ID: Landfill leachate		Site used for QA sample:	

Field data and observations

GPS co-ordinates	

FIELD Physico-	**Results:**
pH	
Redox (mV)	
EC (uS/cm)	
Temperature (°C)	
DO (% satn.)	
Turbidity (NTU)	
Time of sampling	

FIELD

Photos taken (tick and No.)	
Flow rate	[ ] Ponded [ ] Seeping/trickling [ ] Slight [ ] Moderate [ ] Fast
Floating litter, debris, scum, foam, objectionable matter	
Oil/petrochem (film/odour) Specify amount and intensity	
Objectionable odour	Ammonia odour (mild)
Algal blooms or floating vegetation mats etc	
Dead fauna/flora	
Sources of suspended solids/colour of water	
Aquatic fauna life (list observed)	
Other observations/notes	Level of tank exceeded 80% resulting pump for first time in a representative leachate sample for first time, black with ~~traces~~ nil, Coarse sediments. Pump new pump needs to be activated by Gary who received training.
Rain in past week	[ ] Yes [ ] No
Weather	[ ] No rain [ ] Showers Some [ ] Heavy rain [ ] Sunny [ ] Cloud [ ] Over cast [ ] Calm [ ] Breeze [ ] Strong Wind

Generic describing words key:	No detect	Trace	Mild	Moderate	High
	0%	<25%	25-50%	50-80%	>80%

Appendix E

Laboratory Documentation

CERTIFICATE OF ANALYSIS

Work Order	: **EM2305499-AA**	Page	: 1 of 6
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Gregory Gommers
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61-3-8549 9600
Project	: 12564338	Date Samples Received	: 29-Mar-2023 11:45
Order number	: 12564388	Date Analysis Commenced	: 29-Mar-2023
C-O-C number	: ----	Issue Date	: 13-Apr-2023 17:55
Sampler	: RS/MB		
Site	:		
Quote number	: ME/770/21		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- 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
Arenie Vijayaratnam	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Tahlia Freeman	Instrument Operator	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

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.

- ED009x: LOR raised for Iodidie due to sample matrix.
- EA015H: EM2305499 #1 : Insufficient volume for sample to be analysed for total dissolved solids.
- EP030: Workorder EM2305499-#2, BOD has been analysed outside of holding times. Result/s should be scrutinised accordingly.
- It is recognised that Total Phosphorus is less than Reactive Phosphorus for sample EM2305499 #2. However, the difference is within experimental variation of the methods.
- 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.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Samples have been conducted outside of the recommended analytical holding times for nitrite and reactive phosphorous. Results should be scrutinised accordingly.
- 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.
- 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.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	B9	----	----	----	----
				Sampling date / time	27-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2305499-001	--------	--------	--------	--------
					Result	----	----	----	----
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		**162**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**162**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**25**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**21**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**70**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**5**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**13**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**1**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		<0.001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		**0.002**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.001**	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
Iron	7439-89-6	0.05	mg/L		<0.05	----	----	----	----
EG020T: Total Metals by ICP-MS									
Iron	7439-89-6	0.05	mg/L		<0.05	----	----	----	----
EG035F: Dissolved 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		<0.01	----	----	----	----
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		**0.56**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	B9	----	----	----	----
				Sampling date / time	27-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2305499-001	--------	--------	--------	--------
					Result	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.56**	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**0.4**	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**1.0**	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**0.02**	----	----	----	----
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		**4.35**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**4.50**	----	----	----	----
ø Ionic Balance	----	0.01	%		**1.65**	----	----	----	----
EP002: Dissolved Organic Carbon (DOC)									
Dissolved Organic Carbon	----	1	mg/L		**5**	----	----	----	----
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L		**2**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<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	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<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	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	B9	----	----	----	----
				Sampling date / time	27-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2305499-001	--------	--------	--------	--------
					Result	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		**8**	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		**4**	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ **Total Xylenes**	----	2	µg/L		**4**	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L		**12**	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
ED009: Anions									
Bromide	24959-67-9	0.010	mg/L		**0.059**	----	----	----	----
Iodide	20461-54-5	0.010	mg/L		<0.010	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**95.2**	----	----	----	----
Toluene-D8	2037-26-5	2	%		**98.6**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**101**	----	----	----	----

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	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) ED009: Anions

QUALITY CONTROL REPORT

Work Order	: **EM2305499-AA**	Page	: 1 of 8
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Gregory Gommers
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61-3-8549 9600
Project	: 12564338	Date Samples Received	: 29-Mar-2023
Order number	: 12564388	Date Analysis Commenced	: 29-Mar-2023
C-O-C number	: ----	Issue Date	: 13-Apr-2023
Sampler	: RS/MB		
Site	:		
Quote number	: ME/770/21		
No. of samples received	: 1		
No. of samples analysed	: 1		

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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
Arenie Vijayaratnam	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Tahlia Freeman	Instrument Operator	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

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 (%)*
ED009: Anions (QC Lot: 4964349)									
EM2305499-001	B9	ED009-X: Bromide	24959-67-9	0.01	mg/L	0.059	0.058	1.7	No Limit
		ED009-X: Iodide	20461-54-5	0.01	mg/L	<0.010	<0.010	0.0	No Limit
EP2303944-002	Anonymous	ED009-X: Bromide	24959-67-9	0.01	mg/L	65.7	65.2	0.8	0% - 20%
		ED009-X: Iodide	20461-54-5	0.01	mg/L	4.76	4.79	0.8	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4962314)									
EM2305492-003	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	1140	1140	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	1140	1140	0.0	0% - 20%
EM2305452-005	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	57	61	7.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	57	61	7.3	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4961690)									
EM2305467-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	289	296	2.2	0% - 20%
EM2305467-012	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	66	67	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4961691)									
EM2305467-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	2430	2430	0.1	0% - 20%
EM2305467-012	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1200	1210	0.2	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4978450)									
EM2305354-014	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

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 (%)*
ED093F: Dissolved Major Cations (QC Lot: 4978450) - continued									
EM2305354-014	Anonymous	ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EM2305903-006	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	6	6	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: 4978452)									
EM2305903-005	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	0.005	0.005	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: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.28	0.28	0.0	No Limit
EM2305342-027	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	0.005	0.006	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	0.012	0.012	0.0	0% - 50%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.010	0.010	0.0	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.059	0.059	0.0	0% - 50%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	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: 4976027)									
EM2305499-001	B9	EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EM2305738-003	Anonymous	EG020A-T: Iron	7439-89-6	0.05	mg/L	84.6	83.5	1.4	0% - 20%
EG035F: Dissolved Mercury by FIMS (QC Lot: 4978451)									
EM2305903-006	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EM2305342-027	Anonymous	EG035F: 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: 4963074)									
EM2305390-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM2305467-009	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: 4961689)									
EM2305467-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM2305467-012	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: 4963075)									
EM2305390-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	1.16	1.16	0.0	0% - 20%
EM2305467-009	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.11	0.11	0.0	0% - 50%

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: 4962295)									
EM2305448-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.8	1.6	9.8	No Limit
EM2305500-006	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.2	0.2	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 4962294)									
EM2305448-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.19	0.18	0.0	No Limit
EM2305500-006	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.04	0.04	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4961692)									
EM2305499-001	B9	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.01	0.01	0.0	No Limit
EP002: Dissolved Organic Carbon (DOC) (QC Lot: 4965541)									
EM2305499-001	B9	EP002: Dissolved Organic Carbon	----	1	mg/L	5	3	56.7	No Limit
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 4961798)									
EM2305409-001	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	837	692	18.9	0% - 20%
EM2305499-001	B9	EP030: Biochemical Oxygen Demand	----	2	mg/L	2	<2	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4962461)									
EB2309281-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EM2305395-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4962461)									
EB2309281-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EM2305395-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 4962461)									
EB2309281-001	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
EM2305395-001	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
ED009: Anions (QCLot: 4964349)								
ED009-X: Bromide	24959-67-9	0.01	mg/L	<0.010	2 mg/L	105	93.0	109
ED009-X: Iodide	20461-54-5	0.01	mg/L	<0.010	0.5 mg/L	86.6	79.0	123
ED037P: Alkalinity by PC Titrator (QCLot: 4962314)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	96.9	85.0	116
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4961690)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	104	90.0	110
				<1	500 mg/L	106	90.0	110
ED045G: Chloride by Discrete Analyser (QCLot: 4961691)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	105	90.0	110
				<1	1000 mg/L	102	90.0	110
ED093F: Dissolved Major Cations (QCLot: 4978450)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.2	80.0	120
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	98.2	80.0	120
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	100	80.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.3	80.0	120
EG020F: Dissolved Metals by ICP-MS (QCLot: 4978452)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	101	89.0	111
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	96.9	83.2	109
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	97.6	83.1	107
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	98.8	84.6	108
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	97.2	84.8	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	98.3	84.3	110
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	103	82.3	113
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	104	86.3	112
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	97.4	91.8	112
EG020T: Total Metals by ICP-MS (QCLot: 4976027)								
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	100	92.8	118
EG035F: Dissolved Mercury by FIMS (QCLot: 4978451)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	100	71.6	116
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4963074)								

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
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4963074) - continued								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	90.4	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4961689)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	96.4	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4963075)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	100	90.0	110
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4962295)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	87.5	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4962294)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	87.7	71.9	114
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4961692)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	106	90.0	110
EP002: Dissolved Organic Carbon (DOC) (QCLot: 4965541)								
EP002: Dissolved Organic Carbon	----	1	mg/L	<1	100 mg/L	91.8	83.0	115
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 4961798)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	198 mg/L	87.4	79.5	122
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4962188)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	4460 µg/L	58.6	47.2	122
EP071: C15 - C28 Fraction	----	100	µg/L	<100	14300 µg/L	62.8	52.9	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	7300 µg/L	63.8	50.4	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4962461)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	115	66.2	134
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4962188)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	6090 µg/L	66.1	49.1	125
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	19400 µg/L	59.7	51.6	128
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1300 µg/L	78.2	47.2	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4962461)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	114	66.2	132
EP080: BTEXN (QCLot: 4962461)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	111	68.8	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	111	72.9	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	116	71.7	130
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	118	72.3	136
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	115	75.9	134

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: BTEXN (QCLot: 4962461) - continued								
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	109	68.3	131

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
ED009: Anions (QCLot: 4964349)							
EM2305499-001	B9	ED009-X: Bromide	24959-67-9	0.2 mg/L	85.5	70.0	130
		ED009-X: Iodide	20461-54-5	0.2 mg/L	74.0	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4961690)							
EM2305467-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4961691)							
EM2305467-002	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	142
EG020F: Dissolved Metals by ICP-MS (QCLot: 4978452)							
EM2305342-027	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	88.6	76.6	124
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	85.4	71.0	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	87.9	76.0	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	86.7	75.0	133
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	86.5	64.0	134
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	86.5	73.0	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	89.8	75.0	131
EG035F: Dissolved Mercury by FIMS (QCLot: 4978451)							
EM2305354-014	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	98.6	70.0	120
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4963074)							
EM2305467-001	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	130	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4961689)							
EM2305467-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	94.2	80.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4963075)							
EM2305467-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	90.3	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4962295)							
EM2305448-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	96.5	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*
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4962294)							
EM2305448-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	94.9	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4961692)							
EM2305504-002	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	88.2	79.0	123
EP002: Dissolved Organic Carbon (DOC) (QCLot: 4965541)							
EM2305499-002	Anonymous	EP002: Dissolved Organic Carbon	----	100 mg/L	108	75.0	117
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4962461)							
EM2305395-002	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	96.9	33.9	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4962461)							
EM2305395-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	94.0	34.0	122
EP080: BTEXN (QCLot: 4962461)							
EM2305395-002	Anonymous	EP080: Benzene	71-43-2	20 µg/L	108	56.3	133
		EP080: Toluene	108-88-3	20 µg/L	106	60.4	132

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2305499**	Page	: 1 of 10
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Telephone	: +61-3-8549 9600
Project	: 12564338	Date Samples Received	: 29-Mar-2023
Site	:	Issue Date	: 13-Apr-2023
Sampler	: RS/MB	No. of samples received	: 2
Order number	: 12564388	No. of samples analysed	: 2

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

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

Outliers : 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	EM2305467--002	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	EM2305627--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.**
ED045G: Chloride by Discrete Analyser	EM2305467--002	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EM2305627--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural						
B8	----	----	----	31-Mar-2023	29-Mar-2023	**2**
EK071G: Reactive Phosphorus as P by discrete analyser						
Clear Plastic Bottle - Natural						
B8	----	----	----	31-Mar-2023	29-Mar-2023	**2**
EP030: Biochemical Oxygen Demand (BOD)						
Clear Plastic Bottle - Natural						
B8	----	----	----	30-Mar-2023	29-Mar-2023	**1**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
	1				
Laboratory Duplicates (DUP)					
TRH - Semivolatile Fraction	1	21	4.76	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Total Metals by ICP-MS - Suite A	0	7	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	1	21	4.76	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)							
B8	**27-Mar-2023**	**----**	----	**----**	**31-Mar-2023**	03-Apr-2023	✓
ED009: Anions							
Clear Plastic Bottle - Natural (ED009-X)							
B8	**27-Mar-2023**	**----**	----	**----**	**05-Apr-2023**	24-Apr-2023	✓
Clear Plastic Bottle - Natural (ED009-X)							
B9	**27-Mar-2023**	**----**	----	**----**	**30-Mar-2023**	24-Apr-2023	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
B8	**27-Mar-2023**	**----**	----	**----**	**03-Apr-2023**	10-Apr-2023	✓
Clear Plastic Bottle - Natural (ED037-P)							
B9	**27-Mar-2023**	**----**	----	**----**	**31-Mar-2023**	10-Apr-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
B9, B8	**27-Mar-2023**	**----**	----	**----**	**31-Mar-2023**	24-Apr-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
B9, B8	**27-Mar-2023**	**----**	----	**----**	**31-Mar-2023**	24-Apr-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F)							
B9, B8	**27-Mar-2023**	**----**	----	**----**	**11-Apr-2023**	24-Apr-2023	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)							
B9, B8	**27-Mar-2023**	**----**	----	**----**	**06-Apr-2023**	23-Sep-2023	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
B9, B8	**27-Mar-2023**	**05-Apr-2023**	23-Sep-2023	✓	**05-Apr-2023**	23-Sep-2023	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F)							
B9, B8	**27-Mar-2023**	**----**	----	**----**	**11-Apr-2023**	24-Apr-2023	✓

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
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) B9	27-Mar-2023	----	----	----	30-Mar-2023	24-Apr-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) B8	27-Mar-2023	----	----	----	31-Mar-2023	24-Apr-2023	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) B9	27-Mar-2023	----	----	----	29-Mar-2023	29-Mar-2023	✓
Clear Plastic Bottle - Natural (EK057G) B8	27-Mar-2023	----	----	----	31-Mar-2023	29-Mar-2023	×
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) B8	27-Mar-2023	----	----	----	01-Apr-2023	24-Apr-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) B9	27-Mar-2023	----	----	----	31-Mar-2023	24-Apr-2023	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) B8	27-Mar-2023	30-Mar-2023	24-Apr-2023	✓	31-Mar-2023	24-Apr-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK061G) B9	27-Mar-2023	31-Mar-2023	24-Apr-2023	✓	03-Apr-2023	24-Apr-2023	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) B8	27-Mar-2023	30-Mar-2023	24-Apr-2023	✓	31-Mar-2023	24-Apr-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK067G) B9	27-Mar-2023	31-Mar-2023	24-Apr-2023	✓	03-Apr-2023	24-Apr-2023	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) B9	27-Mar-2023	----	----	----	29-Mar-2023	29-Mar-2023	✓
Clear Plastic Bottle - Natural (EK071G) B8	27-Mar-2023	----	----	----	31-Mar-2023	29-Mar-2023	×
EP002: Dissolved Organic Carbon (DOC)							
Amber DOC Filtered- Sulfuric Preserved (EP002) B9, B8	27-Mar-2023	----	----	----	03-Apr-2023	24-Apr-2023	✓
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030) B9	27-Mar-2023	----	----	----	29-Mar-2023	29-Mar-2023	✓
Clear Plastic Bottle - Natural (EP030) B8	27-Mar-2023	----	----	----	30-Mar-2023	29-Mar-2023	×

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 Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) B9, B8	**27-Mar-2023**	**30-Mar-2023**	03-Apr-2023	✓	**31-Mar-2023**	09-May-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080) B9	**27-Mar-2023**	**30-Mar-2023**	10-Apr-2023	✓	**30-Mar-2023**	10-Apr-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080) B8	**27-Mar-2023**	**31-Mar-2023**	10-Apr-2023	✓	**01-Apr-2023**	10-Apr-2023	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) B9, B8	**27-Mar-2023**	**30-Mar-2023**	03-Apr-2023	✓	**31-Mar-2023**	09-May-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080) B9	**27-Mar-2023**	**30-Mar-2023**	10-Apr-2023	✓	**30-Mar-2023**	10-Apr-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080) B8	**27-Mar-2023**	**31-Mar-2023**	10-Apr-2023	✓	**01-Apr-2023**	10-Apr-2023	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) B9	**27-Mar-2023**	**30-Mar-2023**	10-Apr-2023	✓	**30-Mar-2023**	10-Apr-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080) B8	**27-Mar-2023**	**31-Mar-2023**	10-Apr-2023	✓	**01-Apr-2023**	10-Apr-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	4	34	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	30	**13.33**	**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
Dissolved Organic Carbon	EP002	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	4	35	**11.43**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	4	33	**12.12**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Standard Anions -by IC (Extended Method)	ED009-X	3	29	**10.34**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	37	**10.81**	**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	3	23	**13.04**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	7	**28.57**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	3	19	**15.79**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	21	**4.76**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	4	35	**11.43**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	30	**13.33**	**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
Dissolved Organic Carbon	EP002	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	35	**5.71**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	14	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Standard Anions -by IC (Extended Method)	ED009-X	2	29	**6.90**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	37	**10.81**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	3	39	**7.69**	**7.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	7	**14.29**	**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	19	**10.53**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	35	**5.71**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	30	**6.67**	**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
Dissolved Organic Carbon	EP002	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	35	**5.71**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	14	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Standard Anions -by IC (Extended Method)	ED009-X	2	29	**6.90**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	37	**5.41**	**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	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	19	**10.53**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	35	**5.71**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	30	**6.67**	**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
Dissolved Organic Carbon	EP002	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	35	**5.71**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	14	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Standard Anions -by IC (Extended Method)	ED009-X	2	29	**6.90**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	0	7	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	19	**10.53**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	21	**4.76**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	35	**5.71**	**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)
Standard Anions -by IC (Extended Method)	ED009-X	WATER	In house: Referenced to APHA 4110B. 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).
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)

Analytical Methods	Method	Matrix	Method Descriptions
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 1030F. This method is compliant with NEPM Schedule B(3)
Dissolved Organic Carbon	EP002	WATER	In house: Referenced to APHA 5310 B. This method is compliant with NEPM Schedule B(3). Samples are combusted at high temperature in the presence of an oxidative catalyst. The evolved carbon dioxide is quantified using an IR detector.
Biochemical Oxygen Demand (BOD)	EP030	WATER	In house: Referenced to APHA 5210 B. The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. 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.

CERTIFICATE OF ANALYSIS

Work Order	: **EM2305513**	Page	: 1 of 4
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Gregory Gommers
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61-3-8549 9600
Project	: 12564388	Date Samples Received	: 29-Mar-2023 11:45
Order number	: 12564388	Date Analysis Commenced	: 29-Mar-2023
C-O-C number	: ----	Issue Date	: 05-Apr-2023 16:43
Sampler	: ----		
Site	: ----		
Quote number	: ME/770/21		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Arenie Vijayaratnam	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC

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.

- EP030: Workorder EM2305513-#2,3, BOD has been analysed outside of holding times. Result/s should be scrutinised accordingly.
- 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.
- ALS is not NATA accredited for the analysis of EK055G-NH4:Ammonium as N.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- 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.
- 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.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	S9	S4	S6	----	----
			Sampling date / time	27-Mar-2023 00:00	27-Mar-2023 00:00	27-Mar-2023 00:00	----	----
Compound	CAS Number	LOR	Unit	EM2305513-001	EM2305513-002	EM2305513-003	--------	--------
				Result	Result	Result	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.40**	**7.35**	**7.61**	**----**	**----**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**509**	**482**	**500**	**----**	**----**
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**8**	**8**	<5	**----**	**----**
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	**184**	**176**	**184**	**----**	**----**
Total Alkalinity as CaCO3	----	1	mg/L	**184**	**176**	**184**	**----**	**----**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**32**	**29**	**31**	**----**	**----**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**22**	**20**	**20**	**----**	**----**
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**78**	**73**	**77**	**----**	**----**
Magnesium	7439-95-4	1	mg/L	**6**	**6**	**6**	**----**	**----**
Sodium	7440-23-5	1	mg/L	**15**	**15**	**15**	**----**	**----**
Potassium	7440-09-7	1	mg/L	**1**	**1**	**1**	**----**	**----**
EG020F: Dissolved Metals by ICP-MS								
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	**----**	**----**
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	**----**	**----**
Manganese	7439-96-5	0.001	mg/L	**0.009**	**0.007**	**0.010**	**----**	**----**
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	**----**	**----**
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	**----**	**----**
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	<0.05	**----**	**----**
EG020T: Total Metals by ICP-MS								
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	**----**	**----**
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	**----**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	S9	S4	S6	----	----
				Sampling date / time	27-Mar-2023 00:00	27-Mar-2023 00:00	27-Mar-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		EM2305513-001	EM2305513-002	EM2305513-003	--------	--------
					Result	Result	Result	----	----
EG020T: Total Metals by ICP-MS - Continued									
Manganese	7439-96-5	0.001	mg/L		**0.025**	**0.013**	**0.017**	**----**	**----**
Nickel	7440-02-0	0.001	mg/L		**0.002**	**0.001**	<0.001	**----**	**----**
Zinc	7440-66-6	0.005	mg/L		<0.005	<0.005	<0.005	**----**	**----**
Iron	7439-89-6	0.05	mg/L		**0.27**	**0.12**	**0.11**	**----**	**----**
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		<0.01	<0.01	<0.01	**----**	**----**
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	**----**	**----**
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.72**	**0.67**	**0.75**	**----**	**----**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.72**	**0.67**	**0.75**	**----**	**----**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**0.3**	**0.2**	**0.7**	**----**	**----**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ **Total Nitrogen as N**	----	0.1	mg/L		**1.0**	**0.9**	**1.4**	**----**	**----**
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**0.05**	<0.01	<0.01	**----**	**----**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.01**	<0.01	<0.01	**----**	**----**
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**4.96**	**4.68**	**4.88**	**----**	**----**
ø **Total Cations**	----	0.01	meq/L		**5.06**	**4.81**	**5.01**	**----**	**----**
ø **Ionic Balance**	----	0.01	%		**1.01**	**1.37**	**1.30**	**----**	**----**
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L		<2	<2	<2	**----**	**----**

QUALITY CONTROL REPORT

Work Order	: **EM2305513**	Page	: 1 of 9
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Gregory Gommers
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61-3-8549 9600
Project	: 12564388	Date Samples Received	: 29-Mar-2023
Order number	: 12564388	Date Analysis Commenced	: 29-Mar-2023
C-O-C number	: ----	Issue Date	: 05-Apr-2023
Sampler	: ----		
Site	: ----		
Quote number	: ME/770/21		
No. of samples received	: 3		
No. of samples analysed	: 3		

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*
Arenie Vijayaratnam	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC

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 (%)
EA005P: pH by PC Titrator (QC Lot: 4965147)									
EM2305466-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	6.65	6.66	0.2	0% - 20%
EM2305477-008	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.95	8.02	0.9	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4965148)									
EM2305466-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	88	88	0.0	0% - 20%
EM2305477-008	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1040	1040	0.0	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 4968331)									
EM2305372-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	6990	7000	0.1	0% - 20%
EM2305476-006	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
EM2305530-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	12	8	37.0	No Limit
EM2305611-003	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	18	27	42.2	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 4965150)									
EM2305496-002	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	305	305	0.0	0% - 20%
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	1380	1380	0.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	1680	1680	0.1	0% - 20%
EM2305612-002	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	414	401	3.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	414	401	3.1	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4961693)									
EM2305504-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	391	379	3.3	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4963091)									
EM2305537-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	210	210	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 (%)*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4963091) - continued									
EM2305513-002	S4	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	29	29	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4961695)									
EM2305504-006	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	938	932	0.7	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4963092)									
EM2305537-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	2180	2190	0.3	0% - 20%
EM2305513-002	S4	ED045G: Chloride	16887-00-6	1	mg/L	20	21	4.9	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4968540)									
EM2305496-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	73	72	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	228	227	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1540	1540	0.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	76	76	0.0	0% - 20%
EM2305513-003	S6	ED093F: Calcium	7440-70-2	1	mg/L	77	76	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	6	6	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	15	14	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	1	1	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 4968535)									
EM2305496-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	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	0.005	0.005	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	0.011	0.010	0.0	0% - 50%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.008	0.008	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.022	0.022	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EM2305398-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0004	0.0005	22.3	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.023	0.022	0.0	0% - 20%
		EG020A-F: Copper	7440-50-8	0.001	mg/L	2.53	2.57	1.5	0% - 20%
		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	0.362	0.361	0.4	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.018	0.019	0.0	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.059	0.057	2.8	0% - 50%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	5.39	5.43	0.6	0% - 20%
EG020T: Total Metals by ICP-MS (QC Lot: 4967725)									
EM2305448-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.005	0.004	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.020	0.020	0.0	0% - 50%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.059	0.059	0.0	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.004	0.004	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: 4967725) - continued									
EM2305448-001	Anonymous	EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.031	0.031	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	1.98	1.73	13.2	0% - 20%
EM2305466-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	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	0.002	0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.006	0.006	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	6.08	6.20	2.0	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.46	0.47	2.3	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 4963774)									
EM2305495-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	39.5	36.4	8.1	0% - 20%
EM2305496-009	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: 4961694)									
EM2305504-003	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: 4963093)									
EM2305537-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	2.02	2.02	0.0	0% - 20%
EM2305513-002	S4	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: 4963775)									
EM2305495-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	91.8	85.1	7.5	0% - 20%
EM2305496-009	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: 4962299)									
EM2305398-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.2	0.2	0.0	No Limit
EM2305477-008	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	6.2	6.1	1.6	0% - 50%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 4964324)									
EM2305499-002	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: 4962298)									
EM2305398-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.03	0.02	40.6	No Limit
EM2305477-008	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.70	0.68	3.0	0% - 50%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 4964323)									
EM2305499-002	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: 4961692)									
EM2305499-001	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: 4963094)									
EM2305513-002	S4	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 4961798)									
EM2305409-001	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	837	692	18.9	0% - 20%
EM2305499-001	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/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 (%)*
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 4964643)									
EM2305476-001	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	5	6	0.0	No Limit
EM2305477-004	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	<2	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 4965147)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.8	101
				----	7 pH Unit	100	99.3	101
EA010P: Conductivity by PC Titrator (QCLot: 4965148)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	97.2	85.0	119
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 4968331)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	94.0	91.0	109
				<5	836 mg/L	104	84.8	115
				<5	1000 mg/L	93.0	90.3	109
ED037P: Alkalinity by PC Titrator (QCLot: 4965150)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	98.8	85.0	116
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4961693)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	106	90.0	110
				<1	500 mg/L	104	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4963091)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	105	90.0	110
				<1	500 mg/L	106	90.0	110
ED045G: Chloride by Discrete Analyser (QCLot: 4961695)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	105	90.0	110
				<1	1000 mg/L	103	90.0	110
ED045G: Chloride by Discrete Analyser (QCLot: 4963092)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	105	90.0	110
				<1	1000 mg/L	100	90.0	110
ED093F: Dissolved Major Cations (QCLot: 4968540)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	96.1	80.0	120
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	100	80.0	120
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.5	80.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	100	80.0	120
EG020F: Dissolved Metals by ICP-MS (QCLot: 4968535)								
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.9	83.5	111
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	96.8	83.2	109

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
EG020F: Dissolved Metals by ICP-MS (QCLot: 4968535) - continued								
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	97.2	83.1	107
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	99.9	84.6	108
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	97.4	84.8	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.7	84.3	110
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	102	86.3	112
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	99.3	91.8	112
EG020T: Total Metals by ICP-MS (QCLot: 4967725)								
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	101	86.4	115
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	104	86.9	112
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	100	86.9	111
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	103	88.3	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	103	88.7	113
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	101	87.9	113
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	102	86.7	117
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	103	92.8	118
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4963774)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	93.8	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4961694)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	95.7	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4963093)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	96.3	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4963775)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	106	90.0	110
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4962299)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	91.7	70.0	117
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4964324)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	91.6	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4962298)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	88.2	71.9	114
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4964323)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	85.2	71.9	114
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4961692)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	106	90.0	110
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4963094)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS: Spike Recovery (%)	Acceptable Limits (%): Low	Acceptable Limits (%): High
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4963094) - continued								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	104	90.0	110
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 4961798)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	198 mg/L	87.4	79.5	122
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 4964643)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	198 mg/L	90.4	79.5	122

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: 4961693)							
EM2305504-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	106	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4963091)							
EM2305398-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4961695)							
EM2305504-007	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	142
ED045G: Chloride by Discrete Analyser (QCLot: 4963092)							
EM2305398-002	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	103	70.0	142
EG020F: Dissolved Metals by ICP-MS (QCLot: 4968535)							
EM2305398-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.05 mg/L	87.4	74.6	118
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	83.3	71.0	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	# Not Determined	76.0	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	86.4	75.0	133
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	79.2	64.0	134
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	85.2	73.0	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	87.1	75.0	131
EG020T: Total Metals by ICP-MS (QCLot: 4967725)							
EM2305448-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.25 mg/L	96.3	81.8	123
		EG020A-T: Chromium	7440-47-3	1 mg/L	99.0	78.9	119
		EG020A-T: Copper	7440-50-8	1 mg/L	99.3	80.4	118

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: 4967725) - continued							
EM2305448-001	Anonymous	EG020A-T: Lead	7439-92-1	1 mg/L	99.4	80.5	121
		EG020A-T: Manganese	7439-96-5	1 mg/L	96.0	73.0	123
		EG020A-T: Nickel	7440-02-0	1 mg/L	95.2	80.0	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	94.6	74.0	120
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4963774)							
EM2305495-002	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	# Not Determined	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4961694)							
EM2305504-004	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	94.2	80.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4963093)							
EM2305513-003	S6	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	87.6	80.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4963775)							
EM2305495-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	# Not Determined	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4962299)							
EM2305398-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	80.7	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4964324)							
EM2305513-002	S4	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	87.5	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4962298)							
EM2305398-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	75.4	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4964323)							
EM2305513-002	S4	EK067G: Total Phosphorus as P	----	1 mg/L	82.2	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4961692)							
EM2305504-002	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	88.2	79.0	123
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4963094)							
EM2305513-003	S6	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	95.5	79.0	123

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2305513**	Page	: 1 of 8
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Telephone	: +61-3-8549 9600
Project	: 12564388	Date Samples Received	: 29-Mar-2023
Site	: ----	Issue Date	: 05-Apr-2023
Sampler	: ----	No. of samples received	: 3
Order number	: 12564388	No. of samples analysed	: 3

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, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

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	EM2305398--002	Anonymous	**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	EM2305504--007	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG020F: Dissolved Metals by ICP-MS	EM2305398--001	Anonymous	**Copper**	7440-50-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK055G: Ammonia as N by Discrete Analyser	EM2305495--002	Anonymous	**Ammonia as N**	7664-41-7	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Ar	EM2305495--002	Anonymous	**Nitrite + Nitrate as N**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
S9, S4, S6	----	----	----	03-Apr-2023	27-Mar-2023	**7**
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural						
S4, S6	----	----	----	30-Mar-2023	29-Mar-2023	**1**
EK071G: Reactive Phosphorus as P by discrete analyser						
Clear Plastic Bottle - Natural						
S4, S6	----	----	----	30-Mar-2023	29-Mar-2023	**1**
EP030: Biochemical Oxygen Demand (BOD)						
Clear Plastic Bottle - Natural						
S4, S6	----	----	----	30-Mar-2023	29-Mar-2023	**1**

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
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P) S9, S4, S6	**27-Mar-2023**	**----**	----	----	**03-Apr-2023**	27-Mar-2023	✗
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P) S9, S4, S6	**27-Mar-2023**	**----**	----	----	**03-Apr-2023**	24-Apr-2023	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H) S9, S4, S6	**27-Mar-2023**	**----**	----	----	**03-Apr-2023**	03-Apr-2023	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) S9, S4, S6	**27-Mar-2023**	**----**	----	----	**03-Apr-2023**	10-Apr-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) S9, S4, S6	**27-Mar-2023**	**----**	----	----	**31-Mar-2023**	24-Apr-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) S9, S4, S6	**27-Mar-2023**	**----**	----	----	**31-Mar-2023**	24-Apr-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F) S9, S4, S6	**27-Mar-2023**	**----**	----	----	**03-Apr-2023**	24-Apr-2023	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F) S9, S4, S6	**27-Mar-2023**	**----**	----	----	**04-Apr-2023**	23-Sep-2023	✓

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
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
S9, S4, S6	**27-Mar-2023**	**01-Apr-2023**	23-Sep-2023	✓	**01-Apr-2023**	23-Sep-2023	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
S9, S4, S6	**27-Mar-2023**	**----**	----	----	**30-Mar-2023**	24-Apr-2023	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
S9	**27-Mar-2023**	**----**	----	----	**29-Mar-2023**	29-Mar-2023	✓
Clear Plastic Bottle - Natural (EK057G)							
S4, S6	**27-Mar-2023**	**----**	----	----	**30-Mar-2023**	29-Mar-2023	×
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
S9, S4, S6	**27-Mar-2023**	**----**	----	----	**31-Mar-2023**	24-Apr-2023	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
S4, S6	**27-Mar-2023**	**30-Mar-2023**	24-Apr-2023	✓	**31-Mar-2023**	24-Apr-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
S9	**27-Mar-2023**	**31-Mar-2023**	24-Apr-2023	✓	**03-Apr-2023**	24-Apr-2023	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
S4, S6	**27-Mar-2023**	**30-Mar-2023**	24-Apr-2023	✓	**31-Mar-2023**	24-Apr-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
S9	**27-Mar-2023**	**31-Mar-2023**	24-Apr-2023	✓	**03-Apr-2023**	24-Apr-2023	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
S9	**27-Mar-2023**	**----**	----	----	**29-Mar-2023**	29-Mar-2023	✓
Clear Plastic Bottle - Natural (EK071G)							
S4, S6	**27-Mar-2023**	**----**	----	----	**30-Mar-2023**	29-Mar-2023	×
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030)							
S9	**27-Mar-2023**	**----**	----	----	**29-Mar-2023**	29-Mar-2023	✓
Clear Plastic Bottle - Natural (EP030)							
S4, S6	**27-Mar-2023**	**----**	----	----	**30-Mar-2023**	29-Mar-2023	×

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
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	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	3	14	**21.43**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	11	**18.18**	**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	3	17	**17.65**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	10	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	3	22	**13.64**	**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 Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	25	**12.00**	**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	3	24	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	14	**28.57**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	11	**9.09**	**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	17	**11.76**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	10	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	22	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	40	**7.50**	**7.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	25	**8.00**	**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	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	2	40	**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*	
Method Blanks (MB) - Continued							
Chloride by Discrete Analyser	ED045G	2	14	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	11	**9.09**	**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	17	**11.76**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	10	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	22	**9.09**	**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 Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	25	**8.00**	**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	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	14	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	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	17	**11.76**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	10	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	25	**8.00**	**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	2	24	**8.33**	**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
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. 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.
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)

Analytical Methods	Method	Matrix	Method Descriptions
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 1030F. This method is compliant with NEPM Schedule B(3)
Biochemical Oxygen Demand (BOD)	EP030	WATER	In house: Referenced to APHA 5210 B. The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. This method is compliant with 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)
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)

CERTIFICATE OF ANALYSIS

Work Order	: **EM2305600**	Page	: 1 of 6
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAMANTHA KING	Contact	: Gregory Gommers
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61-3-8549 9600
Project	: 12564388	Date Samples Received	: 30-Mar-2023 11:05
Order number	: 12564388	Date Analysis Commenced	: 30-Mar-2023
C-O-C number	: ----	Issue Date	: 11-Apr-2023 16:06
Sampler	: MIGUEL BENAVIDES, RICHARD SCOTT		
Site	: ----		
Quote number	: ME/770/21		
No. of samples received	: 4		
No. of samples analysed	: 4		

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
Arenie Vijayaratnam	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Tahlia Freeman	Instrument Operator	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

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: Particular samples EM2305600-001,002,003 show minor BTEX hits. Confirmed by re-analysis.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- 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.
- 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.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	B12	B14	B7	B6	----
			Sampling date / time	28-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00	----
Compound	CAS Number	LOR	Unit	EM2305600-001	EM2305600-002	EM2305600-003	EM2305600-004	--------
				Result	Result	Result	Result	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	**133**	**469**	**294**	**254**	----
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	**17**	**296**	**230**	**166**	----
Total Alkalinity as CaCO3	----	1	mg/L	**17**	**296**	**230**	**166**	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**1**	**22**	**5**	**6**	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**41**	**55**	**19**	**26**	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**6**	**103**	**92**	**50**	----
Magnesium	7439-95-4	1	mg/L	**2**	**8**	**4**	**14**	----
Sodium	7440-23-5	1	mg/L	**28**	**51**	**10**	**17**	----
Potassium	7440-09-7	1	mg/L	<1	**10**	<1	**2**	----
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	**0.001**	<0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Manganese	7439-96-5	0.001	mg/L	**0.054**	**0.148**	**0.006**	**0.128**	----
Nickel	7440-02-0	0.001	mg/L	**0.005**	**0.002**	<0.001	<0.001	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Zinc	7440-66-6	0.005	mg/L	**0.018**	<0.005	<0.005	<0.005	----
Iron	7439-89-6	0.05	mg/L	<0.05	**0.52**	<0.05	**5.84**	----
EG020T: Total Metals by ICP-MS								
Iron	7439-89-6	0.05	mg/L	**0.12**	**0.98**	<0.05	**6.75**	----
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	**0.30**	**0.34**	<0.01	**0.06**	----
EK057G: Nitrite as N by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	B12	B14	B7	B6	----
			Sampling date / time	28-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00	----
Compound	CAS Number	LOR	Unit	EM2305600-001	EM2305600-002	EM2305600-003	EM2305600-004	--------
				Result	Result	Result	Result	----
EK057G: Nitrite as N by Discrete Analyser - Continued								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**2.46**	**0.01**	<0.01	**0.03**	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**2.46**	**0.01**	<0.01	**0.03**	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**0.8**	**1.2**	<0.1	**0.2**	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	**3.3**	**1.2**	<0.1	**0.2**	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.03**	**0.03**	**0.03**	**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	<0.01	<0.01	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**1.52**	**7.92**	**5.24**	**4.18**	----
ø Total Cations	----	0.01	meq/L	**1.68**	**8.27**	**5.36**	**4.44**	----
ø Ionic Balance	----	0.01	%	**----**	**2.15**	**1.13**	**3.05**	----
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	<1	**2**	<1	<1	----
EP030: Biochemical Oxygen Demand (BOD)								
Biochemical Oxygen Demand	----	2	mg/L	<2	<2	<2	<2	----
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	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	B12	B14	B7	B6	----
				Sampling date / time	28-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00	----
Compound	CAS Number	LOR	Unit		EM2305600-001	EM2305600-002	EM2305600-003	EM2305600-004	--------
					Result	Result	Result	Result	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>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		**10**	**14**	**3**	<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		**10**	**14**	**5**	<1	----
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	----
ED009: Anions									
Bromide	24959-67-9	0.010	mg/L		**0.085**	**0.258**	**0.049**	**0.100**	----
Iodide	20461-54-5	0.010	mg/L		<0.010	<0.010	<0.010	**0.021**	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**113**	**118**	**119**	**104**	----
Toluene-D8	2037-26-5	2	%		**112**	**113**	**115**	**106**	----
4-Bromofluorobenzene	460-00-4	2	%		**119**	**123**	**123**	**123**	----

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	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) ED009: Anions

QUALITY CONTROL REPORT

Work Order	: **EM2305600**	Page	: 1 of 9
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAMANTHA KING	Contact	: Gregory Gommers
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61-3-8549 9600
Project	: 12564388	Date Samples Received	: 30-Mar-2023
Order number	: 12564388	Date Analysis Commenced	: 30-Mar-2023
C-O-C number	: ----	Issue Date	: 11-Apr-2023
Sampler	: MIGUEL BENAVIDES, RICHARD SCOTT		
Site	: ----		
Quote number	: ME/770/21		
No. of samples received	: 4		
No. of samples analysed	: 4		

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
Arenie Vijayaratnam	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Tahlia Freeman	Instrument Operator	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

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 (%)
ED009: Anions (QC Lot: 4970005)									
EM2305585-001	Anonymous	ED009-X: Bromide	24959-67-9	0.01	mg/L	<0.010	<0.010	0.0	No Limit
		ED009-X: Iodide	20461-54-5	0.01	mg/L	<0.010	<0.010	0.0	No Limit
EP2303924-005	Anonymous	ED009-X: Bromide	24959-67-9	0.01	mg/L	0.549	0.555	1.1	0% - 20%
		ED009-X: Iodide	20461-54-5	0.01	mg/L	<0.010	<0.010	0.0	No Limit
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 4968336)									
EM2305582-036	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	32900	39100	17.2	0% - 20%
EM2305609-003	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	6160	6160	0.1	0% - 20%
EM2305797-006	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	<10	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 4971557)									
EM2305585-002	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	16	20	19.6	0% - 50%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	16	20	19.6	0% - 50%
EM2305602-004	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	37	35	4.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	37	35	4.4	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4964578)									
EM2305600-002	B14	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	22	23	0.0	0% - 20%
EM2305548-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1860	1820	1.9	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4964579)									
EM2305600-001	B12	ED045G: Chloride	16887-00-6	1	mg/L	41	40	0.0	0% - 20%
EM2305548-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	5940	5920	0.3	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 (%)*
ED093F: Dissolved Major Cations (QC Lot: 4974452)									
EM2305570-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	290	289	0.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	160	160	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	427	426	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	82	82	0.0	0% - 20%
EM2305594-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	34	34	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	322	328	1.7	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	3140	3190	1.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	181	184	1.5	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 4974454)									
EM2305570-001	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	0.002	0.002	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.005	0.005	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	0.247	0.261	5.2	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.005	0.005	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.008	0.010	12.1	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	14.4	15.7	8.5	0% - 20%
EM2305594-001	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	0.004	0.003	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.011	0.011	0.0	0% - 50%
		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	0.168	0.165	2.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.187	0.185	1.3	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.005	0.006	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	2.71	2.67	1.5	0% - 20%
EG020T: Total Metals by ICP-MS (QC Lot: 4967795)									
EM2305388-005	Anonymous	EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EM2305535-001	Anonymous	EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 4974453)									
EM2305570-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EM2305594-001	Anonymous	EG035F: 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: 4966548)									
EM2303418-022	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.08	<0.01	156	No Limit
EM2303418-031	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.06	0.06	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4964580)									

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: 4964580) - continued									
EM2305600-002	B14	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM2305548-001	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: 4966549)									
EM2303418-022	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM2303418-031	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: 4965481)									
EM2305600-001	B12	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.8	1.0	14.9	No Limit
EM2305604-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1370	1350	1.6	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 4965480)									
EM2305600-001	B12	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.03	0.02	0.0	No Limit
EM2305604-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	16.6	16.1	2.8	0% - 20%
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4964581)									
EM2305573-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP002: Dissolved Organic Carbon (DOC) (QC Lot: 4977521)									
EM2305600-001	B12	EP002: Dissolved Organic Carbon	----	1	mg/L	<1	<1	0.0	No Limit
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 4964644)									
EM2305596-001	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	18	18	0.0	No Limit
EM2305574-001	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	<8	<8	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4969901)									
EM2305600-001	B12	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EM2305609-003	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4969901)									
EM2305600-001	B12	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EM2305609-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 4969901)									
EM2305600-001	B12	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	10	10	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
EM2305609-003	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

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: 4969901) - continued									
EM2305609-003	Anonymous	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
ED009: Anions (QCLot: 4970005)								
ED009-X: Bromide	24959-67-9	0.01	mg/L	<0.010	2 mg/L	101	93.0	109
ED009-X: Iodide	20461-54-5	0.01	mg/L	<0.010	0.5 mg/L	89.4	79.0	123
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 4968336)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	101	91.0	110
				<10	2440 mg/L	104	81.6	118
				<10	293 mg/L	103	91.0	110
ED037P: Alkalinity by PC Titrator (QCLot: 4971557)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	92.1	85.0	116
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4964578)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	105	90.0	110
				<1	500 mg/L	109	90.0	110
ED045G: Chloride by Discrete Analyser (QCLot: 4964579)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	108	90.0	110
				<1	1000 mg/L	102	90.0	110
ED093F: Dissolved Major Cations (QCLot: 4974452)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	80.0	120
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	98.9	80.0	120
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	80.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.9	80.0	120
EG020F: Dissolved Metals by ICP-MS (QCLot: 4974454)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	103	89.0	111
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	102	83.5	111
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	98.9	83.2	109
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	97.7	83.1	107
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	100	84.6	108
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	98.4	84.8	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	99.6	84.3	110
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	98.0	82.3	113
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	108	86.3	112
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	96.5	91.8	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: 4967795)								
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	104	92.8	118
EG035F: Dissolved Mercury by FIMS (QCLot: 4974453)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	94.2	71.6	116
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4966548)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	92.0	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4964580)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	96.0	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4966549)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	103	90.0	110
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4965481)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	90.9	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4965480)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	87.9	71.9	114
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4964581)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	107	90.0	110
EP002: Dissolved Organic Carbon (DOC) (QCLot: 4977521)								
EP002: Dissolved Organic Carbon	----	1	mg/L	<1	100 mg/L	107	83.0	115
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 4964644)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	198 mg/L	98.9	79.5	122
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4963813)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	4460 µg/L	59.5	47.2	122
EP071: C15 - C28 Fraction	----	100	µg/L	<100	14300 µg/L	74.5	52.9	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	7300 µg/L	70.5	50.4	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4969901)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	102	66.2	134
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4963813)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	6090 µg/L	61.1	49.1	125
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	19400 µg/L	71.8	51.6	128
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1300 µg/L	68.2	47.2	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4969901)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	99.7	66.2	132
EP080: BTEXN (QCLot: 4969901)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	104	68.8	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	104	72.9	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS: Spike Recovery (%)	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP080: BTEXN (QCLot: 4969901) - continued								
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	104	71.7	130
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	111	72.3	136
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	111	75.9	134
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	93.0	68.3	131

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
ED009: Anions (QCLot: 4970005)							
EM2305585-001	Anonymous	ED009-X: Bromide	24959-67-9	0.2 mg/L	82.0	70.0	130
		ED009-X: Iodide	20461-54-5	0.2 mg/L	70.0	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4964578)							
EM2305548-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4964579)							
EM2305548-002	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	142
EG020F: Dissolved Metals by ICP-MS (QCLot: 4974454)							
EM2305570-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	108	76.6	124
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	102	74.6	118
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	99.6	71.0	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	93.6	76.0	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	77.4	75.0	133
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	91.7	64.0	134
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	102	73.0	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	99.8	75.0	131
EG035F: Dissolved Mercury by FIMS (QCLot: 4974453)							
EM2305570-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	86.4	70.0	120
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4966548)							
EM2303418-023	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	129	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4964580)							

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: 4964580) - continued							
EM2305548-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	96.0	80.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4966549)							
EM2303418-023	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	95.4	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4965481)							
EM2305600-002	B14	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	93.9	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4965480)							
EM2305600-002	B14	EK067G: Total Phosphorus as P	----	1 mg/L	92.0	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4964581)							
EM2305600-001	B12	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	98.5	79.0	123
EP002: Dissolved Organic Carbon (DOC) (QCLot: 4977521)							
EM2305600-002	B14	EP002: Dissolved Organic Carbon	----	100 mg/L	103	75.0	117
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4969901)							
EM2305600-002	B14	EP080: C6 - C9 Fraction	----	280 µg/L	84.9	33.9	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4969901)							
EM2305600-002	B14	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	79.9	34.0	122
EP080: BTEXN (QCLot: 4969901)							
EM2305600-002	B14	EP080: Benzene	71-43-2	20 µg/L	100	56.3	133
		EP080: Toluene	108-88-3	20 µg/L	88.4	60.4	132

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2305600**	Page	: 1 of 9
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAMANTHA KING	Telephone	: +61-3-8549 9600
Project	: 12564388	Date Samples Received	: 30-Mar-2023
Site	: ----	Issue Date	: 11-Apr-2023
Sampler	: MIGUEL BENAVIDES, RICHARD SCOTT	No. of samples received	: 4
Order number	: 12564388	No. of samples analysed	: 4

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, 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	EM2305548--002	Anonymous	**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	EM2305548--002	Anonymous	**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 / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
	0				
Laboratory Duplicates (DUP)					
TRH - Semivolatile Fraction	0	6	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Total Metals by ICP-MS - Suite A	0	14	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	6	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container* / Client Sample ID(s)	*Sample Date*	*Extraction / Preparation* Date extracted	Due for extraction	Evaluation	*Analysis* Date analysed	Due for analysis	Evaluation
EA015: Total Dissolved Solids dried at 180 ± 5 °C							
Clear Plastic Bottle - Natural (EA015H)							
B12, B14, B7, B6	**28-Mar-2023**	**----**	----	**----**	**03-Apr-2023**	04-Apr-2023	✓
ED009: Anions							
Clear Plastic Bottle - Natural (ED009-X)							
B12, B14, B7, B6	**28-Mar-2023**	**----**	----	**----**	**03-Apr-2023**	25-Apr-2023	✓

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) B12, B14, B7, B6	28-Mar-2023	----	----	----	06-Apr-2023	11-Apr-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) B12, B14, B7, B6	28-Mar-2023	----	----	----	31-Mar-2023	25-Apr-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) B12, B14, B7, B6	28-Mar-2023	----	----	----	31-Mar-2023	25-Apr-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F) B12, B14, B7, B6	28-Mar-2023	----	----	----	11-Apr-2023	25-Apr-2023	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F) B12, B14, B7, B6	28-Mar-2023	----	----	----	06-Apr-2023	24-Sep-2023	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) B12, B14, B7, B6	28-Mar-2023	01-Apr-2023	24-Sep-2023	✓	01-Apr-2023	24-Sep-2023	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F) B12, B14, B7, B6	28-Mar-2023	----	----	----	06-Apr-2023	25-Apr-2023	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) B12, B14, B7, B6	28-Mar-2023	----	----	----	31-Mar-2023	25-Apr-2023	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) B12, B14, B7, B6	28-Mar-2023	----	----	----	30-Mar-2023	30-Mar-2023	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) B12, B14, B7, B6	28-Mar-2023	----	----	----	31-Mar-2023	25-Apr-2023	✓

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)							
B12, B14, B7, B6	**28-Mar-2023**	**03-Apr-2023**	25-Apr-2023	✓	**04-Apr-2023**	25-Apr-2023	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
B12, B14, B7, B6	**28-Mar-2023**	**03-Apr-2023**	25-Apr-2023	✓	**04-Apr-2023**	25-Apr-2023	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
B12, B14, B7, B6	**28-Mar-2023**	**----**	----	----	**30-Mar-2023**	30-Mar-2023	✓
EP002: Dissolved Organic Carbon (DOC)							
Amber DOC Filtered- Sulfuric Preserved (EP002)							
B12, B14, B7, B6	**28-Mar-2023**	**----**	----	----	**11-Apr-2023**	25-Apr-2023	✓
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030)							
B12, B14, B7, B6	**28-Mar-2023**	**----**	----	----	**30-Mar-2023**	30-Mar-2023	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
B12, B14, B7, B6	**28-Mar-2023**	**30-Mar-2023**	04-Apr-2023	✓	**31-Mar-2023**	09-May-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
B12, B14, B7, B6	**28-Mar-2023**	**03-Apr-2023**	11-Apr-2023	✓	**04-Apr-2023**	11-Apr-2023	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071)							
B12, B14, B7, B6	**28-Mar-2023**	**30-Mar-2023**	04-Apr-2023	✓	**31-Mar-2023**	09-May-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
B12, B14, B7, B6	**28-Mar-2023**	**03-Apr-2023**	11-Apr-2023	✓	**04-Apr-2023**	11-Apr-2023	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080)							
B12, B14, B7, B6	**28-Mar-2023**	**03-Apr-2023**	11-Apr-2023	✓	**04-Apr-2023**	11-Apr-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
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
Biochemical Oxygen Demand (BOD)	EP030	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	12	**16.67**	**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
Dissolved Organic Carbon	EP002	1	5	**20.00**	**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	5	**40.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Standard Anions -by IC (Extended Method)	ED009-X	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	3	23	**13.04**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	14	**14.29**	**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	6	**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	1	20	**5.00**	**5.00**	✓	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
Biochemical Oxygen Demand (BOD)	EP030	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	12	**16.67**	**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
Dissolved Organic Carbon	EP002	1	5	**20.00**	**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	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Standard Anions -by IC (Extended Method)	ED009-X	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	3	23	**13.04**	**7.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	14	**7.14**	**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	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
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
Biochemical Oxygen Demand (BOD)	EP030	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	12	**8.33**	**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
Dissolved Organic Carbon	EP002	1	5	**20.00**	**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	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Standard Anions -by IC (Extended Method)	ED009-X	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	14	**7.14**	**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	6	**16.67**	**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	12	**8.33**	**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
Dissolved Organic Carbon	EP002	1	5	**20.00**	**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	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Standard Anions -by IC (Extended Method)	ED009-X	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	0	14	**0.00**	**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	6	**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)
Standard Anions -by IC (Extended Method)	ED009-X	WATER	In house: Referenced to APHA 4110B. 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).
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)

Analytical Methods	Method	Matrix	Method Descriptions
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 1030F. This method is compliant with NEPM Schedule B(3)
Dissolved Organic Carbon	EP002	WATER	In house: Referenced to APHA 5310 B. This method is compliant with NEPM Schedule B(3). Samples are combusted at high temperature in the presence of an oxidative catalyst. The evolved carbon dioxide is quantified using an IR detector.
Biochemical Oxygen Demand (BOD)	EP030	WATER	In house: Referenced to APHA 5210 B. The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. 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.

CERTIFICATE OF ANALYSIS

Work Order	: **EM2305604**	Page	: 1 of 16
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAMANTHA KING	Contact	: Gregory Gommers
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61-3-8549 9600
Project	: 12564388	Date Samples Received	: 30-Mar-2023 11:05
Order number	: 12564388	Date Analysis Commenced	: 30-Mar-2023
C-O-C number	: ----	Issue Date	: 11-Apr-2023 17:23
Sampler	: MIGUEL BENAVIDES, RICHARD SCOTT		
Site	: ----		
Quote number	: ME/770/21		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- 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
Arenie Vijayaratnam	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Tahlia Freeman	Instrument Operator	Melbourne Inorganics, Springvale, VIC
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

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.

- EK086/EK087 EM2305604 #1 required dilution prior to analysis due to sample matrix. LOR has been raised accordingly
- EK085:EM2305604#1 Dilution is required prior to analysis due to sample matrix, the LOR has raised accordingly.
- EP010: EM2305604#1 Dilution is required prior to analysis due to sample matrix, the LOR has raised accordingly.
- EP075: 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.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP074: Where reported, Total Trihalomethanes is the sum of the reported concentrations of all Trihalomethanes at or above the LOR.
- EP074: Where reported, Total Trimethylbenzenes is the sum of the reported concentrations of 1.2.3-Trimethylbenzene, 1.2.4-Trimethylbenzene and 1.3.5-Trimethylbenzene 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 is recognised that total metals is less than dissolved metals for samples EM2305604 #1 However, the difference is within experimental variation of the methods.
- ED043 : EM2305604 #1 total oxidised sulfur as S required dilution prior analysis due to sample matrix. LORs have been adjusted accordingly.
- EG020T: EM2305604 #1 has been diluted prior to Metals analysis due to sample interferences. LOR values have been adjusted accordingly.
- ED093F : EM2305604 #1 results for dissolved cations have been confirmed by re-preparation and re-analysis.
- EG035T:EM2305604#1 Particular samples required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- EP068: EM2305604_01 Unable to determine surrogate recovery for DEF due to matrix interfenences. Confirmed by re-analysis.
- Ionic balances were calculated using: major anions - chloride, alkalinity, sulfate; and major cations - calcium, magnesium, potassium, sodium and ammonia for #1.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium, sodium, iron, aluminium and ammonia for sample #1.
- 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.
- EP075: Where reported, 'Sum of PAH' is the sum of the USEPA 16 priority PAHs
- 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.

- MBAS (EP050) is calculated as LAS, molecular weight 348 g/mol.

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	30-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2305604-001	--------	--------	--------	--------
					Result	----	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		**7460**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		**201**	----	----	----	----
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		**197**	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**5140**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**5340**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**98**	----	----	----	----
ED043S: Total Oxidised Sulfur as S									
Total Oxidised Sulfur as S	----	10	mg/L		<100	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**2120**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**46**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**32**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**915**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**534**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		**1.16**	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L		**0.090**	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		**0.0002**	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		**0.536**	----	----	----	----
Copper	7440-50-8	0.001	mg/L		**0.017**	----	----	----	----
Lead	7439-92-1	0.001	mg/L		**0.008**	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		**0.171**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.109**	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.164**	----	----	----	----
Iron	7439-89-6	0.05	mg/L		**5.19**	----	----	----	----
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		**4.55**	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	30-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2305604-001	--------	--------	--------	--------
					Result	----	----	----	----
EG020T: Total Metals by ICP-MS - Continued									
Arsenic	7440-38-2	0.001	mg/L		**0.175**	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0010	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		**1.01**	----	----	----	----
Copper	7440-50-8	0.001	mg/L		**0.033**	----	----	----	----
Lead	7439-92-1	0.001	mg/L		**0.029**	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		**0.430**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.224**	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.10	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.323**	----	----	----	----
Iron	7439-89-6	0.05	mg/L		**12.4**	----	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0010	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	0.004	mg/L		<0.004	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**1370**	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		**0.06**	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**6.64**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**6.70**	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**1370**	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**1380**	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**16.6**	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**12.5**	----	----	----	----
EK085M: Sulfide as S2-									

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	30-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2305604-001	--------	--------	--------	--------
					Result	----	----	----	----
EK085M: Sulfide as S2- - Continued									
Sulfide as S2-	18496-25-8	0.1	mg/L		<0.5	----	----	----	----
EK086: Sulfite as SO3 2-									
Sulfite as SO3 2-	14265-45-3	2	mg/L		<100	----	----	----	----
EK087: Thiosulfate as S2O3 2-									
Thiosulfate as S2O3 2-	----	2	mg/L		<100	----	----	----	----
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**168**	----	----	----	----
ø **Total Cations**	----	0.01	meq/L		**157**	----	----	----	----
ø **Ionic Balance**	----	0.01	%		**3.68**	----	----	----	----
EP002: Dissolved Organic Carbon (DOC)									
Dissolved Organic Carbon	----	1	mg/L		**573**	----	----	----	----
EP010: Formaldehyde									
Formaldehyde	50-00-0	0.1	mg/L		<2.0	----	----	----	----
EP020: Oil and Grease (O&G)									
Oil & Grease	----	5	mg/L		**10**	----	----	----	----
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L		**119**	----	----	----	----
EP050: Anionic Surfactants as MBAS									
Anionic Surfactants as MBAS	----	0.1	mg/L		**2.1**	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)									
^ **Total Polychlorinated biphenyls**	----	1	µg/L		<1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.5	µg/L		<0.5	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L		<0.5	----	----	----	----
beta-BHC	319-85-7	0.5	µg/L		<0.5	----	----	----	----
gamma-BHC	58-89-9	0.5	µg/L		<0.5	----	----	----	----
delta-BHC	319-86-8	0.5	µg/L		<0.5	----	----	----	----
Heptachlor	76-44-8	0.5	µg/L		<0.5	----	----	----	----
Aldrin	309-00-2	0.5	µg/L		<0.5	----	----	----	----
Heptachlor epoxide	1024-57-3	0.5	µg/L		<0.5	----	----	----	----
trans-Chlordane	5103-74-2	0.5	µg/L		<0.5	----	----	----	----
alpha-Endosulfan	959-98-8	0.5	µg/L		<0.5	----	----	----	----
cis-Chlordane	5103-71-9	0.5	µg/L		<0.5	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	30-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2305604-001	--------	--------	--------	--------
					Result	----	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued									
Dieldrin	60-57-1	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDE	72-55-9	0.5	µg/L		<0.5	----	----	----	----
Endrin	72-20-8	0.5	µg/L		<0.5	----	----	----	----
beta-Endosulfan	33213-65-9	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDD	72-54-8	0.5	µg/L		<0.5	----	----	----	----
Endrin aldehyde	7421-93-4	0.5	µg/L		<0.5	----	----	----	----
Endosulfan sulfate	1031-07-8	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDT	50-29-3	2.0	µg/L		<2.0	----	----	----	----
Endrin ketone	53494-70-5	0.5	µg/L		<0.5	----	----	----	----
Methoxychlor	72-43-5	2.0	µg/L		<2.0	----	----	----	----
^ **Total Chlordane (sum)**	----	0.5	µg/L		<0.5	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.5	µg/L		<0.5	----	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.5	µg/L		<0.5	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.5	µg/L		<0.5	----	----	----	----
Demeton-S-methyl	919-86-8	0.5	µg/L		<0.5	----	----	----	----
Monocrotophos	6923-22-4	2.0	µg/L		<2.0	----	----	----	----
Dimethoate	60-51-5	0.5	µg/L		<0.5	----	----	----	----
Diazinon	333-41-5	0.5	µg/L		<0.5	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L		<0.5	----	----	----	----
Parathion-methyl	298-00-0	2.0	µg/L		<2.0	----	----	----	----
Malathion	121-75-5	0.5	µg/L		<0.5	----	----	----	----
Fenthion	55-38-9	0.5	µg/L		<0.5	----	----	----	----
Chlorpyrifos	2921-88-2	0.5	µg/L		<0.5	----	----	----	----
Parathion	56-38-2	2.0	µg/L		<2.0	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.5	µg/L		<0.5	----	----	----	----
Chlorfenvinphos	470-90-6	0.5	µg/L		<0.5	----	----	----	----
Bromophos-ethyl	4824-78-6	0.5	µg/L		<0.5	----	----	----	----
Fenamiphos	22224-92-6	0.5	µg/L		<0.5	----	----	----	----
Prothiofos	34643-46-4	0.5	µg/L		<0.5	----	----	----	----
Ethion	563-12-2	0.5	µg/L		<0.5	----	----	----	----
Carbophenothion	786-19-6	0.5	µg/L		<0.5	----	----	----	----
Azinphos Methyl	86-50-0	0.5	µg/L		<0.5	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	30-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2305604-001	--------	--------	--------	--------
					Result	----	----	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup									
C10 - C36 Fraction (sum)	----	50	µg/L		**330**	----	----	----	----
EP071 SG: Total Petroleum Hydrocarbons - SV Silica gel cleanup									
C10 - C14 Fraction	----	50	µg/L		**110**	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		**160**	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		**60**	----	----	----	----
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup									
>C10 - C40 Fraction (sum)	----	100	µg/L		**300**	----	----	----	----
EP071 SG: Total Recoverable Hydrocarbons - SV NEPM 2013 Fractions - Silica gel cleanup									
>C10 - C16 Fraction	----	100	µg/L		**120**	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		**180**	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
EP074B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	50	µg/L		**110**	----	----	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	----	----	----	----
1.2-Dichloropropane	78-87-5	5	µg/L		<5	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	----	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	----	----	----	----
Chloromethane	74-87-3	50	µg/L		<50	----	----	----	----
Vinyl chloride	75-01-4	50	µg/L		<50	----	----	----	----
Bromomethane	74-83-9	50	µg/L		<50	----	----	----	----
Chloroethane	75-00-3	50	µg/L		<50	----	----	----	----
Trichlorofluoromethane	75-69-4	50	µg/L		<50	----	----	----	----
1.1-Dichloroethene	75-35-4	5	µg/L		<5	----	----	----	----
Iodomethane	74-88-4	5	µg/L		<5	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	----	----	----	----
1.1-Dichloroethane	75-34-3	5	µg/L		<5	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	----	----	----	----
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	----	----	----	----
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	----	----	----	----
Carbon Tetrachloride	56-23-5	5	µg/L		<5	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	30-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2305604-001	--------	--------	--------	--------
					Result	----	----	----	----
EP074E: Halogenated Aliphatic Compounds - Continued									
1.2-Dichloroethane	107-06-2	5	µg/L		<5	----	----	----	----
Trichloroethene	79-01-6	5	µg/L		<5	----	----	----	----
Dibromomethane	74-95-3	5	µg/L		<5	----	----	----	----
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	----	----	----	----
1.3-Dichloropropane	142-28-9	5	µg/L		<5	----	----	----	----
Tetrachloroethene	127-18-4	5	µg/L		<5	----	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	----	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	----	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	----	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	----	----	----	----
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	----	----	----	----
Pentachloroethane	76-01-7	5	µg/L		<5	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	----	----	----	----
Hexachlorobutadiene	87-68-3	5	µg/L		<5	----	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	----	----	----	----
Bromobenzene	108-86-1	5	µg/L		<5	----	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L		<5	----	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L		<5	----	----	----	----
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	----	----	----	----
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	----	----	----	----
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	----	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	----	----	----	----
Bromodichloromethane	75-27-4	5	µg/L		<5	----	----	----	----
Dibromochloromethane	124-48-1	5	µg/L		<5	----	----	----	----
Bromoform	75-25-2	5	µg/L		<5	----	----	----	----
EP075A: Phenolic Compounds									
Phenol	108-95-2	2	µg/L		<2	----	----	----	----
2-Chlorophenol	95-57-8	2	µg/L		<2	----	----	----	----
2-Methylphenol	95-48-7	2	µg/L		**24**	----	----	----	----
3- & 4-Methylphenol	1319-77-3	4	µg/L		<4	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	30-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2305604-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075A: Phenolic Compounds - Continued									
2-Nitrophenol	88-75-5	2	µg/L		<2	----	----	----	----
2.4-Dimethylphenol	105-67-9	2	µg/L		<2	----	----	----	----
2.4-Dichlorophenol	120-83-2	2	µg/L		<2	----	----	----	----
2.6-Dichlorophenol	87-65-0	2	µg/L		<2	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	2	µg/L		<2	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	2	µg/L		<2	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	2	µg/L		<2	----	----	----	----
Pentachlorophenol	87-86-5	4	µg/L		<4	----	----	----	----
EP075B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	2	µg/L		<2	----	----	----	----
2-Methylnaphthalene	91-57-6	2	µg/L		<2	----	----	----	----
2-Chloronaphthalene	91-58-7	2	µg/L		<2	----	----	----	----
Acenaphthylene	208-96-8	2	µg/L		<2	----	----	----	----
Acenaphthene	83-32-9	2	µg/L		<2	----	----	----	----
Fluorene	86-73-7	2	µg/L		<2	----	----	----	----
Phenanthrene	85-01-8	2	µg/L		<2	----	----	----	----
Anthracene	120-12-7	2	µg/L		<2	----	----	----	----
Fluoranthene	206-44-0	2	µg/L		<2	----	----	----	----
Pyrene	129-00-0	2	µg/L		<2	----	----	----	----
N-2-Fluorenyl Acetamide	53-96-3	2	µg/L		<2	----	----	----	----
Benz(a)anthracene	56-55-3	2	µg/L		<2	----	----	----	----
Chrysene	218-01-9	2	µg/L		<2	----	----	----	----
Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	4	µg/L		<4	----	----	----	----
7.12-Dimethylbenz(a)anthracene	57-97-6	2	µg/L		<2	----	----	----	----
Benzo(a)pyrene	50-32-8	2	µg/L		<2	----	----	----	----
3-Methylcholanthrene	56-49-5	2	µg/L		<2	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	2	µg/L		<2	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	2	µg/L		<2	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	2	µg/L		<2	----	----	----	----
^ Sum of PAHs	----	2	µg/L		<2	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	2	µg/L		<2	----	----	----	----
EP075C: Phthalate Esters									
Dimethyl phthalate	131-11-3	2	µg/L		<2	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	30-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2305604-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075C: Phthalate Esters - Continued									
Diethyl phthalate	84-66-2	2	µg/L		<2	----	----	----	----
Di-n-butyl phthalate	84-74-2	2	µg/L		<2	----	----	----	----
Butyl benzyl phthalate	85-68-7	2	µg/L		<2	----	----	----	----
bis(2-ethylhexyl) phthalate	117-81-7	10	µg/L		<10	----	----	----	----
Di-n-octylphthalate	117-84-0	2	µg/L		<2	----	----	----	----
EP075D: Nitrosamines									
N-Nitrosomethylethylamine	10595-95-6	2	µg/L		<2	----	----	----	----
N-Nitrosodiethylamine	55-18-5	2	µg/L		<2	----	----	----	----
N-Nitrosopyrrolidine	930-55-2	4	µg/L		<4	----	----	----	----
N-Nitrosomorpholine	59-89-2	2	µg/L		<2	----	----	----	----
N-Nitrosodi-n-propylamine	621-64-7	2	µg/L		<2	----	----	----	----
N-Nitrosopiperidine	100-75-4	2	µg/L		<2	----	----	----	----
N-Nitrosodibutylamine	924-16-3	2	µg/L		<2	----	----	----	----
N-Nitrosodiphenyl & Diphenylamine	86-30-6 122-39-4	4	µg/L		<4	----	----	----	----
Methapyrilene	91-80-5	2	µg/L		<2	----	----	----	----
EP075E: Nitroaromatics and Ketones									
2-Picoline	109-06-8	2	µg/L		**4**	----	----	----	----
Acetophenone	98-86-2	2	µg/L		<2	----	----	----	----
Nitrobenzene	98-95-3	2	µg/L		<2	----	----	----	----
Isophorone	78-59-1	2	µg/L		<2	----	----	----	----
2.6-Dinitrotoluene	606-20-2	4	µg/L		<4	----	----	----	----
2.4-Dinitrotoluene	121-14-2	4	µg/L		<4	----	----	----	----
1-Naphthylamine	134-32-7	2	µg/L		<2	----	----	----	----
4-Nitroquinoline-N-oxide	56-57-5	2	µg/L		<2	----	----	----	----
5-Nitro-o-toluidine	99-55-8	2	µg/L		<2	----	----	----	----
Azobenzene	103-33-3	2	µg/L		<2	----	----	----	----
1.3.5-Trinitrobenzene	99-35-4	2	µg/L		<2	----	----	----	----
Phenacetin	62-44-2	2	µg/L		<2	----	----	----	----
4-Aminobiphenyl	92-67-1	2	µg/L		<2	----	----	----	----
Pentachloronitrobenzene	82-68-8	2	µg/L		<2	----	----	----	----
Pronamide	23950-58-5	2	µg/L		<2	----	----	----	----
Dimethylaminoazobenzene	60-11-7	2	µg/L		<2	----	----	----	----
Chlorobenzilate	510-15-6	2	µg/L		<2	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	30-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2305604-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075F: Haloethers									
Bis(2-chloroethyl) ether	111-44-4	2	µg/L		<2	----	----	----	----
Bis(2-chloroethoxy) methane	111-91-1	2	µg/L		<2	----	----	----	----
4-Chlorophenyl phenyl ether	7005-72-3	2	µg/L		<2	----	----	----	----
4-Bromophenyl phenyl ether	101-55-3	2	µg/L		<2	----	----	----	----
EP075G: Chlorinated Hydrocarbons									
1.3-Dichlorobenzene	541-73-1	2	µg/L		<2	----	----	----	----
1.4-Dichlorobenzene	106-46-7	2	µg/L		<2	----	----	----	----
1.2-Dichlorobenzene	95-50-1	2	µg/L		<2	----	----	----	----
Hexachloroethane	67-72-1	2	µg/L		<2	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	2	µg/L		<2	----	----	----	----
Hexachloropropylene	1888-71-7	2	µg/L		<2	----	----	----	----
Hexachlorobutadiene	87-68-3	2	µg/L		<2	----	----	----	----
Hexachlorocyclopentadiene	77-47-4	10	µg/L		<10	----	----	----	----
Pentachlorobenzene	608-93-5	2	µg/L		<2	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	4	µg/L		<4	----	----	----	----
EP075H: Anilines and Benzidines									
Aniline	62-53-3	2	µg/L		**31**	----	----	----	----
4-Chloroaniline	106-47-8	2	µg/L		<2	----	----	----	----
2-Nitroaniline	88-74-4	4	µg/L		<4	----	----	----	----
3-Nitroaniline	99-09-2	4	µg/L		<4	----	----	----	----
Dibenzofuran	132-64-9	2	µg/L		<2	----	----	----	----
4-Nitroaniline	100-01-6	2	µg/L		<2	----	----	----	----
Carbazole	86-74-8	2	µg/L		<2	----	----	----	----
3.3`-Dichlorobenzidine	91-94-1	2	µg/L		<2	----	----	----	----
EP075I: Organochlorine Pesticides									
alpha-BHC	319-84-6	2	µg/L		<2	----	----	----	----
beta-BHC	319-85-7	2	µg/L		<2	----	----	----	----
gamma-BHC	58-89-9	2	µg/L		<2	----	----	----	----
delta-BHC	319-86-8	2	µg/L		<2	----	----	----	----
Heptachlor	76-44-8	2	µg/L		<2	----	----	----	----
Aldrin	309-00-2	2	µg/L		<2	----	----	----	----
Heptachlor epoxide	1024-57-3	2	µg/L		<2	----	----	----	----
alpha-Endosulfan	959-98-8	2	µg/L		<2	----	----	----	----
4.4`-DDE	72-55-9	2	µg/L		<2	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	30-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2305604-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075I: Organochlorine Pesticides - Continued									
Dieldrin	60-57-1	2	µg/L		<2	----	----	----	----
Endrin	72-20-8	2	µg/L		<2	----	----	----	----
beta-Endosulfan	33213-65-9	2	µg/L		<2	----	----	----	----
4.4`-DDD	72-54-8	2	µg/L		<2	----	----	----	----
Endosulfan sulfate	1031-07-8	2	µg/L		<2	----	----	----	----
4.4`-DDT	50-29-3	4	µg/L		<4	----	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	4	µg/L		<4	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	4	µg/L		<4	----	----	----	----
EP075J: Organophosphorus Pesticides									
Dichlorvos	62-73-7	2	µg/L		<2	----	----	----	----
Dimethoate	60-51-5	2	µg/L		<2	----	----	----	----
Diazinon	333-41-5	2	µg/L		<2	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	2	µg/L		<2	----	----	----	----
Malathion	121-75-5	2	µg/L		<2	----	----	----	----
Fenthion	55-38-9	2	µg/L		<2	----	----	----	----
Chlorpyrifos	2921-88-2	2	µg/L		<2	----	----	----	----
Pirimphos-ethyl	23505-41-1	2	µg/L		<2	----	----	----	----
Chlorfenvinphos	470-90-6	2	µg/L		<2	----	----	----	----
Prothiofos	34643-46-4	2	µg/L		<2	----	----	----	----
Ethion	563-12-2	2	µg/L		<2	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		**70**	----	----	----	----
C10 - C14 Fraction	----	50	µg/L		**1030**	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		**3320**	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		**200**	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		**4550**	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		**40**	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		**30**	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		**1420**	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		**3050**	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	30-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2305604-001	--------	--------	--------	--------
					Result	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ >C10 - C40 Fraction (sum)	----	100	µg/L		**4470**	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		**1420**	----	----	----	----
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		**4**	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		**2**	----	----	----	----
^ Total Xylenes	----	2	µg/L		**6**	----	----	----	----
^ Sum of BTEX	----	1	µg/L		**6**	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP202A: Phenoxyacetic Acid Herbicides by LCMS									
4-Chlorophenoxy acetic acid	122-88-3	10	µg/L		<10	----	----	----	----
2.4-DB	94-82-6	10	µg/L		<10	----	----	----	----
Dicamba	1918-00-9	10	µg/L		<10	----	----	----	----
Mecoprop	93-65-2	10	µg/L		<10	----	----	----	----
MCPA	94-74-6	10	µg/L		<10	----	----	----	----
2.4-DP	120-36-5	10	µg/L		<10	----	----	----	----
2.4-D	94-75-7	10	µg/L		<10	----	----	----	----
Triclopyr	55335-06-3	10	µg/L		<10	----	----	----	----
Silvex (2.4.5-TP/Fenoprop)	93-72-1	10	µg/L		<10	----	----	----	----
2.4.5-T	93-76-5	10	µg/L		<10	----	----	----	----
MCPB	94-81-5	10	µg/L		<10	----	----	----	----
Picloram	1918-02-1	10	µg/L		<10	----	----	----	----
Clopyralid	1702-17-6	10	µg/L		<10	----	----	----	----
Fluroxypyr	69377-81-7	10	µg/L		<10	----	----	----	----
2.6-D	575-90-6	10	µg/L		<10	----	----	----	----
2.4.6-T	575-89-3	10	µg/L		<10	----	----	----	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	1	%		**51.4**	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.5	%		**51.5**	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	30-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2305604-001	--------	--------	--------	--------
					Result	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate - Continued									
DEF	78-48-8	0.5	%		Not Determined	----	----	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	5	%		112	----	----	----	----
Toluene-D8	2037-26-5	5	%		105	----	----	----	----
4-Bromofluorobenzene	460-00-4	5	%		107	----	----	----	----
EP075S: Acid Extractable Surrogates									
2-Fluorophenol	367-12-4	2	%		27.4	----	----	----	----
Phenol-d6	13127-88-3	2	%		23.2	----	----	----	----
2-Chlorophenol-D4	93951-73-6	2	%		47.2	----	----	----	----
2.4.6-Tribromophenol	118-79-6	2	%		50.9	----	----	----	----
EP075T: Base/Neutral Extractable Surrogates									
Nitrobenzene-D5	4165-60-0	2	%		53.0	----	----	----	----
1.2-Dichlorobenzene-D4	2199-69-1	2	%		44.7	----	----	----	----
2-Fluorobiphenyl	321-60-8	2	%		43.8	----	----	----	----
Anthracene-d10	1719-06-8	2	%		49.4	----	----	----	----
4-Terphenyl-d14	1718-51-0	2	%		48.2	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		98.9	----	----	----	----
Toluene-D8	2037-26-5	2	%		101	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		110	----	----	----	----
EP202S: Phenoxyacetic Acid Herbicide Surrogate									
2.4-Dichlorophenyl Acetic Acid	19719-28-9	10	%		101	----	----	----	----

Surrogate Control Limits

Sub-Matrix: LEACHATE		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	41	125
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	117
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	51	127
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72	132
Toluene-D8	2037-26-5	77	132
4-Bromofluorobenzene	460-00-4	67	131
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	6	83
Phenol-d6	13127-88-3	10	65
2-Chlorophenol-D4	93951-73-6	22	112
2.4.6-Tribromophenol	118-79-6	22	125
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	37	115
1.2-Dichlorobenzene-D4	2199-69-1	32	99
2-Fluorobiphenyl	321-60-8	39	116
Anthracene-d10	1719-06-8	49	123
4-Terphenyl-d14	1718-51-0	47	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129
EP202S: Phenoxyacetic Acid Herbicide Surrogate			
2.4-Dichlorophenyl Acetic Acid	19719-28-9	64	140

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP020: Oil and Grease (O&G)

(WATER) EP050: Anionic Surfactants as MBAS

(WATER) EP202A: Phenoxyacetic Acid Herbicides by LCMS

(WATER) EP202S: Phenoxyacetic Acid Herbicide Surrogate

QUALITY CONTROL REPORT

Work Order	: **EM2305604**	Page	: 1 of 19
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAMANTHA KING	Contact	: Gregory Gommers
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61-3-8549 9600
Project	: 12564388	Date Samples Received	: 30-Mar-2023
Order number	: 12564388	Date Analysis Commenced	: 30-Mar-2023
C-O-C number	: ----	Issue Date	: 11-Apr-2023
Sampler	: MIGUEL BENAVIDES, RICHARD SCOTT		
Site	: ----		
Quote number	: ME/770/21		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Arenie Vijayaratnam	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Tahlia Freeman	Instrument Operator	Melbourne Inorganics, Springvale, VIC
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

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: 4970906)									
EM2305594-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	9750	10000	3.1	0% - 20%
EM2305608-004	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1600	1580	0.7	0% - 20%
EM2305730-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1480	1450	2.2	0% - 20%
EM2305739-005	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	24300	25500	4.7	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 4970907)									
EM2305595-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	574	556	3.3	0% - 20%
EM2305616-004	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	81	77	4.8	0% - 50%
EM2305730-003	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
EM2305819-004	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	21	24	13.5	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 4971557)									
EM2305585-002	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	16	20	19.6	0% - 50%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	16	20	19.6	0% - 50%
EM2305602-004	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	37	35	4.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	37	35	4.4	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4965937)									
EM2305443-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	22	22	0.0	0% - 20%
EM2305480-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1830	1960	6.6	0% - 20%
ED043S: Total Oxidised Sulfur as S (QC Lot: 4965752)									
EM2305386-001	Anonymous	ED043S: Total Oxidised Sulfur as S	----	10	mg/L	700	660	5.8	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 (%)*
ED045G: Chloride by Discrete Analyser (QC Lot: 4965938)									
EM2305443-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	25	24	0.0	0% - 20%
EM2305480-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	5740	5710	0.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4974452)									
EM2305570-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	290	289	0.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	160	160	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	427	426	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	82	82	0.0	0% - 20%
EM2305594-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	34	34	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	322	328	1.7	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	3140	3190	1.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	181	184	1.5	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 4974454)									
EM2305570-001	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	0.002	0.002	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.005	0.005	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	0.247	0.261	5.2	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.005	0.005	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.008	0.010	12.1	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.01	0.01	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	14.4	15.7	8.5	0% - 20%
EM2305594-001	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	0.004	0.003	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.011	0.011	0.0	0% - 50%
		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	0.168	0.165	2.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.187	0.185	1.3	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.005	0.006	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.02	0.01	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	2.71	2.67	1.5	0% - 20%
EG020T: Total Metals by ICP-MS (QC Lot: 4967795)									
EM2305388-005	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

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: 4967795) - continued									
EM2305388-005	Anonymous	EG020A-T: Manganese	7439-96-5	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
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EM2305535-001	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	0.007	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	0.006	0.008	29.2	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	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	0.869	0.875	0.7	0% - 20%
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 4974453)									
EM2305570-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EM2305594-001	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: 4977184)									
EM2305594-006	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK026SF: Total CN by Segmented Flow Analyser (QC Lot: 4965357)									
EM2305633-005	Anonymous	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EM2305623-001	Anonymous	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 4974207)									
EM2305604-001	Landfill leachate	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	1370	1380	1.0	0% - 20%
EM2305903-008	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: 4965940)									
EM2305604-001	Landfill leachate	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.06	0.06	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4974208)									
EM2305604-001	Landfill leachate	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	6.70	6.77	1.0	0% - 20%
EM2305903-008	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.02	0.0	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 4965481)									
EM2305600-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.8	1.0	14.9	No Limit
EM2305604-001	Landfill leachate	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1370	1350	1.6	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 4965480)									
EM2305600-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.03	0.02	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 (%)*
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 4965480) - continued									
EM2305604-001	Landfill leachate	EK067G: Total Phosphorus as P	----	0.01	mg/L	16.6	16.1	2.8	0% - 20%
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4965939)									
EM2305604-001	Landfill leachate	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	12.5	12.3	1.5	0% - 20%
EK085M: Sulfide as S2- (QC Lot: 4975275)									
EM2305604-001	Landfill leachate	EK085: Sulfide as S2-	18496-25-8	0.1	mg/L	<0.5	<0.5	0.0	No Limit
EM2305903-002	Anonymous	EK085: Sulfide as S2-	18496-25-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EK086: Sulfite as SO3 2- (QC Lot: 4969330)									
EM2305538-001	Anonymous	EK086: Sulfite as SO3 2-	14265-45-3	2	mg/L	<20	<20	0.0	No Limit
EK087: Thiosulfate as S2O3 2- (QC Lot: 4969331)									
EM2305538-001	Anonymous	EK087: Thiosulfate as S2O3 2-	----	2	mg/L	<20	<20	0.0	No Limit
EP002: Dissolved Organic Carbon (DOC) (QC Lot: 4977521)									
EM2305600-001	Anonymous	EP002: Dissolved Organic Carbon	----	1	mg/L	<1	<1	0.0	No Limit
EP010: Formaldehyde (QC Lot: 4964024)									
EM2305604-001	Landfill leachate	EP010: Formaldehyde	50-00-0	0.1	mg/L	<2.0	<2.0	0.0	No Limit
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 4967350)									
EM2305614-004	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	32	# 40	23.9	0% - 20%
EM2305614-003	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	52	56	7.7	0% - 20%
EP050: Anionic Surfactants as MBAS (QC Lot: 4967755)									
ES2310770-004	Anonymous	EP050: Anionic Surfactants as MBAS		0.1	mg/L	<0.1	<0.1	0.0	No Limit
ES2310722-002	Anonymous	EP050: Anionic Surfactants as MBAS		0.1	mg/L	<0.1	<0.1	0.0	No Limit
EP074B: Oxygenated Compounds (QC Lot: 4973795)									
EM2305604-001	Landfill leachate	EP074: 2-Propanone (Acetone)	67-64-1	50	µg/L	110	110	0.0	No Limit
EP074D: Fumigants (QC Lot: 4973795)									
EM2305604-001	Landfill leachate	EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 4973795)									
EM2305604-001	Landfill leachate	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	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 (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 4973795) - continued									
EM2305604-001	Landfill leachate	EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 4973795)									
EM2305604-001	Landfill leachate	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
EP074G: Trihalomethanes (QC Lot: 4973795)									
EM2305604-001	Landfill leachate	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4973794)									
EM2305604-001	Landfill leachate	EP080: C6 - C9 Fraction	----	20	µg/L	70	70	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4973794)									
EM2305604-001	Landfill leachate	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	40	40	0.0	No Limit
EP080: BTEXN (QC Lot: 4973794)									

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: 4973794) - continued									
EM2305604-001	Landfill leachate	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	4	4	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
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QC Lot: 4969611)									
EM2305337-001	Anonymous	EP202-SL: 4-Chlorophenoxy acetic acid	122-88-3	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: 2.4-DB	94-82-6	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Dicamba	1918-00-9	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Mecoprop	93-65-2	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: MCPA	94-74-6	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: 2.4-DP	120-36-5	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: 2.4-D	94-75-7	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Triclopyr	55335-06-3	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Silvex (2.4.5-TP/Fenoprop)	93-72-1	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: 2.4.5-T	93-76-5	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: MCPB	94-81-5	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Picloram	1918-02-1	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Clopyralid	1702-17-6	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Fluroxypyr	69377-81-7	10	µg/L	<10	<10	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
EP071 SG: Total Petroleum Hydrocarbons - SV Silica gel cleanup (QCLot: 4970698)								
EP071-SVSG: C10 - C14 Fraction	----	50	µg/L	<50	4460 µg/L	66.7	40.3	115
EP071-SVSG: C15 - C28 Fraction	----	100	µg/L	<100	14300 µg/L	73.3	36.8	133
EP071-SVSG: C29 - C36 Fraction	----	50	µg/L	<50	7300 µg/L	74.2	59.6	122
EP071 SG: Total Recoverable Hydrocarbons - SV NEPM 2013 Fractions - Silica gel cleanup (QCLot: 4970698)								
EP071-SVSG: >C10 - C16 Fraction	----	100	µg/L	<100	6090 µg/L	64.0	62.3	120
EP071-SVSG: >C16 - C34 Fraction	----	100	µg/L	<100	19400 µg/L	72.4	62.4	128
EP071-SVSG: >C34 - C40 Fraction	----	100	µg/L	<100	1300 µg/L	79.5	56.2	100
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 4970906)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	98.8	91.0	110
				<10	2440 mg/L	103	81.6	118
				<10	293 mg/L	104	91.0	110
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 4970907)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	98.7	91.0	109
				<5	836 mg/L	106	84.8	115
				<5	1000 mg/L	98.4	90.3	109
ED037P: Alkalinity by PC Titrator (QCLot: 4971557)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	92.1	85.0	116
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4965937)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	96.2	90.0	110
				<1	500 mg/L	101	90.0	110
ED043S: Total Oxidised Sulfur as S (QCLot: 4965752)								
ED043S: Total Oxidised Sulfur as S	----	10	mg/L	<10	167 mg/L	99.8	77.5	119
ED045G: Chloride by Discrete Analyser (QCLot: 4965938)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	95.4	90.0	110
				<1	1000 mg/L	106	90.0	110
ED093F: Dissolved Major Cations (QCLot: 4974452)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	80.0	120
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	98.9	80.0	120
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	80.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.9	80.0	120

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: 4974454)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	100	90.4	111
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	103	89.0	111
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	102	83.5	111
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	98.9	83.2	109
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	97.7	83.1	107
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	100	84.6	108
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	98.4	84.8	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	99.6	84.3	110
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	98.0	82.3	113
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	108	86.3	112
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	96.5	91.8	112
EG020T: Total Metals by ICP-MS (QCLot: 4967795)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	108	90.8	115
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	112	89.2	115
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	112	86.4	115
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.8	86.9	112
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	109	86.9	111
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	106	88.3	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	101	88.7	113
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	109	87.9	113
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	105	84.8	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	100	86.7	117
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	104	92.8	118
EG035F: Dissolved Mercury by FIMS (QCLot: 4974453)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	94.2	71.6	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4977184)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	89.2	73.4	119
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 4965357)								
EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.2 mg/L	109	77.7	116
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4974207)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	91.2	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4965940)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	107	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4974208)								

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
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4974208) - continued								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	102	90.0	110
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4965481)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	90.9	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4965480)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	87.9	71.9	114
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4965939)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	105	90.0	110
EK085M: Sulfide as S2- (QCLot: 4975275)								
EK085: Sulfide as S2-	18496-25-8	0.1	mg/L	<0.1	0.5 mg/L	93.0	81.9	116
EK086: Sulfite as SO3 2- (QCLot: 4969330)								
EK086: Sulfite as SO3 2-	14265-45-3	2	mg/L	<2	100 mg/L	95.0	91.8	101
EK087: Thiosulfate as S2O3 2- (QCLot: 4969331)								
EK087: Thiosulfate as S2O3 2-	----	2	mg/L	<2	100 mg/L	95.0	90.6	106
EP002: Dissolved Organic Carbon (DOC) (QCLot: 4977521)								
EP002: Dissolved Organic Carbon	----	1	mg/L	<1	100 mg/L	107	83.0	115
EP010: Formaldehyde (QCLot: 4964024)								
EP010: Formaldehyde	50-00-0	0.1	mg/L	<0.1	5 mg/L	91.8	85.1	107
EP020: Oil and Grease (O&G) (QCLot: 4973820)								
EP020: Oil & Grease	----	5	mg/L	<5	5000 mg/L	84.5	81.0	121
				<5	4000 mg/L	81.6	70.0	110
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 4967350)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	198 mg/L	99.6	79.5	122
EP050: Anionic Surfactants as MBAS (QCLot: 4967755)								
EP050: Anionic Surfactants as MBAS		0.1	mg/L	<0.1	1 mg/L	87.1	74.0	118
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 4964870)								
EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	73.1	52.0	136
EP068A: Organochlorine Pesticides (OC) (QCLot: 4964869)								
EP068: alpha-BHC	319-84-6	0.5	µg/L	<0.5	2.5 µg/L	78.6	50.6	119
EP068: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	2.5 µg/L	76.7	44.2	117
EP068: beta-BHC	319-85-7	0.5	µg/L	<0.5	2.5 µg/L	81.6	53.7	119
EP068: gamma-BHC	58-89-9	0.5	µg/L	<0.5	2.5 µg/L	81.7	47.7	117
EP068: delta-BHC	319-86-8	0.5	µg/L	<0.5	2.5 µg/L	82.0	52.5	117
EP068: Heptachlor	76-44-8	0.5	µg/L	<0.5	2.5 µg/L	82.1	46.9	118
EP068: Aldrin	309-00-2	0.5	µg/L	<0.5	2.5 µg/L	80.2	48.0	115

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
EP068A: Organochlorine Pesticides (OC) (QCLot: 4964869) - continued								
EP068: Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	2.5 µg/L	83.2	51.1	119
EP068: trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	2.5 µg/L	82.3	48.4	120
EP068: alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	2.5 µg/L	83.7	50.1	122
EP068: cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	2.5 µg/L	82.6	51.0	118
EP068: Dieldrin	60-57-1	0.5	µg/L	<0.5	2.5 µg/L	83.6	48.4	116
EP068: 4.4`-DDE	72-55-9	0.5	µg/L	<0.5	2.5 µg/L	82.4	49.3	116
EP068: Endrin	72-20-8	0.5	µg/L	<0.5	2.5 µg/L	85.7	47.1	130
EP068: beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	2.5 µg/L	86.8	51.6	118
EP068: 4.4`-DDD	72-54-8	0.5	µg/L	<0.5	2.5 µg/L	84.2	48.6	122
EP068: Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	2.5 µg/L	62.2	49.4	128
EP068: Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	2.5 µg/L	83.5	49.1	123
EP068: 4.4`-DDT	50-29-3	2	µg/L	<2.0	2.5 µg/L	85.3	45.6	126
EP068: Endrin ketone	53494-70-5	0.5	µg/L	<0.5	2.5 µg/L	82.4	52.8	117
EP068: Methoxychlor	72-43-5	2	µg/L	<2.0	2.5 µg/L	88.4	47.1	126
EP068B: Organophosphorus Pesticides (OP) (QCLot: 4964869)								
EP068: Dichlorvos	62-73-7	0.5	µg/L	<0.5	2.5 µg/L	80.2	47.4	133
EP068: Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	2.5 µg/L	87.5	46.4	129
EP068: Monocrotophos	6923-22-4	2	µg/L	<2.0	2.5 µg/L	15.3	10.0	42.9
EP068: Dimethoate	60-51-5	0.5	µg/L	<0.5	2.5 µg/L	81.3	41.7	131
EP068: Diazinon	333-41-5	0.5	µg/L	<0.5	2.5 µg/L	82.0	50.5	122
EP068: Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	2.5 µg/L	83.5	52.4	123
EP068: Parathion-methyl	298-00-0	2	µg/L	<2.0	2.5 µg/L	89.4	52.0	132
EP068: Malathion	121-75-5	0.5	µg/L	<0.5	2.5 µg/L	88.7	51.8	133
EP068: Fenthion	55-38-9	0.5	µg/L	<0.5	2.5 µg/L	85.1	52.3	123
EP068: Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	2.5 µg/L	84.3	48.7	122
EP068: Parathion	56-38-2	2	µg/L	<2.0	2.5 µg/L	91.4	49.5	136
EP068: Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	2.5 µg/L	83.8	50.4	123
EP068: Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	2.5 µg/L	89.4	50.9	131
EP068: Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	2.5 µg/L	88.1	47.5	126
EP068: Fenamiphos	22224-92-6	0.5	µg/L	<0.5	2.5 µg/L	102	46.5	138
EP068: Prothiofos	34643-46-4	0.5	µg/L	<0.5	2.5 µg/L	84.6	49.2	119
EP068: Ethion	563-12-2	0.5	µg/L	<0.5	2.5 µg/L	88.8	50.0	126
EP068: Carbophenothion	786-19-6	0.5	µg/L	<0.5	2.5 µg/L	93.7	50.0	131
EP068: Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	2.5 µg/L	106	41.7	147

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
EP074B: Oxygenated Compounds (QCLot: 4973795)								
EP074: 2-Propanone (Acetone)	67-64-1	50	µg/L	<50	200 µg/L	99.2	39.9	142
EP074D: Fumigants (QCLot: 4973795)								
EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	20 µg/L	98.1	71.1	118
EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	20 µg/L	102	78.5	117
EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	20 µg/L	99.5	75.7	115
EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	20 µg/L	99.0	76.4	115
EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	20 µg/L	100	77.1	118
EP074E: Halogenated Aliphatic Compounds (QCLot: 4973795)								
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	200 µg/L	108	51.9	140
EP074: Chloromethane	74-87-3	50	µg/L	<50	200 µg/L	111	63.2	134
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	200 µg/L	107	58.1	135
EP074: Bromomethane	74-83-9	50	µg/L	<50	200 µg/L	98.2	54.4	130
EP074: Chloroethane	75-00-3	50	µg/L	<50	200 µg/L	104	69.4	129
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	200 µg/L	103	70.1	126
EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	20 µg/L	106	68.4	125
EP074: Iodomethane	74-88-4	5	µg/L	<5	20 µg/L	89.3	30.9	126
EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	20 µg/L	104	70.8	122
EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	20 µg/L	107	76.6	121
EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	20 µg/L	108	79.1	120
EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	20 µg/L	103	72.5	120
EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	20 µg/L	102	69.4	120
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	20 µg/L	97.8	67.8	120
EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	20 µg/L	110	78.4	120
EP074: Trichloroethene	79-01-6	5	µg/L	<5	20 µg/L	104	73.1	120
EP074: Dibromomethane	74-95-3	5	µg/L	<5	20 µg/L	105	78.3	119
EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	20 µg/L	106	81.1	120
EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	20 µg/L	104	80.3	120
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	20 µg/L	97.9	73.1	118
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	20 µg/L	93.4	76.9	111
EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	20 µg/L	94.4	70.0	122
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	20 µg/L	83.6	62.4	118
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	20 µg/L	110	77.9	128
EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	20 µg/L	104	78.5	124
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	20 µg/L	88.3	68.5	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
EP074E: Halogenated Aliphatic Compounds (QCLot: 4973795) - continued								
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	20 µg/L	89.9	70.7	116
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	20 µg/L	105	60.0	134
EP074F: Halogenated Aromatic Compounds (QCLot: 4973795)								
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	20 µg/L	102	82.6	116
EP074: Bromobenzene	108-86-1	5	µg/L	<5	20 µg/L	98.6	79.3	115
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	20 µg/L	97.2	75.5	116
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	20 µg/L	100.0	75.0	115
EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	20 µg/L	100	76.9	116
EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	20 µg/L	99.3	78.4	118
EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	20 µg/L	99.8	82.2	113
EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	20 µg/L	98.4	67.4	124
EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	20 µg/L	102	70.4	124
EP074G: Trihalomethanes (QCLot: 4973795)								
EP074: Chloroform	67-66-3	5	µg/L	<5	20 µg/L	108	79.6	120
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	20 µg/L	102	76.3	117
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	20 µg/L	91.3	73.5	113
EP074: Bromoform	75-25-2	5	µg/L	<5	20 µg/L	87.3	68.5	113
EP075A: Phenolic Compounds (QCLot: 4964872)								
EP075: Phenol	108-95-2	2	µg/L	<2	10 µg/L	25.8	19.5	48.1
EP075: 2-Chlorophenol	95-57-8	2	µg/L	<2	10 µg/L	54.2	46.3	101
EP075: 2-Methylphenol	95-48-7	2	µg/L	<2	10 µg/L	53.4	41.1	94.4
EP075: 3- & 4-Methylphenol	1319-77-3	2	µg/L	<2	10 µg/L	49.0	35.1	88.8
EP075: 2-Nitrophenol	88-75-5	2	µg/L	<2	10 µg/L	62.8	45.3	113
EP075: 2.4-Dimethylphenol	105-67-9	2	µg/L	<2	10 µg/L	60.8	47.6	108
EP075: 2.4-Dichlorophenol	120-83-2	2	µg/L	<2	10 µg/L	55.9	48.2	110
EP075: 2.6-Dichlorophenol	87-65-0	2	µg/L	<2	10 µg/L	61.5	48.9	107
EP075: 4-Chloro-3-methylphenol	59-50-7	2	µg/L	<2	10 µg/L	61.0	47.2	110
EP075: 2.4.6-Trichlorophenol	88-06-2	2	µg/L	<2	10 µg/L	65.3	45.2	112
EP075: 2.4.5-Trichlorophenol	95-95-4	2	µg/L	<2	10 µg/L	59.0	42.4	113
EP075: Pentachlorophenol	87-86-5	4	µg/L	<4	10 µg/L	24.7	14.2	124
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 4964872)								
EP075: Naphthalene	91-20-3	2	µg/L	<2	10 µg/L	61.9	50.9	107
EP075: 2-Methylnaphthalene	91-57-6	2	µg/L	<2	10 µg/L	60.2	50.3	111
EP075: 2-Chloronaphthalene	91-58-7	2	µg/L	<2	10 µg/L	57.4	50.8	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
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 4964872) - continued								
EP075: Acenaphthylene	208-96-8	2	µg/L	<2	10 µg/L	64.1	52.9	111
EP075: Acenaphthene	83-32-9	2	µg/L	<2	10 µg/L	61.0	54.5	109
EP075: Fluorene	86-73-7	2	µg/L	<2	10 µg/L	65.1	55.7	110
EP075: Phenanthrene	85-01-8	2	µg/L	<2	10 µg/L	64.5	55.4	112
EP075: Anthracene	120-12-7	2	µg/L	<2	10 µg/L	62.4	55.9	111
EP075: Fluoranthene	206-44-0	2	µg/L	<2	10 µg/L	65.4	55.9	112
EP075: Pyrene	129-00-0	2	µg/L	<2	10 µg/L	66.3	56.5	112
EP075: N-2-Fluorenyl Acetamide	53-96-3	2	µg/L	<2	10 µg/L	63.3	50.0	118
EP075: Benz(a)anthracene	56-55-3	2	µg/L	<2	10 µg/L	66.9	55.5	114
EP075: Chrysene	218-01-9	2	µg/L	<2	10 µg/L	63.8	56.0	114
EP075: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	4	µg/L	<4	20 µg/L	61.8	55.4	120
EP075: 7.12-Dimethylbenz(a)anthracene	57-97-6	2	µg/L	<2	10 µg/L	61.3	54.4	121
EP075: Benzo(a)pyrene	50-32-8	2	µg/L	<2	10 µg/L	62.4	53.9	121
EP075: 3-Methylcholanthrene	56-49-5	2	µg/L	<2	10 µg/L	64.9	51.9	121
EP075: Indeno(1.2.3.cd)pyrene	193-39-5	2	µg/L	<2	10 µg/L	62.5	54.4	114
EP075: Dibenz(a.h)anthracene	53-70-3	2	µg/L	<2	10 µg/L	61.3	54.0	115
EP075: Benzo(g.h.i)perylene	191-24-2	2	µg/L	<2	10 µg/L	62.3	51.7	116
EP075C: Phthalate Esters (QCLot: 4964872)								
EP075: Dimethyl phthalate	131-11-3	2	µg/L	<2	10 µg/L	61.4	56.5	115
EP075: Diethyl phthalate	84-66-2	2	µg/L	<2	10 µg/L	65.3	58.0	113
EP075: Di-n-butyl phthalate	84-74-2	2	µg/L	<2	10 µg/L	66.0	57.6	120
EP075: Butyl benzyl phthalate	85-68-7	2	µg/L	<2	10 µg/L	70.0	56.3	119
EP075: bis(2-ethylhexyl) phthalate	117-81-7	10	µg/L	<10	10 µg/L	62.2	57.6	122
EP075: Di-n-octylphthalate	117-84-0	2	µg/L	<2	10 µg/L	62.6	56.5	122
EP075D: Nitrosamines (QCLot: 4964872)								
EP075: N-Nitrosomethylethylamine	10595-95-6	2	µg/L	<2	10 µg/L	47.6	23.9	106
EP075: N-Nitrosodiethylamine	55-18-5	2	µg/L	<2	10 µg/L	57.1	46.1	108
EP075: N-Nitrosopyrrolidine	930-55-2	4	µg/L	<4	10 µg/L	45.9	36.6	83.2
EP075: N-Nitrosomorpholine	59-89-2	2	µg/L	<2	10 µg/L	40.2	34.6	79.0
EP075: N-Nitrosodi-n-propylamine	621-64-7	2	µg/L	<2	10 µg/L	61.1	53.1	114
EP075: N-Nitrosopiperidine	100-75-4	2	µg/L	<2	10 µg/L	60.3	51.0	111
EP075: N-Nitrosodibutylamine	924-16-3	2	µg/L	<2	10 µg/L	51.0	37.0	111
EP075: N-Nitrosodiphenyl & Diphenylamine	86-30-6 122-39-4	4	µg/L	<4	10 µg/L	62.0	51.3	113

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
EP075D: Nitrosamines (QCLot: 4964872) - continued								
EP075: Methapyrilene	91-80-5	2	µg/L	<2	10 µg/L	74.6	10.0	125
EP075E: Nitroaromatics and Ketones (QCLot: 4964872)								
EP075: 2-Picoline	109-06-8	2	µg/L	<2	10 µg/L	68.1	18.8	108
EP075: Acetophenone	98-86-2	2	µg/L	<2	10 µg/L	57.2	52.5	111
EP075: Nitrobenzene	98-95-3	2	µg/L	<2	10 µg/L	56.6	50.6	109
EP075: Isophorone	78-59-1	2	µg/L	<2	10 µg/L	59.2	53.7	113
EP075: 2.6-Dinitrotoluene	606-20-2	4	µg/L	<4	10 µg/L	66.1	54.0	115
EP075: 2.4-Dinitrotoluene	121-14-2	4	µg/L	<4	10 µg/L	59.0	53.3	109
EP075: 1-Naphthylamine	134-32-7	2	µg/L	<2	10 µg/L	59.1	10.9	119
EP075: 4-Nitroquinoline-N-oxide	56-57-5	2	µg/L	<2	10 µg/L	65.5	27.3	147
EP075: 5-Nitro-o-toluidine	99-55-8	2	µg/L	<2	10 µg/L	65.3	44.6	119
EP075: Azobenzene	103-33-3	2	µg/L	<2	10 µg/L	64.0	55.6	110
EP075: 1.3.5-Trinitrobenzene	99-35-4	2	µg/L	<2	10 µg/L	63.2	37.6	124
EP075: Phenacetin	62-44-2	2	µg/L	<2	10 µg/L	58.9	44.8	101
EP075: 4-Aminobiphenyl	92-67-1	2	µg/L	<2	10 µg/L	67.8	24.0	149
EP075: Pentachloronitrobenzene	82-68-8	2	µg/L	<2	10 µg/L	61.0	54.6	111
EP075: Pronamide	23950-58-5	2	µg/L	<2	10 µg/L	68.6	56.5	113
EP075: Dimethylaminoazobenzene	60-11-7	2	µg/L	<2	10 µg/L	65.5	53.8	112
EP075: Chlorobenzilate	510-15-6	2	µg/L	<2	10 µg/L	67.9	55.0	113
EP075F: Haloethers (QCLot: 4964872)								
EP075: Bis(2-chloroethyl) ether	111-44-4	2	µg/L	<2	10 µg/L	56.6	45.3	112
EP075: Bis(2-chloroethoxy) methane	111-91-1	2	µg/L	<2	10 µg/L	60.8	52.7	111
EP075: 4-Chlorophenyl phenyl ether	7005-72-3	2	µg/L	<2	10 µg/L	62.0	55.8	110
EP075: 4-Bromophenyl phenyl ether	101-55-3	2	µg/L	<2	10 µg/L	60.9	55.7	114
EP075G: Chlorinated Hydrocarbons (QCLot: 4964872)								
EP075: 1.4-Dichlorobenzene	106-46-7	2	µg/L	<2	10 µg/L	56.9	43.2	104
EP075: 1.3-Dichlorobenzene	541-73-1	2	µg/L	<2	10 µg/L	54.1	42.7	103
EP075: 1.2-Dichlorobenzene	95-50-1	2	µg/L	<2	10 µg/L	56.0	44.4	104
EP075: Hexachloroethane	67-72-1	2	µg/L	<2	10 µg/L	54.1	41.5	105
EP075: 1.2.4-Trichlorobenzene	120-82-1	2	µg/L	<2	10 µg/L	50.6	46.1	107
EP075: Hexachloropropylene	1888-71-7	2	µg/L	<2	10 µg/L	60.0	41.4	109
EP075: Hexachlorobutadiene	87-68-3	2	µg/L	<2	10 µg/L	61.4	43.9	108
EP075: Hexachlorocyclopentadiene	77-47-4	10	µg/L	<10	10 µg/L	66.6	14.6	133
EP075: Pentachlorobenzene	608-93-5	2	µg/L	<2	10 µg/L	63.6	53.3	109

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
EP075G: Chlorinated Hydrocarbons (QCLot: 4964872) - continued								
EP075: Hexachlorobenzene (HCB)	118-74-1	4	µg/L	<4	10 µg/L	63.7	48.4	116
EP075H: Anilines and Benzidines (QCLot: 4964872)								
EP075: Aniline	62-53-3	2	µg/L	<2	10 µg/L	52.8	21.2	116
EP075: 4-Chloroaniline	106-47-8	2	µg/L	<2	10 µg/L	55.2	14.5	126
EP075: 2-Nitroaniline	88-74-4	4	µg/L	<4	10 µg/L	60.3	49.5	111
EP075: 3-Nitroaniline	99-09-2	4	µg/L	<4	10 µg/L	53.2	28.4	125
EP075: Dibenzofuran	132-64-9	2	µg/L	<2	10 µg/L	64.5	55.4	110
EP075: 4-Nitroaniline	100-01-6	2	µg/L	<2	10 µg/L	51.5	37.3	112
EP075: Carbazole	86-74-8	2	µg/L	<2	10 µg/L	73.1	51.6	116
EP075: 3.3`-Dichlorobenzidine	91-94-1	2	µg/L	<2	10 µg/L	70.1	42.3	142
EP075I: Organochlorine Pesticides (QCLot: 4964872)								
EP075: alpha-BHC	319-84-6	2	µg/L	<2	10 µg/L	67.5	56.2	112
EP075: beta-BHC	319-85-7	2	µg/L	<2	10 µg/L	64.9	56.2	113
EP075: gamma-BHC	58-89-9	2	µg/L	<2	10 µg/L	64.1	55.2	113
EP075: delta-BHC	319-86-8	2	µg/L	<2	10 µg/L	63.3	52.6	117
EP075: Heptachlor	76-44-8	2	µg/L	<2	10 µg/L	64.1	53.4	111
EP075: Aldrin	309-00-2	2	µg/L	<2	10 µg/L	64.4	54.0	112
EP075: Heptachlor epoxide	1024-57-3	2	µg/L	<2	10 µg/L	60.9	54.2	113
EP075: alpha-Endosulfan	959-98-8	2	µg/L	<2	10 µg/L	63.7	49.3	122
EP075: 4.4`-DDE	72-55-9	2	µg/L	<2	10 µg/L	65.0	56.0	121
EP075: Dieldrin	60-57-1	2	µg/L	<2	10 µg/L	65.5	55.2	118
EP075: Endrin	72-20-8	2	µg/L	<2	10 µg/L	66.5	52.7	121
EP075: beta-Endosulfan	33213-65-9	2	µg/L	<2	10 µg/L	65.1	55.1	119
EP075: 4.4`-DDD	72-54-8	2	µg/L	<2	10 µg/L	63.3	55.4	120
EP075: Endosulfan sulfate	1031-07-8	2	µg/L	<2	10 µg/L	70.3	49.6	123
EP075: 4.4`-DDT	50-29-3	4	µg/L	<4	10 µg/L	68.8	47.8	127
EP075J: Organophosphorus Pesticides (QCLot: 4964872)								
EP075: Dichlorvos	62-73-7	2	µg/L	<2	10 µg/L	60.1	50.1	115
EP075: Dimethoate	60-51-5	2	µg/L	<2	10 µg/L	57.8	40.8	108
EP075: Diazinon	333-41-5	2	µg/L	<2	10 µg/L	66.5	55.4	118
EP075: Chlorpyrifos-methyl	5598-13-0	2	µg/L	<2	10 µg/L	67.3	53.0	118
EP075: Malathion	121-75-5	2	µg/L	<2	10 µg/L	65.0	54.6	122
EP075: Fenthion	55-38-9	2	µg/L	<2	10 µg/L	63.2	55.1	119
EP075: Chlorpyrifos	2921-88-2	2	µg/L	<2	10 µg/L	68.2	55.3	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
EP075J: Organophosphorus Pesticides (QCLot: 4964872) - continued								
EP075: Pirimphos-ethyl	23505-41-1	2	µg/L	<2	10 µg/L	68.2	55.8	118
EP075: Chlorfenvinphos	470-90-6	2	µg/L	<2	10 µg/L	64.4	45.8	118
EP075: Prothiofos	34643-46-4	2	µg/L	<2	10 µg/L	66.1	56.1	118
EP075: Ethion	563-12-2	2	µg/L	<2	10 µg/L	70.9	57.7	119
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4964871)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	4460 µg/L	55.4	47.2	122
EP071: C15 - C28 Fraction	----	100	µg/L	<100	14300 µg/L	67.7	52.9	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	7300 µg/L	63.7	50.4	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4973794)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	106	66.2	134
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4964871)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	6090 µg/L	56.8	49.1	125
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	19400 µg/L	65.0	51.6	128
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1300 µg/L	59.9	47.2	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4973794)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	105	66.2	132
EP080: BTEXN (QCLot: 4973794)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	105	68.8	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	107	72.9	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	108	71.7	130
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	112	72.3	136
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	113	75.9	134
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	116	68.3	131
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QCLot: 4969611)								
EP202-SL: 4-Chlorophenoxy acetic acid	122-88-3	10	µg/L	<10	100 µg/L	95.3	82.0	136
EP202-SL: 2.4-DB	94-82-6	10	µg/L	<10	100 µg/L	93.2	65.0	147
EP202-SL: Dicamba	1918-00-9	10	µg/L	<10	100 µg/L	98.4	83.0	137
EP202-SL: Mecoprop	93-65-2	10	µg/L	<10	100 µg/L	95.4	75.0	143
EP202-SL: MCPA	94-74-6	10	µg/L	<10	100 µg/L	93.6	76.0	140
EP202-SL: 2.4-DP	120-36-5	10	µg/L	<10	100 µg/L	94.2	76.0	144
EP202-SL: 2.4-D	94-75-7	10	µg/L	<10	100 µg/L	93.6	77.0	139
EP202-SL: Triclopyr	55335-06-3	10	µg/L	<10	100 µg/L	91.8	77.0	141
EP202-SL: Silvex (2.4.5-TP/Fenoprop)	93-72-1	10	µg/L	<10	100 µg/L	97.0	75.0	143

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
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QCLot: 4969611) - continued								
EP202-SL: 2.4.5-T	93-76-5	10	µg/L	<10	100 µg/L	92.1	78.0	140
EP202-SL: MCPB	94-81-5	10	µg/L	<10	100 µg/L	96.2	69.2	139
EP202-SL: Picloram	1918-02-1	10	µg/L	<10	100 µg/L	94.3	70.0	144
EP202-SL: Clopyralid	1702-17-6	10	µg/L	<10	100 µg/L	82.4	70.0	145
EP202-SL: Fluroxypyr	69377-81-7	10	µg/L	<10	100 µg/L	94.0	77.0	145

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: 4965937)							
EM2305443-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	119	70.0	130
ED043S: Total Oxidised Sulfur as S (QCLot: 4965752)							
EM2305390-001	Anonymous	ED043S: Total Oxidised Sulfur as S	----	167 mg/L	93.8	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4965938)							
EM2305443-002	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	109	70.0	142
EG020F: Dissolved Metals by ICP-MS (QCLot: 4974454)							
EM2305570-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	108	76.6	124
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	102	74.6	118
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	99.6	71.0	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	93.6	76.0	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	77.4	75.0	133
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	91.7	64.0	134
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	102	73.0	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	99.8	75.0	131
EG020T: Total Metals by ICP-MS (QCLot: 4967795)							
EM2305388-005	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	111	82.0	123
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	114	81.8	123
		EG020A-T: Chromium	7440-47-3	1 mg/L	107	78.9	119
		EG020A-T: Copper	7440-50-8	1 mg/L	112	80.4	118
		EG020A-T: Lead	7439-92-1	1 mg/L	114	80.5	121
		EG020A-T: Manganese	7439-96-5	1 mg/L	103	73.0	123
		EG020A-T: Nickel	7440-02-0	1 mg/L	109	80.0	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	108	74.0	120

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: 4974453)							
EM2305570-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	86.4	70.0	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4977184)							
EM2305604-001	Landfill leachate	EG035T: Mercury	7439-97-6	0.1 mg/L	85.7	70.0	130
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 4965357)							
EM2305594-002	Anonymous	EK026SF: Total Cyanide	57-12-5	1 mg/L	122	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4974207)							
EM2305820-001	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	103	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4965940)							
EM2305623-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	81.1	80.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4974208)							
EM2305820-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	98.8	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4965481)							
EM2305600-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	93.9	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4965480)							
EM2305600-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	92.0	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4965939)							
EM2305623-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	92.5	79.0	123
EK085M: Sulfide as S2- (QCLot: 4975275)							
EM2305818-001	Anonymous	EK085: Sulfide as S2-	18496-25-8	0.33 mg/L	94.2	70.0	130
EP002: Dissolved Organic Carbon (DOC) (QCLot: 4977521)							
EM2305600-002	Anonymous	EP002: Dissolved Organic Carbon	----	100 mg/L	103	75.0	117
EP050: Anionic Surfactants as MBAS (QCLot: 4967755)							
ES2310770-004	Anonymous	EP050: Anionic Surfactants as MBAS		1 mg/L	91.9	70.0	130
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QCLot: 4969611)							
EM2305337-001	Anonymous	EP202-SL: Mecoprop	93-65-2	100 µg/L	96.1	75.0	143
		EP202-SL: MCPA	94-74-6	100 µg/L	98.9	76.0	140
		EP202-SL: 2.4-D	94-75-7	100 µg/L	93.1	77.0	139
		EP202-SL: Triclopyr	55335-06-3	100 µg/L	96.9	77.0	141
		EP202-SL: 2.4.5-T	93-76-5	100 µg/L	99.0	78.0	140
		EP202-SL: Picloram	1918-02-1	100 µg/L	91.4	70.0	144
		EP202-SL: Clopyralid	1702-17-6	100 µg/L	93.5	70.0	145

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2305604**	Page	: 1 of 15
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAMANTHA KING	Telephone	: +61-3-8549 9600
Project	: 12564388	Date Samples Received	: 30-Mar-2023
Site	: ----	Issue Date	: 11-Apr-2023
Sampler	: MIGUEL BENAVIDES, RICHARD SCOTT	No. of samples received	: 1
Order number	: 12564388	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

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

Outliers : 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
Duplicate (DUP) RPDs							
EP030: Biochemical Oxygen Demand (BOD)	EM2305614--004	Anonymous	**Biochemical Oxygen Demand**	----	23.9 %	0% - 20%	**RPD exceeds LOR based limits**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EK086: Sulfite as SO3 2-						
Clear Plastic Bottle - EDTA/Zinc Acetate						
Landfill leachate	----	----	----	03-Apr-2023	01-Apr-2023	**2**
EK087: Thiosulfate as S2O3 2-						
Clear Plastic Bottle - EDTA/Zinc Acetate						
Landfill leachate	----	----	----	03-Apr-2023	01-Apr-2023	**2**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count: QC	Count: Regular	Rate (%): Actual	Rate (%): Expected	Quality Control Specification
	0				
Laboratory Duplicates (DUP)					
Pesticides by GCMS	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Formaldehyde	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	0	1	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) Landfill leachate	**30-Mar-2023**	**----**	----	**----**	**04-Apr-2023**	06-Apr-2023	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H) Landfill leachate	**30-Mar-2023**	**----**	----	**----**	**04-Apr-2023**	06-Apr-2023	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) Landfill leachate	**30-Mar-2023**	**----**	----	**----**	**06-Apr-2023**	13-Apr-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) Landfill leachate	**30-Mar-2023**	**----**	----	**----**	**01-Apr-2023**	27-Apr-2023	✓
ED043S: Total Oxidised Sulfur as S							
Clear Plastic Bottle - Natural (ED043S) Landfill leachate	**30-Mar-2023**	**31-Mar-2023**	27-Apr-2023	✓	**31-Mar-2023**	27-Apr-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) Landfill leachate	**30-Mar-2023**	**----**	----	**----**	**01-Apr-2023**	27-Apr-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F) Landfill leachate	**30-Mar-2023**	**----**	----	**----**	**11-Apr-2023**	27-Apr-2023	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F) Landfill leachate	**30-Mar-2023**	**----**	----	**----**	**06-Apr-2023**	26-Sep-2023	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) Landfill leachate	**30-Mar-2023**	**01-Apr-2023**	26-Sep-2023	✓	**01-Apr-2023**	26-Sep-2023	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F) Landfill leachate	**30-Mar-2023**	**----**	----	**----**	**06-Apr-2023**	27-Apr-2023	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG035T) Landfill leachate	**30-Mar-2023**	**----**	----	**----**	**06-Apr-2023**	27-Apr-2023	✓

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
EK026SF: Total CN by Segmented Flow Analyser							
Opaque plastic bottle - NaOH (EK026SF) Landfill leachate	**30-Mar-2023**	**----**	----	**----**	**03-Apr-2023**	13-Apr-2023	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) Landfill leachate	**30-Mar-2023**	**----**	----	**----**	**05-Apr-2023**	27-Apr-2023	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) Landfill leachate	**30-Mar-2023**	**----**	----	**----**	**31-Mar-2023**	01-Apr-2023	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) Landfill leachate	**30-Mar-2023**	**----**	----	**----**	**05-Apr-2023**	27-Apr-2023	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) Landfill leachate	**30-Mar-2023**	**03-Apr-2023**	27-Apr-2023	✓	**04-Apr-2023**	27-Apr-2023	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) Landfill leachate	**30-Mar-2023**	**03-Apr-2023**	27-Apr-2023	✓	**04-Apr-2023**	27-Apr-2023	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) Landfill leachate	**30-Mar-2023**	**----**	----	**----**	**31-Mar-2023**	01-Apr-2023	✓
EK085M: Sulfide as S2-							
Clear Plastic Bottle - Zinc Acetate/NaOH (EK085) Landfill leachate	**30-Mar-2023**	**----**	----	**----**	**05-Apr-2023**	06-Apr-2023	✓
EK086: Sulfite as SO3 2-							
Clear Plastic Bottle - EDTA/Zinc Acetate (EK086) Landfill leachate	**30-Mar-2023**	**----**	----	**----**	**03-Apr-2023**	01-Apr-2023	×
EK087: Thiosulfate as S2O3 2-							
Clear Plastic Bottle - EDTA/Zinc Acetate (EK087) Landfill leachate	**30-Mar-2023**	**----**	----	**----**	**03-Apr-2023**	01-Apr-2023	×
EP002: Dissolved Organic Carbon (DOC)							
Amber DOC Filtered- Sulfuric Preserved (EP002) Landfill leachate	**30-Mar-2023**	**----**	----	**----**	**11-Apr-2023**	27-Apr-2023	✓
EP010: Formaldehyde							
Clear Plastic Bottle - Natural (EP010) Landfill leachate	**30-Mar-2023**	**----**	----	**----**	**30-Mar-2023**	01-Apr-2023	✓
EP020: Oil and Grease (O&G)							
Amber Jar - Sulfuric Acid or Sodium Bisulfate (EP020) Landfill leachate	**30-Mar-2023**	**----**	----	**----**	**05-Apr-2023**	27-Apr-2023	✓

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
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030)							
Landfill leachate	**30-Mar-2023**	**----**	----	**----**	**31-Mar-2023**	01-Apr-2023	✓
EP050: Anionic Surfactants as MBAS							
Pres. with Formaldehyde on receipt (EP050)							
Landfill leachate	**30-Mar-2023**	**----**	----	**----**	**01-Apr-2023**	03-Apr-2023	✓
EP066: Polychlorinated Biphenyls (PCB)							
Amber Glass Bottle - Unpreserved (EP066)							
Landfill leachate	**30-Mar-2023**	**31-Mar-2023**	06-Apr-2023	✓	**03-Apr-2023**	10-May-2023	✓
EP068A: Organochlorine Pesticides (OC)							
Amber Glass Bottle - Unpreserved (EP068)							
Landfill leachate	**30-Mar-2023**	**31-Mar-2023**	06-Apr-2023	✓	**01-Apr-2023**	10-May-2023	✓
EP068B: Organophosphorus Pesticides (OP)							
Amber Glass Bottle - Unpreserved (EP068)							
Landfill leachate	**30-Mar-2023**	**31-Mar-2023**	06-Apr-2023	✓	**01-Apr-2023**	10-May-2023	✓
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071-SVSG)							
Landfill leachate	**30-Mar-2023**	**31-Mar-2023**	06-Apr-2023	✓	**05-Apr-2023**	10-May-2023	✓
EP071 SG: Total Petroleum Hydrocarbons - SV Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071-SVSG)							
Landfill leachate	**30-Mar-2023**	**31-Mar-2023**	06-Apr-2023	✓	**05-Apr-2023**	10-May-2023	✓
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071-SVSG)							
Landfill leachate	**30-Mar-2023**	**31-Mar-2023**	06-Apr-2023	✓	**05-Apr-2023**	10-May-2023	✓
EP071 SG: Total Recoverable Hydrocarbons - SV NEPM 2013 Fractions - Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071-SVSG)							
Landfill leachate	**30-Mar-2023**	**31-Mar-2023**	06-Apr-2023	✓	**05-Apr-2023**	10-May-2023	✓
EP074B: Oxygenated Compounds							
Amber VOC Vial - Sulfuric Acid (EP074)							
Landfill leachate	**30-Mar-2023**	**05-Apr-2023**	13-Apr-2023	✓	**05-Apr-2023**	13-Apr-2023	✓
EP074D: Fumigants							
Amber VOC Vial - Sulfuric Acid (EP074)							
Landfill leachate	**30-Mar-2023**	**05-Apr-2023**	13-Apr-2023	✓	**05-Apr-2023**	13-Apr-2023	✓
EP074E: Halogenated Aliphatic Compounds							
Amber VOC Vial - Sulfuric Acid (EP074)							
Landfill leachate	**30-Mar-2023**	**05-Apr-2023**	13-Apr-2023	✓	**05-Apr-2023**	13-Apr-2023	✓
EP074F: Halogenated Aromatic Compounds							
Amber VOC Vial - Sulfuric Acid (EP074)							
Landfill leachate	**30-Mar-2023**	**05-Apr-2023**	13-Apr-2023	✓	**05-Apr-2023**	13-Apr-2023	✓

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
EP074G: Trihalomethanes							
Amber VOC Vial - Sulfuric Acid (EP074) Landfill leachate	**30-Mar-2023**	**05-Apr-2023**	13-Apr-2023	✓	**05-Apr-2023**	13-Apr-2023	✓
EP075A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**30-Mar-2023**	**31-Mar-2023**	06-Apr-2023	✓	**31-Mar-2023**	10-May-2023	✓
EP075B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**30-Mar-2023**	**31-Mar-2023**	06-Apr-2023	✓	**31-Mar-2023**	10-May-2023	✓
EP075C: Phthalate Esters							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**30-Mar-2023**	**31-Mar-2023**	06-Apr-2023	✓	**31-Mar-2023**	10-May-2023	✓
EP075D: Nitrosamines							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**30-Mar-2023**	**31-Mar-2023**	06-Apr-2023	✓	**31-Mar-2023**	10-May-2023	✓
EP075E: Nitroaromatics and Ketones							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**30-Mar-2023**	**31-Mar-2023**	06-Apr-2023	✓	**31-Mar-2023**	10-May-2023	✓
EP075F: Haloethers							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**30-Mar-2023**	**31-Mar-2023**	06-Apr-2023	✓	**31-Mar-2023**	10-May-2023	✓
EP075G: Chlorinated Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**30-Mar-2023**	**31-Mar-2023**	06-Apr-2023	✓	**31-Mar-2023**	10-May-2023	✓
EP075H: Anilines and Benzidines							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**30-Mar-2023**	**31-Mar-2023**	06-Apr-2023	✓	**31-Mar-2023**	10-May-2023	✓
EP075I: Organochlorine Pesticides							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**30-Mar-2023**	**31-Mar-2023**	06-Apr-2023	✓	**31-Mar-2023**	10-May-2023	✓
EP075J: Organophosphorus Pesticides							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**30-Mar-2023**	**31-Mar-2023**	06-Apr-2023	✓	**31-Mar-2023**	10-May-2023	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) Landfill leachate	**30-Mar-2023**	**31-Mar-2023**	06-Apr-2023	✓	**31-Mar-2023**	10-May-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080) Landfill leachate	**30-Mar-2023**	**05-Apr-2023**	13-Apr-2023	✓	**05-Apr-2023**	13-Apr-2023	✓

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) Landfill leachate	**30-Mar-2023**	**31-Mar-2023**	06-Apr-2023	✓	**31-Mar-2023**	10-May-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080) Landfill leachate	**30-Mar-2023**	**05-Apr-2023**	13-Apr-2023	✓	**05-Apr-2023**	13-Apr-2023	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) Landfill leachate	**30-Mar-2023**	**05-Apr-2023**	13-Apr-2023	✓	**05-Apr-2023**	13-Apr-2023	✓
EP202A: Phenoxyacetic Acid Herbicides by LCMS							
Amber Glass Bottle - Unpreserved (EP202-SL) Landfill leachate	**30-Mar-2023**	**----**	----	----	**03-Apr-2023**	06-Apr-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
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	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Anionic Surfactants as MBAS	EP050	2	9	**22.22**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	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
Dissolved Organic Carbon	EP002	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	1	1	**100.00**	**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	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	0	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202-SL	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	0	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	0	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfide as S2-	EK085	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfite as SO3 2-	EK086	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
Thiosulfate as S2O3 2-	EK087	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	2	18	**11.11**	**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	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	8	**12.50**	**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 Oxidised Sulfur as S	ED043S	1	5	**20.00**	**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	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	EP071-SVSG	0	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	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							
Ammonia as N by Discrete analyser	EK055G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Anionic Surfactants as MBAS	EP050	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	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
Dissolved Organic Carbon	EP002	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	1	1	**100.00**	**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	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Oil and Grease	EP020	4	47	**8.51**	**8.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202-SL	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfide as S2-	EK085	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfite as SO3 2-	EK086	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	40	**7.50**	**7.50**	✓	NEPM 2013 B3 & ALS QC Standard
Thiosulfate as S2O3 2-	EK087	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	3	40	**7.50**	**7.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	8	**12.50**	**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 Oxidised Sulfur as S	ED043S	1	5	**20.00**	**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	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	EP071-SVSG	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Anionic Surfactants as MBAS	EP050	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	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

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*	
Method Blanks (MB) - Continued							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Organic Carbon	EP002	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	1	1	**100.00**	**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	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Oil and Grease	EP020	3	47	**6.38**	**6.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202-SL	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfide as S2-	EK085	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfite as SO3 2-	EK086	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
Thiosulfate as S2O3 2-	EK087	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	18	**5.56**	**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	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	8	**12.50**	**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 Oxidised Sulfur as S	ED043S	1	5	**20.00**	**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	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	EP071-SVSG	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Anionic Surfactants as MBAS	EP050	1	9	**11.11**	**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
Dissolved Organic Carbon	EP002	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	0	1	**0.00**	**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*	
Matrix Spikes (MS) - Continued							
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202-SL	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfide as S2-	EK085	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	8	**12.50**	**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 Oxidised Sulfur as S	ED043S	1	5	**20.00**	**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	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	EP071-SVSG	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
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)
Total Oxidised Sulfur as S	ED043S	WATER	In house: The sample is treated with Peroxide to convert all Sulfur species to Sulfate. Sulfate in the sample can then be determined by ICPAES and reported as TOS as S.
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.

Analytical Methods	Method	Matrix	Method Descriptions
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).
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).
Total Cyanide by Segmented Flow Analyser	EK026SF	WATER	In house: Referenced to APHA 4500-CN C&O / ASTM D7511 / ISO 14403. Sodium hydroxide preserved samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM Schedule B(3)
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)

Analytical Methods	Method	Matrix	Method Descriptions
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)
Sulfide as S2-	EK085	WATER	In house: Referenced to APHA 4500-S2- D. Sulfide species present in water samples are immediately precipitated when collected in pretreated caustic/zinc acetate preserved sample containers. The sulphides are coloured using methylene blue indicator. Non-detects may be screened by comparison against a standard at half-LOR, otherwise samples are measured using UV-VIS detection at 664nm. This method is compliant with NEPM Schedule B(3)
Sulfite as SO3 2-	EK086	WATER	In house: Referenced to APHA 4500-SO32- B. Sulfite is determined by standardised Iodate / Iodide titration.
Thiosulfate as S2O3 2-	EK087	WATER	In house: Thiosulfate is determined by standardised Iodate / Iodide titration following formaledyde pretreatment.
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Dissolved Organic Carbon	EP002	WATER	In house: Referenced to APHA 5310 B. This method is compliant with NEPM Schedule B(3). Samples are combusted at high temperature in the presence of an oxidative catalyst. The evolved carbon dioxide is quantified using an IR detector.
Formaldehyde	EP010	WATER	In house: Referenced to ASTM D 6303-98. s
Oil and Grease	EP020	WATER	In house: Referenced to APHA 5520 B. Oil & grease is a gravimetric procedure to determine the amount of dissolved or emulsified oil & grease residue in an aqueous sample. The sample is serially extracted three times n-hexane. The resultant extracts are combined, dehydrated and concentrated prior to gravimetric determination. This method is compliant with NEPM Schedule B(3)
Biochemical Oxygen Demand (BOD)	EP030	WATER	In house: Referenced to APHA 5210 B. The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. This method is compliant with NEPM Schedule B(3).
Anionic Surfactants as MBAS	EP050	WATER	In house: Referenced to APHA 5540 B&C. This method comprises three successive extractions from acid aqueous medium containing excess methylene blue, into chloroform, followed by an aqueous backwash and measurement of the colour by spectrophotometry at 652nm. This method is compliant with NEPM Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
Pesticides by GCMS	EP068	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. 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 - Semivolatile Fractions Only (after Silica Gel Cleanup)	EP071-SVSG	WATER	In house: Referenced to USEPA SW 846 - 8015 Sample extracts cleaned up using silica gel and are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Volatile Organic Compounds	EP074	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. This method is compliant with NEPM Schedule B(3)
Semivolatile Organic Compounds	EP075	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS 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)
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202-SL	WATER	In house: LCMS (Electrospray in negative mode). After adding surrogate and acetic acid, water samples are injected on a C18 column for LC/MS determination.

Preparation Methods	Method	Matrix	Method Descriptions
Total Oxidisable Sulfur as SO4 2- Prep	ED043-PR	WATER	In house
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.

QUALITY CONTROL REPORT

Work Order	: **EM2305738**	Page	: 1 of 10
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Gregory Gommers
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61-3-8549 9600
Project	: 12564388	Date Samples Received	: 31-Mar-2023
Order number	: 12564388	Date Analysis Commenced	: 31-Mar-2023
C-O-C number	: ----	Issue Date	: 13-Apr-2023
Sampler	: MIGUEL BENAVIDES		
Site	: ----		
Quote number	: ME/770/21		
No. of samples received	: 3		
No. of samples analysed	: 3		

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
Arenie Vijayaratnam	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Tahlia Freeman	Instrument Operator	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

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 (%)*
ED009: Anions (QC Lot: 4976210)									
EM2305738-001	B2	ED009-X: Bromide	24959-67-9	0.01	mg/L	0.419	0.409	2.4	0% - 20%
		ED009-X: Iodide	20461-54-5	0.01	mg/L	0.143	0.140	2.1	0% - 50%
ES2311061-007	Anonymous	ED009-X: Bromide	24959-67-9	0.01	mg/L	0.352	0.355	0.8	0% - 20%
		ED009-X: Iodide	20461-54-5	0.01	mg/L	<0.050	<0.050	0.0	No Limit
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 4970906)									
EM2305594-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	9750	10000	3.1	0% - 20%
EM2305608-004	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1600	1580	0.7	0% - 20%
EM2305730-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1480	1450	2.2	0% - 20%
EM2305739-005	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	24300	25500	4.7	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4971562)									
EM2305684-022	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	361	363	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	361	363	0.5	0% - 20%
EM2305720-003	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	3	2	68.0	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	3	2	68.0	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4967210)									
EM2305719-023	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<20	<20	0.0	No Limit
EM2305738-001	B2	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	38	38	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4967209)									
EM2305719-023	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	336	336	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: 4967209) - continued									
EM2305738-001	B2	ED045G: Chloride	16887-00-6	1	mg/L	365	365	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4985092)									
EM2305738-002	B4	ED093F: Calcium	7440-70-2	1	mg/L	165	163	1.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	7	7	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	62	62	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EM2305799-005	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	25	25	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	79	79	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	928	928	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	28	28	0.0	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 4985091)									
EM2305738-001	B2	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	1.41	1.41	0.6	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.012	0.012	0.0	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.011	0.011	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	4.49	4.50	0.0	0% - 20%
EM2305799-005	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	0.004	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	0.002	0.002	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.012	0.012	0.0	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	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: 4976027)									
EM2305499-001	Anonymous	EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EM2305738-003	B11	EG020A-T: Iron	7439-89-6	0.05	mg/L	84.6	83.5	1.4	0% - 20%
EG035F: Dissolved Mercury by FIMS (QC Lot: 4985093)									
EM2305738-001	B2	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EM2305799-005	Anonymous	EG035F: 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: 4971548)									
EM2305746-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	41.5	43.9	5.5	0% - 20%
EM2305666-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.79	0.75	5.3	0% - 20%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4967208)									

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: 4967208) - continued									
EM2305719-015	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM2305719-027	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.04	0.04	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4971549)									
EM2305666-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.33	0.33	0.0	0% - 20%
EM2305746-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	4.12	4.14	0.4	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 4968347)									
EM2305666-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.8	1.8	0.0	0% - 50%
EM2305738-002	B4	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.3	0.3	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 4968346)									
EM2305666-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.38	0.42	8.8	0% - 20%
EM2305738-002	B4	EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	0.03	105	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4967204)									
EM2305576-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.07	0.07	0.0	No Limit
EP002: Dissolved Organic Carbon (DOC) (QC Lot: 4982362)									
EM2305738-001	B2	EP002: Dissolved Organic Carbon	----	1	mg/L	14	11	23.6	0% - 50%
EM2305903-007	Anonymous	EP002: Dissolved Organic Carbon	----	1	mg/L	7	7	0.0	No Limit
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 4967351)									
EM2305719-008	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	<2	0.0	No Limit
EM2305738-003	B11	EP030: Biochemical Oxygen Demand	----	2	mg/L	3	3	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4968266)									
EM2305723-001	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	1320	1320	0.0	0% - 50%
		EP071: C10 - C14 Fraction	----	50	µg/L	470	440	6.8	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	200	200	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4974612)									
EM2305736-024	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EB2309670-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	250	250	0.0	0% - 50%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4974622)									
EM2305738-002	B4	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EM2305799-008	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4968266)									
EM2305723-001	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	640	610	4.9	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	1310	1310	0.0	0% - 50%
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4974612)									
EM2305736-024	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EB2309670-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	290	280	0.0	0% - 50%
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4974622)									
EM2305738-002	B4	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	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 Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4974622) - continued									
EM2305799-008	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 4974612)									
EM2305736-024	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
EB2309670-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	36	36	0.0	0% - 50%
		EP080: Ethylbenzene	100-41-4	2	µg/L	17	17	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	36	36	0.0	0% - 50%
		EP080: ortho-Xylene	95-47-6	2	µg/L	63	63	0.0	0% - 20%
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
EP080: BTEXN (QC Lot: 4974622)									
EM2305738-002	B4	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	12	11	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
EM2305799-008	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
ED009: Anions (QCLot: 4976210)								
ED009-X: Bromide	24959-67-9	0.01	mg/L	<0.010	2 mg/L	102	93.0	109
ED009-X: Iodide	20461-54-5	0.01	mg/L	<0.010	0.5 mg/L	90.8	79.0	123
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 4970906)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	98.8	91.0	110
				<10	2440 mg/L	103	81.6	118
				<10	293 mg/L	104	91.0	110
ED037P: Alkalinity by PC Titrator (QCLot: 4971562)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	97.5	85.0	116
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4967210)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	106	90.0	110
				<1	500 mg/L	105	90.0	110
ED045G: Chloride by Discrete Analyser (QCLot: 4967209)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	103	90.0	110
				<1	1000 mg/L	101	90.0	110
ED093F: Dissolved Major Cations (QCLot: 4985092)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	80.0	120
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.4	80.0	120
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	103	80.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.7	80.0	120
EG020F: Dissolved Metals by ICP-MS (QCLot: 4985091)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	102	89.0	111
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.1	83.2	109
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	100	83.1	107
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	99.5	84.6	108
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	98.2	84.8	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	100.0	84.3	110
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	104	82.3	113
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	101	86.3	112
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	93.2	91.8	112
EG020T: Total Metals by ICP-MS (QCLot: 4976027)								

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: 4976027) - continued								
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	100	92.8	118
EG035F: Dissolved Mercury by FIMS (QCLot: 4985093)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	115	71.6	116
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4971548)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	95.5	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4967208)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	104	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4971549)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	101	90.0	110
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4968347)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	90.2	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4968346)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	88.4	71.9	114
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4967204)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	102	90.0	110
EP002: Dissolved Organic Carbon (DOC) (QCLot: 4982362)								
EP002: Dissolved Organic Carbon	----	1	mg/L	<1	100 mg/L	105	83.0	115
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 4967351)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	198 mg/L	85.6	79.5	122
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4968266)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	4460 µg/L	92.3	47.2	122
EP071: C15 - C28 Fraction	----	100	µg/L	<100	14300 µg/L	97.8	52.9	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	7300 µg/L	105	50.4	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4974612)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	100	66.2	134
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4974622)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	93.3	66.2	134
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4968266)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	6090 µg/L	89.5	49.1	125
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	19400 µg/L	99.9	51.6	128
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1300 µg/L	92.5	47.2	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4974612)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	98.1	66.2	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4974622)								

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: 4974622) - continued								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	93.7	66.2	132
EP080: BTEXN (QCLot: 4974612)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	98.0	68.8	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	103	72.9	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	102	71.7	130
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	107	72.3	136
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	112	75.9	134
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	100	68.3	131
EP080: BTEXN (QCLot: 4974622)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	99.4	68.8	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	97.1	72.9	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	98.6	71.7	130
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	97.8	72.3	136
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	101	75.9	134
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	102	68.3	131

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
ED009: Anions (QCLot: 4976210)							
EM2305738-001	B2	ED009-X: Bromide	24959-67-9	0.2 mg/L	87.5	70.0	130
		ED009-X: Iodide	20461-54-5	0.2 mg/L	72.0	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4967210)							
EM2305719-024	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	93.4	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4967209)							
EM2305719-024	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	75.5	70.0	142
EG020F: Dissolved Metals by ICP-MS (QCLot: 4985091)							
EM2305738-001	B2	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	87.1	76.6	124
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	80.8	71.0	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	87.3	76.0	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: 4985091) - continued							
EM2305738-001	B2	EG020A-F: Lead	7439-92-1	0.2 mg/L	82.8	75.0	133
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	# Not Determined	64.0	134
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	85.4	73.0	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	88.8	75.0	131
EG035F: Dissolved Mercury by FIMS (QCLot: 4985093)							
EM2305738-002	B4	EG035F: Mercury	7439-97-6	0.01 mg/L	110	70.0	120
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4971548)							
EM2305666-002	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	120	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4967208)							
EM2305719-016	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	85.2	80.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4971549)							
EM2305666-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	83.8	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4968347)							
EM2305666-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	91.9	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4968346)							
EM2305666-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	93.2	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4967204)							
EM2305576-002	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	89.8	79.0	123
EP002: Dissolved Organic Carbon (DOC) (QCLot: 4982362)							
EM2305738-002	B4	EP002: Dissolved Organic Carbon	----	100 mg/L	105	75.0	117
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4974612)							
EB2309670-002	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	60.6	33.9	126
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4974622)							
EM2305738-003	B11	EP080: C6 - C9 Fraction	----	280 µg/L	69.6	33.9	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4974612)							
EB2309670-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	56.8	34.0	122
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4974622)							
EM2305738-003	B11	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	61.7	34.0	122
EP080: BTEXN (QCLot: 4974612)							
EB2309670-002	Anonymous	EP080: Benzene	71-43-2	20 µg/L	76.2	56.3	133
		EP080: Toluene	108-88-3	20 µg/L	79.1	60.4	132
EP080: BTEXN (QCLot: 4974622)							
EM2305738-003	B11	EP080: Benzene	71-43-2	20 µg/L	90.2	56.3	133

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: 4974622) - continued							
EM2305738-003	B11	EP080: Toluene	108-88-3	20 µg/L	89.7	60.4	132

CERTIFICATE OF ANALYSIS

Work Order	: **EM2305738**	Page	: 1 of 6
Amendment	: **1**		
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Gregory Gommers
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61-3-8549 9600
Project	: 12564388	Date Samples Received	: 31-Mar-2023 11:35
Order number	: 12564388	Date Analysis Commenced	: 31-Mar-2023
C-O-C number	: ----	Issue Date	: 14-Apr-2023 17:39
Sampler	: MIGUEL BENAVIDES		
Site	: ----		
Quote number	: ME/770/21		
No. of samples received	: 3		
No. of samples analysed	: 3		

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
Arenie Vijayaratnam	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Tahlia Freeman	Instrument Operator	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

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.

- ED009x: LOR raised for Iodide due to sample matrix.
- ED093F: EM2305738 #3, the results for dissolved major cations have been confirmed by re-preparation and re-analysis.
- 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 is recognised that TKN is less than Ammonia as N for sample 1. However, the difference is within experimental variation of the methods.
- It is recognised that total iron is less than dissolved iron for samples #1. However, the difference is within experimental variation of the methods.
- EK057G: EM2305738 #3 Sample required dilution for Nitrite as N due to sample matrix. LOR has been raised accordingly.
- EA015H: EM2305738 #2-3 TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- Ionic Balance out of acceptable limits for sample #3 due to analytes not quantified in this report.
- EP030: The DO depletion for sample EM2305738-#1 is less than 2mg/L, this indicates that the sample has been over diluted and the BOD is less than 8mg/L. The BOD result reported was estimated from the lowest dilution.
- Amendment (14/4/23):This report has been amended to report Cd-EG020F on samples 1-3
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium, sodium and iron for sample #1-3.
- 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.
- 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.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)			Sample ID	B2	B4	B11	----	----
			Sampling date / time	29-Mar-2023 00:00	29-Mar-2023 00:00	29-Mar-2023 00:00	----	----
Compound	CAS Number	LOR	Unit	EM2305738-001	EM2305738-002	EM2305738-003	--------	--------
				Result	Result	Result	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	**1020**	**986**	**557**	----	----
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	**314**	**269**	**2**	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**314**	**269**	**2**	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**38**	**14**	**1**	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**365**	**238**	**274**	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**120**	**165**	**2**	----	----
Magnesium	7439-95-4	1	mg/L	**9**	**7**	**12**	----	----
Sodium	7440-23-5	1	mg/L	**175**	**62**	**70**	----	----
Potassium	7440-09-7	1	mg/L	**35**	<1	**2**	----	----
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	**0.003**	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	**0.002**	----	----
Manganese	7439-96-5	0.001	mg/L	**1.41**	**0.237**	**0.119**	----	----
Nickel	7440-02-0	0.001	mg/L	**0.012**	**0.004**	**0.020**	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	----	----
Zinc	7440-66-6	0.005	mg/L	**0.011**	**0.007**	**0.811**	----	----
Iron	7439-89-6	0.05	mg/L	**4.49**	**8.35**	**84.4**	----	----
EG020T: Total Metals by ICP-MS								
Iron	7439-89-6	0.05	mg/L	**4.47**	**8.94**	**84.6**	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**16.5**	**0.09**	**0.02**	----	----
EK057G: Nitrite as N by Discrete Analyser								

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	B2	B4	B11	----	----
				Sampling date / time	29-Mar-2023 00:00	29-Mar-2023 00:00	29-Mar-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		EM2305738-001	EM2305738-002	EM2305738-003	--------	--------
					Result	Result	Result	----	----
EK057G: Nitrite as N by Discrete Analyser - Continued									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.02	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.01**	<0.01	<0.02	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.01**	<0.01	<0.01	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**16.2**	**0.3**	**0.5**	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**16.2**	**0.3**	**0.5**	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**0.03**	<0.01	**0.02**	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	<0.01	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**17.4**	**12.4**	**7.79**	----	----
ø Total Cations	----	0.01	meq/L		**15.5**	**12.0**	**8.73**	----	----
ø Ionic Balance	----	0.01	%		**5.75**	**1.77**	**5.68**	----	----
EP002: Dissolved Organic Carbon (DOC)									
Dissolved Organic Carbon	----	1	mg/L		**14**	**2**	**2**	----	----
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L		<8	<2	**3**	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		**30**	<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		**30**	<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	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	B2	B4	B11	----	----
				Sampling date / time	29-Mar-2023 00:00	29-Mar-2023 00:00	29-Mar-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		EM2305738-001	EM2305738-002	EM2305738-003	--------	--------
					Result	Result	Result	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>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	----	----
Toluene	108-88-3	2	µg/L		**16**	**12**	**10**	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	----	----
^ Total Xylenes	----	2	µg/L		<2	<2	<2	----	----
^ Sum of BTEX	----	1	µg/L		**16**	**12**	**10**	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	----	----
ED009: Anions									
Bromide	24959-67-9	0.010	mg/L		**0.419**	**0.208**	**0.331**	----	----
Iodide	20461-54-5	0.010	mg/L		**0.143**	<0.050	**0.112**	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**101**	**105**	**103**	----	----
Toluene-D8	2037-26-5	2	%		**111**	**96.7**	**92.5**	----	----
4-Bromofluorobenzene	460-00-4	2	%		**110**	**96.2**	**95.4**	----	----

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	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) ED009: Anions

QUALITY CONTROL REPORT

Work Order	: **EM2305738**	Page	: 1 of 10
Amendment	: **1**		
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Gregory Gommers
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61-3-8549 9600
Project	: 12564388	Date Samples Received	: 31-Mar-2023
Order number	: 12564388	Date Analysis Commenced	: 31-Mar-2023
C-O-C number	: ----	Issue Date	: 14-Apr-2023
Sampler	: MIGUEL BENAVIDES		
Site	: ----		
Quote number	: ME/770/21		
No. of samples received	: 3		
No. of samples analysed	: 3		

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
Arenie Vijayaratnam	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Tahlia Freeman	Instrument Operator	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

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 (%)*
ED009: Anions (QC Lot: 4976210)									
EM2305738-001	B2	ED009-X: Bromide	24959-67-9	0.01	mg/L	0.419	0.409	2.4	0% - 20%
		ED009-X: Iodide	20461-54-5	0.01	mg/L	0.143	0.140	2.1	0% - 50%
ES2311061-007	Anonymous	ED009-X: Bromide	24959-67-9	0.01	mg/L	0.352	0.355	0.8	0% - 20%
		ED009-X: Iodide	20461-54-5	0.01	mg/L	<0.050	<0.050	0.0	No Limit
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 4970906)									
EM2305594-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	9750	10000	3.1	0% - 20%
EM2305608-004	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1600	1580	0.7	0% - 20%
EM2305730-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1480	1450	2.2	0% - 20%
EM2305739-005	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	24300	25500	4.7	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4971562)									
EM2305684-022	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	361	363	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	361	363	0.5	0% - 20%
EM2305720-003	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	3	2	68.0	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	3	2	68.0	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4967210)									
EM2305719-023	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<20	<20	0.0	No Limit
EM2305738-001	B2	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	38	38	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4967209)									
EM2305719-023	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	336	336	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: 4967209) - continued									
EM2305738-001	B2	ED045G: Chloride	16887-00-6	1	mg/L	365	365	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4985092)									
EM2305738-002	B4	ED093F: Calcium	7440-70-2	1	mg/L	165	163	1.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	7	7	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	62	62	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EM2305799-005	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	25	25	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	79	79	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	928	928	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	28	28	0.0	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 4985091)									
EM2305738-001	B2	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	1.41	1.41	0.6	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.012	0.012	0.0	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.011	0.011	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	4.49	4.50	0.0	0% - 20%
EM2305799-005	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	0.002	0.002	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.012	0.012	0.0	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	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: 4976027)									
EM2305499-001	Anonymous	EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EM2305738-003	B11	EG020A-T: Iron	7439-89-6	0.05	mg/L	84.6	83.5	1.4	0% - 20%
EG035F: Dissolved Mercury by FIMS (QC Lot: 4985093)									
EM2305738-001	B2	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EM2305799-005	Anonymous	EG035F: 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: 4971548)									
EM2305746-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	41.5	43.9	5.5	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 (%)*
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 4971548) - continued									
EM2305666-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.79	0.75	5.3	0% - 20%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4967208)									
EM2305719-015	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM2305719-027	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.04	0.04	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4971549)									
EM2305666-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.33	0.33	0.0	0% - 20%
EM2305746-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	4.12	4.14	0.4	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 4968347)									
EM2305666-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.8	1.8	0.0	0% - 50%
EM2305738-002	B4	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.3	0.3	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 4968346)									
EM2305666-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.38	0.42	8.8	0% - 20%
EM2305738-002	B4	EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	0.03	105	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4967204)									
EM2305576-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.07	0.07	0.0	No Limit
EP002: Dissolved Organic Carbon (DOC) (QC Lot: 4982362)									
EM2305738-001	B2	EP002: Dissolved Organic Carbon	----	1	mg/L	14	11	23.6	0% - 50%
EM2305903-007	Anonymous	EP002: Dissolved Organic Carbon	----	1	mg/L	7	7	0.0	No Limit
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 4967351)									
EM2305719-008	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	<2	0.0	No Limit
EM2305738-003	B11	EP030: Biochemical Oxygen Demand	----	2	mg/L	3	3	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4968266)									
EM2305723-001	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	1320	1320	0.0	0% - 50%
		EP071: C10 - C14 Fraction	----	50	µg/L	470	440	6.8	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	200	200	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4974612)									
EM2305736-024	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EB2309670-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	250	250	0.0	0% - 50%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4974622)									
EM2305738-002	B4	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EM2305799-008	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4968266)									
EM2305723-001	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	640	610	4.9	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	1310	1310	0.0	0% - 50%
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4974612)									
EM2305736-024	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EB2309670-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	290	280	0.0	0% - 50%

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 Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4974622)									
EM2305738-002	B4	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EM2305799-008	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 4974612)									
EM2305736-024	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
EB2309670-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	36	36	0.0	0% - 50%
		EP080: Ethylbenzene	100-41-4	2	µg/L	17	17	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	36	36	0.0	0% - 50%
		EP080: ortho-Xylene	95-47-6	2	µg/L	63	63	0.0	0% - 20%
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
EP080: BTEXN (QC Lot: 4974622)									
EM2305738-002	B4	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	12	11	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
EM2305799-008	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
ED009: Anions (QCLot: 4976210)								
ED009-X: Bromide	24959-67-9	0.01	mg/L	<0.010	2 mg/L	102	93.0	109
ED009-X: Iodide	20461-54-5	0.01	mg/L	<0.010	0.5 mg/L	90.8	79.0	123
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 4970906)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	98.8	91.0	110
				<10	2440 mg/L	103	81.6	118
				<10	293 mg/L	104	91.0	110
ED037P: Alkalinity by PC Titrator (QCLot: 4971562)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	97.5	85.0	116
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4967210)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	106	90.0	110
				<1	500 mg/L	105	90.0	110
ED045G: Chloride by Discrete Analyser (QCLot: 4967209)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	103	90.0	110
				<1	1000 mg/L	101	90.0	110
ED093F: Dissolved Major Cations (QCLot: 4985092)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	80.0	120
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.4	80.0	120
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	103	80.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.7	80.0	120
EG020F: Dissolved Metals by ICP-MS (QCLot: 4985091)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	102	89.0	111
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	106	83.5	111
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.1	83.2	109
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	100	83.1	107
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	99.5	84.6	108
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	98.2	84.8	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	100.0	84.3	110
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	104	82.3	113
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	101	86.3	112
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	93.2	91.8	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: 4976027)								
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	100	92.8	118
EG035F: Dissolved Mercury by FIMS (QCLot: 4985093)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	115	71.6	116
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4971548)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	95.5	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4967208)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	104	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4971549)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	101	90.0	110
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4968347)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	90.2	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4968346)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	88.4	71.9	114
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4967204)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	102	90.0	110
EP002: Dissolved Organic Carbon (DOC) (QCLot: 4982362)								
EP002: Dissolved Organic Carbon	----	1	mg/L	<1	100 mg/L	105	83.0	115
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 4967351)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	198 mg/L	85.6	79.5	122
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4968266)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	4460 µg/L	92.3	47.2	122
EP071: C15 - C28 Fraction	----	100	µg/L	<100	14300 µg/L	97.8	52.9	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	7300 µg/L	105	50.4	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4974612)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	100	66.2	134
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4974622)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	93.3	66.2	134
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4968266)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	6090 µg/L	89.5	49.1	125
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	19400 µg/L	99.9	51.6	128
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1300 µg/L	92.5	47.2	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4974612)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	98.1	66.2	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4974622)								

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: 4974622) - continued								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	93.7	66.2	132
EP080: BTEXN (QCLot: 4974612)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	98.0	68.8	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	103	72.9	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	102	71.7	130
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	107	72.3	136
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	112	75.9	134
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	100	68.3	131
EP080: BTEXN (QCLot: 4974622)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	99.4	68.8	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	97.1	72.9	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	98.6	71.7	130
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	97.8	72.3	136
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	101	75.9	134
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	102	68.3	131

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
ED009: Anions (QCLot: 4976210)							
EM2305738-001	B2	ED009-X: Bromide	24959-67-9	0.2 mg/L	87.5	70.0	130
		ED009-X: Iodide	20461-54-5	0.2 mg/L	72.0	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4967210)							
EM2305719-024	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	93.4	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4967209)							
EM2305719-024	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	75.5	70.0	142
EG020F: Dissolved Metals by ICP-MS (QCLot: 4985091)							
EM2305738-001	B2	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	87.1	76.6	124
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	91.8	74.6	118
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	80.8	71.0	135

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: 4985091) - continued							
EM2305738-001	B2	EG020A-F: Copper	7440-50-8	0.2 mg/L	87.3	76.0	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	82.8	75.0	133
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	# Not Determined	64.0	134
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	85.4	73.0	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	88.8	75.0	131
EG035F: Dissolved Mercury by FIMS (QCLot: 4985093)							
EM2305738-002	B4	EG035F: Mercury	7439-97-6	0.01 mg/L	110	70.0	120
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4971548)							
EM2305666-002	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	120	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4967208)							
EM2305719-016	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	85.2	80.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4971549)							
EM2305666-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	83.8	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4968347)							
EM2305666-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	91.9	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4968346)							
EM2305666-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	93.2	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4967204)							
EM2305576-002	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	89.8	79.0	123
EP002: Dissolved Organic Carbon (DOC) (QCLot: 4982362)							
EM2305738-002	B4	EP002: Dissolved Organic Carbon	----	100 mg/L	105	75.0	117
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4974612)							
EB2309670-002	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	60.6	33.9	126
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4974622)							
EM2305738-003	B11	EP080: C6 - C9 Fraction	----	280 µg/L	69.6	33.9	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4974612)							
EB2309670-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	56.8	34.0	122
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4974622)							
EM2305738-003	B11	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	61.7	34.0	122
EP080: BTEXN (QCLot: 4974612)							
EB2309670-002	Anonymous	EP080: Benzene	71-43-2	20 µg/L	76.2	56.3	133
		EP080: Toluene	108-88-3	20 µg/L	79.1	60.4	132
EP080: BTEXN (QCLot: 4974622)							

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: 4974622) - continued							
EM2305738-003	B11	EP080: Benzene	71-43-2	20 µg/L	90.2	56.3	133
		EP080: Toluene	108-88-3	20 µg/L	89.7	60.4	132

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2305738**	Page	: 1 of 9
Amendment	: **1**		
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Telephone	: +61-3-8549 9600
Project	: 12564388	Date Samples Received	: 31-Mar-2023
Site	: ----	Issue Date	: 14-Apr-2023
Sampler	: MIGUEL BENAVIDES	No. of samples received	: 3
Order number	: 12564388	No. of samples analysed	: 3

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, 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							
EG020F: Dissolved Metals by ICP-MS	EM2305738--001	B2	**Manganese**	7439-96-5	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
Method	QC	Regular	Actual	Expected	
	1				
Laboratory Duplicates (DUP)					
TRH - Semivolatile Fraction	1	16	6.25	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Total Metals by ICP-MS - Suite A	0	7	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	16	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)							
B2, B4, B11	**29-Mar-2023**	**----**	----	**----**	**04-Apr-2023**	05-Apr-2023	✓
ED009: Anions							
Clear Plastic Bottle - Natural (ED009-X)							
B2, B4, B11	**29-Mar-2023**	**----**	----	**----**	**06-Apr-2023**	26-Apr-2023	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
B2, B4, B11	**29-Mar-2023**	**----**	----	**----**	**06-Apr-2023**	12-Apr-2023	✓

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) B2, B4, B11	**29-Mar-2023**	----	----	----	**03-Apr-2023**	26-Apr-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) B2, B4, B11	**29-Mar-2023**	----	----	----	**03-Apr-2023**	26-Apr-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F) B2, B4, B11	**29-Mar-2023**	----	----	----	**12-Apr-2023**	26-Apr-2023	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F) B2, B4, B11	**29-Mar-2023**	----	----	----	**12-Apr-2023**	25-Sep-2023	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) B2, B4, B11	**29-Mar-2023**	**05-Apr-2023**	25-Sep-2023	✓	**05-Apr-2023**	25-Sep-2023	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F) B2, B4, B11	**29-Mar-2023**	----	----	----	**13-Apr-2023**	26-Apr-2023	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) B2, B4, B11	**29-Mar-2023**	----	----	----	**04-Apr-2023**	26-Apr-2023	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) B2, B4, B11	**29-Mar-2023**	----	----	----	**31-Mar-2023**	31-Mar-2023	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) B2, B4, B11	**29-Mar-2023**	----	----	----	**04-Apr-2023**	26-Apr-2023	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) B2, B4, B11	**29-Mar-2023**	**04-Apr-2023**	26-Apr-2023	✓	**04-Apr-2023**	26-Apr-2023	✓

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
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) B2, B4, B11	**29-Mar-2023**	**04-Apr-2023**	26-Apr-2023	✓	**04-Apr-2023**	26-Apr-2023	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) B2, B4, B11	**29-Mar-2023**	**----**	----	----	**31-Mar-2023**	31-Mar-2023	✓
EP002: Dissolved Organic Carbon (DOC)							
Amber DOC Filtered- Sulfuric Preserved (EP002) B2, B4, B11	**29-Mar-2023**	**----**	----	----	**11-Apr-2023**	26-Apr-2023	✓
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030) B2, B4, B11	**29-Mar-2023**	**----**	----	----	**31-Mar-2023**	31-Mar-2023	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) B2, B4, B11	**29-Mar-2023**	**03-Apr-2023**	05-Apr-2023	✓	**04-Apr-2023**	13-May-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080) B4, B11	**29-Mar-2023**	**05-Apr-2023**	12-Apr-2023	✓	**06-Apr-2023**	12-Apr-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080) B2	**29-Mar-2023**	**05-Apr-2023**	12-Apr-2023	✓	**11-Apr-2023**	12-Apr-2023	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) B2, B4, B11	**29-Mar-2023**	**03-Apr-2023**	05-Apr-2023	✓	**04-Apr-2023**	13-May-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080) B4, B11	**29-Mar-2023**	**05-Apr-2023**	12-Apr-2023	✓	**06-Apr-2023**	12-Apr-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080) B2	**29-Mar-2023**	**05-Apr-2023**	12-Apr-2023	✓	**11-Apr-2023**	12-Apr-2023	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) B4, B11	**29-Mar-2023**	**05-Apr-2023**	12-Apr-2023	✓	**06-Apr-2023**	12-Apr-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080) B2	**29-Mar-2023**	**05-Apr-2023**	12-Apr-2023	✓	**11-Apr-2023**	12-Apr-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
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	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	12	**16.67**	**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
Dissolved Organic Carbon	EP002	2	11	**18.18**	**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	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	17	**11.76**	**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
Standard Anions -by IC (Extended Method)	ED009-X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	12	**16.67**	**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 Metals by ICP-MS - Suite A	EG020A-T	2	7	**28.57**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	16	**6.25**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	12	**16.67**	**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
Dissolved Organic Carbon	EP002	1	11	**9.09**	**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	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	17	**5.88**	**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
Standard Anions -by IC (Extended Method)	ED009-X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	3	40	**7.50**	**7.50**	✓	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 Metals by ICP-MS - Suite A	EG020A-T	1	7	**14.29**	**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	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	12	**8.33**	**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
Dissolved Organic Carbon	EP002	1	11	**9.09**	**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	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	17	**5.88**	**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
Standard Anions -by IC (Extended Method)	ED009-X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	12	**8.33**	**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 Metals by ICP-MS - Suite A	EG020A-T	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	12	**8.33**	**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
Dissolved Organic Carbon	EP002	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	17	**5.88**	**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
Standard Anions -by IC (Extended Method)	ED009-X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	12	**8.33**	**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 Metals by ICP-MS - Suite A	EG020A-T	0	7	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	16	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	40	**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)
Standard Anions -by IC (Extended Method)	ED009-X	WATER	In house: Referenced to APHA 4110B. 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).
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)

Analytical Methods	Method	Matrix	Method Descriptions
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 1030F. This method is compliant with NEPM Schedule B(3)
Dissolved Organic Carbon	EP002	WATER	In house: Referenced to APHA 5310 B. This method is compliant with NEPM Schedule B(3). Samples are combusted at high temperature in the presence of an oxidative catalyst. The evolved carbon dioxide is quantified using an IR detector.
Biochemical Oxygen Demand (BOD)	EP030	WATER	In house: Referenced to APHA 5210 B. The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. 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.

CERTIFICATE OF ANALYSIS

Work Order	: **EM2308845**	Page	: 1 of 4
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Gregory Gommers
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61-3-8549 9600
Project	: 12564388	Date Samples Received	: 18-May-2023 11:15
Order number	: 12564388	Date Analysis Commenced	: 19-May-2023
C-O-C number	: ----	Issue Date	: 25-May-2023 19:54
Sampler	: SAM KING		
Site	: ----		
Quote number	: ME/770/21		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC

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.

- 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.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- 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.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	S1	S2	S3	----	----
			Sampling date / time	17-May-2023 00:00	17-May-2023 00:00	17-May-2023 00:00	----	----
Compound	CAS Number	LOR	Unit	EM2308845-001	EM2308845-002	EM2308845-003	--------	--------
				Result	Result	Result	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**8.05**	**8.03**	**8.03**	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**416**	**418**	**581**	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	<5	**12**	**64**	----	----
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	**188**	**186**	**260**	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**188**	**186**	**260**	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**32**	**32**	**24**	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**21**	**21**	**47**	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**80**	**81**	**92**	----	----
Magnesium	7439-95-4	1	mg/L	**6**	**6**	**10**	----	----
Sodium	7440-23-5	1	mg/L	**14**	**14**	**27**	----	----
Potassium	7440-09-7	1	mg/L	**1**	<1	**17**	----	----
EG020F: Dissolved Metals by ICP-MS								
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	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Manganese	7439-96-5	0.001	mg/L	**0.008**	**0.010**	**0.219**	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	**0.001**	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	----	----
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	**0.09**	----	----
EG020T: Total Metals by ICP-MS								
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	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	S1	S2	S3	----	----
				Sampling date / time	17-May-2023 00:00	17-May-2023 00:00	17-May-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		EM2308845-001	EM2308845-002	EM2308845-003	--------	--------
					Result	Result	Result	----	----
EG020T: Total Metals by ICP-MS - Continued									
Manganese	7439-96-5	0.001	mg/L		**0.028**	**0.039**	**0.261**	**----**	**----**
Nickel	7440-02-0	0.001	mg/L		**0.001**	**0.002**	**0.002**	**----**	**----**
Zinc	7440-66-6	0.005	mg/L		<0.005	<0.005	<0.005	**----**	**----**
Iron	7439-89-6	0.05	mg/L		**0.25**	**0.33**	**1.30**	**----**	**----**
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.02**	<0.01	**0.39**	**----**	**----**
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	**0.02**	**----**	**----**
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.86**	**0.89**	**0.77**	**----**	**----**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.86**	**0.89**	**0.79**	**----**	**----**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**0.1**	**0.1**	**0.8**	**----**	**----**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ **Total Nitrogen as N**	----	0.1	mg/L		**1.0**	**1.0**	**1.6**	**----**	**----**
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		<0.01	<0.01	**0.18**	**----**	**----**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	**0.01**	**0.04**	**----**	**----**
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**5.01**	**4.97**	**7.02**	**----**	**----**
ø **Total Cations**	----	0.01	meq/L		**5.12**	**5.14**	**7.02**	**----**	**----**
ø **Ionic Balance**	----	0.01	%		**1.04**	**1.68**	**0.02**	**----**	**----**
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L		<2	<2	**4**	**----**	**----**

QUALITY CONTROL REPORT

Work Order	: **EM2308845**	Page	: 1 of 7
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Gregory Gommers
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61-3-8549 9600
Project	: 12564388	Date Samples Received	: 18-May-2023
Order number	: 12564388	Date Analysis Commenced	: 19-May-2023
C-O-C number	: ----	Issue Date	: 25-May-2023
Sampler	: SAM KING		
Site	: ----		
Quote number	: ME/770/21		
No. of samples received	: 3		
No. of samples analysed	: 3		

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*
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC

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 (%)
EA005P: pH by PC Titrator (QC Lot: 5059239)									
EM2308762-007	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.44	8.46	0.2	0% - 20%
EM2308827-003	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	2.77	2.81	1.4	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5059245)									
EM2308842-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	227	229	0.8	0% - 20%
EM2308827-003	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	2340	2060	12.9	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5066768)									
EM2308716-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	13	17	25.2	No Limit
EM2308784-009	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
EM2308862-006	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	90	88	2.3	0% - 50%
ED037P: Alkalinity by PC Titrator (QC Lot: 5059241)									
EM2308819-009	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	3	3	0.0	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	3	3	0.0	No Limit
EM2308827-003	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	<1	<1	0.0	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	<1	0.0	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5059877)									
EM2308877-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	470	472	0.5	0% - 20%
EM2308845-001	S1	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	32	31	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5059878)									
EM2308877-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	2690	2700	0.5	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: 5059878) - continued									
EM2308845-001	S1	ED045G: Chloride	16887-00-6	1	mg/L	21	22	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5066994)									
EM2308802-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	4	4	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	13	13	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	174	174	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EM2308689-021	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	188	185	1.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	222	222	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	2080	2070	0.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	111	112	0.0	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5066996)									
EM2308845-002	S2	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	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	0.010	0.010	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	<0.005	<0.005	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EM2308689-020	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0046	0.0041	10.6	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	2.38	2.36	0.9	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.144	0.141	2.2	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.603	0.583	3.4	0% - 20%
		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: 5065453)									
EM2308609-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	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: Manganese	7439-96-5	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
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EM2308790-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0002	0.0002	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.024	0.023	0.0	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.002	0.002	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: 5065453) - continued									
EM2308790-002	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.071	0.071	0.0	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.007	0.007	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.490	0.485	1.1	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	2.55	2.28	11.1	0% - 20%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5062910)									
EM2308787-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.07	0.05	27.3	No Limit
EM2308877-004	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: 5059879)									
EM2308877-003	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM2308845-001	S1	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: 5062911)									
EM2308787-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM2308877-004	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.03	0.0	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 5063897)									
EM2308629-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EM2308790-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.6	0.5	24.6	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 5063896)									
EM2308629-002	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM2308790-002	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.28	0.29	0.0	0% - 20%
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5059880)									
EM2308845-001	S1	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.01	0.0	No Limit
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 5061654)									
EM2308784-001	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	<2	0.0	No Limit
EM2308845-001	S1	EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	<2	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 5059239)								
EA005-P: pH Value	----	----	pH Unit	----	7 pH Unit	99.8	98.8	101
				----	9 pH Unit	99.9	99.3	101
EA010P: Conductivity by PC Titrator (QCLot: 5059245)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	95.7	85.0	119
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5066768)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	106	91.0	109
				<5	836 mg/L	111	84.8	115
				<5	1000 mg/L	95.9	90.3	109
ED037P: Alkalinity by PC Titrator (QCLot: 5059241)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	100	85.0	116
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5059877)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	104	90.0	110
				<1	500 mg/L	107	90.0	110
ED045G: Chloride by Discrete Analyser (QCLot: 5059878)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	105	90.0	110
				<1	1000 mg/L	101	90.0	110
ED093F: Dissolved Major Cations (QCLot: 5066994)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	80.0	120
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.2	80.0	120
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.9	80.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	94.1	80.0	120
EG020F: Dissolved Metals by ICP-MS (QCLot: 5066996)								
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.0	83.5	111
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	95.7	83.2	109
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	102	83.1	107
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	102	84.6	108
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	95.9	84.8	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	105	84.3	110
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	106	86.3	112
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	98.0	91.8	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: 5065453)								
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	105	86.4	115
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	100	86.9	112
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	102	86.9	111
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	101	88.3	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	102	88.7	113
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	102	87.9	113
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	110	86.7	117
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	99.8	92.8	118
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5062910)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	94.1	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5059879)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	109	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5062911)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	102	90.0	110
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5063897)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	81.2	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5063896)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	81.9	71.9	114
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5059880)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	98.6	90.0	110
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 5061654)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	198 mg/L	91.3	79.5	122

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: 5059877)							
EM2308845-002	S2	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	96.2	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5059878)							
EM2308845-002	S2	ED045G: Chloride	16887-00-6	400 mg/L	111	70.0	142
EG020F: Dissolved Metals by ICP-MS (QCLot: 5066996)							

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: 5066996) - continued							
EM2308689-020	Anonymous	EG020A-F: Cadmium	7440-43-9	0.05 mg/L	104	74.6	118
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	94.7	71.0	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	104	76.0	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	95.9	75.0	133
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	# Not Determined	64.0	134
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	98.4	73.0	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	87.4	75.0	131
EG020T: Total Metals by ICP-MS (QCLot: 5065453)							
EM2308609-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.25 mg/L	95.2	81.8	123
		EG020A-T: Chromium	7440-47-3	1 mg/L	99.3	78.9	119
		EG020A-T: Copper	7440-50-8	1 mg/L	94.9	80.4	118
		EG020A-T: Lead	7439-92-1	1 mg/L	100	80.5	121
		EG020A-T: Manganese	7439-96-5	1 mg/L	95.6	73.0	123
		EG020A-T: Nickel	7440-02-0	1 mg/L	92.4	80.0	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	91.1	74.0	120
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5062910)							
EM2308832-001	Anonymous	EK055G: Ammonia as N	7664-41-7	2 mg/L	117	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5059879)							
EM2308845-002	S2	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	98.8	80.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5062911)							
EM2308832-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	1 mg/L	# Not Determined	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5063897)							
EM2308629-003	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	90.8	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5063896)							
EM2308629-003	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	94.1	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5059880)							
EM2308845-002	S2	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	97.2	79.0	123

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2308845**	Page	: 1 of 8
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Telephone	: +61-3-8549 9600
Project	: 12564388	Date Samples Received	: 18-May-2023
Site	: ----	Issue Date	: 25-May-2023
Sampler	: SAM KING	No. of samples received	: 3
Order number	: 12564388	No. of samples analysed	: 3

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, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

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							
EG020F: Dissolved Metals by ICP-MS	EM2308689--020	Anonymous	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Ar	EM2308832--001	Anonymous	**Nitrite + Nitrate as N**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Due for extraction	Days overdue	Analysis: Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
S1, S2, S3	----	----	----	22-May-2023	17-May-2023	**5**
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural						
S1, S2, S3	----	----	----	22-May-2023	19-May-2023	**3**
EK071G: Reactive Phosphorus as P by discrete analyser						
Clear Plastic Bottle - Natural						
S1, S2, S3	----	----	----	22-May-2023	19-May-2023	**3**

Analysis Holding Time Compliance

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

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

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Due for extraction	Evaluation	Analysis: 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
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P) S1, S2, S3	17-May-2023	----	----	----	22-May-2023	17-May-2023	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P) S1, S2, S3	17-May-2023	----	----	----	22-May-2023	14-Jun-2023	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H) S1, S2, S3	17-May-2023	----	----	----	23-May-2023	24-May-2023	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) S1, S2, S3	17-May-2023	----	----	----	22-May-2023	31-May-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) S1, S2, S3	17-May-2023	----	----	----	22-May-2023	14-Jun-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) S1, S2, S3	17-May-2023	----	----	----	22-May-2023	14-Jun-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F) S1, S2, S3	17-May-2023	----	----	----	24-May-2023	14-Jun-2023	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F) S1, S2, S3	17-May-2023	----	----	----	23-May-2023	13-Nov-2023	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) S1, S2, S3	17-May-2023	23-May-2023	13-Nov-2023	✓	23-May-2023	13-Nov-2023	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) S2, S3	17-May-2023	----	----	----	22-May-2023	14-Jun-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) S1	17-May-2023	----	----	----	23-May-2023	14-Jun-2023	✓

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) S1, S2, S3	**17-May-2023**	**----**	----	----	**22-May-2023**	19-May-2023	×
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) S1, S2, S3	**17-May-2023**	**----**	----	----	**23-May-2023**	14-Jun-2023	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) S1, S2, S3	**17-May-2023**	**23-May-2023**	14-Jun-2023	✓	**23-May-2023**	14-Jun-2023	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) S1, S2, S3	**17-May-2023**	**23-May-2023**	14-Jun-2023	✓	**23-May-2023**	14-Jun-2023	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) S1, S2, S3	**17-May-2023**	**----**	----	----	**22-May-2023**	19-May-2023	×
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030) S1, S2, S3	**17-May-2023**	**----**	----	----	**19-May-2023**	19-May-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
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	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	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
Conductivity by Auto Titrator	EA010-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	24	**12.50**	**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 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	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	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
Conductivity by Auto Titrator	EA010-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	24	**12.50**	**7.50**	✓	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 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	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	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*	
Method Blanks (MB) - Continued							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	24	**8.33**	**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 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	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	19	**5.26**	**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 Metals by ICP-MS - Suite A	EG020A-F	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**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 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	16	**6.25**	**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
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. 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.
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)

Analytical Methods	Method	Matrix	Method Descriptions
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 1030F. This method is compliant with NEPM Schedule B(3)
Biochemical Oxygen Demand (BOD)	EP030	WATER	In house: Referenced to APHA 5210 B. The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. This method is compliant with 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)
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)

CERTIFICATE OF ANALYSIS

Work Order	: **EM2311710**	Page	: 1 of 15
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAMANTHA KING	Contact	: Peter Ravlic
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 30-Jun-2023 11:15
Order number	: 12564388	Date Analysis Commenced	: 30-Jun-2023
C-O-C number	: ----	Issue Date	: 11-Jul-2023 18:42
Sampler	: MB		
Site	: ----		
Quote number	: ME/770/21 V2		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- 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*
Andrew Lu	VOC Section Supervisor	Melbourne Organics, Springvale, VIC
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Samantha Smith	Assistant Laboratory Manager	WRG Subcontracting, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

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.

- EK026SF: EM2311710 #1: Sample was diluted prior to analysis due to sample matrix. LOR's have been raised accordingly.
- EP202: Poor matrix spike recoveries for particular compounds due to matrix interferences.
- EK086/EK087 EM2311710 #1 required dilution prior to analysis due to sample matrix.
- EK057G: EM2311710 #1 Sample required dilution prior Nitrite as N analysis due to sample matrix. LOR value has been adjusted accordingly.
- ED043S: EM2311710 #1, a dilution was required prior to the analysis of Total Oxidised Sulfur due to sample matrix effects, and the LOR has been raised accordingly.
- EP075: 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.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP074: Where reported, Total Trihalomethanes is the sum of the reported concentrations of all Trihalomethanes at or above the LOR.
- EP074: Where reported, Total Trimethylbenzenes is the sum of the reported concentrations of 1.2.3-Trimethylbenzene, 1.2.4-Trimethylbenzene and 1.3.5-Trimethylbenzene 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.
- EG035T:EM2311710#1 Particular samples required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium, sodium and ammonia for sample #1.
- Samples have been conducted outside of the recommended analytical holding times for EA025H and EA015H. Results should be scrutinised accordingly.
- EP075: EM2311710_001 Poor surrogate recovery due to matrix effects. Confirmed by re-extraction and re-analysis.
- EG020F: EM2311710#1 Poor matrix spike recovery for zinc due to sample matrix. There is insufficient sample to confirm by re-extraction and re-analysis.
- 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.
- EP075: Where reported, 'Sum of PAH' is the sum of the USEPA 16 priority PAHs
- MBAS (W-MBAS)is conducted by ALS Scoresby NATA accreditation no. 992, site no. 989.
- 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.

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	29-Jun-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2311710-001	--------	--------	--------	--------
					Result	----	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		**5940**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		**204**	----	----	----	----
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		**3590**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**3590**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**145**	----	----	----	----
ED043S: Total Oxidised Sulfur as S									
Total Oxidised Sulfur as S	----	10	mg/L		<100	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**1490**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**117**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**53**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**874**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**480**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		**0.78**	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L		**0.060**	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		**0.0002**	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		**0.200**	----	----	----	----
Copper	7440-50-8	0.001	mg/L		**0.004**	----	----	----	----
Lead	7439-92-1	0.001	mg/L		**0.003**	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		**0.725**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.098**	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.099**	----	----	----	----
Iron	7439-89-6	0.05	mg/L		**5.00**	----	----	----	----
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		**2.00**	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	29-Jun-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2311710-001	--------	--------	--------	--------
					Result	----	----	----	----
EG020T: Total Metals by ICP-MS - Continued									
Arsenic	7440-38-2	0.001	mg/L		**0.072**	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		**0.0005**	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		**0.435**	----	----	----	----
Copper	7440-50-8	0.001	mg/L		**0.022**	----	----	----	----
Lead	7439-92-1	0.001	mg/L		**0.024**	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		**0.860**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.113**	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.270**	----	----	----	----
Iron	7439-89-6	0.05	mg/L		**12.1**	----	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0005	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	0.004	mg/L		<0.020	----	----	----	----
EK055: Ammonia as N									
Ammonia as N	7664-41-7	0.1	mg/L		**576**	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.05	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		<0.05	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.03**	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**1020**	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**1020**	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**12.8**	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**6.84**	----	----	----	----
EK085M: Sulfide as S2-									

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	29-Jun-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2311710-001	--------	--------	--------	--------
					Result	----	----	----	----
EK085M: Sulfide as S2- - Continued									
Sulfide as S2-	18496-25-8	0.1	mg/L		**0.1**	----	----	----	----
EK086: Sulfite as SO3 2-									
Sulfite as SO3 2-	14265-45-3	2	mg/L		<40	----	----	----	----
EK087: Thiosulfate as S2O3 2-									
Thiosulfate as S2O3 2-	----	2	mg/L		<40	----	----	----	----
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**117**	----	----	----	----
ø **Total Cations**	----	0.01	meq/L		**102**	----	----	----	----
ø **Ionic Balance**	----	0.01	%		**6.96**	----	----	----	----
EP002: Dissolved Organic Carbon (DOC)									
Dissolved Organic Carbon	----	1	mg/L		**895**	----	----	----	----
EP010: Formaldehyde									
Formaldehyde	50-00-0	0.1	mg/L		**4.9**	----	----	----	----
EP020: Oil and Grease (O&G)									
Oil & Grease	----	5	mg/L		<5	----	----	----	----
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L		**795**	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)									
^ **Total Polychlorinated biphenyls**	----	1	µg/L		<1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.5	µg/L		<0.5	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L		<0.5	----	----	----	----
beta-BHC	319-85-7	0.5	µg/L		<0.5	----	----	----	----
gamma-BHC	58-89-9	0.5	µg/L		<0.5	----	----	----	----
delta-BHC	319-86-8	0.5	µg/L		<0.5	----	----	----	----
Heptachlor	76-44-8	0.5	µg/L		<0.5	----	----	----	----
Aldrin	309-00-2	0.5	µg/L		<0.5	----	----	----	----
Heptachlor epoxide	1024-57-3	0.5	µg/L		<0.5	----	----	----	----
trans-Chlordane	5103-74-2	0.5	µg/L		<0.5	----	----	----	----
alpha-Endosulfan	959-98-8	0.5	µg/L		<0.5	----	----	----	----
cis-Chlordane	5103-71-9	0.5	µg/L		<0.5	----	----	----	----
Dieldrin	60-57-1	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDE	72-55-9	0.5	µg/L		<0.5	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	29-Jun-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2311710-001	--------	--------	--------	--------
					Result	----	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued									
Endrin	72-20-8	0.5	µg/L		<0.5	----	----	----	----
beta-Endosulfan	33213-65-9	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDD	72-54-8	0.5	µg/L		<0.5	----	----	----	----
Endrin aldehyde	7421-93-4	0.5	µg/L		<0.5	----	----	----	----
Endosulfan sulfate	1031-07-8	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDT	50-29-3	2.0	µg/L		<2.0	----	----	----	----
Endrin ketone	53494-70-5	0.5	µg/L		<0.5	----	----	----	----
Methoxychlor	72-43-5	2.0	µg/L		<2.0	----	----	----	----
^ Total Chlordane (sum)	----	0.5	µg/L		<0.5	----	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	µg/L		<0.5	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.5	µg/L		<0.5	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.5	µg/L		<0.5	----	----	----	----
Demeton-S-methyl	919-86-8	0.5	µg/L		<0.5	----	----	----	----
Monocrotophos	6923-22-4	2.0	µg/L		<2.0	----	----	----	----
Dimethoate	60-51-5	0.5	µg/L		<0.5	----	----	----	----
Diazinon	333-41-5	0.5	µg/L		<0.5	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L		<0.5	----	----	----	----
Parathion-methyl	298-00-0	2.0	µg/L		<2.0	----	----	----	----
Malathion	121-75-5	0.5	µg/L		<0.5	----	----	----	----
Fenthion	55-38-9	0.5	µg/L		<0.5	----	----	----	----
Chlorpyrifos	2921-88-2	0.5	µg/L		<0.5	----	----	----	----
Parathion	56-38-2	2.0	µg/L		<2.0	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.5	µg/L		<0.5	----	----	----	----
Chlorfenvinphos	470-90-6	0.5	µg/L		<0.5	----	----	----	----
Bromophos-ethyl	4824-78-6	0.5	µg/L		<0.5	----	----	----	----
Fenamiphos	22224-92-6	0.5	µg/L		<0.5	----	----	----	----
Prothiofos	34643-46-4	0.5	µg/L		<0.5	----	----	----	----
Ethion	563-12-2	0.5	µg/L		<0.5	----	----	----	----
Carbophenothion	786-19-6	0.5	µg/L		<0.5	----	----	----	----
Azinphos Methyl	86-50-0	0.5	µg/L		<0.5	----	----	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup									
C10 - C36 Fraction (sum)	----	50	µg/L		<50	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	29-Jun-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2311710-001	--------	--------	--------	--------
					Result	----	----	----	----
EP071 SG: Total Petroleum Hydrocarbons - SV Silica gel cleanup									
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup									
>C10 - C40 Fraction (sum)	----	100	µg/L		<100	----	----	----	----
EP071 SG: Total Recoverable Hydrocarbons - SV NEPM 2013 Fractions - Silica gel cleanup									
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
EP074B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	50	µg/L		**400**	----	----	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	----	----	----	----
1.2-Dichloropropane	78-87-5	5	µg/L		<5	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	----	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	----	----	----	----
Chloromethane	74-87-3	50	µg/L		<50	----	----	----	----
Vinyl chloride	75-01-4	50	µg/L		<50	----	----	----	----
Bromomethane	74-83-9	50	µg/L		<50	----	----	----	----
Chloroethane	75-00-3	50	µg/L		<50	----	----	----	----
Trichlorofluoromethane	75-69-4	50	µg/L		<50	----	----	----	----
1.1-Dichloroethene	75-35-4	5	µg/L		<5	----	----	----	----
Iodomethane	74-88-4	5	µg/L		<5	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	----	----	----	----
1.1-Dichloroethane	75-34-3	5	µg/L		<5	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	----	----	----	----
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	----	----	----	----
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	----	----	----	----
Carbon Tetrachloride	56-23-5	5	µg/L		<5	----	----	----	----
1.2-Dichloroethane	107-06-2	5	µg/L		<5	----	----	----	----
Trichloroethene	79-01-6	5	µg/L		<5	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	29-Jun-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2311710-001	--------	--------	--------	--------
					Result	----	----	----	----
EP074E: Halogenated Aliphatic Compounds - Continued									
Dibromomethane	74-95-3	5	µg/L		<5	----	----	----	----
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	----	----	----	----
1.3-Dichloropropane	142-28-9	5	µg/L		<5	----	----	----	----
Tetrachloroethene	127-18-4	5	µg/L		<5	----	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	----	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	----	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	----	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	----	----	----	----
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	----	----	----	----
Pentachloroethane	76-01-7	5	µg/L		<5	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	----	----	----	----
Hexachlorobutadiene	87-68-3	5	µg/L		<5	----	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	----	----	----	----
Bromobenzene	108-86-1	5	µg/L		<5	----	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L		<5	----	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L		<5	----	----	----	----
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	----	----	----	----
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	----	----	----	----
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	----	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	----	----	----	----
Bromodichloromethane	75-27-4	5	µg/L		<5	----	----	----	----
Dibromochloromethane	124-48-1	5	µg/L		<5	----	----	----	----
Bromoform	75-25-2	5	µg/L		<5	----	----	----	----
EP075A: Phenolic Compounds									
Phenol	108-95-2	2	µg/L		**50**	----	----	----	----
2-Chlorophenol	95-57-8	2	µg/L		<2	----	----	----	----
2-Methylphenol	95-48-7	2	µg/L		**10**	----	----	----	----
3- & 4-Methylphenol	1319-77-3	4	µg/L		**112**	----	----	----	----
2-Nitrophenol	88-75-5	2	µg/L		<2	----	----	----	----
2.4-Dimethylphenol	105-67-9	2	µg/L		<2	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	29-Jun-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2311710-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075A: Phenolic Compounds - Continued									
2.4-Dichlorophenol	120-83-2	2	µg/L		<2	----	----	----	----
2.6-Dichlorophenol	87-65-0	2	µg/L		<2	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	2	µg/L		<2	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	2	µg/L		<2	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	2	µg/L		<2	----	----	----	----
Pentachlorophenol	87-86-5	4	µg/L		<4	----	----	----	----
EP075B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	2	µg/L		<2	----	----	----	----
2-Methylnaphthalene	91-57-6	2	µg/L		<2	----	----	----	----
2-Chloronaphthalene	91-58-7	2	µg/L		<2	----	----	----	----
Acenaphthylene	208-96-8	2	µg/L		<2	----	----	----	----
Acenaphthene	83-32-9	2	µg/L		<2	----	----	----	----
Fluorene	86-73-7	2	µg/L		<2	----	----	----	----
Phenanthrene	85-01-8	2	µg/L		<2	----	----	----	----
Anthracene	120-12-7	2	µg/L		<2	----	----	----	----
Fluoranthene	206-44-0	2	µg/L		<2	----	----	----	----
Pyrene	129-00-0	2	µg/L		<2	----	----	----	----
N-2-Fluorenyl Acetamide	53-96-3	2	µg/L		<2	----	----	----	----
Benz(a)anthracene	56-55-3	2	µg/L		<2	----	----	----	----
Chrysene	218-01-9	2	µg/L		<2	----	----	----	----
Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	4	µg/L		<4	----	----	----	----
7.12-Dimethylbenz(a)anthracene	57-97-6	2	µg/L		<2	----	----	----	----
Benzo(a)pyrene	50-32-8	2	µg/L		<2	----	----	----	----
3-Methylcholanthrene	56-49-5	2	µg/L		<2	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	2	µg/L		<2	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	2	µg/L		<2	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	2	µg/L		<2	----	----	----	----
^ Sum of PAHs	----	2	µg/L		<3	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	2	µg/L		<3	----	----	----	----
EP075C: Phthalate Esters									
Dimethyl phthalate	131-11-3	2	µg/L		<2	----	----	----	----
Diethyl phthalate	84-66-2	2	µg/L		<2	----	----	----	----
Di-n-butyl phthalate	84-74-2	2	µg/L		<2	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	29-Jun-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2311710-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075C: Phthalate Esters - Continued									
Butyl benzyl phthalate	85-68-7	2	µg/L		<2	----	----	----	----
bis(2-ethylhexyl) phthalate	117-81-7	10	µg/L		<10	----	----	----	----
Di-n-octylphthalate	117-84-0	2	µg/L		<2	----	----	----	----
EP075D: Nitrosamines									
N-Nitrosomethylethylamine	10595-95-6	2	µg/L		<2	----	----	----	----
N-Nitrosodiethylamine	55-18-5	2	µg/L		<2	----	----	----	----
N-Nitrosopyrrolidine	930-55-2	4	µg/L		<4	----	----	----	----
N-Nitrosomorpholine	59-89-2	2	µg/L		<2	----	----	----	----
N-Nitrosodi-n-propylamine	621-64-7	2	µg/L		<2	----	----	----	----
N-Nitrosopiperidine	100-75-4	2	µg/L		<2	----	----	----	----
N-Nitrosodibutylamine	924-16-3	2	µg/L		<2	----	----	----	----
N-Nitrosodiphenyl & Diphenylamine	86-30-6 122-39-4	4	µg/L		<4	----	----	----	----
Methapyrilene	91-80-5	2	µg/L		<2	----	----	----	----
EP075E: Nitroaromatics and Ketones									
2-Picoline	109-06-8	2	µg/L		<2	----	----	----	----
Acetophenone	98-86-2	2	µg/L		<2	----	----	----	----
Nitrobenzene	98-95-3	2	µg/L		<2	----	----	----	----
Isophorone	78-59-1	2	µg/L		<2	----	----	----	----
2.6-Dinitrotoluene	606-20-2	4	µg/L		<4	----	----	----	----
2.4-Dinitrotoluene	121-14-2	4	µg/L		<4	----	----	----	----
1-Naphthylamine	134-32-7	2	µg/L		<2	----	----	----	----
4-Nitroquinoline-N-oxide	56-57-5	2	µg/L		<2	----	----	----	----
5-Nitro-o-toluidine	99-55-8	2	µg/L		<2	----	----	----	----
Azobenzene	103-33-3	2	µg/L		<2	----	----	----	----
1.3.5-Trinitrobenzene	99-35-4	2	µg/L		<2	----	----	----	----
Phenacetin	62-44-2	2	µg/L		<2	----	----	----	----
4-Aminobiphenyl	92-67-1	2	µg/L		<2	----	----	----	----
Pentachloronitrobenzene	82-68-8	2	µg/L		<2	----	----	----	----
Pronamide	23950-58-5	2	µg/L		<2	----	----	----	----
Dimethylaminoazobenzene	60-11-7	2	µg/L		<2	----	----	----	----
Chlorobenzilate	510-15-6	2	µg/L		<2	----	----	----	----
EP075F: Haloethers									
Bis(2-chloroethyl) ether	111-44-4	2	µg/L		<2	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	29-Jun-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2311710-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075F: Haloethers - Continued									
Bis(2-chloroethoxy) methane	111-91-1	2	µg/L		<2	----	----	----	----
4-Chlorophenyl phenyl ether	7005-72-3	2	µg/L		<2	----	----	----	----
4-Bromophenyl phenyl ether	101-55-3	2	µg/L		<2	----	----	----	----
EP075G: Chlorinated Hydrocarbons									
1.3-Dichlorobenzene	541-73-1	2	µg/L		<2	----	----	----	----
1.4-Dichlorobenzene	106-46-7	2	µg/L		<2	----	----	----	----
1.2-Dichlorobenzene	95-50-1	2	µg/L		<2	----	----	----	----
Hexachloroethane	67-72-1	2	µg/L		<2	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	2	µg/L		<2	----	----	----	----
Hexachloropropylene	1888-71-7	2	µg/L		<2	----	----	----	----
Hexachlorobutadiene	87-68-3	2	µg/L		<2	----	----	----	----
Hexachlorocyclopentadiene	77-47-4	10	µg/L		<10	----	----	----	----
Pentachlorobenzene	608-93-5	2	µg/L		<2	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	4	µg/L		<4	----	----	----	----
EP075H: Anilines and Benzidines									
Aniline	62-53-3	2	µg/L		<2	----	----	----	----
4-Chloroaniline	106-47-8	2	µg/L		<2	----	----	----	----
2-Nitroaniline	88-74-4	4	µg/L		<4	----	----	----	----
3-Nitroaniline	99-09-2	4	µg/L		<4	----	----	----	----
Dibenzofuran	132-64-9	2	µg/L		<2	----	----	----	----
4-Nitroaniline	100-01-6	2	µg/L		<2	----	----	----	----
Carbazole	86-74-8	2	µg/L		<2	----	----	----	----
3.3`-Dichlorobenzidine	91-94-1	2	µg/L		<2	----	----	----	----
EP075I: Organochlorine Pesticides									
alpha-BHC	319-84-6	2	µg/L		<2	----	----	----	----
beta-BHC	319-85-7	2	µg/L		<2	----	----	----	----
gamma-BHC	58-89-9	2	µg/L		<2	----	----	----	----
delta-BHC	319-86-8	2	µg/L		<2	----	----	----	----
Heptachlor	76-44-8	2	µg/L		<2	----	----	----	----
Aldrin	309-00-2	2	µg/L		<2	----	----	----	----
Heptachlor epoxide	1024-57-3	2	µg/L		<2	----	----	----	----
alpha-Endosulfan	959-98-8	2	µg/L		<2	----	----	----	----
4.4`-DDE	72-55-9	2	µg/L		<2	----	----	----	----
Dieldrin	60-57-1	2	µg/L		<2	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	29-Jun-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2311710-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075I: Organochlorine Pesticides - Continued									
Endrin	72-20-8	2	µg/L		<2	----	----	----	----
beta-Endosulfan	33213-65-9	2	µg/L		<2	----	----	----	----
4.4`-DDD	72-54-8	2	µg/L		<2	----	----	----	----
Endosulfan sulfate	1031-07-8	2	µg/L		<2	----	----	----	----
4.4`-DDT	50-29-3	4	µg/L		<4	----	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	4	µg/L		<4	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	4	µg/L		<4	----	----	----	----
EP075J: Organophosphorus Pesticides									
Dichlorvos	62-73-7	2	µg/L		<2	----	----	----	----
Dimethoate	60-51-5	2	µg/L		<2	----	----	----	----
Diazinon	333-41-5	2	µg/L		<2	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	2	µg/L		<2	----	----	----	----
Malathion	121-75-5	2	µg/L		<2	----	----	----	----
Fenthion	55-38-9	2	µg/L		<2	----	----	----	----
Chlorpyrifos	2921-88-2	2	µg/L		<2	----	----	----	----
Pirimphos-ethyl	23505-41-1	2	µg/L		<2	----	----	----	----
Chlorfenvinphos	470-90-6	2	µg/L		<2	----	----	----	----
Prothiofos	34643-46-4	2	µg/L		<2	----	----	----	----
Ethion	563-12-2	2	µg/L		<2	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		**200**	----	----	----	----
C10 - C14 Fraction	----	50	µg/L		**1220**	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		**2320**	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		**330**	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		**3870**	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		**190**	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		**150**	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		**1520**	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		**2160**	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		**170**	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		**3850**	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	29-Jun-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2311710-001	--------	--------	--------	--------
					Result	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		**1520**	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		**14**	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		**4**	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		**14**	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		**8**	----	----	----	----
^ Total Xylenes	----	2	µg/L		**22**	----	----	----	----
^ Sum of BTEX	----	1	µg/L		**40**	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP202A: Phenoxyacetic Acid Herbicides by LCMS									
4-Chlorophenoxy acetic acid	122-88-3	10	µg/L		<10	----	----	----	----
2.4-DB	94-82-6	10	µg/L		<10	----	----	----	----
Dicamba	1918-00-9	10	µg/L		<10	----	----	----	----
Mecoprop	93-65-2	10	µg/L		<10	----	----	----	----
MCPA	94-74-6	10	µg/L		<10	----	----	----	----
2.4-DP	120-36-5	10	µg/L		<10	----	----	----	----
2.4-D	94-75-7	10	µg/L		<10	----	----	----	----
Triclopyr	55335-06-3	10	µg/L		<10	----	----	----	----
Silvex (2.4.5-TP/Fenoprop)	93-72-1	10	µg/L		<10	----	----	----	----
2.4.5-T	93-76-5	10	µg/L		<10	----	----	----	----
MCPB	94-81-5	10	µg/L		<10	----	----	----	----
Picloram	1918-02-1	10	µg/L		<10	----	----	----	----
Clopyralid	1702-17-6	10	µg/L		<10	----	----	----	----
Fluroxypyr	69377-81-7	10	µg/L		<10	----	----	----	----
2.6-D	575-90-6	10	µg/L		<10	----	----	----	----
2.4.6-T	575-89-3	10	µg/L		<10	----	----	----	----
Subcontracted Analysis: MBAS									
Anionic Surfactants as MBAS	----	0.05	mg/L		**0.60**	----	----	----	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	1	%		**46.1**	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.5	%		**53.2**	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	29-Jun-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2311710-001	--------	--------	--------	--------
					Result	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.5	%		**52.4**	----	----	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	5	%		**111**	----	----	----	----
Toluene-D8	2037-26-5	5	%		**102**	----	----	----	----
4-Bromofluorobenzene	460-00-4	5	%		**107**	----	----	----	----
EP075S: Acid Extractable Surrogates									
2-Fluorophenol	367-12-4	2	%		**20.9**	----	----	----	----
Phenol-d6	13127-88-3	2	%		**16.9**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	2	%		**27.8**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	2	%		**47.8**	----	----	----	----
EP075T: Base/Neutral Extractable Surrogates									
Nitrobenzene-D5	4165-60-0	2	%		**24.6**	----	----	----	----
1.2-Dichlorobenzene-D4	2199-69-1	2	%		**22.9**	----	----	----	----
2-Fluorobiphenyl	321-60-8	2	%		**35.8**	----	----	----	----
Anthracene-d10	1719-06-8	2	%		**40.4**	----	----	----	----
4-Terphenyl-d14	1718-51-0	2	%		**42.4**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**115**	----	----	----	----
Toluene-D8	2037-26-5	2	%		**98.3**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**97.1**	----	----	----	----
EP202S: Phenoxyacetic Acid Herbicide Surrogate									
2.4-Dichlorophenyl Acetic Acid	19719-28-9	10	%		**90.4**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: LEACHATE		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	41	125
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	117
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	51	127
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72	132
Toluene-D8	2037-26-5	77	132
4-Bromofluorobenzene	460-00-4	67	131
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	6	83
Phenol-d6	13127-88-3	10	65
2-Chlorophenol-D4	93951-73-6	22	112
2.4.6-Tribromophenol	118-79-6	22	125
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	37	115
1.2-Dichlorobenzene-D4	2199-69-1	32	99
2-Fluorobiphenyl	321-60-8	39	116
Anthracene-d10	1719-06-8	49	123
4-Terphenyl-d14	1718-51-0	47	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129
EP202S: Phenoxyacetic Acid Herbicide Surrogate			
2.4-Dichlorophenyl Acetic Acid	19719-28-9	64	140

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP020: Oil and Grease (O&G)

(WATER) EP202A: Phenoxyacetic Acid Herbicides by LCMS

(WATER) EP202S: Phenoxyacetic Acid Herbicide Surrogate

QUALITY CONTROL REPORT

Work Order	: **EM2311710**	Page	: 1 of 19
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAMANTHA KING	Contact	: Peter Ravlic
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 30-Jun-2023
Order number	: 12564388	Date Analysis Commenced	: 30-Jun-2023
C-O-C number	: ----	Issue Date	: 11-Jul-2023
Sampler	: MB		
Site	: ----		
Quote number	: ME/770/21 V2		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Andrew Lu	VOC Section Supervisor	Melbourne Organics, Springvale, VIC
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Samantha Smith	Assistant Laboratory Manager	WRG Subcontracting, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

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: 5160855)									
EM2311917-004	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	79700	79200	0.7	0% - 20%
EM2311929-010	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	3200	3200	0.0	0% - 20%
EM2312006-005	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	315	314	0.3	0% - 20%
EM2311710-001	Landfill leachate	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	5940	5940	0.0	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5160856)									
EM2312006-006	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	67	69	2.2	0% - 50%
EM2312150-004	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	5	0.0	No Limit
EM2311710-001	Landfill leachate	EA025H: Suspended Solids (SS)	----	5	mg/L	204	182	11.9	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5149706)									
EM2311807-001	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	872	867	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	872	867	0.6	0% - 20%
EM2311808-005	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	460	463	0.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	460	463	0.7	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5145636)									
EM2311808-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	146	145	0.0	0% - 20%
EM2311710-001	Landfill leachate	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	145	123	16.2	0% - 20%
ED043S: Total Oxidised Sulfur as S (QC Lot: 5161399)									
EM2311710-001	Landfill leachate	ED043S: Total Oxidised Sulfur as S	----	10	mg/L	<100	<100	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 5145637)									

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: 5145637) - continued									
EM2311808-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	773	758	1.9	0% - 20%
EM2311710-001	Landfill leachate	ED045G: Chloride	16887-00-6	1	mg/L	1490	1250	17.1	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5158809)									
EM2311917-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	253	253	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1440	1440	0.2	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10600	10600	0.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	150	149	0.0	0% - 20%
EM2311790-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	11	11	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	2	2	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5158808)									
EM2311710-001	Landfill leachate	EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.099	0.097	2.3	0% - 50%
EM2311917-004	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0005	0.0010	62.4	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.005	0.006	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.005	0.008	43.8	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.038	0.044	15.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.098	0.118	18.7	0% - 20%
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.189	0.215	12.8	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.117	0.129	9.4	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	2.15	2.52	16.1	0% - 20%
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	66.2	74.8	12.3	0% - 20%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.05	<0.05	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	15.5	17.8	13.6	0% - 20%
EM2311710-001	Landfill leachate	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0002	0.0002	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.060	0.058	4.0	0% - 20%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.200	0.192	4.0	0% - 20%
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.004	0.003	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.725	0.702	3.2	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.098	0.093	5.1	0% - 20%
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.78	0.76	3.2	0% - 20%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	5.00	4.87	2.6	0% - 20%
EG020T: Total Metals by ICP-MS (QC Lot: 5159078)									
EM2312011-003	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0006	0.0004	36.3	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	0.010	0.010	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.006	0.006	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: 5159078) - continued									
EM2312011-003	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.083	0.082	2.2	0% - 20%
		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	0.226	0.223	1.2	0% - 20%
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.46	0.46	0.0	0% - 20%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.49	0.48	0.0	No Limit
EM2311562-044	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: Manganese	7439-96-5	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
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 5158810)									
EM2311929-011	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EM2311710-001	Landfill leachate	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: 5151072)									
EM2311660-004	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EM2311732-058	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK026SF: Total CN by Segmented Flow Analyser (QC Lot: 5162235)									
EM2311710-001	Landfill leachate	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.020	<0.020	0.0	No Limit
EK055: Ammonia as N (QC Lot: 5161260)									
EM2311710-001	Landfill leachate	EK055: Ammonia as N	7664-41-7	0.1	mg/L	576	591	2.5	0% - 20%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5145638)									
EM2311808-004	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM2311710-001	Landfill leachate	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.05	<0.05	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5164142)									
EM2311710-001	Landfill leachate	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.03	0.03	0.0	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 5154230)									
EM2311842-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	14.9	14.2	4.6	0% - 20%
EM2312007-002	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: 5154229)									
EM2311842-002	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	15.4	16.9	9.3	0% - 20%
EM2312007-002	Anonymous	EK067G: Total Phosphorus as P	----	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 (%)*
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5145639)									
EM2311710-001	Landfill leachate	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	6.84	5.85	15.6	0% - 20%
EK085M: Sulfide as S2- (QC Lot: 5151091)									
EM2311710-001	Landfill leachate	EK085: Sulfide as S2-	18496-25-8	0.1	mg/L	0.1	0.2	0.0	No Limit
EM2311769-008	Anonymous	EK085: Sulfide as S2-	18496-25-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EK086: Sulfite as SO3 2- (QC Lot: 5145278)									
EM2311710-001	Landfill leachate	EK086: Sulfite as SO3 2-	14265-45-3	2	mg/L	<40	<40	0.0	No Limit
EK087: Thiosulfate as S2O3 2- (QC Lot: 5145279)									
EM2311710-001	Landfill leachate	EK087: Thiosulfate as S2O3 2-	----	2	mg/L	<40	<40	0.0	No Limit
EP002: Dissolved Organic Carbon (DOC) (QC Lot: 5159320)									
EM2311710-001	Landfill leachate	EP002: Dissolved Organic Carbon	----	1	mg/L	895	871	2.7	0% - 20%
EP010: Formaldehyde (QC Lot: 5145851)									
EM2311710-001	Landfill leachate	EP010: Formaldehyde	50-00-0	0.1	mg/L	4.9	3.8	25.3	No Limit
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 5146342)									
EM2311727-001	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	9	10	0.0	No Limit
EM2311748-004	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	3	6	53.8	No Limit
EP074B: Oxygenated Compounds (QC Lot: 5147133)									
EM2311710-001	Landfill leachate	EP074: 2-Propanone (Acetone)	67-64-1	50	µg/L	400	420	4.2	No Limit
EP074D: Fumigants (QC Lot: 5147133)									
EM2311710-001	Landfill leachate	EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 5147133)									
EM2311710-001	Landfill leachate	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	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 (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 5147133) - continued									
EM2311710-001	Landfill leachate	EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 5147133)									
EM2311710-001	Landfill leachate	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
EP074G: Trihalomethanes (QC Lot: 5147133)									
EM2311710-001	Landfill leachate	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5145199)									
EM2311852-001	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	1040	1030	0.0	0% - 50%
		EP071: C10 - C14 Fraction	----	50	µg/L	110	140	26.5	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	1020	1140	11.1	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5147134)									
EM2311710-001	Landfill leachate	EP080: C6 - C9 Fraction	----	20	µg/L	200	200	0.0	0% - 50%
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5145199)									
EM2311852-001	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	350	390	10.8	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	1820	1910	5.0	0% - 50%
		EP071: >C34 - C40 Fraction	----	100	µg/L	120	130	8.3	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 Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5147134)									
EM2311710-001	Landfill leachate	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	190	190	0.0	No Limit
EP080: BTEXN (QC Lot: 5147134)									
EM2311710-001	Landfill leachate	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	14	14	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	4	4	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	14	14	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	8	8	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QC Lot: 5158061)									
EM2311710-001	Landfill leachate	EP202-SL: 4-Chlorophenoxy acetic acid	122-88-3	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: 2.4-DB	94-82-6	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Dicamba	1918-00-9	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Mecoprop	93-65-2	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: MCPA	94-74-6	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: 2.4-DP	120-36-5	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: 2.4-D	94-75-7	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Triclopyr	55335-06-3	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Silvex (2.4.5-TP/Fenoprop)	93-72-1	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: 2.4.5-T	93-76-5	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: MCPB	94-81-5	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Picloram	1918-02-1	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Clopyralid	1702-17-6	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Fluroxypyr	69377-81-7	10	µg/L	<10	<10	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
EP071 SG: Total Petroleum Hydrocarbons - SV Silica gel cleanup (QCLot: 5150814)								
EP071-SVSG: C10 - C14 Fraction	----	50	µg/L	<50	4460 µg/L	64.1	40.3	115
EP071-SVSG: C15 - C28 Fraction	----	100	µg/L	<100	14300 µg/L	76.6	36.8	133
EP071-SVSG: C29 - C36 Fraction	----	50	µg/L	<50	7300 µg/L	78.2	59.6	122
EP071 SG: Total Recoverable Hydrocarbons - SV NEPM 2013 Fractions - Silica gel cleanup (QCLot: 5150814)								
EP071-SVSG: >C10 - C16 Fraction	----	100	µg/L	<100	6090 µg/L	64.5	62.3	120
EP071-SVSG: >C16 - C34 Fraction	----	100	µg/L	<100	19400 µg/L	75.7	62.4	128
EP071-SVSG: >C34 - C40 Fraction	----	100	µg/L	<100	1300 µg/L	87.6	56.2	100
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 5160855)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	96.6	91.0	110
				<10	2340 mg/L	108	80.8	119
				<10	293 mg/L	100	91.0	110
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5160856)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	102	91.0	109
				<5	825 mg/L	108	84.7	116
				<5	1000 mg/L	94.9	90.3	109
ED037P: Alkalinity by PC Titrator (QCLot: 5149706)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	102	85.0	116
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5145636)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	90.0	110
				<1	500 mg/L	106	90.0	110
ED043S: Total Oxidised Sulfur as S (QCLot: 5161399)								
ED043S: Total Oxidised Sulfur as S	----	10	mg/L	<10	167 mg/L	98.0	77.5	119
ED045G: Chloride by Discrete Analyser (QCLot: 5145637)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	92.2	90.0	110
				<1	1000 mg/L	94.2	90.0	110
ED093F: Dissolved Major Cations (QCLot: 5158809)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	80.0	120
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.7	80.0	120
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	102	80.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.3	80.0	120

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: 5158808)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	101	90.4	111
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	99.7	89.0	111
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	106	83.5	111
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.8	83.2	109
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	98.1	83.1	107
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	100	84.6	108
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	100	84.8	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	98.8	84.3	110
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	101	82.3	113
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	98.8	86.3	112
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	100	91.8	112
EG020T: Total Metals by ICP-MS (QCLot: 5159078)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	103	90.8	115
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	104	89.2	115
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	101	86.4	115
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	101	86.9	112
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	102	86.9	111
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	104	88.3	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	103	88.7	113
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	99.6	87.9	113
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	100	84.8	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	105	86.7	117
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	101	92.8	118
EG035F: Dissolved Mercury by FIMS (QCLot: 5158810)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	114	71.6	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5151072)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	102	73.4	119
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 5162235)								
EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.2 mg/L	110	77.7	116
EK055: Ammonia as N (QCLot: 5161260)								
EK055: Ammonia as N	7664-41-7	0.1	mg/L	<0.1	25 mg/L	87.7	83.2	108
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5145638)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	108	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5164142)								

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
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5164142) - continued								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	91.3	90.0	110
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5154230)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	83.2	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5154229)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	95.7	71.9	114
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5145639)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	106	90.0	110
EK085M: Sulfide as S2- (QCLot: 5151091)								
EK085: Sulfide as S2-	18496-25-8	0.1	mg/L	<0.1	0.5 mg/L	103	81.9	116
EK086: Sulfite as SO3 2- (QCLot: 5145278)								
EK086: Sulfite as SO3 2-	14265-45-3	2	mg/L	<2	100 mg/L	93.0	91.8	101
EK087: Thiosulfate as S2O3 2- (QCLot: 5145279)								
EK087: Thiosulfate as S2O3 2-	----	2	mg/L	<2	100 mg/L	102	90.6	106
EP002: Dissolved Organic Carbon (DOC) (QCLot: 5159320)								
EP002: Dissolved Organic Carbon	----	1	mg/L	<1	100 mg/L	96.8	83.0	115
EP010: Formaldehyde (QCLot: 5145851)								
EP010: Formaldehyde	50-00-0	0.1	mg/L	<0.1	5 mg/L	93.2	85.1	107
EP020: Oil and Grease (O&G) (QCLot: 5156810)								
EP020: Oil & Grease	----	5	mg/L	<5	5000 mg/L	93.4	81.0	121
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 5146342)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	198 mg/L	98.1	79.5	122
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 5145198)								
EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	85.3	52.0	136
EP068A: Organochlorine Pesticides (OC) (QCLot: 5145197)								
EP068: alpha-BHC	319-84-6	0.5	µg/L	<0.5	2.5 µg/L	76.8	50.6	119
EP068: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	2.5 µg/L	75.3	44.2	117
EP068: beta-BHC	319-85-7	0.5	µg/L	<0.5	2.5 µg/L	78.5	53.7	119
EP068: gamma-BHC	58-89-9	0.5	µg/L	<0.5	2.5 µg/L	63.4	47.7	117
EP068: delta-BHC	319-86-8	0.5	µg/L	<0.5	2.5 µg/L	76.8	52.5	117
EP068: Heptachlor	76-44-8	0.5	µg/L	<0.5	2.5 µg/L	66.6	46.9	118
EP068: Aldrin	309-00-2	0.5	µg/L	<0.5	2.5 µg/L	78.9	48.0	115
EP068: Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	2.5 µg/L	79.2	51.1	119
EP068: trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	2.5 µg/L	79.6	48.4	120
EP068: alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	2.5 µg/L	78.5	50.1	122

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
EP068A: Organochlorine Pesticides (OC) (QCLot: 5145197) - continued								
EP068: cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	2.5 µg/L	79.3	51.0	118
EP068: Dieldrin	60-57-1	0.5	µg/L	<0.5	2.5 µg/L	78.3	48.4	116
EP068: 4.4`-DDE	72-55-9	0.5	µg/L	<0.5	2.5 µg/L	78.5	49.3	116
EP068: Endrin	72-20-8	0.5	µg/L	<0.5	2.5 µg/L	79.4	47.1	130
EP068: beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	2.5 µg/L	54.7	51.6	118
EP068: 4.4`-DDD	72-54-8	0.5	µg/L	<0.5	2.5 µg/L	78.9	48.6	122
EP068: Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	2.5 µg/L	72.1	49.4	128
EP068: Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	2.5 µg/L	83.4	49.1	123
EP068: 4.4`-DDT	50-29-3	2	µg/L	<2.0	2.5 µg/L	80.7	45.6	126
EP068: Endrin ketone	53494-70-5	0.5	µg/L	<0.5	2.5 µg/L	80.2	52.8	117
EP068: Methoxychlor	72-43-5	2	µg/L	<2.0	2.5 µg/L	79.6	47.1	126
EP068B: Organophosphorus Pesticides (OP) (QCLot: 5145197)								
EP068: Dichlorvos	62-73-7	0.5	µg/L	<0.5	2.5 µg/L	82.2	47.4	133
EP068: Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	2.5 µg/L	82.2	46.4	129
EP068: Monocrotophos	6923-22-4	2	µg/L	<2.0	2.5 µg/L	22.3	10.0	42.9
EP068: Dimethoate	60-51-5	0.5	µg/L	<0.5	2.5 µg/L	81.3	41.7	131
EP068: Diazinon	333-41-5	0.5	µg/L	<0.5	2.5 µg/L	77.0	50.5	122
EP068: Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	2.5 µg/L	78.5	52.4	123
EP068: Parathion-methyl	298-00-0	2	µg/L	<2.0	2.5 µg/L	79.0	52.0	132
EP068: Malathion	121-75-5	0.5	µg/L	<0.5	2.5 µg/L	81.3	51.8	133
EP068: Fenthion	55-38-9	0.5	µg/L	<0.5	2.5 µg/L	78.0	52.3	123
EP068: Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	2.5 µg/L	79.8	48.7	122
EP068: Parathion	56-38-2	2	µg/L	<2.0	2.5 µg/L	78.5	49.5	136
EP068: Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	2.5 µg/L	78.5	50.4	123
EP068: Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	2.5 µg/L	84.4	50.9	131
EP068: Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	2.5 µg/L	80.8	47.5	126
EP068: Fenamiphos	22224-92-6	0.5	µg/L	<0.5	2.5 µg/L	84.5	46.5	138
EP068: Prothiofos	34643-46-4	0.5	µg/L	<0.5	2.5 µg/L	79.1	49.2	119
EP068: Ethion	563-12-2	0.5	µg/L	<0.5	2.5 µg/L	66.1	50.0	126
EP068: Carbophenothion	786-19-6	0.5	µg/L	<0.5	2.5 µg/L	77.7	50.0	131
EP068: Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	2.5 µg/L	97.3	41.7	147
EP074B: Oxygenated Compounds (QCLot: 5147133)								
EP074: 2-Propanone (Acetone)	67-64-1	50	µg/L	<50	200 µg/L	92.6	39.9	142
EP074D: Fumigants (QCLot: 5147133)								

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
EP074D: Fumigants (QCLot: 5147133) - continued								
EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	20 µg/L	114	71.1	118
EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	20 µg/L	100	78.5	117
EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	20 µg/L	98.2	75.7	115
EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	20 µg/L	98.6	76.4	115
EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	20 µg/L	95.5	77.1	118
EP074E: Halogenated Aliphatic Compounds (QCLot: 5147133)								
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	200 µg/L	123	51.9	140
EP074: Chloromethane	74-87-3	50	µg/L	<50	200 µg/L	119	63.2	134
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	200 µg/L	120	58.1	135
EP074: Bromomethane	74-83-9	50	µg/L	<50	200 µg/L	124	54.4	130
EP074: Chloroethane	75-00-3	50	µg/L	<50	200 µg/L	113	69.4	129
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	200 µg/L	116	70.1	126
EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	20 µg/L	116	68.4	125
EP074: Iodomethane	74-88-4	5	µg/L	<5	20 µg/L	104	30.9	126
EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	20 µg/L	115	70.8	122
EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	20 µg/L	115	76.6	121
EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	20 µg/L	111	79.1	120
EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	20 µg/L	111	72.5	120
EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	20 µg/L	105	69.4	120
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	20 µg/L	109	67.8	120
EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	20 µg/L	104	78.4	120
EP074: Trichloroethene	79-01-6	5	µg/L	<5	20 µg/L	105	73.1	120
EP074: Dibromomethane	74-95-3	5	µg/L	<5	20 µg/L	102	78.3	119
EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	20 µg/L	96.3	81.1	120
EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	20 µg/L	96.0	80.3	120
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	20 µg/L	110	73.1	118
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	20 µg/L	99.8	76.9	111
EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	20 µg/L	94.6	70.0	122
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	20 µg/L	80.6	62.4	118
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	20 µg/L	95.7	77.9	128
EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	20 µg/L	96.1	78.5	124
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	20 µg/L	101	68.5	110
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	20 µg/L	87.9	70.7	116
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	20 µg/L	116	60.0	134

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
EP074F: Halogenated Aromatic Compounds (QCLot: 5147133)								
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	20 µg/L	108	82.6	116
EP074: Bromobenzene	108-86-1	5	µg/L	<5	20 µg/L	108	79.3	115
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	20 µg/L	111	75.5	116
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	20 µg/L	106	75.0	115
EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	20 µg/L	107	76.9	116
EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	20 µg/L	106	78.4	118
EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	20 µg/L	103	82.2	113
EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	20 µg/L	107	67.4	124
EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	20 µg/L	98.1	70.4	124
EP074G: Trihalomethanes (QCLot: 5147133)								
EP074: Chloroform	67-66-3	5	µg/L	<5	20 µg/L	110	79.6	120
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	20 µg/L	102	76.3	117
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	20 µg/L	94.9	73.5	113
EP074: Bromoform	75-25-2	5	µg/L	<5	20 µg/L	94.8	68.5	113
EP075A: Phenolic Compounds (QCLot: 5145200)								
EP075: Phenol	108-95-2	2	µg/L	<2	10 µg/L	28.3	19.5	48.1
EP075: 2-Chlorophenol	95-57-8	2	µg/L	<2	10 µg/L	67.7	46.3	101
EP075: 2-Methylphenol	95-48-7	2	µg/L	<2	10 µg/L	58.7	41.1	94.4
EP075: 3- & 4-Methylphenol	1319-77-3	2	µg/L	<2	10 µg/L	52.8	35.1	88.8
EP075: 2-Nitrophenol	88-75-5	2	µg/L	<2	10 µg/L	61.8	45.3	113
EP075: 2.4-Dimethylphenol	105-67-9	2	µg/L	<2	10 µg/L	69.3	47.6	108
EP075: 2.4-Dichlorophenol	120-83-2	2	µg/L	<2	10 µg/L	68.5	48.2	110
EP075: 2.6-Dichlorophenol	87-65-0	2	µg/L	<2	10 µg/L	67.6	48.9	107
EP075: 4-Chloro-3-methylphenol	59-50-7	2	µg/L	<2	10 µg/L	69.4	47.2	110
EP075: 2.4.6-Trichlorophenol	88-06-2	2	µg/L	<2	10 µg/L	61.9	45.2	112
EP075: 2.4.5-Trichlorophenol	95-95-4	2	µg/L	<2	10 µg/L	72.8	42.4	113
EP075: Pentachlorophenol	87-86-5	4	µg/L	<4	10 µg/L	22.9	14.2	124
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 5145200)								
EP075: Naphthalene	91-20-3	2	µg/L	<2	10 µg/L	67.8	50.9	107
EP075: 2-Methylnaphthalene	91-57-6	2	µg/L	<2	10 µg/L	67.7	50.3	111
EP075: 2-Chloronaphthalene	91-58-7	2	µg/L	<2	10 µg/L	69.7	50.8	110
EP075: Acenaphthylene	208-96-8	2	µg/L	<2	10 µg/L	70.3	52.9	111
EP075: Acenaphthene	83-32-9	2	µg/L	<2	10 µg/L	72.7	54.5	109
EP075: Fluorene	86-73-7	2	µg/L	<2	10 µg/L	68.9	55.7	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
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 5145200) - continued								
EP075: Phenanthrene	85-01-8	2	µg/L	<2	10 µg/L	68.3	55.4	112
EP075: Anthracene	120-12-7	2	µg/L	<2	10 µg/L	67.5	55.9	111
EP075: Fluoranthene	206-44-0	2	µg/L	<2	10 µg/L	72.4	55.9	112
EP075: Pyrene	129-00-0	2	µg/L	<2	10 µg/L	68.6	56.5	112
EP075: N-2-Fluorenyl Acetamide	53-96-3	2	µg/L	<2	10 µg/L	67.8	50.0	118
EP075: Benz(a)anthracene	56-55-3	2	µg/L	<2	10 µg/L	71.3	55.5	114
EP075: Chrysene	218-01-9	2	µg/L	<2	10 µg/L	68.2	56.0	114
EP075: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	4	µg/L	<4	20 µg/L	68.3	55.4	120
EP075: 7.12-Dimethylbenz(a)anthracene	57-97-6	2	µg/L	<2	10 µg/L	84.3	54.4	121
EP075: Benzo(a)pyrene	50-32-8	2	µg/L	<2	10 µg/L	68.8	53.9	121
EP075: 3-Methylcholanthrene	56-49-5	2	µg/L	<2	10 µg/L	65.6	51.9	121
EP075: Indeno(1.2.3.cd)pyrene	193-39-5	2	µg/L	<2	10 µg/L	68.2	54.4	114
EP075: Dibenz(a.h)anthracene	53-70-3	2	µg/L	<2	10 µg/L	69.2	54.0	115
EP075: Benzo(g.h.i)perylene	191-24-2	2	µg/L	<2	10 µg/L	64.9	51.7	116
EP075C: Phthalate Esters (QCLot: 5145200)								
EP075: Dimethyl phthalate	131-11-3	2	µg/L	<2	10 µg/L	71.6	56.5	115
EP075: Diethyl phthalate	84-66-2	2	µg/L	<2	10 µg/L	69.6	58.0	113
EP075: Di-n-butyl phthalate	84-74-2	2	µg/L	<2	10 µg/L	70.1	57.6	120
EP075: Butyl benzyl phthalate	85-68-7	2	µg/L	<2	10 µg/L	67.1	56.3	119
EP075: bis(2-ethylhexyl) phthalate	117-81-7	10	µg/L	<10	10 µg/L	73.5	57.6	122
EP075: Di-n-octylphthalate	117-84-0	2	µg/L	<2	10 µg/L	70.8	56.5	122
EP075D: Nitrosamines (QCLot: 5145200)								
EP075: N-Nitrosomethylethylamine	10595-95-6	2	µg/L	<2	10 µg/L	47.9	23.9	106
EP075: N-Nitrosodiethylamine	55-18-5	2	µg/L	<2	10 µg/L	64.0	46.1	108
EP075: N-Nitrosopyrrolidine	930-55-2	4	µg/L	<4	10 µg/L	49.0	36.6	83.2
EP075: N-Nitrosomorpholine	59-89-2	2	µg/L	<2	10 µg/L	48.8	34.6	79.0
EP075: N-Nitrosodi-n-propylamine	621-64-7	2	µg/L	<2	10 µg/L	66.7	53.1	114
EP075: N-Nitrosopiperidine	100-75-4	2	µg/L	<2	10 µg/L	65.9	51.0	111
EP075: N-Nitrosodibutylamine	924-16-3	2	µg/L	<2	10 µg/L	57.1	37.0	111
EP075: N-Nitrosodiphenyl & Diphenylamine	86-30-6 122-39-4	4	µg/L	<4	10 µg/L	75.0	51.3	113
EP075: Methapyrilene	91-80-5	2	µg/L	<2	10 µg/L	59.7	10.0	125
EP075E: Nitroaromatics and Ketones (QCLot: 5145200)								
EP075: 2-Picoline	109-06-8	2	µg/L	<2	10 µg/L	45.9	18.8	108

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
EP075E: Nitroaromatics and Ketones (QCLot: 5145200) - continued								
EP075: Acetophenone	98-86-2	2	µg/L	<2	10 µg/L	67.9	52.5	111
EP075: Nitrobenzene	98-95-3	2	µg/L	<2	10 µg/L	64.7	50.6	109
EP075: Isophorone	78-59-1	2	µg/L	<2	10 µg/L	67.2	53.7	113
EP075: 2.6-Dinitrotoluene	606-20-2	4	µg/L	<4	10 µg/L	69.0	54.0	115
EP075: 2.4-Dinitrotoluene	121-14-2	4	µg/L	<4	10 µg/L	68.4	53.3	109
EP075: 1-Naphthylamine	134-32-7	2	µg/L	<2	10 µg/L	70.5	10.9	119
EP075: 4-Nitroquinoline-N-oxide	56-57-5	2	µg/L	<2	10 µg/L	43.8	27.3	147
EP075: 5-Nitro-o-toluidine	99-55-8	2	µg/L	<2	10 µg/L	75.4	44.6	119
EP075: Azobenzene	103-33-3	2	µg/L	<2	10 µg/L	68.8	55.6	110
EP075: 1.3.5-Trinitrobenzene	99-35-4	2	µg/L	<2	10 µg/L	56.9	37.6	124
EP075: Phenacetin	62-44-2	2	µg/L	<2	10 µg/L	64.1	44.8	101
EP075: 4-Aminobiphenyl	92-67-1	2	µg/L	<2	10 µg/L	77.4	24.0	149
EP075: Pentachloronitrobenzene	82-68-8	2	µg/L	<2	10 µg/L	69.8	54.6	111
EP075: Pronamide	23950-58-5	2	µg/L	<2	10 µg/L	66.1	56.5	113
EP075: Dimethylaminoazobenzene	60-11-7	2	µg/L	<2	10 µg/L	70.2	53.8	112
EP075: Chlorobenzilate	510-15-6	2	µg/L	<2	10 µg/L	68.3	55.0	113
EP075F: Haloethers (QCLot: 5145200)								
EP075: Bis(2-chloroethyl) ether	111-44-4	2	µg/L	<2	10 µg/L	67.1	45.3	112
EP075: Bis(2-chloroethoxy) methane	111-91-1	2	µg/L	<2	10 µg/L	65.7	52.7	111
EP075: 4-Chlorophenyl phenyl ether	7005-72-3	2	µg/L	<2	10 µg/L	67.8	55.8	110
EP075: 4-Bromophenyl phenyl ether	101-55-3	2	µg/L	<2	10 µg/L	71.7	55.7	114
EP075G: Chlorinated Hydrocarbons (QCLot: 5145200)								
EP075: 1.4-Dichlorobenzene	106-46-7	2	µg/L	<2	10 µg/L	65.2	43.2	104
EP075: 1.3-Dichlorobenzene	541-73-1	2	µg/L	<2	10 µg/L	64.0	42.7	103
EP075: 1.2-Dichlorobenzene	95-50-1	2	µg/L	<2	10 µg/L	60.6	44.4	104
EP075: Hexachloroethane	67-72-1	2	µg/L	<2	10 µg/L	60.7	41.5	105
EP075: 1.2.4-Trichlorobenzene	120-82-1	2	µg/L	<2	10 µg/L	63.2	46.1	107
EP075: Hexachloropropylene	1888-71-7	2	µg/L	<2	10 µg/L	62.7	41.4	109
EP075: Hexachlorobutadiene	87-68-3	2	µg/L	<2	10 µg/L	65.1	43.9	108
EP075: Hexachlorocyclopentadiene	77-47-4	10	µg/L	<10	10 µg/L	46.2	14.6	133
EP075: Pentachlorobenzene	608-93-5	2	µg/L	<2	10 µg/L	67.6	53.3	109
EP075: Hexachlorobenzene (HCB)	118-74-1	4	µg/L	<4	10 µg/L	69.2	48.4	116
EP075H: Anilines and Benzidines (QCLot: 5145200)								
EP075: Aniline	62-53-3	2	µg/L	<2	10 µg/L	59.0	21.2	116

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
EP075H: Anilines and Benzidines (QCLot: 5145200) - continued								
EP075: 4-Chloroaniline	106-47-8	2	µg/L	<2	10 µg/L	55.9	14.5	126
EP075: 2-Nitroaniline	88-74-4	4	µg/L	<4	10 µg/L	68.9	49.5	111
EP075: 3-Nitroaniline	99-09-2	4	µg/L	<4	10 µg/L	71.0	28.4	125
EP075: Dibenzofuran	132-64-9	2	µg/L	<2	10 µg/L	68.3	55.4	110
EP075: 4-Nitroaniline	100-01-6	2	µg/L	<2	10 µg/L	65.5	37.3	112
EP075: Carbazole	86-74-8	2	µg/L	<2	10 µg/L	69.9	51.6	116
EP075: 3.3`-Dichlorobenzidine	91-94-1	2	µg/L	<2	10 µg/L	66.4	42.3	142
EP075I: Organochlorine Pesticides (QCLot: 5145200)								
EP075: alpha-BHC	319-84-6	2	µg/L	<2	10 µg/L	70.9	56.2	112
EP075: beta-BHC	319-85-7	2	µg/L	<2	10 µg/L	72.7	56.2	113
EP075: gamma-BHC	58-89-9	2	µg/L	<2	10 µg/L	71.9	55.2	113
EP075: delta-BHC	319-86-8	2	µg/L	<2	10 µg/L	69.2	52.6	117
EP075: Heptachlor	76-44-8	2	µg/L	<2	10 µg/L	68.3	53.4	111
EP075: Aldrin	309-00-2	2	µg/L	<2	10 µg/L	62.2	54.0	112
EP075: Heptachlor epoxide	1024-57-3	2	µg/L	<2	10 µg/L	71.5	54.2	113
EP075: alpha-Endosulfan	959-98-8	2	µg/L	<2	10 µg/L	65.0	49.3	122
EP075: 4.4`-DDE	72-55-9	2	µg/L	<2	10 µg/L	70.8	56.0	121
EP075: Dieldrin	60-57-1	2	µg/L	<2	10 µg/L	68.0	55.2	118
EP075: Endrin	72-20-8	2	µg/L	<2	10 µg/L	71.2	52.7	121
EP075: beta-Endosulfan	33213-65-9	2	µg/L	<2	10 µg/L	70.7	55.1	119
EP075: 4.4`-DDD	72-54-8	2	µg/L	<2	10 µg/L	69.9	55.4	120
EP075: Endosulfan sulfate	1031-07-8	2	µg/L	<2	10 µg/L	65.9	49.6	123
EP075: 4.4`-DDT	50-29-3	4	µg/L	<4	10 µg/L	53.7	47.8	127
EP075J: Organophosphorus Pesticides (QCLot: 5145200)								
EP075: Dichlorvos	62-73-7	2	µg/L	<2	10 µg/L	68.4	50.1	115
EP075: Dimethoate	60-51-5	2	µg/L	<2	10 µg/L	62.8	40.8	108
EP075: Diazinon	333-41-5	2	µg/L	<2	10 µg/L	72.6	55.4	118
EP075: Chlorpyrifos-methyl	5598-13-0	2	µg/L	<2	10 µg/L	69.0	53.0	118
EP075: Malathion	121-75-5	2	µg/L	<2	10 µg/L	68.4	54.6	122
EP075: Fenthion	55-38-9	2	µg/L	<2	10 µg/L	62.8	55.1	119
EP075: Chlorpyrifos	2921-88-2	2	µg/L	<2	10 µg/L	69.8	55.3	118
EP075: Pirimphos-ethyl	23505-41-1	2	µg/L	<2	10 µg/L	71.3	55.8	118
EP075: Chlorfenvinphos	470-90-6	2	µg/L	<2	10 µg/L	66.2	45.8	118
EP075: Prothiofos	34643-46-4	2	µg/L	<2	10 µg/L	69.8	56.1	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
EP075J: Organophosphorus Pesticides (QCLot: 5145200) - continued								
EP075: Ethion	563-12-2	2	µg/L	<2	10 µg/L	71.5	57.7	119
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5145199)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	4560 µg/L	83.6	47.2	122
EP071: C15 - C28 Fraction	----	100	µg/L	<100	16200 µg/L	92.6	52.9	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8650 µg/L	94.6	50.4	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5147134)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	100.0	66.2	134
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5145199)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	6190 µg/L	96.2	49.1	125
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	22200 µg/L	89.1	51.6	128
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1520 µg/L	97.0	47.2	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5147134)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	108	66.2	132
EP080: BTEXN (QCLot: 5147134)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	102	68.8	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	101	72.9	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	101	71.7	130
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	113	72.3	136
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	112	75.9	134
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	103	68.3	131
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QCLot: 5158061)								
EP202-SL: 4-Chlorophenoxy acetic acid	122-88-3	10	µg/L	<10	100 µg/L	106	82.0	136
EP202-SL: 2.4-DB	94-82-6	10	µg/L	<10	100 µg/L	107	65.0	147
EP202-SL: Dicamba	1918-00-9	10	µg/L	<10	100 µg/L	104	83.0	137
EP202-SL: Mecoprop	93-65-2	10	µg/L	<10	100 µg/L	106	75.0	143
EP202-SL: MCPA	94-74-6	10	µg/L	<10	100 µg/L	103	76.0	140
EP202-SL: 2.4-DP	120-36-5	10	µg/L	<10	100 µg/L	106	76.0	144
EP202-SL: 2.4-D	94-75-7	10	µg/L	<10	100 µg/L	104	77.0	139
EP202-SL: Triclopyr	55335-06-3	10	µg/L	<10	100 µg/L	109	77.0	141
EP202-SL: Silvex (2.4.5-TP/Fenoprop)	93-72-1	10	µg/L	<10	100 µg/L	105	75.0	143
EP202-SL: 2.4.5-T	93-76-5	10	µg/L	<10	100 µg/L	109	78.0	140
EP202-SL: MCPB	94-81-5	10	µg/L	<10	100 µg/L	109	69.2	139
EP202-SL: Picloram	1918-02-1	10	µg/L	<10	100 µg/L	102	70.0	144

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
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QCLot: 5158061) - continued								
EP202-SL: Clopyralid	1702-17-6	10	µg/L	<10	100 µg/L	103	70.0	145
EP202-SL: Fluroxypyr	69377-81-7	10	µg/L	<10	100 µg/L	104	77.0	145

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: 5145636)							
EM2311807-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	101	70.0	130
ED043S: Total Oxidised Sulfur as S (QCLot: 5161399)							
EM2311873-001	Anonymous	ED043S: Total Oxidised Sulfur as S	----	167 mg/L	83.4	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5145637)							
EM2311807-001	Anonymous	ED045G: Chloride	16887-00-6	800 mg/L	70.2	70.0	142
EG020F: Dissolved Metals by ICP-MS (QCLot: 5158808)							
EM2311710-001	Landfill leachate	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	100	76.6	124
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	105	74.6	118
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	84.8	71.0	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	94.3	76.0	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	83.6	75.0	133
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	74.0	64.0	134
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	93.5	73.0	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	# 133	75.0	131
EG020T: Total Metals by ICP-MS (QCLot: 5159078)							
EM2311562-044	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	102	82.0	123
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	102	81.8	123
		EG020A-T: Chromium	7440-47-3	1 mg/L	102	78.9	119
		EG020A-T: Copper	7440-50-8	1 mg/L	103	80.4	118
		EG020A-T: Lead	7439-92-1	1 mg/L	104	80.5	121
		EG020A-T: Manganese	7439-96-5	1 mg/L	103	73.0	123
		EG020A-T: Nickel	7440-02-0	1 mg/L	99.5	80.0	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	98.3	74.0	120
EG035F: Dissolved Mercury by FIMS (QCLot: 5158810)							
EM2311790-001	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	113	70.0	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5151072)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5151072) - continued							
EM2311660-005	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	94.6	70.0	130
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 5162235)							
EM2311937-001	Anonymous	EK026SF: Total Cyanide	57-12-5	0.2 mg/L	88.2	70.0	130
EK055: Ammonia as N (QCLot: 5161260)							
EM2311852-001	Anonymous	EK055: Ammonia as N	7664-41-7	50 mg/L	88.6	80.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5145638)							
EM2311807-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	110	80.0	114
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5154230)							
EM2311842-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	# Not Determined	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5145639)							
EM2311842-004	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	1 mg/L	# Not Determined	79.0	123
EK085M: Sulfide as S2- (QCLot: 5151091)							
EM2311761-001	Anonymous	EK085: Sulfide as S2-	18496-25-8	0.5 mg/L	120	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5147134)							
EM2311852-001	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	78.2	33.9	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5147134)							
EM2311852-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	73.3	34.0	122
EP080: BTEXN (QCLot: 5147134)							
EM2311852-001	Anonymous	EP080: Benzene	71-43-2	20 µg/L	84.5	56.3	133
		EP080: Toluene	108-88-3	20 µg/L	86.9	60.4	132
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QCLot: 5158061)							
EM2311710-001	Landfill leachate	EP202-SL: Mecoprop	93-65-2	100 µg/L	# 22.2	75.0	143
		EP202-SL: MCPA	94-74-6	100 µg/L	# 29.4	76.0	140
		EP202-SL: 2.4-D	94-75-7	100 µg/L	# 30.3	77.0	139
		EP202-SL: Triclopyr	55335-06-3	100 µg/L	# 29.3	77.0	141
		EP202-SL: 2.4.5-T	93-76-5	100 µg/L	# 43.5	78.0	140
		EP202-SL: Picloram	1918-02-1	100 µg/L	# 24.7	70.0	144
		EP202-SL: Clopyralid	1702-17-6	100 µg/L	# 10.9	70.0	145

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2311710**	Page	: 1 of 15
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAMANTHA KING	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 30-Jun-2023
Site	: ----	Issue Date	: 11-Jul-2023
Sampler	: MB	No. of samples received	: 1
Order number	: 12564388	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **Surrogate recovery outliers exist for all regular sample matrices - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

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

Outliers : 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							
EG020F: Dissolved Metals by ICP-MS	EM2311710--001	Landfill leachate	**Zinc**	7440-66-6	133 %	75.0-131%	**Recovery greater than upper data quality objective**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser	EM2311842--001	Anonymous	**Total Kjeldahl Nitrogen as N**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK071G: Reactive Phosphorus as P by discrete analyse	EM2311842--004	Anonymous	**Reactive Phosphorus as P**	14265-44-2	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP202A: Phenoxyacetic Acid Herbicides by LCMS	EM2311710--001	Landfill leachate	**Mecoprop**	93-65-2	22.2 %	75.0-143%	**Recovery less than lower data quality objective**
EP202A: Phenoxyacetic Acid Herbicides by LCMS	EM2311710--001	Landfill leachate	**MCPA**	94-74-6	29.4 %	76.0-140%	**Recovery less than lower data quality objective**
EP202A: Phenoxyacetic Acid Herbicides by LCMS	EM2311710--001	Landfill leachate	**2.4-D**	94-75-7	30.3 %	77.0-139%	**Recovery less than lower data quality objective**
EP202A: Phenoxyacetic Acid Herbicides by LCMS	EM2311710--001	Landfill leachate	**Triclopyr**	55335-06-3	29.3 %	77.0-141%	**Recovery less than lower data quality objective**
EP202A: Phenoxyacetic Acid Herbicides by LCMS	EM2311710--001	Landfill leachate	**2.4.5-T**	93-76-5	43.5 %	78.0-140%	**Recovery less than lower data quality objective**
EP202A: Phenoxyacetic Acid Herbicides by LCMS	EM2311710--001	Landfill leachate	**Picloram**	1918-02-1	24.7 %	70.0-144%	**Recovery less than lower data quality objective**
EP202A: Phenoxyacetic Acid Herbicides by LCMS	EM2311710--001	Landfill leachate	**Clopyralid**	1702-17-6	10.9 %	70.0-145%	**Recovery less than lower data quality objective**

Regular Sample Surrogates

Sub-Matrix: **LEACHATE**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP075T: Base/Neutral Extractable Surrogates	EM2311710-001	Landfill leachate	**Nitrobenzene-D5**	4165-60-0	24.6 %	37.3-115 %	**Recovery less than lower data quality objective**
EP075T: Base/Neutral Extractable Surrogates	EM2311710-001	Landfill leachate	**1.2-Dichlorobenzene-D4**	2199-69-1	22.9 %	32.3-99.0 %	**Recovery less than lower data quality objective**
EP075T: Base/Neutral Extractable Surrogates	EM2311710-001	Landfill leachate	**2-Fluorobiphenyl**	321-60-8	35.8 %	38.8-116 %	**Recovery less than lower data quality objective**
EP075T: Base/Neutral Extractable Surrogates	EM2311710-001	Landfill leachate	**Anthracene-d10**	1719-06-8	40.4 %	48.8-123 %	**Recovery less than lower data quality objective**
EP075T: Base/Neutral Extractable Surrogates	EM2311710-001	Landfill leachate	**4-Terphenyl-d14**	1718-51-0	42.4 %	46.8-129 %	**Recovery less than lower data quality objective**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EA015: Total Dissolved Solids dried at 180 ± 5 °C						
Clear Plastic Bottle - Natural						
Landfill leachate	----	----	----	08-Jul-2023	06-Jul-2023	**2**
EA025: Total Suspended Solids dried at 104 ± 2°C						
Clear Plastic Bottle - Natural						
Landfill leachate	----	----	----	10-Jul-2023	06-Jul-2023	**4**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count: QC	Count: Regular	Rate (%): Actual	Rate (%): Expected	Quality Control Specification
	0				
Laboratory Duplicates (DUP)					
Pesticides by GCMS	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	0	2	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)					
Oil and Grease	2	30	6.67	8.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Dissolved Organic Carbon	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	0	13	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	2	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	0	2	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	0	1	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.

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)							
Landfill leachate	**29-Jun-2023**	**----**	----	**----**	**08-Jul-2023**	06-Jul-2023	×
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H)							
Landfill leachate	**29-Jun-2023**	**----**	----	**----**	**10-Jul-2023**	06-Jul-2023	×
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
Landfill leachate	**29-Jun-2023**	**----**	----	**----**	**06-Jul-2023**	13-Jul-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
Landfill leachate	**29-Jun-2023**	**----**	----	**----**	**01-Jul-2023**	27-Jul-2023	✓
ED043S: Total Oxidised Sulfur as S							
Clear Plastic Bottle - Natural (ED043S)							
Landfill leachate	**29-Jun-2023**	**10-Jul-2023**	27-Jul-2023	✓	**10-Jul-2023**	27-Jul-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
Landfill leachate	**29-Jun-2023**	**----**	----	**----**	**01-Jul-2023**	27-Jul-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F)							
Landfill leachate	**29-Jun-2023**	**----**	----	**----**	**07-Jul-2023**	27-Jul-2023	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)							
Landfill leachate	**29-Jun-2023**	**----**	----	**----**	**07-Jul-2023**	26-Dec-2023	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
Landfill leachate	**29-Jun-2023**	**07-Jul-2023**	26-Dec-2023	✓	**07-Jul-2023**	26-Dec-2023	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F)							
Landfill leachate	**29-Jun-2023**	**----**	----	**----**	**10-Jul-2023**	27-Jul-2023	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG035T)							
Landfill leachate	**29-Jun-2023**	**----**	----	**----**	**05-Jul-2023**	27-Jul-2023	✓
EK026SF: Total CN by Segmented Flow Analyser							
Black Opaque Plastic Bottle - NaOH (EK026SF)							
Landfill leachate	**29-Jun-2023**	**----**	----	**----**	**11-Jul-2023**	13-Jul-2023	✓
EK055: Ammonia as N							
Clear Plastic Bottle - Sulfuric Acid (EK055)							
Landfill leachate	**29-Jun-2023**	**----**	----	**----**	**10-Jul-2023**	27-Jul-2023	✓

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)							
Landfill leachate	**29-Jun-2023**	**----**	----	**----**	**01-Jul-2023**	01-Jul-2023	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
Landfill leachate	**29-Jun-2023**	**----**	----	**----**	**11-Jul-2023**	27-Jul-2023	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
Landfill leachate	**29-Jun-2023**	**05-Jul-2023**	27-Jul-2023	✓	**06-Jul-2023**	27-Jul-2023	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
Landfill leachate	**29-Jun-2023**	**05-Jul-2023**	27-Jul-2023	✓	**06-Jul-2023**	27-Jul-2023	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
Landfill leachate	**29-Jun-2023**	**----**	----	**----**	**01-Jul-2023**	01-Jul-2023	✓
EK085M: Sulfide as S2-							
Clear Plastic Bottle - Zinc Acetate/NaOH (EK085)							
Landfill leachate	**29-Jun-2023**	**----**	----	**----**	**04-Jul-2023**	06-Jul-2023	✓
EK086: Sulfite as SO3 2-							
Clear Plastic Bottle - EDTA/Zinc Acetate (EK086)							
Landfill leachate	**29-Jun-2023**	**----**	----	**----**	**30-Jun-2023**	01-Jul-2023	✓
EK087: Thiosulfate as S2O3 2-							
Clear Plastic Bottle - EDTA/Zinc Acetate (EK087)							
Landfill leachate	**29-Jun-2023**	**----**	----	**----**	**30-Jun-2023**	01-Jul-2023	✓
EP002: Dissolved Organic Carbon (DOC)							
Amber DOC Filtered- Sulfuric Preserved (EP002)							
Landfill leachate	**29-Jun-2023**	**----**	----	**----**	**10-Jul-2023**	27-Jul-2023	✓
EP010: Formaldehyde							
Clear Plastic Bottle - Natural (EP010)							
Landfill leachate	**29-Jun-2023**	**----**	----	**----**	**30-Jun-2023**	01-Jul-2023	✓
EP020: Oil and Grease (O&G)							
Amber Jar - Sulfuric Acid or Sodium Bisulfate (EP020)							
Landfill leachate	**29-Jun-2023**	**----**	----	**----**	**06-Jul-2023**	27-Jul-2023	✓
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030)							
Landfill leachate	**29-Jun-2023**	**----**	----	**----**	**30-Jun-2023**	01-Jul-2023	✓
EP066: Polychlorinated Biphenyls (PCB)							
Amber Glass Bottle - Unpreserved (EP066)							
Landfill leachate	**29-Jun-2023**	**30-Jun-2023**	06-Jul-2023	✓	**03-Jul-2023**	09-Aug-2023	✓

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
EP068A: Organochlorine Pesticides (OC)							
Amber Glass Bottle - Unpreserved (EP068) Landfill leachate	**29-Jun-2023**	**30-Jun-2023**	06-Jul-2023	✓	**03-Jul-2023**	09-Aug-2023	✓
EP068B: Organophosphorus Pesticides (OP)							
Amber Glass Bottle - Unpreserved (EP068) Landfill leachate	**29-Jun-2023**	**30-Jun-2023**	06-Jul-2023	✓	**03-Jul-2023**	09-Aug-2023	✓
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071-SVSG) Landfill leachate	**29-Jun-2023**	**30-Jun-2023**	06-Jul-2023	✓	**04-Jul-2023**	09-Aug-2023	✓
EP071 SG: Total Petroleum Hydrocarbons - SV Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071-SVSG) Landfill leachate	**29-Jun-2023**	**30-Jun-2023**	06-Jul-2023	✓	**04-Jul-2023**	09-Aug-2023	✓
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071-SVSG) Landfill leachate	**29-Jun-2023**	**30-Jun-2023**	06-Jul-2023	✓	**04-Jul-2023**	09-Aug-2023	✓
EP071 SG: Total Recoverable Hydrocarbons - SV NEPM 2013 Fractions - Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071-SVSG) Landfill leachate	**29-Jun-2023**	**30-Jun-2023**	06-Jul-2023	✓	**04-Jul-2023**	09-Aug-2023	✓
EP074B: Oxygenated Compounds							
Amber VOC Vial - Sulfuric Acid (EP074) Landfill leachate	**29-Jun-2023**	**03-Jul-2023**	13-Jul-2023	✓	**05-Jul-2023**	13-Jul-2023	✓
EP074D: Fumigants							
Amber VOC Vial - Sulfuric Acid (EP074) Landfill leachate	**29-Jun-2023**	**03-Jul-2023**	13-Jul-2023	✓	**05-Jul-2023**	13-Jul-2023	✓
EP074E: Halogenated Aliphatic Compounds							
Amber VOC Vial - Sulfuric Acid (EP074) Landfill leachate	**29-Jun-2023**	**03-Jul-2023**	13-Jul-2023	✓	**05-Jul-2023**	13-Jul-2023	✓
EP074F: Halogenated Aromatic Compounds							
Amber VOC Vial - Sulfuric Acid (EP074) Landfill leachate	**29-Jun-2023**	**03-Jul-2023**	13-Jul-2023	✓	**05-Jul-2023**	13-Jul-2023	✓
EP074G: Trihalomethanes							
Amber VOC Vial - Sulfuric Acid (EP074) Landfill leachate	**29-Jun-2023**	**03-Jul-2023**	13-Jul-2023	✓	**05-Jul-2023**	13-Jul-2023	✓
EP075A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**29-Jun-2023**	**30-Jun-2023**	06-Jul-2023	✓	**04-Jul-2023**	09-Aug-2023	✓
EP075B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**29-Jun-2023**	**30-Jun-2023**	06-Jul-2023	✓	**04-Jul-2023**	09-Aug-2023	✓

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
EP075C: Phthalate Esters							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**29-Jun-2023**	**30-Jun-2023**	06-Jul-2023	✓	**04-Jul-2023**	09-Aug-2023	✓
EP075D: Nitrosamines							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**29-Jun-2023**	**30-Jun-2023**	06-Jul-2023	✓	**04-Jul-2023**	09-Aug-2023	✓
EP075E: Nitroaromatics and Ketones							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**29-Jun-2023**	**30-Jun-2023**	06-Jul-2023	✓	**04-Jul-2023**	09-Aug-2023	✓
EP075F: Haloethers							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**29-Jun-2023**	**30-Jun-2023**	06-Jul-2023	✓	**04-Jul-2023**	09-Aug-2023	✓
EP075G: Chlorinated Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**29-Jun-2023**	**30-Jun-2023**	06-Jul-2023	✓	**04-Jul-2023**	09-Aug-2023	✓
EP075H: Anilines and Benzidines							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**29-Jun-2023**	**30-Jun-2023**	06-Jul-2023	✓	**04-Jul-2023**	09-Aug-2023	✓
EP075I: Organochlorine Pesticides							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**29-Jun-2023**	**30-Jun-2023**	06-Jul-2023	✓	**04-Jul-2023**	09-Aug-2023	✓
EP075J: Organophosphorus Pesticides							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**29-Jun-2023**	**30-Jun-2023**	06-Jul-2023	✓	**04-Jul-2023**	09-Aug-2023	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) Landfill leachate	**29-Jun-2023**	**30-Jun-2023**	06-Jul-2023	✓	**03-Jul-2023**	09-Aug-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080) Landfill leachate	**29-Jun-2023**	**03-Jul-2023**	13-Jul-2023	✓	**05-Jul-2023**	13-Jul-2023	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) Landfill leachate	**29-Jun-2023**	**30-Jun-2023**	06-Jul-2023	✓	**03-Jul-2023**	09-Aug-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080) Landfill leachate	**29-Jun-2023**	**03-Jul-2023**	13-Jul-2023	✓	**05-Jul-2023**	13-Jul-2023	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) Landfill leachate	**29-Jun-2023**	**03-Jul-2023**	13-Jul-2023	✓	**05-Jul-2023**	13-Jul-2023	✓
EP202A: Phenoxyacetic Acid Herbicides by LCMS							
Amber Glass Bottle - Unpreserved (EP202-SL) Landfill leachate	**29-Jun-2023**	**----**	----	**----**	**06-Jul-2023**	06-Jul-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	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	3	20	**15.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Organic Carbon	EP002	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	1	**100.00**	**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
Pesticides by GCMS	EP068	0	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202-SL	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	0	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	0	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfide as S2-	EK085	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfite as SO3 2-	EK086	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	29	**10.34**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Thiosulfate as S2O3 2-	EK087	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Ammonia as N	EK055	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	9	**11.11**	**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	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	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Oxidised Sulfur as S	ED043S	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	EP071-SVSG	0	2	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	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							
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
Dissolved Organic Carbon	EP002	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	1	**100.00**	**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
Oil and Grease	EP020	2	30	**6.67**	**8.00**	×	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202-SL	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfide as S2-	EK085	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfite as SO3 2-	EK086	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	29	**10.34**	**7.50**	✓	NEPM 2013 B3 & ALS QC Standard
Thiosulfate as S2O3 2-	EK087	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Ammonia as N	EK055	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	3	40	**7.50**	**7.50**	✓	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	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Oxidised Sulfur as S	ED043S	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	EP071-SVSG	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Biochemical Oxygen Demand (BOD)	EP030	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
Dissolved Organic Carbon	EP002	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	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*	
Method Blanks (MB) - Continued							
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	1	**100.00**	**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
Oil and Grease	EP020	2	30	**6.67**	**6.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202-SL	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfide as S2-	EK085	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfite as SO3 2-	EK086	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	29	**6.90**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Thiosulfate as S2O3 2-	EK087	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Ammonia as N	EK055	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	9	**11.11**	**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	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	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Oxidised Sulfur as S	ED043S	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	EP071-SVSG	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
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
Dissolved Organic Carbon	EP002	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	0	1	**0.00**	**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
Pesticides by GCMS	EP068	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202-SL	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	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*	
Matrix Spikes (MS) - Continued							
Sulfide as S2-	EK085	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Ammonia as N	EK055	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	9	**11.11**	**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	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Oxidised Sulfur as S	ED043S	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	0	13	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	2	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	EP071-SVSG	0	2	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
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)
Total Oxidised Sulfur as S	ED043S	WATER	In house: The sample is treated with Peroxide to convert all Sulfur species to Sulfate. Sulfate in the sample can then be determined by ICPAES and reported as TOS as S.
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.

Analytical Methods	Method	Matrix	Method Descriptions
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).
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).
Total Cyanide by Segmented Flow Analyser	EK026SF	WATER	In house: Referenced to APHA 4500-CN C&O / ASTM D7511 / ISO 14403. Sodium hydroxide preserved samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM Schedule B(3)
Total Ammonia as N	EK055	WATER	In house: Referenced to APHA 4500-NH3 H. This procedure involves a Buchi steam distillation followed by a titrimetric finish to determine ammonia in solid wastes, water and wastewater. 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)

Analytical Methods	Method	Matrix	Method Descriptions
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)
Sulfide as S2-	EK085	WATER	In house: Referenced to APHA 4500-S2- D. Sulfide species present in water samples are immediately precipitated when collected in pretreated caustic/zinc acetate preserved sample containers. The sulphides are coloured using methylene blue indicator. Non-detects may be screened by comparison against a standard at half-LOR, otherwise samples are measured using UV-VIS detection at 664nm. This method is compliant with NEPM Schedule B(3)
Sulfite as SO3 2-	EK086	WATER	In house: Referenced to APHA 4500-SO32- B. Sulfite is determined by standardised Iodate / Iodide titration.
Thiosulfate as S2O3 2-	EK087	WATER	In house: Thiosulfate is determined by standardised Iodate / Iodide titration following formaledyde pretreatment.
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Dissolved Organic Carbon	EP002	WATER	In house: Referenced to APHA 5310 B. This method is compliant with NEPM Schedule B(3). Samples are combusted at high temperature in the presence of an oxidative catalyst. The evolved carbon dioxide is quantified using an IR detector.
Formaldehyde	EP010	WATER	In house: Referenced to ASTM D 6303-98. s
Oil and Grease	EP020	WATER	In house: Referenced to APHA 5520 B. Oil & grease is a gravimetric procedure to determine the amount of dissolved or emulsified oil & grease residue in an aqueous sample. The sample is serially extracted three times n-hexane. The resultant extracts are combined, dehydrated and concentrated prior to gravimetric determination. This method is compliant with NEPM Schedule B(3)
Biochemical Oxygen Demand (BOD)	EP030	WATER	In house: Referenced to APHA 5210 B. The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. This method is compliant with NEPM Schedule B(3).
Polychlorinated Biphenyls (PCB)	EP066	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
Pesticides by GCMS	EP068	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. 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 - Semivolatile Fractions Only (after Silica Gel Cleanup)	EP071-SVSG	WATER	In house: Referenced to USEPA SW 846 - 8015 Sample extracts cleaned up using silica gel and are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM Schedule B(3)
Volatile Organic Compounds	EP074	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. This method is compliant with NEPM Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Semivolatile Organic Compounds	EP075	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS 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)
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202-SL	WATER	In house: LCMS (Electrospray in negative mode). After adding surrogate and acetic acid, water samples are injected on a C18 column for LC/MS determination.
Anionic Surfactants as MBAS	W-MBAS	WATER	APHA 5540 C. Analysis subcontracted to ALS Scoresby (NATA Accredited Laboratory No. 992).

Preparation Methods	Method	Matrix	Method Descriptions
Total Oxidisable Sulfur as SO4 2- Prep	ED043-PR	WATER	In house
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.

CERTIFICATE OF ANALYSIS

Work Order	: **EM2311855**	Page	: 1 of 6
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAMANTHA KING	Contact	: Gregory Gommers
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61-3-8549 9600
Project	: 12564388	Date Samples Received	: 30-Jun-2023 11:15
Order number	: 12564388	Date Analysis Commenced	: 01-Jul-2023
C-O-C number	: ----	Issue Date	: 07-Jul-2023 20:07
Sampler	: MB		
Site	: ----		
Quote number	: ME/770/21 V2		
No. of samples received	: 7		
No. of samples analysed	: 7		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Arenie Vijayaratnam	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Tahlia Freeman	Instrument Operator	Melbourne Inorganics, Springvale, VIC

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.

- 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.
- EP030: The DO depletion for sample EM2311855 #5,6 is less than 2mg/L, this indicates that the sample has been over diluted and the BOD is less than 8mg/L. The BOD result reported was estimated from the lowest dilution.
- 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.
- 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.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	S1	S2	S3	S4	S6
			Sampling date / time	29-Jun-2023 00:00	29-Jun-2023 00:00	29-Jun-2023 00:00	29-Jun-2023 00:00	29-Jun-2023 00:00
Compound	CAS Number	LOR	Unit	EM2311855-001	EM2311855-002	EM2311855-003	EM2311855-004	EM2311855-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.62**	**7.75**	**7.49**	**7.85**	**7.96**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**395**	**433**	**516**	**427**	**435**
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**11**	**15**	**29**	<5	<5
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**114**	**136**	**121**	**138**	**142**
Total Alkalinity as CaCO3	----	1	mg/L	**114**	**136**	**121**	**138**	**142**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**34**	**36**	**54**	**36**	**36**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**22**	**23**	**46**	**21**	**22**
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**50**	**58**	**36**	**57**	**58**
Magnesium	7439-95-4	1	mg/L	**5**	**5**	**9**	**5**	**5**
Sodium	7440-23-5	1	mg/L	**15**	**14**	**32**	**13**	**13**
Potassium	7440-09-7	1	mg/L	**2**	**1**	**28**	**1**	**1**
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.28**	**0.07**	**0.23**	<0.01	**0.03**
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	**0.04**	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**1.18**	**1.27**	**2.40**	**1.28**	**1.31**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**1.18**	**1.27**	**2.44**	**1.28**	**1.31**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**1.4**	**0.3**	**2.1**	**0.2**	**0.3**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	**2.6**	**1.6**	**4.5**	**1.5**	**1.6**
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	**0.94**	<0.01	<0.01

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	S1	S2	S3	S4	S6
			Sampling date / time	29-Jun-2023 00:00	29-Jun-2023 00:00	29-Jun-2023 00:00	29-Jun-2023 00:00	29-Jun-2023 00:00
Compound	CAS Number	LOR	Unit	EM2311855-001	EM2311855-002	EM2311855-003	EM2311855-004	EM2311855-005
				Result	Result	Result	Result	Result
EK071FG: Dissolved Reactive Phosphorus as P by DA								
Dissolved Reactive Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	**0.66**	<0.01	**0.01**
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**3.61**	**4.12**	**4.84**	**4.10**	**4.21**
ø Total Cations	----	0.01	meq/L	**3.61**	**3.94**	**4.64**	**3.85**	**3.90**
ø Ionic Balance	----	0.01	%	**0.05**	**2.18**	**2.05**	**3.17**	**3.83**
EP030: Biochemical Oxygen Demand (BOD)								
Biochemical Oxygen Demand	----	2	mg/L	<2	<2	**4**	<2	<8

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	S9	QC1	----	----	----
			Sampling date / time	29-Jun-2023 00:00	29-Jun-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EM2311855-006	EM2311855-007	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.99**	**8.00**	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**433**	**427**	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**16**	**10**	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**142**	**139**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**142**	**139**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**37**	**36**	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**22**	**22**	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**60**	**57**	----	----	----
Magnesium	7439-95-4	1	mg/L	**5**	**5**	----	----	----
Sodium	7440-23-5	1	mg/L	**13**	**13**	----	----	----
Potassium	7440-09-7	1	mg/L	**1**	**1**	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**1.31**	**1.26**	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**1.31**	**1.26**	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**0.2**	**0.2**	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	**1.5**	**1.5**	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	<0.01	**0.01**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	S9	QC1	----	----	----
				Sampling date / time	29-Jun-2023 00:00	29-Jun-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EM2311855-006	EM2311855-007	--------	--------	--------
					Result	Result	----	----	----
EK071FG: Dissolved Reactive Phosphorus as P by DA									
Dissolved Reactive Phosphorus as P	----	0.01	mg/L		<0.01	<0.01	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**4.23**	**4.15**	----	----	----
ø Total Cations	----	0.01	meq/L		**4.00**	**3.85**	----	----	----
ø Ionic Balance	----	0.01	%		**2.82**	**3.76**	----	----	----
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L		<8	<2	----	----	----

QUALITY CONTROL REPORT

Work Order	: **EM2311855**	Page	: 1 of 5
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAMANTHA KING	Contact	: Gregory Gommers
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61-3-8549 9600
Project	: 12564388	Date Samples Received	: 30-Jun-2023
Order number	: 12564388	Date Analysis Commenced	: 01-Jul-2023
C-O-C number	: ----	Issue Date	: 07-Jul-2023
Sampler	: MB		
Site	: ----		
Quote number	: ME/770/21 V2		
No. of samples received	: 7		
No. of samples analysed	: 7		

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*
Arenie Vijayaratnam	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Tahlia Freeman	Instrument Operator	Melbourne Inorganics, Springvale, VIC

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 (%)*
EA005P: pH by PC Titrator (QC Lot: 5149681)									
EM2311827-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.48	8.51	0.4	0% - 20%
EM2311855-005	S6	EA005-P: pH Value	----	0.01	pH Unit	7.96	7.99	0.4	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5149680)									
EM2311827-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1650	1650	0.0	0% - 20%
EM2311855-005	S6	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	435	438	0.7	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5149860)									
EM2311750-005	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
EM2311751-003	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	16	12	21.4	No Limit
EM2311827-004	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	22	26	16.7	No Limit
EM2311855-003	S3	EA025H: Suspended Solids (SS)	----	5	mg/L	29	38	26.2	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 5149683)									
EM2311858-004	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	168	171	1.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	168	171	1.7	0% - 20%
EM2311855-005	S6	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	142	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	142	142	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5145640)									
EM2311855-001	S1	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	34	33	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5145641)									
EM2311855-001	S1	ED045G: Chloride	16887-00-6	1	mg/L	22	23	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 (%)*
ED093F: Dissolved Major Cations (QC Lot: 5148590)									
EM2311682-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	8	8	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	6	6	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	32	32	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EM2311831-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	218	219	0.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	16	16	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	667	668	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	43	43	0.0	0% - 20%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5152652)									
EM2311855-006	S9	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: 5145642)									
EM2311855-001	S1	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: 5152653)									
EM2311854-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	1.79	1.78	0.7	0% - 50%
EM2311855-006	S9	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	1.31	1.31	0.0	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 5149765)									
EM2311813-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	0.1	0.0	No Limit
EM2311827-006	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	27.1	31.2	13.9	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 5149766)									
EM2311827-006	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	11.9	13.4	11.3	0% - 20%
EK071FG: Dissolved Reactive Phosphorus as P by DA (QC Lot: 5145643)									
EM2311855-001	S1	EK071FG: Dissolved Reactive Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 5146771)									
EM2311855-001	S1	EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	<2	0.0	No Limit
EM2311858-003	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	<2	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 5149681)								
EA005-P: pH Value	----	----	pH Unit	----	7 pH Unit	101	98.8	101
				----	9 pH Unit	100	99.3	101
EA010P: Conductivity by PC Titrator (QCLot: 5149680)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	104	85.0	119
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5149860)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	100	91.0	109
				<5	825 mg/L	107	84.7	116
				<5	1000 mg/L	99.5	90.3	109
ED037P: Alkalinity by PC Titrator (QCLot: 5149683)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	94.4	85.0	116
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5145640)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	103	90.0	110
				<1	500 mg/L	106	90.0	110
ED045G: Chloride by Discrete Analyser (QCLot: 5145641)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	93.0	90.0	110
				<1	1000 mg/L	95.3	90.0	110
ED093F: Dissolved Major Cations (QCLot: 5148590)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	90.3	80.0	120
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.5	80.0	120
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	95.4	80.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	93.6	80.0	120
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5152652)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	103	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5145642)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	106	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5152653)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	94.2	90.0	110
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5149765)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	82.7	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5149766)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS: Spike Recovery (%)	Acceptable Limits (%): Low	Acceptable Limits (%): High
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5149766) - continued								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	90.2	71.9	114
EK071FG: Dissolved Reactive Phosphorus as P by DA (QCLot: 5145643)								
EK071FG: Dissolved Reactive Phosphorus as P	----	0.01	mg/L	<0.01	0.5 mg/L	106	90.0	110
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 5146771)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	198 mg/L	104	79.5	122

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: 5145640)							
EM2311855-002	S2	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	95.5	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5145641)							
EM2311855-002	S2	ED045G: Chloride	16887-00-6	400 mg/L	92.9	70.0	142
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5152652)							
EM2311855-001	S1	EK055G: Ammonia as N	7664-41-7	1 mg/L	98.9	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5145642)							
EM2311855-002	S2	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	104	80.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5152653)							
EM2311855-001	S1	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	73.2	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5149765)							
EM2311813-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	89.8	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5149766)							
EM2311854-001	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	90.4	70.0	130
EK071FG: Dissolved Reactive Phosphorus as P by DA (QCLot: 5145643)							
EM2311855-002	S2	EK071FG: Dissolved Reactive Phosphorus as P	----	0.5 mg/L	106	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2311855**	Page	: 1 of 8
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAMANTHA KING	Telephone	: +61-3-8549 9600
Project	: 12564388	Date Samples Received	: 30-Jun-2023
Site	: ----	Issue Date	: 07-Jul-2023
Sampler	: MB	No. of samples received	: 7
Order number	: 12564388	No. of samples analysed	: 7

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

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

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
S1, S2, S3, S4, S6, S9, QC1	----	----	----	05-Jul-2023	29-Jun-2023	**6**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
	1				
Laboratory Duplicates (DUP)					
Ammonia as N by Discrete analyser	1	17	5.88	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
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
S1, S2, S3, S4, S6, S9, QC1	**29-Jun-2023**	**----**	----	**----**	**05-Jul-2023**	29-Jun-2023	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
S1, S2, S3, S4, S6, S9, QC1	**29-Jun-2023**	**----**	----	**----**	**05-Jul-2023**	27-Jul-2023	✓

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
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H)							
S1, S2, S3, S4, S6, S9, QC1	**29-Jun-2023**	**----**	----	----	**06-Jul-2023**	06-Jul-2023	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
S1, S2, S3, S4, S6, S9, QC1	**29-Jun-2023**	**----**	----	----	**05-Jul-2023**	13-Jul-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
S1, S2, S3, S4, S6, S9, QC1	**29-Jun-2023**	**----**	----	----	**01-Jul-2023**	27-Jul-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
S1, S2, S3, S4, S6, S9, QC1	**29-Jun-2023**	**----**	----	----	**01-Jul-2023**	27-Jul-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
S1, S2, S3, S4, S6, S9, QC1	**29-Jun-2023**	**----**	----	----	**04-Jul-2023**	06-Jul-2023	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
S1, S2, S3, S4, S6, S9, QC1	**29-Jun-2023**	**----**	----	----	**06-Jul-2023**	27-Jul-2023	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
S1, S2, S3, S4, S6, S9, QC1	**29-Jun-2023**	**----**	----	----	**01-Jul-2023**	01-Jul-2023	✓

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)							
S1, S2, S3, S4, S6, S9, QC1	**29-Jun-2023**	**----**	----	----	**06-Jul-2023**	27-Jul-2023	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
S1, S2, S3, S4, S6, S9, QC1	**29-Jun-2023**	**05-Jul-2023**	27-Jul-2023	✓	**06-Jul-2023**	27-Jul-2023	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
S1, S2, S3, S4, S6, S9, QC1	**29-Jun-2023**	**05-Jul-2023**	27-Jul-2023	✓	**06-Jul-2023**	27-Jul-2023	✓
EK071FG: Dissolved Reactive Phosphorus as P by DA							
Clear Plastic Bottle - Natural (EK071FG)							
S1, S2, S3, S4, S6, S9, QC1	**29-Jun-2023**	**----**	----	----	**01-Jul-2023**	01-Jul-2023	✓
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030)							
S1, S2, S3, S4, S6, S9, QC1	**29-Jun-2023**	**----**	----	----	**01-Jul-2023**	01-Jul-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
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	17	**5.88**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Reactive Phosphorus as P by DA	EK071FG	1	7	**14.29**	**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	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	7	**14.29**	**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 Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	7	**28.57**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Reactive Phosphorus as P by DA	EK071FG	1	7	**14.29**	**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	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	7	**28.57**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	40	**7.50**	**7.50**	✓	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 Phosphorus as P By Discrete Analyser	EK067G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Reactive Phosphorus as P by DA	EK071FG	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	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*	
Method Blanks (MB) - Continued							
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	7	**14.29**	**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 Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Reactive Phosphorus as P by DA	EK071FG	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	7	**14.29**	**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 Phosphorus as P By Discrete Analyser	EK067G	1	9	**11.11**	**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
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. 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)
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)

Analytical Methods	Method	Matrix	Method Descriptions
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)
Dissolved Reactive Phosphorus as P by DA	EK071FG	WATER	In house: Referenced to APHA 4500-P F Water samples are filtered through a 0.45um filter prior to analysis. 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 achieved 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 1030F. This method is compliant with NEPM Schedule B(3)
Biochemical Oxygen Demand (BOD)	EP030	WATER	In house: Referenced to APHA 5210 B. The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. This method is compliant with 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)

CERTIFICATE OF ANALYSIS

Work Order	: **EM2316083**	Page	: 1 of 6
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Peter Ravlic
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 07-Sep-2023 11:35
Order number	: 12564388	Date Analysis Commenced	: 07-Sep-2023
C-O-C number	: ----	Issue Date	: 20-Sep-2023 18:30
Sampler	: MB		
Site	: ----		
Quote number	: ME/770/21 V2		
No. of samples received	: 4		
No. of samples analysed	: 4		

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
Arenie Vijayaratnam	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC

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.

- EK061G: EM2316083-001 Total Kjeldahl Nitrogen as N result has been confirmed by re-digestion and re-analysis
- Poor spike recovery for Bromide and Iodide due to matrix interferences(confirmed by re-analysis).
- EP080: Particular sample EM2316083_002 shows positive hit. Confirmed by re-analysis.
- EK055G: EM2316083 #1 Sample required dilution for Ammonia prior to analysis due to sample matrix. LOR has been raised accordingly.
- EA015H: EM2316083 #3: Sample has been confirmed for total dissolved solids by re-preparation and re-analysis.
- 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.
- ED093F : EM2316083 #4 results for dissolved cations have been confirmed by re-preparation and re-analysis.
- EA015H: EM2316083 #3 TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- Ionic Balance out of acceptable limits for sample #2 due to analytes not quantified in this report.
- Ionic Balance out of acceptable limits for sample #4 due to analytes not quantified in this report.
- Ionic balances were calculated using: major anions - chloride, alkalinity, sulfate; and major cations - calcium, magnesium, potassium, sodium and iron for #1.
- Ionic balances were calculated using: major anions - chloride, alkalinity, sulfate and NOx; and major cations - calcium, magnesium, potassium, sodium for #3.
- 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	B11	B7	B12	B9	----
				Sampling date / time	05-Sep-2023 00:00	05-Sep-2023 00:00	05-Sep-2023 00:00	05-Sep-2023 00:00	----
Compound	CAS Number	LOR	Unit		EM2316083-001	EM2316083-002	EM2316083-003	EM2316083-004	--------
					Result	Result	Result	Result	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		**687**	**318**	**174**	**186**	----
ED009: Anions									
Bromide	24959-67-9	0.010	mg/L		**0.402**	**0.013**	**0.081**	**0.014**	----
Iodide	20461-54-5	0.010	mg/L		**0.190**	<0.010	<0.010	<0.010	----
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		<1	**222**	**6**	**102**	----
Total Alkalinity as CaCO3	----	1	mg/L		<1	**222**	**6**	**102**	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2**	**5**	**2**	**13**	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**399**	**14**	**40**	**14**	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**2**	**94**	**3**	**47**	----
Magnesium	7439-95-4	1	mg/L		**16**	**4**	**2**	**3**	----
Sodium	7440-23-5	1	mg/L		**91**	**11**	**29**	**11**	----
Potassium	7440-09-7	1	mg/L		**2**	<1	<1	<1	----
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		**0.001**	<0.001	<0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L		**0.0001**	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L		**0.012**	<0.001	**0.001**	<0.001	----
Lead	7439-92-1	0.001	mg/L		**0.007**	<0.001	<0.001	<0.001	----
Manganese	7439-96-5	0.001	mg/L		**0.134**	**0.003**	**0.059**	**0.008**	----
Nickel	7440-02-0	0.001	mg/L		**0.025**	<0.001	**0.005**	<0.001	----
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	----
Zinc	7440-66-6	0.005	mg/L		**0.077**	<0.005	**0.018**	<0.005	----
Iron	7439-89-6	0.05	mg/L		**99.7**	<0.05	**0.19**	**0.10**	----
EG020T: Total Metals by ICP-MS									
Iron	7439-89-6	0.05	mg/L		**105**	**0.17**	**0.24**	**1.07**	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	B11	B7	B12	B9	----
				Sampling date / time	05-Sep-2023 00:00	05-Sep-2023 00:00	05-Sep-2023 00:00	05-Sep-2023 00:00	----
Compound	CAS Number	LOR	Unit		EM2316083-001	EM2316083-002	EM2316083-003	EM2316083-004	--------
					Result	Result	Result	Result	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		<0.05	<0.01	<0.01	**0.02**	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		<0.01	<0.01	**2.48**	**0.25**	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	<0.01	**2.48**	**0.25**	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**0.2**	<0.1	**0.8**	<0.1	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**0.2**	<0.1	**3.3**	**0.2**	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**0.02**	**0.02**	**0.01**	**0.05**	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		----	----	**1.46**	----	----
ø Total Anions	----	0.01	meq/L		**11.3**	**4.93**	----	**2.70**	----
ø Total Cations	----	0.01	meq/L		**10.8**	----	----	----	----
ø Total Cations	----	0.01	meq/L		----	**5.50**	**1.58**	**3.07**	----
ø Ionic Balance	----	0.01	%		**2.33**	----	<0.01	----	----
ø Ionic Balance	----	0.01	%		----	**5.40**	----	----	----
EP002: Dissolved Organic Carbon (DOC)									
Dissolved Organic Carbon	----	1	mg/L		**4**	**3**	**2**	**5**	----
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L		**3**	<2	<2	**3**	----
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	B11	B7	B12	B9	----
				Sampling date / time	05-Sep-2023 00:00	05-Sep-2023 00:00	05-Sep-2023 00:00	05-Sep-2023 00:00	----
Compound	CAS Number	LOR	Unit		EM2316083-001	EM2316083-002	EM2316083-003	EM2316083-004	--------
					Result	Result	Result	Result	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
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	**8**	<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	**8**	<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	%		**91.8**	**92.6**	**87.7**	**90.0**	----
Toluene-D8	2037-26-5	2	%		**96.4**	**97.0**	**91.1**	**93.4**	----
4-Bromofluorobenzene	460-00-4	2	%		**115**	**110**	**105**	**110**	----

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	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) ED009: Anions

QUALITY CONTROL REPORT

Work Order	: **EM2316083**	Page	: 1 of 8
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Peter Ravlic
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 07-Sep-2023
Order number	: 12564388	Date Analysis Commenced	: 07-Sep-2023
C-O-C number	: ----	Issue Date	: 20-Sep-2023
Sampler	: MB		
Site	: ----		
Quote number	: ME/770/21 V2		
No. of samples received	: 4		
No. of samples analysed	: 4		

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
Arenie Vijayaratnam	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC

General Comments

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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 (%)
ED009: Anions (QC Lot: 5293179)									
EM2316083-001	B11	ED009-X: Bromide	24959-67-9	0.01	mg/L	0.402	0.411	2.2	0% - 20%
		ED009-X: Iodide	20461-54-5	0.01	mg/L	0.190	0.188	1.1	0% - 50%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 5285115)									
EM2316082-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	214000	224000	4.5	0% - 20%
EM2315925-002	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	918	919	0.1	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5284950)									
EM2316078-008	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	1110	1240	11.2	0% - 20%
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	580	650	11.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	1690	1890	11.2	0% - 20%
EM2316058-004	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	46	45	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	46	45	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5284404)									
EM2316078-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1250	1120	11.7	0% - 20%
EM2316083-001	B11	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2	2	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 5284405)									
EM2316078-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	4590	4470	2.5	0% - 20%
EM2316083-001	B11	ED045G: Chloride	16887-00-6	1	mg/L	399	339	16.3	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5300167)									
EM2315990-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	448	436	2.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	255	249	2.2	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 (%)*
ED093F: Dissolved Major Cations (QC Lot: 5300167) - continued									
EM2315990-002	Anonymous	ED093F: Sodium	7440-23-5	1	mg/L	2250	2200	2.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	104	103	1.3	0% - 20%
EM2316243-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	107	107	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	216	215	0.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	996	989	0.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	32	32	0.0	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5300168)									
EM2315990-001	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	0.517	0.518	0.0	0% - 20%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.005	0.005	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.013	0.013	0.0	0% - 50%
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.005	0.005	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.041	0.040	2.8	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.022	0.022	0.0	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.051	0.049	3.6	0% - 50%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.35	0.35	0.0	No Limit
EM2316243-002	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	0.310	0.312	0.7	0% - 20%
		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	0.006	0.006	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.002	0.002	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	<0.005	<0.005	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.06	0.06	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 5292483)									
EM2316033-003	Anonymous	EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EM2316083-004	B9	EG020A-T: Iron	7439-89-6	0.05	mg/L	1.07	0.96	10.3	0% - 20%
EG035F: Dissolved Mercury by FIMS (QC Lot: 5300169)									
EM2316083-001	B11	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EM2316243-004	Anonymous	EG035F: 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: 5289875)									
EM2316031-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.03	0.03	0.0	No Limit
EM2316038-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	1.63	1.16	33.7	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5284406)									
EM2316078-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.45	0.48	6.8	No Limit
EM2316083-001	B11	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	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 (%)
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5289876)									
EM2316031-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	1.45	1.45	0.0	0% - 20%
EM2316038-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	1.50	1.90	23.5	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 5297159)									
EM2316083-001	B11	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.2	0.2	0.0	No Limit
EM2316185-004	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.5	0.9	58.5	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 5297158)									
EM2316083-001	B11	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.02	0.03	0.0	No Limit
EM2316185-004	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.20	0.10	65.1	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5284407)									
EM2316083-001	B11	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP002: Dissolved Organic Carbon (DOC) (QC Lot: 5285945)									
EM2315963-001	Anonymous	EP002: Dissolved Organic Carbon	----	1	mg/L	14	9	39.2	0% - 50%
EM2315963-010	Anonymous	EP002: Dissolved Organic Carbon	----	1	mg/L	4	2	53.1	No Limit
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 5284473)									
EM2316079-006	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	11	9	14.1	No Limit
EM2316088-004	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	<2	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5288233)									
EM2316161-013	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EM2316011-054	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5288233)									
EM2316161-013	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EM2316011-054	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 5288233)									
EM2316161-013	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
EM2316011-054	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
ED009: Anions (QCLot: 5293179)								
ED009-X: Bromide	24959-67-9	0.01	mg/L	<0.010	2 mg/L	105	93.0	109
ED009-X: Iodide	20461-54-5	0.01	mg/L	<0.010	0.5 mg/L	85.0	79.0	123
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 5285115)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	109	91.0	110
				<10	2340 mg/L	118	80.8	119
ED037P: Alkalinity by PC Titrator (QCLot: 5284950)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	97.5	85.0	116
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5284404)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.6	90.0	110
				<1	500 mg/L	92.4	90.0	110
ED045G: Chloride by Discrete Analyser (QCLot: 5284405)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	101	90.0	110
				<1	1000 mg/L	108	90.0	110
ED093F: Dissolved Major Cations (QCLot: 5300167)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	80.0	120
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	103	80.0	120
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	100	80.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.0	80.0	120
EG020F: Dissolved Metals by ICP-MS (QCLot: 5300168)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	100	89.0	111
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.7	83.5	111
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	95.9	83.2	109
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	97.1	83.1	107
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	98.0	84.6	108
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	97.5	84.8	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	97.1	84.3	110
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	102	82.3	113
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	107	86.3	112
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	105	91.8	112
EG020T: Total Metals by ICP-MS (QCLot: 5292483)								

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: 5292483) - continued								
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	105	92.8	118
EG035F: Dissolved Mercury by FIMS (QCLot: 5300169)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	86.9	71.6	116
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5289875)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	101	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5284406)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	101	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5289876)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	95.5	90.0	110
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5297159)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	87.6	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5297158)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	93.8	71.9	114
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5284407)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	95.9	90.0	110
EP002: Dissolved Organic Carbon (DOC) (QCLot: 5285945)								
EP002: Dissolved Organic Carbon	----	1	mg/L	<1	100 mg/L	98.2	83.0	115
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 5284473)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	198 mg/L	100	79.5	122
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5284745)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	4560 µg/L	58.0	47.2	122
EP071: C15 - C28 Fraction	----	100	µg/L	<100	16200 µg/L	60.8	52.9	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8650 µg/L	65.1	50.4	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5288233)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	107	66.2	134
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5284745)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	6190 µg/L	57.2	49.1	125
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	22200 µg/L	61.1	51.6	128
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1520 µg/L	62.4	47.2	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5288233)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	102	66.2	132
EP080: BTEXN (QCLot: 5288233)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	114	68.8	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	108	72.9	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS: Spike Recovery (%)	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP080: BTEXN (QCLot: 5288233) - continued								
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	112	71.7	130
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	114	72.3	136
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	112	75.9	134
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	121	68.3	131

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
ED009: Anions (QCLot: 5293179)							
EM2316083-001	B11	ED009-X: Bromide	24959-67-9	0.2 mg/L	# 69.5	70.0	130
		ED009-X: Iodide	20461-54-5	0.2 mg/L	# 65.5	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5284404)							
EM2316078-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5284405)							
EM2316078-002	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	142
EG020F: Dissolved Metals by ICP-MS (QCLot: 5300168)							
EM2315990-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	92.1	76.6	124
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	96.2	74.6	118
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	92.0	71.0	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	94.4	76.0	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	90.6	75.0	133
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	90.3	64.0	134
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	94.4	73.0	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	114	75.0	131
EG035F: Dissolved Mercury by FIMS (QCLot: 5300169)							
EM2316083-002	B7	EG035F: Mercury	7439-97-6	0.01 mg/L	90.8	70.0	120
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5289875)							
EM2316031-002	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	93.1	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5284406)							

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: 5284406) - continued							
EM2316078-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	103	80.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5289876)							
EM2316031-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	# Not Determined	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5297159)							
EM2316083-002	B7	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	106	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5297158)							
EM2316083-002	B7	EK067G: Total Phosphorus as P	----	1 mg/L	111	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5284407)							
EM2316083-002	B7	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	98.5	79.0	123
EP002: Dissolved Organic Carbon (DOC) (QCLot: 5285945)							
EM2315963-002	Anonymous	EP002: Dissolved Organic Carbon	----	100 mg/L	104	75.0	117
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5288233)							
EM2316159-001	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	92.3	33.9	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5288233)							
EM2316159-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	86.0	34.0	122
EP080: BTEXN (QCLot: 5288233)							
EM2316159-001	Anonymous	EP080: Benzene	71-43-2	20 µg/L	104	56.3	133
		EP080: Toluene	108-88-3	20 µg/L	111	60.4	132

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2316083**	Page	: 1 of 9
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 07-Sep-2023
Site	: ----	Issue Date	: 20-Sep-2023
Sampler	: MB	No. of samples received	: 4
Order number	: 12564388	No. of samples analysed	: 4

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, 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							
ED009: Anions	EM2316083--001	B11	**Bromide**	24959-67-9	69.5 %	70.0-130%	**Recovery less than lower data quality objective**
ED009: Anions	EM2316083--001	B11	**Iodide**	20461-54-5	65.5 %	70.0-130%	**Recovery less than lower data quality objective**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EM2316078--002	Anonymous	**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	EM2316078--002	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Ar	EM2316031--002	Anonymous	**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 / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
TRH - Semivolatile Fraction	0	6	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Total Metals by ICP-MS - Suite A	0	10	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	6	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container* / Client Sample ID(s)	*Sample Date*	*Extraction / Preparation* Date extracted	Due for extraction	Evaluation	*Analysis* Date analysed	Due for analysis	Evaluation
EA015: Total Dissolved Solids dried at 180 ± 5 °C							
Clear Plastic Bottle - Natural (EA015H)							
B11, B7, B12, B9	**05-Sep-2023**	**----**	----	**----**	**08-Sep-2023**	12-Sep-2023	✓

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
ED009: Anions							
Clear Plastic Bottle - Natural (ED009-X)							
B11, B7, B12, B9	**05-Sep-2023**	**----**	----	----	**13-Sep-2023**	03-Oct-2023	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
B11, B7, B12, B9	**05-Sep-2023**	**----**	----	----	**11-Sep-2023**	19-Sep-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
B11, B7, B12, B9	**05-Sep-2023**	**----**	----	----	**07-Sep-2023**	03-Oct-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
B11, B7, B12, B9	**05-Sep-2023**	**----**	----	----	**07-Sep-2023**	03-Oct-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F)							
B11, B7, B12, B9	**05-Sep-2023**	**----**	----	----	**16-Sep-2023**	03-Oct-2023	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)							
B11, B7, B12, B9	**05-Sep-2023**	**----**	----	----	**15-Sep-2023**	03-Mar-2024	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
B11, B7, B12, B9	**05-Sep-2023**	**12-Sep-2023**	03-Mar-2024	✓	**12-Sep-2023**	03-Mar-2024	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F)							
B11, B7, B12, B9	**05-Sep-2023**	**----**	----	----	**15-Sep-2023**	03-Oct-2023	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
B11, B7, B12, B9	**05-Sep-2023**	**----**	----	----	**12-Sep-2023**	03-Oct-2023	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
B11, B7, B12, B9	**05-Sep-2023**	**----**	----	----	**07-Sep-2023**	07-Sep-2023	✓

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)							
B11, B7, B12, B9	**05-Sep-2023**	**----**	----	**----**	**12-Sep-2023**	03-Oct-2023	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
B11, B7, B12, B9	**05-Sep-2023**	**15-Sep-2023**	03-Oct-2023	✓	**16-Sep-2023**	03-Oct-2023	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
B11, B7, B12, B9	**05-Sep-2023**	**15-Sep-2023**	03-Oct-2023	✓	**16-Sep-2023**	03-Oct-2023	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
B11, B7, B12, B9	**05-Sep-2023**	**----**	----	**----**	**07-Sep-2023**	07-Sep-2023	✓
EP002: Dissolved Organic Carbon (DOC)							
Amber DOC Filtered- Sulfuric Preserved (EP002)							
B11, B7, B12, B9	**05-Sep-2023**	**----**	----	**----**	**11-Sep-2023**	03-Oct-2023	✓
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030)							
B11, B7, B12, B9	**05-Sep-2023**	**----**	----	**----**	**07-Sep-2023**	07-Sep-2023	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
B11, B7, B12, B9	**05-Sep-2023**	**08-Sep-2023**	12-Sep-2023	✓	**11-Sep-2023**	18-Oct-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
B11, B7, B12, B9	**05-Sep-2023**	**12-Sep-2023**	19-Sep-2023	✓	**12-Sep-2023**	19-Sep-2023	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071)							
B11, B7, B12, B9	**05-Sep-2023**	**08-Sep-2023**	12-Sep-2023	✓	**11-Sep-2023**	18-Oct-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
B11, B7, B12, B9	**05-Sep-2023**	**12-Sep-2023**	19-Sep-2023	✓	**12-Sep-2023**	19-Sep-2023	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080)							
B11, B7, B12, B9	**05-Sep-2023**	**12-Sep-2023**	19-Sep-2023	✓	**12-Sep-2023**	19-Sep-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
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
Biochemical Oxygen Demand (BOD)	EP030	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	19	**10.53**	**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
Dissolved Organic Carbon	EP002	2	15	**13.33**	**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	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
Standard Anions -by IC (Extended Method)	ED009-X	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	17	**11.76**	**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 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	0	6	**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	1	20	**5.00**	**5.00**	✓	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
Biochemical Oxygen Demand (BOD)	EP030	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	19	**5.26**	**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
Dissolved Organic Carbon	EP002	1	15	**6.67**	**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	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
Standard Anions -by IC (Extended Method)	ED009-X	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	17	**11.76**	**7.50**	✓	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 Metals by ICP-MS - Suite A	EG020A-T	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							
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	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
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
Biochemical Oxygen Demand (BOD)	EP030	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	19	**5.26**	**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
Dissolved Organic Carbon	EP002	1	15	**6.67**	**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	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
Standard Anions -by IC (Extended Method)	ED009-X	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	1	17	**5.88**	**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 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	6	**16.67**	**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	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	19	**5.26**	**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
Dissolved Organic Carbon	EP002	1	15	**6.67**	**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	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
Standard Anions -by IC (Extended Method)	ED009-X	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	18	**5.56**	**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 Metals by ICP-MS - Suite A	EG020A-T	0	10	**0.00**	**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	6	**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)
Standard Anions -by IC (Extended Method)	ED009-X	WATER	In house: Referenced to APHA 4110B. 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).
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)

Analytical Methods	Method	Matrix	Method Descriptions
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 1030F. This method is compliant with NEPM Schedule B(3)
Dissolved Organic Carbon	EP002	WATER	In house: Referenced to APHA 5310 B. This method is compliant with NEPM Schedule B(3). Samples are combusted at high temperature in the presence of an oxidative catalyst. The evolved carbon dioxide is quantified using an IR detector.
Biochemical Oxygen Demand (BOD)	EP030	WATER	In house: Referenced to APHA 5210 B. The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. 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.

CERTIFICATE OF ANALYSIS

Work Order	: **EM2316088**	Page	: 1 of 4
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Peter Ravlic
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 07-Sep-2023 11:35
Order number	: 12564388	Date Analysis Commenced	: 07-Sep-2023
C-O-C number	: ----	Issue Date	: 14-Sep-2023 12:00
Sampler	: MB		
Site	: ----		
Quote number	: ME/770/21 V2		
No. of samples received	: 4		
No. of samples analysed	: 4		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC

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.

- 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.
- Ionic Balance out of acceptable limits for sample #1 due to analytes not quantified in this report.
- 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: SURFACE WATER (Matrix: WATER)			Sample ID	S9	S7	S3	S2	----
			Sampling date / time	04-Sep-2023 00:00	05-Sep-2023 00:00	05-Sep-2023 00:00	05-Sep-2023 00:00	----
Compound	CAS Number	LOR	Unit	EM2316088-001	EM2316088-002	EM2316088-003	EM2316088-004	--------
				Result	Result	Result	Result	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.85**	**7.80**	**7.71**	**8.15**	**----**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**508**	**1990**	**1230**	**418**	**----**
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**12**	**225**	**141**	**30**	**----**
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	**151**	**565**	**381**	**156**	**----**
Total Alkalinity as CaCO3	----	1	mg/L	**151**	**565**	**381**	**156**	**----**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**28**	**14**	**26**	**25**	**----**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**17**	**211**	**146**	**17**	**----**
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**71**	**40**	**65**	**69**	**----**
Magnesium	7439-95-4	1	mg/L	**5**	**30**	**19**	**5**	**----**
Sodium	7440-23-5	1	mg/L	**13**	**117**	**73**	**13**	**----**
Potassium	7440-09-7	1	mg/L	**1**	**211**	**108**	**1**	**----**
EG020F: Dissolved Metals by ICP-MS								
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	**----**
Chromium	7440-47-3	0.001	mg/L	<0.001	**0.004**	**0.002**	<0.001	**----**
Copper	7440-50-8	0.001	mg/L	<0.001	**0.002**	**0.003**	<0.001	**----**
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	**----**
Manganese	7439-96-5	0.001	mg/L	**0.008**	**0.756**	**0.997**	**0.008**	**----**
Nickel	7440-02-0	0.001	mg/L	<0.001	**0.017**	**0.010**	<0.001	**----**
Zinc	7440-66-6	0.005	mg/L	<0.005	**0.007**	**0.008**	<0.005	**----**
Iron	7439-89-6	0.05	mg/L	<0.05	**1.60**	**2.76**	<0.05	**----**
EG020T: Total Metals by ICP-MS								
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	**0.0002**	<0.0001	<0.0001	**----**
Chromium	7440-47-3	0.001	mg/L	**0.001**	**0.008**	**0.006**	<0.001	**----**
Copper	7440-50-8	0.001	mg/L	<0.001	**0.002**	**0.008**	<0.001	**----**
Lead	7439-92-1	0.001	mg/L	<0.001	**0.009**	**0.004**	<0.001	**----**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	S9	S7	S3	S2	----
				Sampling date / time	04-Sep-2023 00:00	05-Sep-2023 00:00	05-Sep-2023 00:00	05-Sep-2023 00:00	----
Compound	CAS Number	LOR	Unit		EM2316088-001	EM2316088-002	EM2316088-003	EM2316088-004	--------
					Result	Result	Result	Result	----
EG020T: Total Metals by ICP-MS - Continued									
Manganese	7439-96-5	0.001	mg/L		**0.024**	**1.01**	**1.23**	**0.013**	**----**
Nickel	7440-02-0	0.001	mg/L		**0.002**	**0.022**	**0.013**	**0.001**	**----**
Zinc	7440-66-6	0.005	mg/L		<0.005	**0.075**	**0.033**	<0.005	**----**
Iron	7439-89-6	0.05	mg/L		**0.28**	**10.1**	**7.47**	**0.12**	**----**
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.04**	**43.4**	**16.7**	**0.01**	**----**
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	**----**
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.94**	**0.01**	<0.01	**0.86**	**----**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.94**	**0.01**	<0.01	**0.86**	**----**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**0.2**	**59.0**	**31.7**	**0.2**	**----**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**1.1**	**59.0**	**31.7**	**1.1**	**----**
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**0.01**	**11.8**	**6.57**	**0.01**	**----**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	**9.76**	**4.14**	<0.01	**----**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**4.08**	**17.5**	**12.3**	**4.12**	**----**
ø Total Cations	----	0.01	meq/L		**4.54**	**15.0**	**10.7**	**4.44**	**----**
ø Ionic Balance	----	0.01	%		**5.40**	**7.95**	**6.64**	**3.84**	**----**
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L		<2	**160**	**62**	<2	**----**

QUALITY CONTROL REPORT

Work Order	: **EM2316088**	Page	: 1 of 9
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Peter Ravlic
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 07-Sep-2023
Order number	: 12564388	Date Analysis Commenced	: 07-Sep-2023
C-O-C number	: ----	Issue Date	: 14-Sep-2023
Sampler	: MB		
Site	: ----		
Quote number	: ME/770/21 V2		
No. of samples received	: 4		
No. of samples analysed	: 4		

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*
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC

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 (%)*
EA005P: pH by PC Titrator (QC Lot: 5284891)									
EM2316070-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	6.59	6.60	0.2	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5284889)									
EM2316060-007	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	348	351	0.8	0% - 20%
EM2316070-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	420	408	3.0	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5284892)									
EM2316088-003	S3	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1230	1240	0.3	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5285113)									
EM2315894-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	242	255	5.2	0% - 20%
EM2316054-003	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	7	29.8	No Limit
EM2316058-002	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 5284884)									
EM2315985-001	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	120	118	1.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	120	118	1.1	0% - 20%
EM2316070-002	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	20	20	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	20	20	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5284404)									
EM2316078-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1250	1120	11.7	0% - 20%
EM2316083-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2	2	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 5284405)									

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: 5284405) - continued									
EM2316078-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	4590	4470	2.5	0% - 20%
EM2316083-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	399	339	16.3	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5291590)									
EM2316054-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	53	52	2.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	6	6	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	13	13	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
EM2316088-001	S9	ED093F: Calcium	7440-70-2	1	mg/L	71	71	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	5	5	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	13	13	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	1	1	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5291589)									
EM2316007-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	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	0.023	0.023	0.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.005	0.005	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.013	0.014	10.7	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	56.6	57.4	1.5	0% - 20%
EM2316054-010	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0001	0.0001	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	0.039	0.039	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	0.084	0.087	2.9	0% - 50%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.18	0.17	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 5292210)									
EM2316054-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0003	0.0001	84.0	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	0.002	0.002	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.056	0.056	0.0	0% - 20%
		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	0.075	0.073	3.0	0% - 50%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.16	0.16	0.0	No Limit
EM2316054-011	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0079	0.0066	17.8	0% - 20%
		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	0.100	0.099	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 (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 5292210) - continued									
EM2316054-011	Anonymous	EG020A-T: Lead	7439-92-1	0.001	mg/L	0.127	0.128	1.0	0% - 20%
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.568	0.565	0.4	0% - 20%
		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	2.72	2.74	0.5	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.84	0.78	7.3	0% - 50%
EG020T: Total Metals by ICP-MS (QC Lot: 5292212)									
EM2316088-004	S2	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	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: Manganese	7439-96-5	0.001	mg/L	0.013	0.013	0.0	0% - 50%
		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
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.12	0.11	11.6	No Limit
EM2316122-017	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0004	0.0005	28.3	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.009	0.009	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.184	0.215	15.5	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.028	0.030	6.4	0% - 20%
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	5.58	5.64	1.0	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.009	0.011	12.2	0% - 50%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.288	0.294	2.2	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	32.2	34.8	7.9	0% - 20%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5284853)									
EM2316047-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.47	0.48	0.0	0% - 20%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5284406)									
EM2316083-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM2316078-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.31	0.31	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5284852)									
EM2315925-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.08	0.02	111	No Limit
EM2316047-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	1.00	1.01	0.0	0% - 20%
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5284854)									
EM2316088-004	S2	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.86	0.86	0.0	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 5288524)									
EM2316086-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.0	2.2	10.6	0% - 50%
EM2316088-004	S2	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.2	0.1	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 5288523)									
EM2316086-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	1.81	1.93	6.6	0% - 20%
EM2316088-004	S2	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.01	0.02	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 (%)*
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5284407)									
EM2316083-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 5284473)									
EM2316079-006	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	11	9	14.1	No Limit
EM2316088-004	S2	EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	<2	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 5284891)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.8	101
				----	7 pH Unit	99.6	99.3	101
EA010P: Conductivity by PC Titrator (QCLot: 5284889)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	104	85.0	119
EA010P: Conductivity by PC Titrator (QCLot: 5284892)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	106	85.0	119
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5285113)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	94.7	91.0	109
				<5	825 mg/L	112	84.7	116
				<5	1000 mg/L	100	90.3	109
ED037P: Alkalinity by PC Titrator (QCLot: 5284884)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	99.1	85.0	116
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5284404)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.6	90.0	110
				<1	500 mg/L	92.4	90.0	110
ED045G: Chloride by Discrete Analyser (QCLot: 5284405)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	101	90.0	110
				<1	1000 mg/L	108	90.0	110
ED093F: Dissolved Major Cations (QCLot: 5291590)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	80.0	120
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.9	80.0	120
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.9	80.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	100	80.0	120
EG020F: Dissolved Metals by ICP-MS (QCLot: 5291589)								
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	97.2	83.5	111
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	98.9	83.2	109
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	98.5	83.1	107
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	97.6	84.6	108
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	98.5	84.8	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	99.6	84.3	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
EG020F: Dissolved Metals by ICP-MS (QCLot: 5291589) - continued								
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	110	86.3	112
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	101	91.8	112
EG020T: Total Metals by ICP-MS (QCLot: 5292210)								
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	109	86.4	115
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	103	86.9	112
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	104	86.9	111
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	102	88.3	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	102	88.7	113
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	104	87.9	113
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	106	86.7	117
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	99.7	92.8	118
EG020T: Total Metals by ICP-MS (QCLot: 5292212)								
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	106	86.4	115
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	103	86.9	112
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	108	86.9	111
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	103	88.3	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	103	88.7	113
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	108	87.9	113
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	107	86.7	117
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	103	92.8	118
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5284853)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	104	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5284406)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	101	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5284852)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	98.6	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5284854)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	100	90.0	110
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5288524)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	76.8	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5288523)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	89.8	71.9	114
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5284407)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	95.9	90.0	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
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 5284473)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	198 mg/L	100	79.5	122

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: 5284404)							
EM2316078-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5284405)							
EM2316078-002	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	142
EG020F: Dissolved Metals by ICP-MS (QCLot: 5291589)							
EM2316007-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.05 mg/L	91.7	74.6	118
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	90.7	71.0	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	92.3	76.0	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	93.5	75.0	133
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	89.2	64.0	134
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	92.7	73.0	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	104	75.0	131
EG020T: Total Metals by ICP-MS (QCLot: 5292210)							
EM2316054-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.25 mg/L	106	81.8	123
		EG020A-T: Chromium	7440-47-3	1 mg/L	103	78.9	119
		EG020A-T: Copper	7440-50-8	1 mg/L	107	80.4	118
		EG020A-T: Lead	7439-92-1	1 mg/L	104	80.5	121
		EG020A-T: Manganese	7439-96-5	1 mg/L	101	73.0	123
		EG020A-T: Nickel	7440-02-0	1 mg/L	103	80.0	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	101	74.0	120
EG020T: Total Metals by ICP-MS (QCLot: 5292212)							
EM2316088-004	S2	EG020A-T: Cadmium	7440-43-9	0.25 mg/L	105	81.8	123
		EG020A-T: Chromium	7440-47-3	1 mg/L	102	78.9	119
		EG020A-T: Copper	7440-50-8	1 mg/L	107	80.4	118
		EG020A-T: Lead	7439-92-1	1 mg/L	104	80.5	121
		EG020A-T: Manganese	7439-96-5	1 mg/L	99.7	73.0	123
		EG020A-T: Nickel	7440-02-0	1 mg/L	105	80.0	118

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: 5292212) - continued							
EM2316088-004	S2	EG020A-T: Zinc	7440-66-6	1 mg/L	105	74.0	120
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5284853)							
EM2316047-002	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	77.7	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5284406)							
EM2316078-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	103	80.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5284852)							
EM2316047-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	# Not Determined	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5288524)							
EM2316086-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	80.3	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5288523)							
EM2316086-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	97.4	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5284407)							
EM2316083-002	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	98.5	79.0	123

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2316088**	Page	: 1 of 9
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 07-Sep-2023
Site	: ----	Issue Date	: 14-Sep-2023
Sampler	: MB	No. of samples received	: 4
Order number	: 12564388	No. of samples analysed	: 4

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, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

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	EM2316078--002	Anonymous	**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	EM2316078--002	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Ar	EM2316047--002	Anonymous	**Nitrite + Nitrate as N**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural S9	----	----	----	11-Sep-2023	04-Sep-2023	**7**
Clear Plastic Bottle - Natural S7, S3, S2	----	----	----	11-Sep-2023	05-Sep-2023	**6**
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural S9	----	----	----	08-Sep-2023	06-Sep-2023	**2**
Clear Plastic Bottle - Natural S7, S3, S2	----	----	----	08-Sep-2023	07-Sep-2023	**1**
EK071G: Reactive Phosphorus as P by discrete analyser						
Clear Plastic Bottle - Natural S9	----	----	----	08-Sep-2023	06-Sep-2023	**2**
Clear Plastic Bottle - Natural S7, S3, S2	----	----	----	08-Sep-2023	07-Sep-2023	**1**
EP030: Biochemical Oxygen Demand (BOD)						
Clear Plastic Bottle - Natural S9	----	----	----	07-Sep-2023	06-Sep-2023	**1**

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
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P) S9	**04-Sep-2023**	**----**	----	----	**11-Sep-2023**	04-Sep-2023	✗
Clear Plastic Bottle - Natural (EA005-P) S7, S3, S2	**05-Sep-2023**	**----**	----	----	**11-Sep-2023**	05-Sep-2023	✗
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P) S9	**04-Sep-2023**	**----**	----	----	**11-Sep-2023**	02-Oct-2023	✓
Clear Plastic Bottle - Natural (EA010-P) S7, S3, S2	**05-Sep-2023**	**----**	----	----	**11-Sep-2023**	03-Oct-2023	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H) S9	**04-Sep-2023**	**----**	----	----	**08-Sep-2023**	11-Sep-2023	✓
Clear Plastic Bottle - Natural (EA025H) S7, S3, S2	**05-Sep-2023**	**----**	----	----	**08-Sep-2023**	12-Sep-2023	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) S9	**04-Sep-2023**	**----**	----	----	**11-Sep-2023**	18-Sep-2023	✓
Clear Plastic Bottle - Natural (ED037-P) S7, S3, S2	**05-Sep-2023**	**----**	----	----	**11-Sep-2023**	19-Sep-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) S9	**04-Sep-2023**	**----**	----	----	**08-Sep-2023**	02-Oct-2023	✓
Clear Plastic Bottle - Natural (ED041G) S7, S3, S2	**05-Sep-2023**	**----**	----	----	**08-Sep-2023**	03-Oct-2023	✓

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
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
S9	04-Sep-2023	----	----	----	08-Sep-2023	02-Oct-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
S7, S3, S2	05-Sep-2023	----	----	----	08-Sep-2023	03-Oct-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F)							
S9	04-Sep-2023	----	----	----	12-Sep-2023	02-Oct-2023	✓
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F)							
S7, S3, S2	05-Sep-2023	----	----	----	12-Sep-2023	03-Oct-2023	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)							
S9	04-Sep-2023	----	----	----	12-Sep-2023	02-Mar-2024	✓
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)							
S7, S3, S2	05-Sep-2023	----	----	----	12-Sep-2023	03-Mar-2024	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
S9	04-Sep-2023	12-Sep-2023	02-Mar-2024	✓	12-Sep-2023	02-Mar-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
S7, S3, S2	05-Sep-2023	12-Sep-2023	03-Mar-2024	✓	12-Sep-2023	03-Mar-2024	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
S9	04-Sep-2023	----	----	----	09-Sep-2023	02-Oct-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
S7, S3, S2	05-Sep-2023	----	----	----	09-Sep-2023	03-Oct-2023	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
S9	04-Sep-2023	----	----	----	08-Sep-2023	06-Sep-2023	×
Clear Plastic Bottle - Natural (EK057G)							
S7, S3, S2	05-Sep-2023	----	----	----	08-Sep-2023	07-Sep-2023	×
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
S9	04-Sep-2023	----	----	----	09-Sep-2023	02-Oct-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
S7, S3, S2	05-Sep-2023	----	----	----	09-Sep-2023	03-Oct-2023	✓

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) S9	**04-Sep-2023**	**12-Sep-2023**	02-Oct-2023	✓	**12-Sep-2023**	02-Oct-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK061G) S7, S3, S2	**05-Sep-2023**	**12-Sep-2023**	03-Oct-2023	✓	**12-Sep-2023**	03-Oct-2023	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) S9	**04-Sep-2023**	**12-Sep-2023**	02-Oct-2023	✓	**12-Sep-2023**	02-Oct-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK067G) S7, S3, S2	**05-Sep-2023**	**12-Sep-2023**	03-Oct-2023	✓	**12-Sep-2023**	03-Oct-2023	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) S9	**04-Sep-2023**	**----**	----	----	**08-Sep-2023**	06-Sep-2023	×
Clear Plastic Bottle - Natural (EK071G) S7, S3, S2	**05-Sep-2023**	**----**	----	----	**08-Sep-2023**	07-Sep-2023	×
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030) S9	**04-Sep-2023**	**----**	----	----	**07-Sep-2023**	06-Sep-2023	×
Clear Plastic Bottle - Natural (EP030) S7, S3, S2	**05-Sep-2023**	**----**	----	----	**07-Sep-2023**	07-Sep-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
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	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	3	23	**13.04**	**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	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	3	17	**17.65**	**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
pH by Auto Titrator	EA005-P	1	7	**14.29**	**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	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	30	**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 Metals by ICP-MS - Suite A	EG020A-T	4	31	**12.90**	**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
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	23	**8.70**	**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	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	17	**11.76**	**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
pH by Auto Titrator	EA005-P	2	7	**28.57**	**10.00**	✓	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	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	30	**10.00**	**7.50**	✓	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 Metals by ICP-MS - Suite A	EG020A-T	2	31	**6.45**	**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
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	13	**7.69**	**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*	
Method Blanks (MB) - Continued							
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	23	**8.70**	**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	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	17	**11.76**	**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	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	30	**6.67**	**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 Metals by ICP-MS - Suite A	EG020A-T	2	31	**6.45**	**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
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**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	17	**5.88**	**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	17	**5.88**	**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 Metals by ICP-MS - Suite A	EG020A-T	2	31	**6.45**	**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

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
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. 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.
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)

Analytical Methods	Method	Matrix	Method Descriptions
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 1030F. This method is compliant with NEPM Schedule B(3)
Biochemical Oxygen Demand (BOD)	EP030	WATER	In house: Referenced to APHA 5210 B. The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. This method is compliant with 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)
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)

CERTIFICATE OF ANALYSIS

Work Order	: **EM2316156**	Page	: 1 of 4
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Peter Ravlic
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 08-Sep-2023 11:45
Order number	: 12564388	Date Analysis Commenced	: 08-Sep-2023
C-O-C number	: ----	Issue Date	: 13-Sep-2023 22:02
Sampler	: MIGUEL BENAVIDES		
Site	: ----		
Quote number	: ME/770/21 V2		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Arenie Vijayaratnam	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC

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.

- 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.
- EG020-T : EM2316156 #2 results for total metals have been confirmed by re-digestion and re-analysis.
- 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	S4	S6	QC1	----	----
			Sampling date / time	06-Sep-2023 00:00	06-Sep-2023 00:00	06-Sep-2023 00:00	----	----
Compound	CAS Number	LOR	Unit	EM2316156-001	EM2316156-002	EM2316156-003	--------	--------
				Result	Result	Result	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.97**	**8.12**	**8.03**	**----**	**----**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**412**	**420**	**421**	**----**	**----**
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**18**	**8**	**8**	**----**	**----**
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	**147**	**150**	**148**	**----**	**----**
Total Alkalinity as CaCO3	----	1	mg/L	**147**	**150**	**148**	**----**	**----**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**28**	**28**	**28**	**----**	**----**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**25**	**25**	**25**	**----**	**----**
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**72**	**73**	**72**	**----**	**----**
Magnesium	7439-95-4	1	mg/L	**5**	**5**	**5**	**----**	**----**
Sodium	7440-23-5	1	mg/L	**13**	**13**	**13**	**----**	**----**
Potassium	7440-09-7	1	mg/L	**1**	**1**	**1**	**----**	**----**
EG020F: Dissolved Metals by ICP-MS								
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	**----**	**----**
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	**----**	**----**
Manganese	7439-96-5	0.001	mg/L	**0.007**	**0.007**	**0.008**	**----**	**----**
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	**----**	**----**
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	**----**	**----**
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	<0.05	**----**	**----**
EG020T: Total Metals by ICP-MS								
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	**----**	**----**
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	**----**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	S4	S6	QC1	----	----
				Sampling date / time	06-Sep-2023 00:00	06-Sep-2023 00:00	06-Sep-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		EM2316156-001	EM2316156-002	EM2316156-003	--------	--------
					Result	Result	Result	----	----
EG020T: Total Metals by ICP-MS - Continued									
Manganese	7439-96-5	0.001	mg/L		**0.017**	**0.009**	**0.021**	----	----
Nickel	7440-02-0	0.001	mg/L		**0.002**	**0.001**	**0.002**	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	**0.006**	<0.005	----	----
Iron	7439-89-6	0.05	mg/L		**0.29**	**0.12**	**0.34**	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		<0.01	<0.01	<0.01	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.88**	**0.89**	**0.88**	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.88**	**0.89**	**0.88**	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**0.2**	<0.1	<0.1	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**1.1**	**0.9**	**0.9**	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		<0.01	<0.01	<0.01	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	<0.01	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**4.22**	**4.28**	**4.24**	----	----
ø Total Cations	----	0.01	meq/L		**4.60**	**4.64**	**4.60**	----	----
ø Ionic Balance	----	0.01	%		**4.20**	**4.03**	**3.96**	----	----
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L		<2	<2	<2	----	----

QUALITY CONTROL REPORT

Work Order	: **EM2316156**	Page	: 1 of 7
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Peter Ravlic
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 08-Sep-2023
Order number	: 12564388	Date Analysis Commenced	: 08-Sep-2023
C-O-C number	: ----	Issue Date	: 13-Sep-2023
Sampler	: MIGUEL BENAVIDES		
Site	: ----		
Quote number	: ME/770/21 V2		
No. of samples received	: 3		
No. of samples analysed	: 3		

Accreditation No. 825
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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*
Arenie Vijayaratnam	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC

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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 (%)
EA005P: pH by PC Titrator (QC Lot: 5288357)									
EM2316168-003	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	6.47	6.48	0.2	0% - 20%
EM2316145-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.92	8.01	1.1	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5288360)									
EM2316174-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	603	604	0.0	0% - 20%
EM2316145-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	9380	9420	0.4	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5288348)									
EM2316122-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
EM2316122-012	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	21	21	0.0	No Limit
EM2316156-002	S6	EA025H: Suspended Solids (SS)	----	5	mg/L	8	9	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 5288359)									
EM2316168-003	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	451	455	0.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	451	455	0.8	0% - 20%
EM2316145-001	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	188	191	1.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	188	191	1.1	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5286866)									
EM2316159-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.0	No Limit
EM2316040-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3150	3110	1.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5286867)									
EM2316159-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1730	1740	0.6	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: 5286867) - continued									
EM2316040-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	16700	16500	1.5	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5292665)									
EM2316000-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	330	333	0.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	709	711	0.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	3810	3830	0.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	76	77	0.0	0% - 20%
EM2316058-005	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	64	63	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	8	8	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	12	12	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	6	6	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5292667)									
EM2316156-003	QC1	ED093F: Calcium	7440-70-2	1	mg/L	72	72	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	5	5	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	13	13	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	1	1	0.0	No Limit
EM2316177-006	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	53	53	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	56	56	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	368	368	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	66	65	0.0	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5292666)									
EM2316176-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	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	0.110	0.110	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	0.010	0.010	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.71	0.70	0.0	0% - 50%
EM2316174-004	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	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	0.030	0.030	0.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.060	0.062	2.6	0% - 50%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.21	0.22	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 5291159)									
EM2316017-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.1 ug/L	<0.0001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<1 ug/L	<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: 5291159) - continued									
EM2316017-001	Anonymous	EG020A-T: Copper	7440-50-8	0.001	mg/L	<1 ug/L	<0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<1 ug/L	<0.001	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<1 ug/L	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<5 ug/L	<0.005	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EM2316174-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	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	0.002	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.037	0.038	0.0	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.003	0.002	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.008	0.008	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	1.47	1.52	2.8	0% - 20%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5288954)									
EM2316212-003	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.32	0.29	10.1	0% - 50%
EM2316096-001	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: 5286869)									
EM2316145-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	1.00	1.01	0.0	0% - 20%
EM2316162-001	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: 5288955)									
EM2316096-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.41	0.41	0.0	0% - 20%
EM2316212-003	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: 5288524)									
EM2316086-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.0	2.2	10.6	0% - 50%
EM2316088-004	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.2	0.1	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 5288523)									
EM2316086-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	1.81	1.93	6.6	0% - 20%
EM2316088-004	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: 5286870)									
EM2316156-001	S4	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 5287079)									
EM2316090-001	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	<2	0.0	No Limit
EM2316156-001	S4	EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	<2	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 5288357)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.8	101
				----	7 pH Unit	100	99.3	101
EA010P: Conductivity by PC Titrator (QCLot: 5288360)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	104	85.0	119
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5288348)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	103	91.0	109
				<5	825 mg/L	110	84.7	116
				<5	1000 mg/L	94.8	90.3	109
ED037P: Alkalinity by PC Titrator (QCLot: 5288359)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	101	85.0	116
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5286866)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	90.0	110
				<1	500 mg/L	109	90.0	110
ED045G: Chloride by Discrete Analyser (QCLot: 5286867)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	103	90.0	110
				<1	1000 mg/L	98.3	90.0	110
ED093F: Dissolved Major Cations (QCLot: 5292665)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	80.0	120
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	80.0	120
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	80.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	101	80.0	120
ED093F: Dissolved Major Cations (QCLot: 5292667)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	80.0	120
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	80.0	120
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	102	80.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	101	80.0	120
EG020F: Dissolved Metals by ICP-MS (QCLot: 5292666)								
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	96.8	83.5	111
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.1	83.2	109
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	97.6	83.1	107

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
EG020F: Dissolved Metals by ICP-MS (QCLot: 5292666) - continued								
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	99.9	84.6	108
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	97.1	84.8	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	99.0	84.3	110
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	103	86.3	112
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	99.2	91.8	112
EG020T: Total Metals by ICP-MS (QCLot: 5291159)								
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.5	86.4	115
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.2	86.9	112
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	103	86.9	111
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	103	88.3	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	102	88.7	113
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	103	87.9	113
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	110	86.7	117
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	103	92.8	118
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5288954)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	101	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5286869)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	110	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5288955)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	95.3	90.0	110
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5288524)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	76.8	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5288523)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	89.8	71.9	114
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5286870)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	103	90.0	110
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 5287079)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	198 mg/L	102	79.5	122

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Matrix Spike (MS) Report		
Spike	SpikeRecovery(%)	Acceptable Limits (%)

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: 5286866)							
EM2316145-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5286867)							
EM2316145-001	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	142
EG020F: Dissolved Metals by ICP-MS (QCLot: 5292666)							
EM2316156-001	S4	EG020A-F: Cadmium	7440-43-9	0.05 mg/L	102	74.6	118
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	104	71.0	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	101	76.0	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	104	75.0	133
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	104	64.0	134
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	104	73.0	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	105	75.0	131
EG020T: Total Metals by ICP-MS (QCLot: 5291159)							
EM2316017-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.25 mg/L	98.5	81.8	123
		EG020A-T: Chromium	7440-47-3	1 mg/L	103	78.9	119
		EG020A-T: Copper	7440-50-8	1 mg/L	104	80.4	118
		EG020A-T: Lead	7439-92-1	1 mg/L	108	80.5	121
		EG020A-T: Manganese	7439-96-5	1 mg/L	104	73.0	123
		EG020A-T: Nickel	7440-02-0	1 mg/L	103	80.0	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	102	74.0	120
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5288954)							
EM2316096-002	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	83.7	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5286869)							
EM2316145-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	# Not Determined	80.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5288955)							
EM2316096-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	88.9	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5288524)							
EM2316086-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	80.3	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5288523)							
EM2316086-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	97.4	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5286870)							
EM2316156-002	S6	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	89.8	79.0	123

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2316156**	Page	: 1 of 8
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 08-Sep-2023
Site	: ----	Issue Date	: 13-Sep-2023
Sampler	: MIGUEL BENAVIDES	No. of samples received	: 3
Order number	: 12564388	No. of samples analysed	: 3

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, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

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

Outliers : 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	EM2316145--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.**
ED045G: Chloride by Discrete Analyser	EM2316145--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK057G: Nitrite as N by Discrete Analyser	EM2316145--002	Anonymous	**Nitrite as N**	14797-65-0	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
S4, S6, QC1	----	----	----	12-Sep-2023	06-Sep-2023	**6**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Suspended Solids (High Level)	3	31	9.68	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

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
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P) S4, S6, QC1	**06-Sep-2023**	**----**	----	----	**12-Sep-2023**	06-Sep-2023	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P) S4, S6, QC1	**06-Sep-2023**	**----**	----	----	**12-Sep-2023**	04-Oct-2023	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H) S4, S6, QC1	**06-Sep-2023**	**----**	----	----	**11-Sep-2023**	13-Sep-2023	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) S4, S6, QC1	**06-Sep-2023**	**----**	----	----	**12-Sep-2023**	20-Sep-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) S4, S6, QC1	**06-Sep-2023**	**----**	----	----	**08-Sep-2023**	04-Oct-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) S4, S6, QC1	**06-Sep-2023**	**----**	----	----	**08-Sep-2023**	04-Oct-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F) S4, S6, QC1	**06-Sep-2023**	**----**	----	----	**12-Sep-2023**	04-Oct-2023	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F) S4, S6, QC1	**06-Sep-2023**	**----**	----	----	**12-Sep-2023**	04-Mar-2024	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) S4, S6, QC1	**06-Sep-2023**	**12-Sep-2023**	04-Mar-2024	✓	**12-Sep-2023**	04-Mar-2024	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) QC1	**06-Sep-2023**	**----**	----	----	**11-Sep-2023**	04-Oct-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) S4, S6	**06-Sep-2023**	**----**	----	----	**12-Sep-2023**	04-Oct-2023	✓

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) S4, S6, QC1	**06-Sep-2023**	**----**	----	----	**08-Sep-2023**	08-Sep-2023	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) S4, S6, QC1	**06-Sep-2023**	**----**	----	----	**12-Sep-2023**	04-Oct-2023	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) S4, S6, QC1	**06-Sep-2023**	**12-Sep-2023**	04-Oct-2023	✓	**12-Sep-2023**	04-Oct-2023	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) S4, S6, QC1	**06-Sep-2023**	**12-Sep-2023**	04-Oct-2023	✓	**12-Sep-2023**	04-Oct-2023	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) S4, S6, QC1	**06-Sep-2023**	**----**	----	----	**08-Sep-2023**	08-Sep-2023	✓
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030) S4, S6, QC1	**06-Sep-2023**	**----**	----	----	**08-Sep-2023**	08-Sep-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
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	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	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
Conductivity by Auto Titrator	EA010-P	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	4	32	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	31	**9.68**	**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 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
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	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
Conductivity by Auto Titrator	EA010-P	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	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	31	**9.68**	**7.50**	✓	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 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
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	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*	
Method Blanks (MB) - Continued							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	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	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	31	**6.45**	**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 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
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	12	**8.33**	**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 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	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**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 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

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
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. 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.
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)

Analytical Methods	Method	Matrix	Method Descriptions
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 1030F. This method is compliant with NEPM Schedule B(3)
Biochemical Oxygen Demand (BOD)	EP030	WATER	In house: Referenced to APHA 5210 B. The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. This method is compliant with 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)
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)

CERTIFICATE OF ANALYSIS

Work Order	: **EM2316162**	Page	: 1 of 15
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Peter Ravlic
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 08-Sep-2023 11:45
Order number	: 12564388	Date Analysis Commenced	: 08-Sep-2023
C-O-C number	: ----	Issue Date	: 20-Sep-2023 15:24
Sampler	: MIGUEL BENAVIDES		
Site	: ----		
Quote number	: ME/770/21 V2		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- 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
Arenie Vijayaratnam	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Laboratory Coordinator	WRG Subcontracting, Springvale, VIC
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC

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.

- EK057G: EM2316162 #1 Sample required dilution prior Nitrite as N analysis due to sample matrix. LOR value has been adjusted accordingly.
- EK086/EK087: sulfite and thiosulfate for EM2316162 #1 has been diluted prior to analysis due to sample matrix. LORs have been raised accordingly.
- EP075: 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.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP074: Where reported, Total Trihalomethanes is the sum of the reported concentrations of all Trihalomethanes at or above the LOR.
- EP074: Where reported, Total Trimethylbenzenes is the sum of the reported concentrations of 1.2.3-Trimethylbenzene, 1.2.4-Trimethylbenzene and 1.3.5-Trimethylbenzene 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.
- ED043S: Sample EM2316162-001 required dilution prior analysis due to sample matrix. LORs have been adjusted accordingly.
- EP075: Particular sample EM2316162_01 required dilution prior to analysis due to matrix interferences. LOR values have been adjusted accordingly.
- EP030: The residue DO for sample #1 is less than 1 mg/L, this indicates that the sample has not been diluted enough and the BOD is greater than 1180mg/L. The BOD result reported was estimated from the greatest dilution.
- EP068/EP066: Poor surrogate recoveries for sample EM2316162_001 as a result of suspected matrix interferences. Surrogate recoveries have been confirmed by re-extraction.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium, sodium and ammonia for sample #1.
- EP075: Particular sample EM2316162_01 has LOR raised for bis(2-ethylhexyl) phthalate due to potential laboratory background.
- Samples have been received with limited time to adhere to recommended analytical holding times for EP010, EK086 and EK087. Results should be scrutinised accordingly.
- EP075: Where reported, 'Sum of PAH' is the sum of the USEPA 16 priority PAHs
- MBAS (W-MBAS)is conducted by ALS Scoresby NATA accreditation no. 992, site no. 989.
- 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: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	06-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EM2316162-001	--------	--------	--------	--------	
				Result	----	----	----	----	
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L	**2750**	----	----	----	----	
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L	**4410**	----	----	----	----	
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	**1620**	----	----	----	----	
Total Alkalinity as CaCO3	----	1	mg/L	**1620**	----	----	----	----	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**33**	----	----	----	----	
ED043S: Total Oxidised Sulfur as S									
Total Oxidised Sulfur as S	----	10	mg/L	<100	----	----	----	----	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	**786**	----	----	----	----	
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L	**38**	----	----	----	----	
Magnesium	7439-95-4	1	mg/L	**24**	----	----	----	----	
Sodium	7440-23-5	1	mg/L	**489**	----	----	----	----	
Potassium	7440-09-7	1	mg/L	**188**	----	----	----	----	
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L	**0.50**	----	----	----	----	
Arsenic	7440-38-2	0.001	mg/L	**0.036**	----	----	----	----	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----	
Chromium	7440-47-3	0.001	mg/L	**0.114**	----	----	----	----	
Copper	7440-50-8	0.001	mg/L	**0.056**	----	----	----	----	
Lead	7439-92-1	0.001	mg/L	**0.005**	----	----	----	----	
Manganese	7439-96-5	0.001	mg/L	**0.294**	----	----	----	----	
Nickel	7440-02-0	0.001	mg/L	**0.043**	----	----	----	----	
Selenium	7782-49-2	0.01	mg/L	<0.01	----	----	----	----	
Zinc	7440-66-6	0.005	mg/L	**0.082**	----	----	----	----	
Iron	7439-89-6	0.05	mg/L	**2.36**	----	----	----	----	
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L	**3.74**	----	----	----	----	

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	06-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2316162-001	--------	--------	--------	--------
					Result	----	----	----	----
EG020T: Total Metals by ICP-MS - Continued									
Arsenic	7440-38-2	0.001	mg/L		**0.037**	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		**0.0002**	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		**0.207**	----	----	----	----
Copper	7440-50-8	0.001	mg/L		**0.436**	----	----	----	----
Lead	7439-92-1	0.001	mg/L		**0.018**	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		**0.341**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.047**	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.341**	----	----	----	----
Iron	7439-89-6	0.05	mg/L		**7.42**	----	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	0.004	mg/L		**0.005**	----	----	----	----
EK055: Ammonia as N									
Ammonia as N	7664-41-7	0.1	mg/L		**338**	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.02	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.05**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.05**	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**474**	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**474**	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**12.1**	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**4.05**	----	----	----	----
EK085M: Sulfide as S2-									

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	06-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2316162-001	--------	--------	--------	--------
					Result	----	----	----	----
EK085M: Sulfide as S2- - Continued									
Sulfide as S2-	18496-25-8	0.1	mg/L		<0.5	----	----	----	----
EK086: Sulfite as SO3 2-									
Sulfite as SO3 2-	14265-45-3	2	mg/L		<20	----	----	----	----
EK087: Thiosulfate as S2O3 2-									
Thiosulfate as S2O3 2-	----	2	mg/L		<20	----	----	----	----
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**55.2**	----	----	----	----
ø **Total Cations**	----	0.01	meq/L		**54.1**	----	----	----	----
ø **Ionic Balance**	----	0.01	%		**1.06**	----	----	----	----
EP002: Dissolved Organic Carbon (DOC)									
Dissolved Organic Carbon	----	1	mg/L		**286**	----	----	----	----
EP010: Formaldehyde									
Formaldehyde	50-00-0	0.1	mg/L		**2.0**	----	----	----	----
EP020: Oil and Grease (O&G)									
Oil & Grease	----	5	mg/L		**90**	----	----	----	----
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L		**1180**	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)									
^ **Total Polychlorinated biphenyls**	----	1	µg/L		<1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.5	µg/L		<0.5	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L		<0.5	----	----	----	----
beta-BHC	319-85-7	0.5	µg/L		<0.5	----	----	----	----
gamma-BHC	58-89-9	0.5	µg/L		<0.5	----	----	----	----
delta-BHC	319-86-8	0.5	µg/L		<0.5	----	----	----	----
Heptachlor	76-44-8	0.5	µg/L		<0.5	----	----	----	----
Aldrin	309-00-2	0.5	µg/L		<0.5	----	----	----	----
Heptachlor epoxide	1024-57-3	0.5	µg/L		<0.5	----	----	----	----
trans-Chlordane	5103-74-2	0.5	µg/L		<0.5	----	----	----	----
alpha-Endosulfan	959-98-8	0.5	µg/L		<0.5	----	----	----	----
cis-Chlordane	5103-71-9	0.5	µg/L		<0.5	----	----	----	----
Dieldrin	60-57-1	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDE	72-55-9	0.5	µg/L		<0.5	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	06-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2316162-001	--------	--------	--------	--------
					Result	----	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued									
Endrin	72-20-8	0.5	µg/L		<0.5	----	----	----	----
beta-Endosulfan	33213-65-9	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDD	72-54-8	0.5	µg/L		<0.5	----	----	----	----
Endrin aldehyde	7421-93-4	0.5	µg/L		<0.5	----	----	----	----
Endosulfan sulfate	1031-07-8	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDT	50-29-3	2.0	µg/L		<2.0	----	----	----	----
Endrin ketone	53494-70-5	0.5	µg/L		<0.5	----	----	----	----
Methoxychlor	72-43-5	2.0	µg/L		<2.0	----	----	----	----
^ Total Chlordane (sum)	----	0.5	µg/L		<0.5	----	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	µg/L		<0.5	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.5	µg/L		<0.5	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.5	µg/L		<0.5	----	----	----	----
Demeton-S-methyl	919-86-8	0.5	µg/L		<0.5	----	----	----	----
Monocrotophos	6923-22-4	2.0	µg/L		<2.0	----	----	----	----
Dimethoate	60-51-5	0.5	µg/L		<0.5	----	----	----	----
Diazinon	333-41-5	0.5	µg/L		<0.5	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L		<0.5	----	----	----	----
Parathion-methyl	298-00-0	2.0	µg/L		<2.0	----	----	----	----
Malathion	121-75-5	0.5	µg/L		<0.5	----	----	----	----
Fenthion	55-38-9	0.5	µg/L		<0.5	----	----	----	----
Chlorpyrifos	2921-88-2	0.5	µg/L		<0.5	----	----	----	----
Parathion	56-38-2	2.0	µg/L		<2.0	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.5	µg/L		<0.5	----	----	----	----
Chlorfenvinphos	470-90-6	0.5	µg/L		<0.5	----	----	----	----
Bromophos-ethyl	4824-78-6	0.5	µg/L		<0.5	----	----	----	----
Fenamiphos	22224-92-6	0.5	µg/L		<0.5	----	----	----	----
Prothiofos	34643-46-4	0.5	µg/L		<0.5	----	----	----	----
Ethion	563-12-2	0.5	µg/L		<0.5	----	----	----	----
Carbophenothion	786-19-6	0.5	µg/L		<0.5	----	----	----	----
Azinphos Methyl	86-50-0	0.5	µg/L		<0.5	----	----	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup									
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	06-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2316162-001	--------	--------	--------	--------
					Result	----	----	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup - Continued									
C15 - C28 Fraction	----	100	µg/L		**540**	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		**410**	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		**950**	----	----	----	----
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup									
>C10 - C16 Fraction	----	100	µg/L		**100**	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		**810**	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		**190**	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		**1100**	----	----	----	----
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		**100**	----	----	----	----
EP074B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	50	µg/L		**180**	----	----	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	----	----	----	----
1.2-Dichloropropane	78-87-5	5	µg/L		<5	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	----	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	----	----	----	----
Chloromethane	74-87-3	50	µg/L		<50	----	----	----	----
Vinyl chloride	75-01-4	50	µg/L		<50	----	----	----	----
Bromomethane	74-83-9	50	µg/L		<50	----	----	----	----
Chloroethane	75-00-3	50	µg/L		<50	----	----	----	----
Trichlorofluoromethane	75-69-4	50	µg/L		<50	----	----	----	----
1.1-Dichloroethene	75-35-4	5	µg/L		<5	----	----	----	----
Iodomethane	74-88-4	5	µg/L		<5	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	----	----	----	----
1.1-Dichloroethane	75-34-3	5	µg/L		<5	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	----	----	----	----
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	----	----	----	----
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	----	----	----	----
Carbon Tetrachloride	56-23-5	5	µg/L		<5	----	----	----	----
1.2-Dichloroethane	107-06-2	5	µg/L		<5	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	06-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2316162-001	--------	--------	--------	--------
					Result	----	----	----	----
EP074E: Halogenated Aliphatic Compounds - Continued									
Trichloroethene	79-01-6	5	µg/L		<5	----	----	----	----
Dibromomethane	74-95-3	5	µg/L		<5	----	----	----	----
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	----	----	----	----
1.3-Dichloropropane	142-28-9	5	µg/L		<5	----	----	----	----
Tetrachloroethene	127-18-4	5	µg/L		<5	----	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	----	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	----	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	----	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	----	----	----	----
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	----	----	----	----
Pentachloroethane	76-01-7	5	µg/L		<5	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	----	----	----	----
Hexachlorobutadiene	87-68-3	5	µg/L		<5	----	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	----	----	----	----
Bromobenzene	108-86-1	5	µg/L		<5	----	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L		<5	----	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L		<5	----	----	----	----
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	----	----	----	----
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	----	----	----	----
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	----	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	----	----	----	----
Bromodichloromethane	75-27-4	5	µg/L		<5	----	----	----	----
Dibromochloromethane	124-48-1	5	µg/L		<5	----	----	----	----
Bromoform	75-25-2	5	µg/L		<5	----	----	----	----
EP075A: Phenolic Compounds									
Phenol	108-95-2	2	µg/L		<8	----	----	----	----
2-Chlorophenol	95-57-8	2	µg/L		<8	----	----	----	----
2-Methylphenol	95-48-7	2	µg/L		**10**	----	----	----	----
3- & 4-Methylphenol	1319-77-3	4	µg/L		**9**	----	----	----	----
2-Nitrophenol	88-75-5	2	µg/L		<8	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	06-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2316162-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075A: Phenolic Compounds - Continued									
2.4-Dimethylphenol	105-67-9	2	µg/L		<8	----	----	----	----
2.4-Dichlorophenol	120-83-2	2	µg/L		<8	----	----	----	----
2.6-Dichlorophenol	87-65-0	2	µg/L		<8	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	2	µg/L		<8	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	2	µg/L		<8	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	2	µg/L		<8	----	----	----	----
Pentachlorophenol	87-86-5	4	µg/L		<8	----	----	----	----
EP075B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	2	µg/L		<8	----	----	----	----
2-Methylnaphthalene	91-57-6	2	µg/L		<8	----	----	----	----
2-Chloronaphthalene	91-58-7	2	µg/L		<8	----	----	----	----
Acenaphthylene	208-96-8	2	µg/L		<8	----	----	----	----
Acenaphthene	83-32-9	2	µg/L		<8	----	----	----	----
Fluorene	86-73-7	2	µg/L		<8	----	----	----	----
Phenanthrene	85-01-8	2	µg/L		<8	----	----	----	----
Anthracene	120-12-7	2	µg/L		<8	----	----	----	----
Fluoranthene	206-44-0	2	µg/L		<8	----	----	----	----
Pyrene	129-00-0	2	µg/L		<8	----	----	----	----
N-2-Fluorenyl Acetamide	53-96-3	2	µg/L		<8	----	----	----	----
Benz(a)anthracene	56-55-3	2	µg/L		<8	----	----	----	----
Chrysene	218-01-9	2	µg/L		<8	----	----	----	----
Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	4	µg/L		<15	----	----	----	----
7.12-Dimethylbenz(a)anthracene	57-97-6	2	µg/L		<8	----	----	----	----
Benzo(a)pyrene	50-32-8	2	µg/L		<8	----	----	----	----
3-Methylcholanthrene	56-49-5	2	µg/L		<8	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	2	µg/L		<8	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	2	µg/L		<8	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	2	µg/L		<8	----	----	----	----
^ Sum of PAHs	----	2	µg/L		<9	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	2	µg/L		<9	----	----	----	----
EP075C: Phthalate Esters									
Dimethyl phthalate	131-11-3	2	µg/L		<8	----	----	----	----
Diethyl phthalate	84-66-2	2	µg/L		<8	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	06-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2316162-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075C: Phthalate Esters - Continued									
Di-n-butyl phthalate	84-74-2	2	µg/L		<8	----	----	----	----
Butyl benzyl phthalate	85-68-7	2	µg/L		<8	----	----	----	----
bis(2-ethylhexyl) phthalate	117-81-7	10	µg/L		<20	----	----	----	----
Di-n-octylphthalate	117-84-0	2	µg/L		<8	----	----	----	----
EP075D: Nitrosamines									
N-Nitrosomethylethylamine	10595-95-6	2	µg/L		<8	----	----	----	----
N-Nitrosodiethylamine	55-18-5	2	µg/L		<8	----	----	----	----
N-Nitrosopyrrolidine	930-55-2	4	µg/L		<8	----	----	----	----
N-Nitrosomorpholine	59-89-2	2	µg/L		<8	----	----	----	----
N-Nitrosodi-n-propylamine	621-64-7	2	µg/L		<8	----	----	----	----
N-Nitrosopiperidine	100-75-4	2	µg/L		<8	----	----	----	----
N-Nitrosodibutylamine	924-16-3	2	µg/L		<8	----	----	----	----
N-Nitrosodiphenyl & Diphenylamine	86-30-6 122-39-4	4	µg/L		<8	----	----	----	----
Methapyrilene	91-80-5	2	µg/L		<8	----	----	----	----
EP075E: Nitroaromatics and Ketones									
2-Picoline	109-06-8	2	µg/L		<8	----	----	----	----
Acetophenone	98-86-2	2	µg/L		<8	----	----	----	----
Nitrobenzene	98-95-3	2	µg/L		<8	----	----	----	----
Isophorone	78-59-1	2	µg/L		<8	----	----	----	----
2.6-Dinitrotoluene	606-20-2	4	µg/L		<8	----	----	----	----
2.4-Dinitrotoluene	121-14-2	4	µg/L		<8	----	----	----	----
1-Naphthylamine	134-32-7	2	µg/L		<8	----	----	----	----
4-Nitroquinoline-N-oxide	56-57-5	2	µg/L		<8	----	----	----	----
5-Nitro-o-toluidine	99-55-8	2	µg/L		<8	----	----	----	----
Azobenzene	103-33-3	2	µg/L		<8	----	----	----	----
1.3.5-Trinitrobenzene	99-35-4	2	µg/L		<8	----	----	----	----
Phenacetin	62-44-2	2	µg/L		<8	----	----	----	----
4-Aminobiphenyl	92-67-1	2	µg/L		<8	----	----	----	----
Pentachloronitrobenzene	82-68-8	2	µg/L		<8	----	----	----	----
Pronamide	23950-58-5	2	µg/L		<8	----	----	----	----
Dimethylaminoazobenzene	60-11-7	2	µg/L		<8	----	----	----	----
Chlorobenzilate	510-15-6	2	µg/L		<8	----	----	----	----
EP075F: Haloethers									

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	06-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2316162-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075F: Haloethers - Continued									
Bis(2-chloroethyl) ether	111-44-4	2	µg/L		<8	----	----	----	----
Bis(2-chloroethoxy) methane	111-91-1	2	µg/L		<8	----	----	----	----
4-Chlorophenyl phenyl ether	7005-72-3	2	µg/L		<8	----	----	----	----
4-Bromophenyl phenyl ether	101-55-3	2	µg/L		<8	----	----	----	----
EP075G: Chlorinated Hydrocarbons									
1.3-Dichlorobenzene	541-73-1	2	µg/L		<8	----	----	----	----
1.4-Dichlorobenzene	106-46-7	2	µg/L		<8	----	----	----	----
1.2-Dichlorobenzene	95-50-1	2	µg/L		<8	----	----	----	----
Hexachloroethane	67-72-1	2	µg/L		<8	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	2	µg/L		<8	----	----	----	----
Hexachloropropylene	1888-71-7	2	µg/L		<8	----	----	----	----
Hexachlorobutadiene	87-68-3	2	µg/L		<8	----	----	----	----
Hexachlorocyclopentadiene	77-47-4	10	µg/L		<10	----	----	----	----
Pentachlorobenzene	608-93-5	2	µg/L		<8	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	4	µg/L		<8	----	----	----	----
EP075H: Anilines and Benzidines									
Aniline	62-53-3	2	µg/L		<8	----	----	----	----
4-Chloroaniline	106-47-8	2	µg/L		<8	----	----	----	----
2-Nitroaniline	88-74-4	4	µg/L		<8	----	----	----	----
3-Nitroaniline	99-09-2	4	µg/L		<8	----	----	----	----
Dibenzofuran	132-64-9	2	µg/L		<8	----	----	----	----
4-Nitroaniline	100-01-6	2	µg/L		<8	----	----	----	----
Carbazole	86-74-8	2	µg/L		<8	----	----	----	----
3.3`-Dichlorobenzidine	91-94-1	2	µg/L		<8	----	----	----	----
EP075I: Organochlorine Pesticides									
alpha-BHC	319-84-6	2	µg/L		<8	----	----	----	----
beta-BHC	319-85-7	2	µg/L		<8	----	----	----	----
gamma-BHC	58-89-9	2	µg/L		<8	----	----	----	----
delta-BHC	319-86-8	2	µg/L		<8	----	----	----	----
Heptachlor	76-44-8	2	µg/L		<8	----	----	----	----
Aldrin	309-00-2	2	µg/L		<8	----	----	----	----
Heptachlor epoxide	1024-57-3	2	µg/L		<8	----	----	----	----
alpha-Endosulfan	959-98-8	2	µg/L		<8	----	----	----	----
4.4`-DDE	72-55-9	2	µg/L		<8	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	06-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2316162-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075I: Organochlorine Pesticides - Continued									
Dieldrin	60-57-1	2	µg/L		<8	----	----	----	----
Endrin	72-20-8	2	µg/L		<8	----	----	----	----
beta-Endosulfan	33213-65-9	2	µg/L		<8	----	----	----	----
4.4`-DDD	72-54-8	2	µg/L		<8	----	----	----	----
Endosulfan sulfate	1031-07-8	2	µg/L		<8	----	----	----	----
4.4`-DDT	50-29-3	4	µg/L		<8	----	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	4	µg/L		<9	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	4	µg/L		<9	----	----	----	----
EP075J: Organophosphorus Pesticides									
Dichlorvos	62-73-7	2	µg/L		<8	----	----	----	----
Dimethoate	60-51-5	2	µg/L		<8	----	----	----	----
Diazinon	333-41-5	2	µg/L		<8	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	2	µg/L		<8	----	----	----	----
Malathion	121-75-5	2	µg/L		<8	----	----	----	----
Fenthion	55-38-9	2	µg/L		<8	----	----	----	----
Chlorpyrifos	2921-88-2	2	µg/L		<8	----	----	----	----
Pirimphos-ethyl	23505-41-1	2	µg/L		<8	----	----	----	----
Chlorfenvinphos	470-90-6	2	µg/L		<8	----	----	----	----
Prothiofos	34643-46-4	2	µg/L		<8	----	----	----	----
Ethion	563-12-2	2	µg/L		<8	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		**200**	----	----	----	----
C10 - C14 Fraction	----	50	µg/L		**1040**	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		**32400**	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		**2660**	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		**36100**	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		**190**	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		**100**	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		**1680**	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		**33600**	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		**600**	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	06-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2316162-001	--------	--------	--------	--------
					Result	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ >C10 - C40 Fraction (sum)	----	100	µg/L		**35900**	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		**1680**	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		**3**	----	----	----	----
Toluene	108-88-3	2	µg/L		**16**	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		**6**	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		**42**	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		**22**	----	----	----	----
^ Total Xylenes	----	2	µg/L		**64**	----	----	----	----
^ Sum of BTEX	----	1	µg/L		**89**	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP202A: Phenoxyacetic Acid Herbicides by LCMS									
4-Chlorophenoxy acetic acid	122-88-3	10	µg/L		<10	----	----	----	----
2.4-DB	94-82-6	10	µg/L		<10	----	----	----	----
Dicamba	1918-00-9	10	µg/L		<10	----	----	----	----
Mecoprop	93-65-2	10	µg/L		<10	----	----	----	----
MCPA	94-74-6	10	µg/L		<10	----	----	----	----
2.4-DP	120-36-5	10	µg/L		<10	----	----	----	----
2.4-D	94-75-7	10	µg/L		<10	----	----	----	----
Triclopyr	55335-06-3	10	µg/L		<10	----	----	----	----
Silvex (2.4.5-TP/Fenoprop)	93-72-1	10	µg/L		<10	----	----	----	----
2.4.5-T	93-76-5	10	µg/L		<10	----	----	----	----
MCPB	94-81-5	10	µg/L		<10	----	----	----	----
Picloram	1918-02-1	10	µg/L		<10	----	----	----	----
Clopyralid	1702-17-6	10	µg/L		<10	----	----	----	----
Fluroxypyr	69377-81-7	10	µg/L		<10	----	----	----	----
2.6-D	575-90-6	10	µg/L		<10	----	----	----	----
2.4.6-T	575-89-3	10	µg/L		<10	----	----	----	----
Subcontracted Analysis: MBAS									
Anionic Surfactants as MBAS	----	0.05	mg/L		<0.5	----	----	----	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	1	%		**32.3**	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	06-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2316162-001	--------	--------	--------	--------
					Result	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate - Continued									
Dibromo-DDE	21655-73-2	0.5	%		49.4	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.5	%		4.1	----	----	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	5	%		119	----	----	----	----
Toluene-D8	2037-26-5	5	%		126	----	----	----	----
4-Bromofluorobenzene	460-00-4	5	%		124	----	----	----	----
EP075S: Acid Extractable Surrogates									
2-Fluorophenol	367-12-4	2	%		52.2	----	----	----	----
Phenol-d6	13127-88-3	2	%		34.3	----	----	----	----
2-Chlorophenol-D4	93951-73-6	2	%		67.6	----	----	----	----
2.4.6-Tribromophenol	118-79-6	2	%		87.4	----	----	----	----
EP075T: Base/Neutral Extractable Surrogates									
Nitrobenzene-D5	4165-60-0	2	%		61.2	----	----	----	----
1.2-Dichlorobenzene-D4	2199-69-1	2	%		61.5	----	----	----	----
2-Fluorobiphenyl	321-60-8	2	%		79.5	----	----	----	----
Anthracene-d10	1719-06-8	2	%		74.4	----	----	----	----
4-Terphenyl-d14	1718-51-0	2	%		79.9	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		115	----	----	----	----
Toluene-D8	2037-26-5	2	%		122	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		124	----	----	----	----
EP202S: Phenoxyacetic Acid Herbicide Surrogate									
2.4-Dichlorophenyl Acetic Acid	19719-28-9	10	%		90.9	----	----	----	----

Surrogate Control Limits

Sub-Matrix: LEACHATE		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	41	125
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	117
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	51	127
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72	132
Toluene-D8	2037-26-5	77	132
4-Bromofluorobenzene	460-00-4	67	131
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	6	83
Phenol-d6	13127-88-3	10	65
2-Chlorophenol-D4	93951-73-6	22	112
2.4.6-Tribromophenol	118-79-6	22	125
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	37	115
1.2-Dichlorobenzene-D4	2199-69-1	32	99
2-Fluorobiphenyl	321-60-8	39	116
Anthracene-d10	1719-06-8	49	123
4-Terphenyl-d14	1718-51-0	47	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129
EP202S: Phenoxyacetic Acid Herbicide Surrogate			
2.4-Dichlorophenyl Acetic Acid	19719-28-9	64	140

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP020: Oil and Grease (O&G)

(WATER) EP202A: Phenoxyacetic Acid Herbicides by LCMS

(WATER) EP202S: Phenoxyacetic Acid Herbicide Surrogate

QUALITY CONTROL REPORT

Work Order	: **EM2316162**	Page	: 1 of 19
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Peter Ravlic
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 08-Sep-2023
Order number	: 12564388	Date Analysis Commenced	: 08-Sep-2023
C-O-C number	: ----	Issue Date	: 20-Sep-2023
Sampler	: MIGUEL BENAVIDES		
Site	: ----		
Quote number	: ME/770/21 V2		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Arenie Vijayaratnam	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Laboratory Coordinator	WRG Subcontracting, Springvale, VIC
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC

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: 5291002)									
EM2316078-002	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	9880	9900	0.2	0% - 20%
EM2316170-004	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	513	534	4.0	0% - 20%
EM2316243-003	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1430	1400	2.2	0% - 20%
EM2316257-007	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	4050	4010	1.1	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5291003)									
EM2316162-001	Landfill leachate	EA025H: Suspended Solids (SS)	----	5	mg/L	4410	4300	2.6	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5288462)									
EM2316186-003	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	362	362	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	362	362	0.0	0% - 20%
EM2316132-002	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	786	786	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	786	786	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5286866)									
EM2316159-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.0	No Limit
EM2316040-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3150	3110	1.1	0% - 20%
ED043S: Total Oxidised Sulfur as S (QC Lot: 5296582)									
EM2316162-001	Landfill leachate	ED043S: Total Oxidised Sulfur as S	----	10	mg/L	<100	<100	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 5286867)									
EM2316159-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1730	1740	0.6	0% - 20%
EM2316040-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	16700	16500	1.5	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 (%)*
ED093F: Dissolved Major Cations (QC Lot: 5303510)									
EM2315486-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	208	209	0.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	382	384	0.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	3200	3210	0.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	120	120	0.0	0% - 20%
EM2316321-016	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	14	14	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	106	106	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	439	439	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	25	25	0.0	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5303509)									
EM2315486-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0002	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.015	0.015	0.0	0% - 50%
		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	0.169	0.169	0.0	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	0.020	0.021	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.02	0.02	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.74	0.75	0.0	0% - 50%
EM2316445-011	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	<0.001	<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: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	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: 5292856)									
EM2316078-010	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	0.003	0.002	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.030	0.030	0.0	0% - 20%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.013	0.012	10.6	0% - 50%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.181	0.163	10.7	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.643	0.563	13.2	0% - 20%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.034	0.026	26.8	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: 5292856) - continued									
EM2316078-010	Anonymous	EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.17	0.15	8.1	0% - 50%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	0.02	0.02	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	1.20	1.09	9.9	0% - 20%
EM2316159-002	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: Manganese	7439-96-5	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
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 5303511)									
EM2316162-001	Landfill leachate	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EM2316513-003	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: 5300619)									
EM2315711-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EM2316250-006	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK026SF: Total CN by Segmented Flow Analyser (QC Lot: 5288184)									
EM2316162-001	Landfill leachate	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	0.005	0.006	0.0	No Limit
EM2316186-001	Anonymous	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK055: Ammonia as N (QC Lot: 5288144)									
EM2316010-001	Anonymous	EK055: Ammonia as N	7664-41-7	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5286869)									
EM2316145-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	1.00	1.01	0.0	0% - 20%
EM2316162-001	Landfill leachate	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: 5289877)									
EM2316229-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM2316170-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.42	0.42	0.0	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 5300517)									
EM2315486-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.6	0.6	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 5300516)									
EM2315486-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.07	0.09	20.8	No Limit
EM2316314-005	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: 5286870)									
EM2316156-001	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 (%)*
EK085M: Sulfide as S2- (QC Lot: 5287351)									
EM2316146-002	Anonymous	EK085: Sulfide as S2-	18496-25-8	0.1	mg/L	<0.5	0.7	38.7	No Limit
EK086: Sulfite as SO3 2- (QC Lot: 5292050)									
EM2315977-001	Anonymous	EK086: Sulfite as SO3 2-	14265-45-3	2	mg/L	<2	<2	0.0	No Limit
EK087: Thiosulfate as S2O3 2- (QC Lot: 5292051)									
EM2316074-001	Anonymous	EK087: Thiosulfate as S2O3 2-	----	2	mg/L	<20	<20	0.0	No Limit
EP002: Dissolved Organic Carbon (DOC) (QC Lot: 5289586)									
EM2316162-001	Landfill leachate	EP002: Dissolved Organic Carbon	----	1	mg/L	286	295	2.9	0% - 20%
EP010: Formaldehyde (QC Lot: 5287840)									
EM2316162-001	Landfill leachate	EP010: Formaldehyde	50-00-0	0.1	mg/L	2.0	2.3	14.0	No Limit
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 5287079)									
EM2316090-001	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	<2	0.0	No Limit
EM2316156-001	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	<2	0.0	No Limit
EP074B: Oxygenated Compounds (QC Lot: 5296659)									
EM2316162-001	Landfill leachate	EP074: 2-Propanone (Acetone)	67-64-1	50	µg/L	180	190	0.0	No Limit
EP074D: Fumigants (QC Lot: 5296659)									
EM2316162-001	Landfill leachate	EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 5296659)									
EM2316162-001	Landfill leachate	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	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 (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 5296659) - continued									
EM2316162-001	Landfill leachate	EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 5296659)									
EM2316162-001	Landfill leachate	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
EP074G: Trihalomethanes (QC Lot: 5296659)									
EM2316162-001	Landfill leachate	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5296658)									
EM2316162-001	Landfill leachate	EP080: C6 - C9 Fraction	----	20	µg/L	200	200	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5296658)									
EM2316162-001	Landfill leachate	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	190	190	0.0	No Limit
EP080: BTEXN (QC Lot: 5296658)									
EM2316162-001	Landfill leachate	EP080: Benzene	71-43-2	1	µg/L	3	3	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	16	16	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	6	6	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	42	41	3.5	0% - 20%
		EP080: ortho-Xylene	95-47-6	2	µg/L	22	21	0.0	0% - 50%
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QC Lot: 5293372)									

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 (%)*
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QC Lot: 5293372) - continued									
EM2316162-001	Landfill leachate	EP202-SL: 4-Chlorophenoxy acetic acid	122-88-3	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: 2.4-DB	94-82-6	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Dicamba	1918-00-9	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Mecoprop	93-65-2	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: MCPA	94-74-6	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: 2.4-DP	120-36-5	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: 2.4-D	94-75-7	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Triclopyr	55335-06-3	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Silvex (2.4.5-TP/Fenoprop)	93-72-1	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: 2.4.5-T	93-76-5	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: MCPB	94-81-5	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Picloram	1918-02-1	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Clopyralid	1702-17-6	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Fluroxypyr	69377-81-7	10	µg/L	<10	<10	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: 5291002)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	109	91.0	110
				<10	2340 mg/L	105	80.8	119
				<10	293 mg/L	107	91.0	110
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5291003)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	99.3	91.0	109
				<5	825 mg/L	110	84.7	116
ED037P: Alkalinity by PC Titrator (QCLot: 5288462)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	108	85.0	116
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5286866)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	90.0	110
				<1	500 mg/L	109	90.0	110
ED043S: Total Oxidised Sulfur as S (QCLot: 5296582)								
ED043S: Total Oxidised Sulfur as S	----	10	mg/L	<10	167 mg/L	94.1	77.5	119
ED045G: Chloride by Discrete Analyser (QCLot: 5286867)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	103	90.0	110
				<1	1000 mg/L	98.3	90.0	110
ED093F: Dissolved Major Cations (QCLot: 5303510)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.6	80.0	120
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.9	80.0	120
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.9	80.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	100	80.0	120
EG020F: Dissolved Metals by ICP-MS (QCLot: 5303509)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	99.1	90.4	111
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	101	89.0	111
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	95.3	83.5	111
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.3	83.2	109
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	97.8	83.1	107
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	98.8	84.6	108
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	99.1	84.8	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	94.2	84.3	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
EG020F: Dissolved Metals by ICP-MS (QCLot: 5303509) - continued								
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	99.9	82.3	113
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	105	86.3	112
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	96.3	91.8	112
EG020T: Total Metals by ICP-MS (QCLot: 5292856)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	100	90.8	115
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	102	89.2	115
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.7	86.4	115
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	101	86.9	112
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	99.6	86.9	111
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	98.8	88.3	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	100	88.7	113
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	98.5	87.9	113
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	109	84.8	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	101	86.7	117
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	104	92.8	118
EG035F: Dissolved Mercury by FIMS (QCLot: 5303511)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	99.3	71.6	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5300619)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	104	73.4	119
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 5288184)								
EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.2 mg/L	105	77.7	116
EK055: Ammonia as N (QCLot: 5288144)								
EK055: Ammonia as N	7664-41-7	0.1	mg/L	<0.1	25 mg/L	102	83.2	108
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5286869)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	110	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5289877)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	94.5	90.0	110
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5300517)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	94.6	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5300516)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	88.0	71.9	114
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5286870)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	103	90.0	110
EK085M: Sulfide as S2- (QCLot: 5287351)								

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
EK085M: Sulfide as S2- (QCLot: 5287351) - continued								
EK085: Sulfide as S2-	18496-25-8	0.1	mg/L	<0.1	0.5 mg/L	116	81.9	116
EK086: Sulfite as SO3 2- (QCLot: 5292050)								
EK086: Sulfite as SO3 2-	14265-45-3	2	mg/L	<2	100 mg/L	97.0	91.8	101
EK087: Thiosulfate as S2O3 2- (QCLot: 5292051)								
EK087: Thiosulfate as S2O3 2-	----	2	mg/L	<2	100 mg/L	92.4	90.6	106
EP002: Dissolved Organic Carbon (DOC) (QCLot: 5289586)								
EP002: Dissolved Organic Carbon	----	1	mg/L	<1	100 mg/L	95.8	83.0	115
EP010: Formaldehyde (QCLot: 5287840)								
EP010: Formaldehyde	50-00-0	0.1	mg/L	<0.1	5 mg/L	98.8	85.1	107
EP020: Oil and Grease (O&G) (QCLot: 5299206)								
EP020: Oil & Grease	----	5	mg/L	<5	5000 mg/L	90.6	81.0	121
				<5	4000 mg/L	95.2	70.0	110
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 5287079)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	198 mg/L	102	79.5	122
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 5288059)								
EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	96.0	52.0	136
EP068A: Organochlorine Pesticides (OC) (QCLot: 5288060)								
EP068: alpha-BHC	319-84-6	0.5	µg/L	<0.5	2.5 µg/L	95.7	50.6	119
EP068: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	2.5 µg/L	92.2	44.2	117
EP068: beta-BHC	319-85-7	0.5	µg/L	<0.5	2.5 µg/L	96.0	53.7	119
EP068: gamma-BHC	58-89-9	0.5	µg/L	<0.5	2.5 µg/L	94.2	47.7	117
EP068: delta-BHC	319-86-8	0.5	µg/L	<0.5	2.5 µg/L	91.3	52.5	117
EP068: Heptachlor	76-44-8	0.5	µg/L	<0.5	2.5 µg/L	99.0	46.9	118
EP068: Aldrin	309-00-2	0.5	µg/L	<0.5	2.5 µg/L	93.9	48.0	115
EP068: Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	2.5 µg/L	96.1	51.1	119
EP068: trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	2.5 µg/L	95.1	48.4	120
EP068: alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	2.5 µg/L	94.1	50.1	122
EP068: cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	2.5 µg/L	95.5	51.0	118
EP068: Dieldrin	60-57-1	0.5	µg/L	<0.5	2.5 µg/L	94.9	48.4	116
EP068: 4.4`-DDE	72-55-9	0.5	µg/L	<0.5	2.5 µg/L	94.1	49.3	116
EP068: Endrin	72-20-8	0.5	µg/L	<0.5	2.5 µg/L	100	47.1	130
EP068: beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	2.5 µg/L	93.8	51.6	118
EP068: 4.4`-DDD	72-54-8	0.5	µg/L	<0.5	2.5 µg/L	95.0	48.6	122
EP068: Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	2.5 µg/L	89.0	49.4	128

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
EP068A: Organochlorine Pesticides (OC) (QCLot: 5288060) - continued								
EP068: Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	2.5 µg/L	95.0	49.1	123
EP068: 4.4`-DDT	50-29-3	2	µg/L	<2.0	2.5 µg/L	102	45.6	126
EP068: Endrin ketone	53494-70-5	0.5	µg/L	<0.5	2.5 µg/L	95.5	52.8	117
EP068: Methoxychlor	72-43-5	2	µg/L	<2.0	2.5 µg/L	104	47.1	126
EP068B: Organophosphorus Pesticides (OP) (QCLot: 5288060)								
EP068: Dichlorvos	62-73-7	0.5	µg/L	<0.5	2.5 µg/L	89.6	47.4	133
EP068: Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	2.5 µg/L	91.7	46.4	129
EP068: Monocrotophos	6923-22-4	2	µg/L	<2.0	2.5 µg/L	16.2	10.0	42.9
EP068: Dimethoate	60-51-5	0.5	µg/L	<0.5	2.5 µg/L	92.4	41.7	131
EP068: Diazinon	333-41-5	0.5	µg/L	<0.5	2.5 µg/L	96.8	50.5	122
EP068: Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	2.5 µg/L	97.1	52.4	123
EP068: Parathion-methyl	298-00-0	2	µg/L	<2.0	2.5 µg/L	109	52.0	132
EP068: Malathion	121-75-5	0.5	µg/L	<0.5	2.5 µg/L	98.4	51.8	133
EP068: Fenthion	55-38-9	0.5	µg/L	<0.5	2.5 µg/L	96.9	52.3	123
EP068: Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	2.5 µg/L	97.8	48.7	122
EP068: Parathion	56-38-2	2	µg/L	<2.0	2.5 µg/L	112	49.5	136
EP068: Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	2.5 µg/L	96.5	50.4	123
EP068: Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	2.5 µg/L	100	50.9	131
EP068: Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	2.5 µg/L	98.4	47.5	126
EP068: Fenamiphos	22224-92-6	0.5	µg/L	<0.5	2.5 µg/L	110	46.5	138
EP068: Prothiofos	34643-46-4	0.5	µg/L	<0.5	2.5 µg/L	96.9	49.2	119
EP068: Ethion	563-12-2	0.5	µg/L	<0.5	2.5 µg/L	102	50.0	126
EP068: Carbophenothion	786-19-6	0.5	µg/L	<0.5	2.5 µg/L	106	50.0	131
EP068: Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	2.5 µg/L	109	41.7	147
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup (QCLot: 5288063)								
EP071SG: C10 - C14 Fraction	----	50	µg/L	<50	4460 µg/L	66.0	38.6	119
EP071SG: C15 - C28 Fraction	----	100	µg/L	<100	14300 µg/L	77.0	36.8	130
EP071SG: C29 - C36 Fraction	----	50	µg/L	<50	7300 µg/L	83.0	53.1	128
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup (QCLot: 5288063)								
EP071SG: >C10 - C16 Fraction	----	100	µg/L	<100	6090 µg/L	64.4	49.0	132
EP071SG: >C16 - C34 Fraction	----	100	µg/L	<100	19400 µg/L	78.3	59.0	134
EP071SG: >C34 - C40 Fraction	----	100	µg/L	<100	1300 µg/L	88.8	52.6	102
EP074B: Oxygenated Compounds (QCLot: 5296659)								
EP074: 2-Propanone (Acetone)	67-64-1	50	µg/L	<50	200 µg/L	107	39.9	142

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
EP074D: Fumigants (QCLot: 5296659)								
EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	20 µg/L	102	71.1	118
EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	20 µg/L	111	78.5	117
EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	20 µg/L	103	75.7	115
EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	20 µg/L	100	76.4	115
EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	20 µg/L	100	77.1	118
EP074E: Halogenated Aliphatic Compounds (QCLot: 5296659)								
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	200 µg/L	122	51.9	140
EP074: Chloromethane	74-87-3	50	µg/L	<50	200 µg/L	128	63.2	134
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	200 µg/L	118	58.1	135
EP074: Bromomethane	74-83-9	50	µg/L	<50	200 µg/L	115	54.4	130
EP074: Chloroethane	75-00-3	50	µg/L	<50	200 µg/L	119	69.4	129
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	200 µg/L	116	70.1	126
EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	20 µg/L	111	68.4	125
EP074: Iodomethane	74-88-4	5	µg/L	<5	20 µg/L	105	30.9	126
EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	20 µg/L	111	70.8	122
EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	20 µg/L	114	76.6	121
EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	20 µg/L	115	79.1	120
EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	20 µg/L	105	72.5	120
EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	20 µg/L	110	69.4	120
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	20 µg/L	99.0	67.8	120
EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	20 µg/L	111	78.4	120
EP074: Trichloroethene	79-01-6	5	µg/L	<5	20 µg/L	114	73.1	120
EP074: Dibromomethane	74-95-3	5	µg/L	<5	20 µg/L	110	78.3	119
EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	20 µg/L	108	81.1	120
EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	20 µg/L	105	80.3	120
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	20 µg/L	99.4	73.1	118
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	20 µg/L	91.6	76.9	111
EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	20 µg/L	97.9	70.0	122
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	20 µg/L	79.4	62.4	118
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	20 µg/L	109	77.9	128
EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	20 µg/L	103	78.5	124
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	20 µg/L	87.7	68.5	110
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	20 µg/L	90.2	70.7	116
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	20 µg/L	99.3	60.0	134

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
EP074F: Halogenated Aromatic Compounds (QCLot: 5296659)								
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	20 µg/L	107	82.6	116
EP074: Bromobenzene	108-86-1	5	µg/L	<5	20 µg/L	106	79.3	115
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	20 µg/L	105	75.5	116
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	20 µg/L	104	75.0	115
EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	20 µg/L	114	76.9	116
EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	20 µg/L	112	78.4	118
EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	20 µg/L	106	82.2	113
EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	20 µg/L	106	67.4	124
EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	20 µg/L	98.5	70.4	124
EP074G: Trihalomethanes (QCLot: 5296659)								
EP074: Chloroform	67-66-3	5	µg/L	<5	20 µg/L	112	79.6	120
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	20 µg/L	106	76.3	117
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	20 µg/L	91.2	73.5	113
EP074: Bromoform	75-25-2	5	µg/L	<5	20 µg/L	83.6	68.5	113
EP075A: Phenolic Compounds (QCLot: 5288061)								
EP075: Phenol	108-95-2	2	µg/L	<2	10 µg/L	39.9	19.5	48.1
EP075: 2-Chlorophenol	95-57-8	2	µg/L	<2	10 µg/L	80.6	46.3	101
EP075: 2-Methylphenol	95-48-7	2	µg/L	<2	10 µg/L	78.0	41.1	94.4
EP075: 3- & 4-Methylphenol	1319-77-3	2	µg/L	<2	10 µg/L	72.2	35.1	88.8
EP075: 2-Nitrophenol	88-75-5	2	µg/L	<2	10 µg/L	88.2	45.3	113
EP075: 2.4-Dimethylphenol	105-67-9	2	µg/L	<2	10 µg/L	88.1	47.6	108
EP075: 2.4-Dichlorophenol	120-83-2	2	µg/L	<2	10 µg/L	90.9	48.2	110
EP075: 2.6-Dichlorophenol	87-65-0	2	µg/L	<2	10 µg/L	88.8	48.9	107
EP075: 4-Chloro-3-methylphenol	59-50-7	2	µg/L	<2	10 µg/L	91.0	47.2	110
EP075: 2.4.6-Trichlorophenol	88-06-2	2	µg/L	<2	10 µg/L	92.1	45.2	112
EP075: 2.4.5-Trichlorophenol	95-95-4	2	µg/L	<2	10 µg/L	91.2	42.4	113
EP075: Pentachlorophenol	87-86-5	4	µg/L	<4	10 µg/L	46.9	14.2	124
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 5288061)								
EP075: Naphthalene	91-20-3	2	µg/L	<2	10 µg/L	84.6	50.9	107
EP075: 2-Methylnaphthalene	91-57-6	2	µg/L	<2	10 µg/L	87.8	50.3	111
EP075: 2-Chloronaphthalene	91-58-7	2	µg/L	<2	10 µg/L	90.8	50.8	110
EP075: Acenaphthylene	208-96-8	2	µg/L	<2	10 µg/L	91.3	52.9	111
EP075: Acenaphthene	83-32-9	2	µg/L	<2	10 µg/L	93.0	54.5	109
EP075: Fluorene	86-73-7	2	µg/L	<2	10 µg/L	95.1	55.7	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
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 5288061) - continued								
EP075: Phenanthrene	85-01-8	2	µg/L	<2	10 µg/L	89.2	55.4	112
EP075: Anthracene	120-12-7	2	µg/L	<2	10 µg/L	93.9	55.9	111
EP075: Fluoranthene	206-44-0	2	µg/L	<2	10 µg/L	97.9	55.9	112
EP075: Pyrene	129-00-0	2	µg/L	<2	10 µg/L	89.9	56.5	112
EP075: N-2-Fluorenyl Acetamide	53-96-3	2	µg/L	<2	10 µg/L	99.5	50.0	118
EP075: Benz(a)anthracene	56-55-3	2	µg/L	<2	10 µg/L	97.4	55.5	114
EP075: Chrysene	218-01-9	2	µg/L	<2	10 µg/L	95.8	56.0	114
EP075: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	4	µg/L	<4	20 µg/L	90.3	55.4	120
EP075: 7.12-Dimethylbenz(a)anthracene	57-97-6	2	µg/L	<2	10 µg/L	89.0	54.4	121
EP075: Benzo(a)pyrene	50-32-8	2	µg/L	<2	10 µg/L	93.0	53.9	121
EP075: 3-Methylcholanthrene	56-49-5	2	µg/L	<2	10 µg/L	85.0	51.9	121
EP075: Indeno(1.2.3.cd)pyrene	193-39-5	2	µg/L	<2	10 µg/L	90.6	54.4	114
EP075: Dibenz(a.h)anthracene	53-70-3	2	µg/L	<2	10 µg/L	87.0	54.0	115
EP075: Benzo(g.h.i)perylene	191-24-2	2	µg/L	<2	10 µg/L	85.0	51.7	116
EP075C: Phthalate Esters (QCLot: 5288061)								
EP075: Dimethyl phthalate	131-11-3	2	µg/L	<2	10 µg/L	92.8	56.5	115
EP075: Diethyl phthalate	84-66-2	2	µg/L	<2	10 µg/L	96.9	58.0	113
EP075: Di-n-butyl phthalate	84-74-2	2	µg/L	<2	10 µg/L	93.9	57.6	120
EP075: Butyl benzyl phthalate	85-68-7	2	µg/L	<2	10 µg/L	91.8	56.3	119
EP075: bis(2-ethylhexyl) phthalate	117-81-7	10	µg/L	<10	10 µg/L	93.8	57.6	122
EP075: Di-n-octylphthalate	117-84-0	2	µg/L	<2	10 µg/L	88.1	56.5	122
EP075D: Nitrosamines (QCLot: 5288061)								
EP075: N-Nitrosomethylethylamine	10595-95-6	2	µg/L	<2	10 µg/L	69.0	23.9	106
EP075: N-Nitrosodiethylamine	55-18-5	2	µg/L	<2	10 µg/L	88.9	46.1	108
EP075: N-Nitrosopyrrolidine	930-55-2	4	µg/L	<4	10 µg/L	66.6	36.6	83.2
EP075: N-Nitrosomorpholine	59-89-2	2	µg/L	<2	10 µg/L	61.6	34.6	79.0
EP075: N-Nitrosodi-n-propylamine	621-64-7	2	µg/L	<2	10 µg/L	83.5	53.1	114
EP075: N-Nitrosopiperidine	100-75-4	2	µg/L	<2	10 µg/L	93.0	51.0	111
EP075: N-Nitrosodibutylamine	924-16-3	2	µg/L	<2	10 µg/L	75.1	37.0	111
EP075: N-Nitrosodiphenyl & Diphenylamine	86-30-6 122-39-4	4	µg/L	<4	10 µg/L	101	51.3	113
EP075: Methapyrilene	91-80-5	2	µg/L	<2	10 µg/L	81.6	10.0	125
EP075E: Nitroaromatics and Ketones (QCLot: 5288061)								
EP075: 2-Picoline	109-06-8	2	µg/L	<2	10 µg/L	65.2	18.8	108

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
EP075E: Nitroaromatics and Ketones (QCLot: 5288061) - continued								
EP075: Acetophenone	98-86-2	2	µg/L	<2	10 µg/L	83.7	52.5	111
EP075: Nitrobenzene	98-95-3	2	µg/L	<2	10 µg/L	83.3	50.6	109
EP075: Isophorone	78-59-1	2	µg/L	<2	10 µg/L	87.5	53.7	113
EP075: 2.6-Dinitrotoluene	606-20-2	4	µg/L	<4	10 µg/L	92.5	54.0	115
EP075: 2.4-Dinitrotoluene	121-14-2	4	µg/L	<4	10 µg/L	99.4	53.3	109
EP075: 1-Naphthylamine	134-32-7	2	µg/L	<2	10 µg/L	68.3	10.9	119
EP075: 4-Nitroquinoline-N-oxide	56-57-5	2	µg/L	<2	10 µg/L	82.9	27.3	147
EP075: 5-Nitro-o-toluidine	99-55-8	2	µg/L	<2	10 µg/L	105	44.6	119
EP075: Azobenzene	103-33-3	2	µg/L	<2	10 µg/L	97.1	55.6	110
EP075: 1.3.5-Trinitrobenzene	99-35-4	2	µg/L	<2	10 µg/L	92.2	37.6	124
EP075: Phenacetin	62-44-2	2	µg/L	<2	10 µg/L	98.6	44.8	101
EP075: 4-Aminobiphenyl	92-67-1	2	µg/L	<2	10 µg/L	84.1	24.0	149
EP075: Pentachloronitrobenzene	82-68-8	2	µg/L	<2	10 µg/L	102	54.6	111
EP075: Pronamide	23950-58-5	2	µg/L	<2	10 µg/L	95.4	56.5	113
EP075: Dimethylaminoazobenzene	60-11-7	2	µg/L	<2	10 µg/L	96.4	53.8	112
EP075: Chlorobenzilate	510-15-6	2	µg/L	<2	10 µg/L	98.8	55.0	113
EP075F: Haloethers (QCLot: 5288061)								
EP075: Bis(2-chloroethyl) ether	111-44-4	2	µg/L	<2	10 µg/L	83.9	45.3	112
EP075: Bis(2-chloroethoxy) methane	111-91-1	2	µg/L	<2	10 µg/L	87.6	52.7	111
EP075: 4-Chlorophenyl phenyl ether	7005-72-3	2	µg/L	<2	10 µg/L	97.8	55.8	110
EP075: 4-Bromophenyl phenyl ether	101-55-3	2	µg/L	<2	10 µg/L	99.1	55.7	114
EP075G: Chlorinated Hydrocarbons (QCLot: 5288061)								
EP075: 1.4-Dichlorobenzene	106-46-7	2	µg/L	<2	10 µg/L	82.0	43.2	104
EP075: 1.3-Dichlorobenzene	541-73-1	2	µg/L	<2	10 µg/L	79.7	42.7	103
EP075: 1.2-Dichlorobenzene	95-50-1	2	µg/L	<2	10 µg/L	78.9	44.4	104
EP075: Hexachloroethane	67-72-1	2	µg/L	<2	10 µg/L	81.0	41.5	105
EP075: 1.2.4-Trichlorobenzene	120-82-1	2	µg/L	<2	10 µg/L	87.6	46.1	107
EP075: Hexachloropropylene	1888-71-7	2	µg/L	<2	10 µg/L	76.1	41.4	109
EP075: Hexachlorobutadiene	87-68-3	2	µg/L	<2	10 µg/L	86.4	43.9	108
EP075: Hexachlorocyclopentadiene	77-47-4	10	µg/L	<10	10 µg/L	71.6	14.6	133
EP075: Pentachlorobenzene	608-93-5	2	µg/L	<2	10 µg/L	93.8	53.3	109
EP075: Hexachlorobenzene (HCB)	118-74-1	4	µg/L	<4	10 µg/L	97.5	48.4	116
EP075H: Anilines and Benzidines (QCLot: 5288061)								
EP075: Aniline	62-53-3	2	µg/L	<2	10 µg/L	72.5	21.2	116

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
EP075H: Anilines and Benzidines (QCLot: 5288061) - continued								
EP075: 4-Chloroaniline	106-47-8	2	µg/L	<2	10 µg/L	78.9	14.5	126
EP075: 2-Nitroaniline	88-74-4	4	µg/L	<4	10 µg/L	95.6	49.5	111
EP075: 3-Nitroaniline	99-09-2	4	µg/L	<4	10 µg/L	97.0	28.4	125
EP075: Dibenzofuran	132-64-9	2	µg/L	<2	10 µg/L	93.4	55.4	110
EP075: 4-Nitroaniline	100-01-6	2	µg/L	<2	10 µg/L	96.0	37.3	112
EP075: Carbazole	86-74-8	2	µg/L	<2	10 µg/L	99.0	51.6	116
EP075: 3.3`-Dichlorobenzidine	91-94-1	2	µg/L	<2	10 µg/L	106	42.3	142
EP075I: Organochlorine Pesticides (QCLot: 5288061)								
EP075: alpha-BHC	319-84-6	2	µg/L	<2	10 µg/L	99.0	56.2	112
EP075: beta-BHC	319-85-7	2	µg/L	<2	10 µg/L	102	56.2	113
EP075: gamma-BHC	58-89-9	2	µg/L	<2	10 µg/L	107	55.2	113
EP075: delta-BHC	319-86-8	2	µg/L	<2	10 µg/L	95.4	52.6	117
EP075: Heptachlor	76-44-8	2	µg/L	<2	10 µg/L	99.2	53.4	111
EP075: Aldrin	309-00-2	2	µg/L	<2	10 µg/L	101	54.0	112
EP075: Heptachlor epoxide	1024-57-3	2	µg/L	<2	10 µg/L	105	54.2	113
EP075: alpha-Endosulfan	959-98-8	2	µg/L	<2	10 µg/L	80.1	49.3	122
EP075: 4.4`-DDE	72-55-9	2	µg/L	<2	10 µg/L	102	56.0	121
EP075: Dieldrin	60-57-1	2	µg/L	<2	10 µg/L	106	55.2	118
EP075: Endrin	72-20-8	2	µg/L	<2	10 µg/L	93.6	52.7	121
EP075: beta-Endosulfan	33213-65-9	2	µg/L	<2	10 µg/L	98.6	55.1	119
EP075: 4.4`-DDD	72-54-8	2	µg/L	<2	10 µg/L	104	55.4	120
EP075: Endosulfan sulfate	1031-07-8	2	µg/L	<2	10 µg/L	94.8	49.6	123
EP075: 4.4`-DDT	50-29-3	4	µg/L	<4	10 µg/L	86.1	47.8	127
EP075J: Organophosphorus Pesticides (QCLot: 5288061)								
EP075: Dichlorvos	62-73-7	2	µg/L	<2	10 µg/L	89.0	50.1	115
EP075: Dimethoate	60-51-5	2	µg/L	<2	10 µg/L	96.3	40.8	108
EP075: Diazinon	333-41-5	2	µg/L	<2	10 µg/L	95.8	55.4	118
EP075: Chlorpyrifos-methyl	5598-13-0	2	µg/L	<2	10 µg/L	94.0	53.0	118
EP075: Malathion	121-75-5	2	µg/L	<2	10 µg/L	97.4	54.6	122
EP075: Fenthion	55-38-9	2	µg/L	<2	10 µg/L	98.5	55.1	119
EP075: Chlorpyrifos	2921-88-2	2	µg/L	<2	10 µg/L	98.9	55.3	118
EP075: Pirimphos-ethyl	23505-41-1	2	µg/L	<2	10 µg/L	97.8	55.8	118
EP075: Chlorfenvinphos	470-90-6	2	µg/L	<2	10 µg/L	99.7	45.8	118
EP075: Prothiofos	34643-46-4	2	µg/L	<2	10 µg/L	98.9	56.1	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
EP075J: Organophosphorus Pesticides (QCLot: 5288061) - continued								
EP075: Ethion	563-12-2	2	µg/L	<2	10 µg/L	# 120	57.7	119
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5288062)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	4560 µg/L	89.6	47.2	122
EP071: C15 - C28 Fraction	----	100	µg/L	<100	16200 µg/L	86.2	52.9	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8650 µg/L	95.1	50.4	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5296658)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	124	66.2	134
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5288062)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	6190 µg/L	85.6	49.1	125
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	22200 µg/L	87.4	51.6	128
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1520 µg/L	90.6	47.2	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5296658)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	126	66.2	132
EP080: BTEXN (QCLot: 5296658)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	123	68.8	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	97.6	72.9	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	102	71.7	130
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	126	72.3	136
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	96.7	75.9	134
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	92.1	68.3	131
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QCLot: 5293372)								
EP202-SL: 4-Chlorophenoxy acetic acid	122-88-3	10	µg/L	<10	100 µg/L	103	82.0	136
EP202-SL: 2.4-DB	94-82-6	10	µg/L	<10	100 µg/L	102	65.0	147
EP202-SL: Dicamba	1918-00-9	10	µg/L	<10	100 µg/L	118	83.0	137
EP202-SL: Mecoprop	93-65-2	10	µg/L	<10	100 µg/L	105	75.0	143
EP202-SL: MCPA	94-74-6	10	µg/L	<10	100 µg/L	108	76.0	140
EP202-SL: 2.4-DP	120-36-5	10	µg/L	<10	100 µg/L	114	76.0	144
EP202-SL: 2.4-D	94-75-7	10	µg/L	<10	100 µg/L	114	77.0	139
EP202-SL: Triclopyr	55335-06-3	10	µg/L	<10	100 µg/L	111	77.0	141
EP202-SL: Silvex (2.4.5-TP/Fenoprop)	93-72-1	10	µg/L	<10	100 µg/L	114	75.0	143
EP202-SL: 2.4.5-T	93-76-5	10	µg/L	<10	100 µg/L	114	78.0	140
EP202-SL: MCPB	94-81-5	10	µg/L	<10	100 µg/L	101	69.2	139
EP202-SL: Picloram	1918-02-1	10	µg/L	<10	100 µg/L	112	70.0	144

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
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QCLot: 5293372) - continued								
EP202-SL: Clopyralid	1702-17-6	10	µg/L	<10	100 µg/L	111	70.0	145
EP202-SL: Fluroxypyr	69377-81-7	10	µg/L	<10	100 µg/L	112	77.0	145

Matrix Spike (MS) Report

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

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5286866)							
EM2316145-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5286867)							
EM2316145-001	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	142
EG020F: Dissolved Metals by ICP-MS (QCLot: 5303509)							
EM2315486-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	112	76.6	124
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	93.4	74.6	118
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	97.0	71.0	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	104	76.0	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	94.2	75.0	133
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	93.1	64.0	134
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	104	73.0	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	108	75.0	131
EG020T: Total Metals by ICP-MS (QCLot: 5292856)							
EM2316078-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	113	82.0	123
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	107	81.8	123
		EG020A-T: Chromium	7440-47-3	1 mg/L	# Not Determined	78.9	119
		EG020A-T: Copper	7440-50-8	1 mg/L	106	80.4	118
		EG020A-T: Lead	7439-92-1	1 mg/L	103	80.5	121
		EG020A-T: Manganese	7439-96-5	1 mg/L	100	73.0	123
		EG020A-T: Nickel	7440-02-0	1 mg/L	105	80.0	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	106	74.0	120
EG035F: Dissolved Mercury by FIMS (QCLot: 5303511)							
EM2316302-001	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	102	70.0	120

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5300619)							
EM2315711-002	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	102	70.0	130
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 5288184)							
EM2316168-001	Anonymous	EK026SF: Total Cyanide	57-12-5	0.2 mg/L	72.7	70.0	130
EK055: Ammonia as N (QCLot: 5288144)							
EM2316036-004	Anonymous	EK055: Ammonia as N	7664-41-7	50 mg/L	94.8	80.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5286869)							
EM2316145-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	# Not Determined	80.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5289877)							
EM2316170-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	95.8	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5300517)							
EM2315486-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	93.8	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5300516)							
EM2315486-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	103	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5286870)							
EM2316156-002	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	89.8	79.0	123
EK085M: Sulfide as S2- (QCLot: 5287351)							
EM2316147-002	Anonymous	EK085: Sulfide as S2-	18496-25-8	2.5 mg/L	102	70.0	130
EP002: Dissolved Organic Carbon (DOC) (QCLot: 5289586)							
EM2316170-001	Anonymous	EP002: Dissolved Organic Carbon	----	100 mg/L	102	75.0	117
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QCLot: 5293372)							
EM2316162-001	Landfill leachate	EP202-SL: Mecoprop	93-65-2	100 µg/L	104	75.0	143
		EP202-SL: MCPA	94-74-6	100 µg/L	101	76.0	140
		EP202-SL: 2.4-D	94-75-7	100 µg/L	117	77.0	139
		EP202-SL: Triclopyr	55335-06-3	100 µg/L	103	77.0	141
		EP202-SL: 2.4.5-T	93-76-5	100 µg/L	109	78.0	140
		EP202-SL: Picloram	1918-02-1	100 µg/L	110	70.0	144
		EP202-SL: Clopyralid	1702-17-6	100 µg/L	101	70.0	145

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2316162**	Page	: 1 of 15
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 08-Sep-2023
Site	: ----	Issue Date	: 20-Sep-2023
Sampler	: MIGUEL BENAVIDES	No. of samples received	: 1
Order number	: 12564388	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **Laboratory Control outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **Surrogate recovery outliers exist for all regular sample matrices - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

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

Outliers : 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
Laboratory Control Spike (LCS) Recoveries							
EP075J: Organophosphorus Pesticides	QC-5288061-001	----	**Ethion**	563-12-2	120 %	57.7-119%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EM2316145--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.**
ED045G: Chloride by Discrete Analyser	EM2316145--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG020T: Total Metals by ICP-MS	EM2316078--001	Anonymous	**Chromium**	7440-47-3	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK057G: Nitrite as N by Discrete Analyser	EM2316145--002	Anonymous	**Nitrite as N**	14797-65-0	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Regular Sample Surrogates

Sub-Matrix: **LEACHATE**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP066S: PCB Surrogate	EM2316162-001	Landfill leachate	**Decachlorobiphenyl**	2051-24-3	32.3 %	41.0-125 %	**Recovery less than lower data quality objective**
EP068T: Organophosphorus Pesticide Surrogate	EM2316162-001	Landfill leachate	**DEF**	78-48-8	4.1 %	51.0-127 %	**Recovery less than lower data quality objective**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EK055: Ammonia as N						
Clear Plastic Bottle - Natural						
Landfill leachate	----	----	----	11-Sep-2023	07-Sep-2023	**4**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser						
Clear Plastic Bottle - Natural						
Landfill leachate	----	----	----	12-Sep-2023	08-Sep-2023	**4**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser						
Clear Plastic Bottle - Natural						
Landfill leachate	18-Sep-2023	07-Sep-2023	**11**	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser						

Matrix: **WATER**

Method / **Container** / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	*Due for extraction*	***Days overdue***	*Date analysed*	*Due for analysis*	***Days overdue***
EK067G: Total Phosphorus as P by Discrete Analyser - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural						
Landfill leachate	18-Sep-2023	08-Sep-2023	**10**	----	----	----
EK086: Sulfite as SO3 2-						
Clear Plastic Bottle - EDTA/Zinc Acetate						
Landfill leachate	----	----	----	12-Sep-2023	08-Sep-2023	**4**
EK087: Thiosulfate as S2O3 2-						
Clear Plastic Bottle - EDTA/Zinc Acetate						
Landfill leachate	----	----	----	12-Sep-2023	08-Sep-2023	**4**
EP010: Formaldehyde						
Clear Plastic Bottle - Natural						
Landfill leachate	----	----	----	10-Sep-2023	08-Sep-2023	**2**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC 0	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Pesticides by GCMS	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	1	12	8.33	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Formaldehyde	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Total Oxidised Sulfur as S	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	0	1	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) Landfill leachate	**06-Sep-2023**	**----**	----	**----**	**12-Sep-2023**	13-Sep-2023	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H) Landfill leachate	**06-Sep-2023**	**----**	----	**----**	**12-Sep-2023**	13-Sep-2023	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) Landfill leachate	**06-Sep-2023**	**----**	----	**----**	**12-Sep-2023**	20-Sep-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) Landfill leachate	**06-Sep-2023**	**----**	----	**----**	**08-Sep-2023**	04-Oct-2023	✓
ED043S: Total Oxidised Sulfur as S							
Clear Plastic Bottle - Natural (ED043S) Landfill leachate	**06-Sep-2023**	**14-Sep-2023**	04-Oct-2023	✓	**14-Sep-2023**	04-Oct-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) Landfill leachate	**06-Sep-2023**	**----**	----	**----**	**08-Sep-2023**	04-Oct-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F) Landfill leachate	**06-Sep-2023**	**----**	----	**----**	**18-Sep-2023**	04-Oct-2023	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F) Landfill leachate	**06-Sep-2023**	**----**	----	**----**	**18-Sep-2023**	04-Mar-2024	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) Landfill leachate	**06-Sep-2023**	**12-Sep-2023**	04-Mar-2024	✓	**12-Sep-2023**	04-Mar-2024	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F) Landfill leachate	**06-Sep-2023**	**----**	----	**----**	**18-Sep-2023**	04-Oct-2023	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG035T) Landfill leachate	**06-Sep-2023**	**----**	----	**----**	**15-Sep-2023**	04-Oct-2023	✓

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
EK026SF: Total CN by Segmented Flow Analyser							
Black Opaque Plastic Bottle - NaOH (EK026SF) Landfill leachate	**06-Sep-2023**	**----**	----	**----**	**11-Sep-2023**	20-Sep-2023	✓
EK055: Ammonia as N							
Clear Plastic Bottle - Natural (EK055) Landfill leachate	**06-Sep-2023**	**----**	----	**----**	**11-Sep-2023**	07-Sep-2023	×
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) Landfill leachate	**06-Sep-2023**	**----**	----	**----**	**08-Sep-2023**	08-Sep-2023	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Natural (EK059G) Landfill leachate	**06-Sep-2023**	**----**	----	**----**	**12-Sep-2023**	08-Sep-2023	×
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Natural (EK061G) Landfill leachate	**06-Sep-2023**	**18-Sep-2023**	07-Sep-2023	×	**19-Sep-2023**	16-Oct-2023	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Natural (EK067G) Landfill leachate	**06-Sep-2023**	**18-Sep-2023**	08-Sep-2023	×	**19-Sep-2023**	16-Oct-2023	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) Landfill leachate	**06-Sep-2023**	**----**	----	**----**	**08-Sep-2023**	08-Sep-2023	✓
EK085M: Sulfide as S2-							
Clear Plastic Bottle - Zinc Acetate/NaOH (EK085) Landfill leachate	**06-Sep-2023**	**----**	----	**----**	**09-Sep-2023**	13-Sep-2023	✓
EK086: Sulfite as SO3 2-							
Clear Plastic Bottle - EDTA/Zinc Acetate (EK086) Landfill leachate	**06-Sep-2023**	**----**	----	**----**	**12-Sep-2023**	08-Sep-2023	×
EK087: Thiosulfate as S2O3 2-							
Clear Plastic Bottle - EDTA/Zinc Acetate (EK087) Landfill leachate	**06-Sep-2023**	**----**	----	**----**	**12-Sep-2023**	08-Sep-2023	×
EP002: Dissolved Organic Carbon (DOC)							
Amber DOC Filtered- Sulfuric Preserved (EP002) Landfill leachate	**06-Sep-2023**	**----**	----	**----**	**12-Sep-2023**	04-Oct-2023	✓
EP010: Formaldehyde							
Clear Plastic Bottle - Natural (EP010) Landfill leachate	**06-Sep-2023**	**----**	----	**----**	**10-Sep-2023**	08-Sep-2023	×
EP020: Oil and Grease (O&G)							
Amber Jar - Sulfuric Acid or Sodium Bisulfate (EP020) Landfill leachate	**06-Sep-2023**	**----**	----	**----**	**15-Sep-2023**	04-Oct-2023	✓

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
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030)							
Landfill leachate	**06-Sep-2023**	**----**	----	**----**	**08-Sep-2023**	08-Sep-2023	✓
EP066: Polychlorinated Biphenyls (PCB)							
Amber Glass Bottle - Unpreserved (EP066)							
Landfill leachate	**06-Sep-2023**	**11-Sep-2023**	13-Sep-2023	✓	**13-Sep-2023**	21-Oct-2023	✓
EP068A: Organochlorine Pesticides (OC)							
Amber Glass Bottle - Unpreserved (EP068)							
Landfill leachate	**06-Sep-2023**	**11-Sep-2023**	13-Sep-2023	✓	**14-Sep-2023**	21-Oct-2023	✓
EP068B: Organophosphorus Pesticides (OP)							
Amber Glass Bottle - Unpreserved (EP068)							
Landfill leachate	**06-Sep-2023**	**11-Sep-2023**	13-Sep-2023	✓	**14-Sep-2023**	21-Oct-2023	✓
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071SG)							
Landfill leachate	**06-Sep-2023**	**11-Sep-2023**	13-Sep-2023	✓	**12-Sep-2023**	21-Oct-2023	✓
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071SG)							
Landfill leachate	**06-Sep-2023**	**11-Sep-2023**	13-Sep-2023	✓	**12-Sep-2023**	21-Oct-2023	✓
EP074B: Oxygenated Compounds							
Amber VOC Vial - Sulfuric Acid (EP074)							
Landfill leachate	**06-Sep-2023**	**14-Sep-2023**	20-Sep-2023	✓	**14-Sep-2023**	20-Sep-2023	✓
EP074D: Fumigants							
Amber VOC Vial - Sulfuric Acid (EP074)							
Landfill leachate	**06-Sep-2023**	**14-Sep-2023**	20-Sep-2023	✓	**14-Sep-2023**	20-Sep-2023	✓
EP074E: Halogenated Aliphatic Compounds							
Amber VOC Vial - Sulfuric Acid (EP074)							
Landfill leachate	**06-Sep-2023**	**14-Sep-2023**	20-Sep-2023	✓	**14-Sep-2023**	20-Sep-2023	✓
EP074F: Halogenated Aromatic Compounds							
Amber VOC Vial - Sulfuric Acid (EP074)							
Landfill leachate	**06-Sep-2023**	**14-Sep-2023**	20-Sep-2023	✓	**14-Sep-2023**	20-Sep-2023	✓
EP074G: Trihalomethanes							
Amber VOC Vial - Sulfuric Acid (EP074)							
Landfill leachate	**06-Sep-2023**	**14-Sep-2023**	20-Sep-2023	✓	**14-Sep-2023**	20-Sep-2023	✓
EP075A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved (EP075)							
Landfill leachate	**06-Sep-2023**	**11-Sep-2023**	13-Sep-2023	✓	**12-Sep-2023**	21-Oct-2023	✓
EP075B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075)							
Landfill leachate	**06-Sep-2023**	**11-Sep-2023**	13-Sep-2023	✓	**12-Sep-2023**	21-Oct-2023	✓

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
EP075C: Phthalate Esters							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**06-Sep-2023**	**11-Sep-2023**	13-Sep-2023	✓	**12-Sep-2023**	21-Oct-2023	✓
EP075D: Nitrosamines							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**06-Sep-2023**	**11-Sep-2023**	13-Sep-2023	✓	**12-Sep-2023**	21-Oct-2023	✓
EP075E: Nitroaromatics and Ketones							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**06-Sep-2023**	**11-Sep-2023**	13-Sep-2023	✓	**12-Sep-2023**	21-Oct-2023	✓
EP075F: Haloethers							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**06-Sep-2023**	**11-Sep-2023**	13-Sep-2023	✓	**12-Sep-2023**	21-Oct-2023	✓
EP075G: Chlorinated Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**06-Sep-2023**	**11-Sep-2023**	13-Sep-2023	✓	**12-Sep-2023**	21-Oct-2023	✓
EP075H: Anilines and Benzidines							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**06-Sep-2023**	**11-Sep-2023**	13-Sep-2023	✓	**12-Sep-2023**	21-Oct-2023	✓
EP075I: Organochlorine Pesticides							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**06-Sep-2023**	**11-Sep-2023**	13-Sep-2023	✓	**12-Sep-2023**	21-Oct-2023	✓
EP075J: Organophosphorus Pesticides							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**06-Sep-2023**	**11-Sep-2023**	13-Sep-2023	✓	**12-Sep-2023**	21-Oct-2023	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) Landfill leachate	**06-Sep-2023**	**11-Sep-2023**	13-Sep-2023	✓	**12-Sep-2023**	21-Oct-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080) Landfill leachate	**06-Sep-2023**	**14-Sep-2023**	20-Sep-2023	✓	**14-Sep-2023**	20-Sep-2023	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) Landfill leachate	**06-Sep-2023**	**11-Sep-2023**	13-Sep-2023	✓	**12-Sep-2023**	21-Oct-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080) Landfill leachate	**06-Sep-2023**	**14-Sep-2023**	20-Sep-2023	✓	**14-Sep-2023**	20-Sep-2023	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) Landfill leachate	**06-Sep-2023**	**14-Sep-2023**	20-Sep-2023	✓	**14-Sep-2023**	20-Sep-2023	✓
EP202A: Phenoxyacetic Acid Herbicides by LCMS							
Amber Glass Bottle - Unpreserved (EP202-SL) Landfill leachate	**06-Sep-2023**	**----**	----	**----**	**13-Sep-2023**	13-Sep-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	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	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Organic Carbon	EP002	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	1	1	**100.00**	**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	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	0	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202-SL	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	0	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	0	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfide as S2-	EK085	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfite as SO3 2-	EK086	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Thiosulfate as S2O3 2-	EK087	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Ammonia as N	EK055	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	2	17	**11.76**	**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	1	12	**8.33**	**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 Oxidised Sulfur as S	ED043S	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	0	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	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							
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Organic Carbon	EP002	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	1	1	**100.00**	**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	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Oil and Grease	EP020	4	50	**8.00**	**8.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202-SL	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfide as S2-	EK085	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfite as SO3 2-	EK086	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	1	**200.00**	**7.50**	✓	NEPM 2013 B3 & ALS QC Standard
Thiosulfate as S2O3 2-	EK087	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Ammonia as N	EK055	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	3	40	**7.50**	**7.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	12	**8.33**	**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 Oxidised Sulfur as S	ED043S	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Biochemical Oxygen Demand (BOD)	EP030	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	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Organic Carbon	EP002	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

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*	
Method Blanks (MB) - Continued							
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Oil and Grease	EP020	3	50	**6.00**	**6.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202-SL	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfide as S2-	EK085	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfite as SO3 2-	EK086	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Thiosulfate as S2O3 2-	EK087	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Ammonia as N	EK055	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	17	**5.88**	**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	12	**8.33**	**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 Oxidised Sulfur as S	ED043S	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Organic Carbon	EP002	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202-SL	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	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*	
Matrix Spikes (MS) - Continued							
Sulfide as S2-	EK085	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Ammonia as N	EK055	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	12	**8.33**	**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 Oxidised Sulfur as S	ED043S	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
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)
Total Oxidised Sulfur as S	ED043S	WATER	In house: The sample is treated with Peroxide to convert all Sulfur species to Sulfate. Sulfate in the sample can then be determined by ICPAES and reported as TOS as S.
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.

Analytical Methods	Method	Matrix	Method Descriptions
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).
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).
Total Cyanide by Segmented Flow Analyser	EK026SF	WATER	In house: Referenced to APHA 4500-CN C&O / ASTM D7511 / ISO 14403. Sodium hydroxide preserved samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM Schedule B(3)
Total Ammonia as N	EK055	WATER	In house: Referenced to APHA 4500-NH3 H. This procedure involves a Buchi steam distillation followed by a titrimetric finish to determine ammonia in solid wastes, water and wastewater. 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)

Analytical Methods	Method	Matrix	Method Descriptions
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)
Sulfide as S2-	EK085	WATER	In house: Referenced to APHA 4500-S2- D. Sulfide species present in water samples are immediately precipitated when collected in pretreated caustic/zinc acetate preserved sample containers. The sulphides are coloured using methylene blue indicator. Non-detects may be screened by comparison against a standard at half-LOR, otherwise samples are measured using UV-VIS detection at 664nm. This method is compliant with NEPM Schedule B(3)
Sulfite as SO3 2-	EK086	WATER	In house: Referenced to APHA 4500-SO32- B. Sulfite is determined by standardised Iodate / Iodide titration.
Thiosulfate as S2O3 2-	EK087	WATER	In house: Thiosulfate is determined by standardised Iodate / Iodide titration following formaledyde pretreatment.
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Dissolved Organic Carbon	EP002	WATER	In house: Referenced to APHA 5310 B. This method is compliant with NEPM Schedule B(3). Samples are combusted at high temperature in the presence of an oxidative catalyst. The evolved carbon dioxide is quantified using an IR detector.
Formaldehyde	EP010	WATER	In house: Referenced to ASTM D 6303-98. s
Oil and Grease	EP020	WATER	In house: Referenced to APHA 5520 B. Oil & grease is a gravimetric procedure to determine the amount of dissolved or emulsified oil & grease residue in an aqueous sample. The sample is serially extracted three times n-hexane. The resultant extracts are combined, dehydrated and concentrated prior to gravimetric determination. This method is compliant with NEPM Schedule B(3)
Biochemical Oxygen Demand (BOD)	EP030	WATER	In house: Referenced to APHA 5210 B. The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. This method is compliant with NEPM Schedule B(3).
Polychlorinated Biphenyls (PCB)	EP066	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
Pesticides by GCMS	EP068	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. 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 - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	WATER	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM Schedule B(3).
Volatile Organic Compounds	EP074	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. This method is compliant with NEPM Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Semivolatile Organic Compounds	EP075	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS 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)
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202-SL	WATER	In house: LCMS (Electrospray in negative mode). After adding surrogate and acetic acid, water samples are injected on a C18 column for LC/MS determination.
Anionic Surfactants as MBAS	W-MBAS	WATER	APHA 5540 C. Analysis subcontracted to ALS Scoresby (NATA Accredited Laboratory No. 992).

Preparation Methods	Method	Matrix	Method Descriptions
Total Oxidisable Sulfur as SO4 2- Prep	ED043-PR	WATER	In house
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.

CERTIFICATE OF ANALYSIS

Work Order	: **EM2316170**	Page	: 1 of 6
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Peter Ravlic
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 08-Sep-2023 11:45
Order number	: 12564388	Date Analysis Commenced	: 08-Sep-2023
C-O-C number	: ----	Issue Date	: 18-Sep-2023 17:53
Sampler	: MIGUEL BENAVIDES		
Site	: ----		
Quote number	: ME/770/21 V2		
No. of samples received	: 4		
No. of samples analysed	: 4		

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
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC

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.

- Poor spike recovery for Bromide and Iodide due to matrix interferences(confirmed by re-analysis).
- ED009 LOR raised for Bromide due to sample matrix.
- EP080: Particular sample EM2316170_001 shows minor positive hit. Confirmed by re-analysis.
- 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.
- EA015H: EM2316170 #1 TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- EP030: The DO depletion for sample EM2316170 #2-4 is less than 2mg/L, this indicates that the sample has been over diluted and the BOD is less than 8mg/L. The BOD result reported was estimated from the lowest dilution.
- 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	B2	B4	B6	B14	----
			Sampling date / time	06-Sep-2023 00:00	06-Sep-2023 00:00	06-Sep-2023 00:00	06-Sep-2023 00:00	----
Compound	CAS Number	LOR	Unit	EM2316170-001	EM2316170-002	EM2316170-003	EM2316170-004	--------
				Result	Result	Result	Result	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	**1060**	**693**	**331**	**513**	----
ED009: Anions								
Bromide	24959-67-9	0.010	mg/L	<0.020	<0.020	**0.015**	**0.010**	----
Iodide	20461-54-5	0.010	mg/L	**0.069**	**0.051**	**0.014**	**0.064**	----
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	**261**	**272**	**174**	**303**	----
Total Alkalinity as CaCO3	----	1	mg/L	**261**	**272**	**174**	**303**	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**55**	**22**	**7**	**20**	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**142**	**116**	**41**	**60**	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**98**	**133**	**51**	**98**	----
Magnesium	7439-95-4	1	mg/L	**8**	**6**	**15**	**8**	----
Sodium	7440-23-5	1	mg/L	**113**	**35**	**19**	**47**	----
Potassium	7440-09-7	1	mg/L	**26**	<1	**2**	**8**	----
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	**0.001**	<0.001	<0.001	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Manganese	7439-96-5	0.001	mg/L	**0.774**	**0.178**	**0.135**	**0.069**	----
Nickel	7440-02-0	0.001	mg/L	**0.012**	**0.004**	<0.001	<0.001	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Zinc	7440-66-6	0.005	mg/L	**0.008**	<0.005	<0.005	<0.005	----
Iron	7439-89-6	0.05	mg/L	**6.93**	**4.63**	**5.89**	**0.42**	----
EG020T: Total Metals by ICP-MS								
Iron	7439-89-6	0.05	mg/L	**8.01**	**4.86**	**5.96**	**0.48**	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	B2	B4	B6	B14	----
			Sampling date / time	06-Sep-2023 00:00	06-Sep-2023 00:00	06-Sep-2023 00:00	06-Sep-2023 00:00	----
Compound	CAS Number	LOR	Unit	EM2316170-001	EM2316170-002	EM2316170-003	EM2316170-004	--------
				Result	Result	Result	Result	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**6.52**	**0.08**	**0.06**	**0.24**	**----**
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	**----**
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**0.42**	<0.01	<0.01	<0.01	**----**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.42**	<0.01	<0.01	<0.01	**----**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**6.9**	**0.2**	**0.1**	**0.6**	**----**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	**7.3**	**0.2**	**0.1**	**0.6**	**----**
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.02**	**0.06**	**0.04**	<0.01	**----**
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	**----**
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**10.4**	**9.16**	**4.78**	**8.16**	**----**
ø Total Cations	----	0.01	meq/L	**11.1**	**8.65**	**4.66**	**7.80**	**----**
ø Ionic Balance	----	0.01	%	**3.55**	**2.87**	**1.29**	**2.29**	**----**
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	**16**	**8**	**5**	**8**	**----**
EP030: Biochemical Oxygen Demand (BOD)								
Biochemical Oxygen Demand	----	2	mg/L	**22**	<8	<8	<8	**----**
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	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	B2	B4	B6	B14	----
				Sampling date / time	06-Sep-2023 00:00	06-Sep-2023 00:00	06-Sep-2023 00:00	06-Sep-2023 00:00	----
Compound	CAS Number	LOR	Unit		EM2316170-001	EM2316170-002	EM2316170-003	EM2316170-004	--------
					Result	Result	Result	Result	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>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		3	<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		3	<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	%		93.8	97.0	93.0	93.5	----
Toluene-D8	2037-26-5	2	%		100	102	97.0	96.0	----
4-Bromofluorobenzene	460-00-4	2	%		116	118	111	110	----

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	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) ED009: Anions

QUALITY CONTROL REPORT

Work Order	: **EM2316170**	Page	: 1 of 9
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Peter Ravlic
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 08-Sep-2023
Order number	: 12564388	Date Analysis Commenced	: 08-Sep-2023
C-O-C number	: ----	Issue Date	: 18-Sep-2023
Sampler	: MIGUEL BENAVIDES		
Site	: ----		
Quote number	: ME/770/21 V2		
No. of samples received	: 4		
No. of samples analysed	: 4		

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
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC

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 (%)*
ED009: Anions (QC Lot: 5293179)									
EM2316083-001	Anonymous	ED009-X: Bromide	24959-67-9	0.01	mg/L	0.402	0.411	2.2	0% - 20%
		ED009-X: Iodide	20461-54-5	0.01	mg/L	0.190	0.188	1.1	0% - 50%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 5291002)									
EM2316078-002	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	9880	9900	0.2	0% - 20%
EM2316170-004	B14	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	513	534	4.0	0% - 20%
EM2316243-003	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1430	1400	2.2	0% - 20%
EM2316257-007	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	4050	4010	1.1	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5288462)									
EM2316186-003	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	362	362	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	362	362	0.0	0% - 20%
EM2316132-002	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	786	786	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	786	786	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5286866)									
EM2316159-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.0	No Limit
EM2316040-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3150	3110	1.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5286867)									
EM2316159-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1730	1740	0.6	0% - 20%
EM2316040-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	16700	16500	1.5	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5297456)									

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 (%)*
ED093F: Dissolved Major Cations (QC Lot: 5297456) - continued									
EM2316031-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	104	105	1.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	408	410	0.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	2220	2240	0.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	43	43	0.0	0% - 20%
EM2316041-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	6	6	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	5	5	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	34	33	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5297453)									
EM2316132-003	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	0.004	0.004	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	0.003	0.003	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.085	0.088	2.6	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	0.035	0.037	5.1	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.14	0.14	0.0	No Limit
EM2316031-001	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	0.007	0.007	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	0.010	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	0.015	0.015	0.0	0% - 50%
		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	0.011	0.011	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	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: 5292856)									
EM2316078-010	Anonymous	EG020A-T: Iron	7439-89-6	0.05	mg/L	1.20	1.09	9.9	0% - 20%
EM2316159-002	Anonymous	EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 5297454)									
EM2316132-003	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EM2316031-001	Anonymous	EG035F: 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: 5289878)									
EM2316229-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	1.05	1.10	4.8	0% - 20%
EM2316170-001	B2	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	6.52	6.49	0.4	0% - 20%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5286869)									

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: 5286869) - continued									
EM2316145-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	1.00	1.01	0.0	0% - 20%
EM2316162-001	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: 5289877)									
EM2316229-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM2316170-001	B2	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.42	0.42	0.0	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 5294251)									
EM2316031-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.8	1.8	0.0	0% - 50%
EM2316041-004	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	95.0	90.4	4.9	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 5294250)									
EM2316031-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	2.61	2.44	6.7	0% - 20%
EM2316041-004	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	9.25	8.99	2.8	0% - 20%
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5286870)									
EM2316156-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP002: Dissolved Organic Carbon (DOC) (QC Lot: 5289586)									
EM2316162-001	Anonymous	EP002: Dissolved Organic Carbon	----	1	mg/L	286	295	2.9	0% - 20%
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 5287079)									
EM2316090-001	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	<2	0.0	No Limit
EM2316156-001	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	<2	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5288071)									
EM2316186-009	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: 5288233)									
EM2316161-013	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EM2316011-054	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5288071)									
EM2316186-009	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: 5288233)									
EM2316161-013	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EM2316011-054	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 5288233)									
EM2316161-013	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

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: 5288233) - continued									
EM2316161-013	Anonymous	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
EM2316011-054	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
ED009: Anions (QCLot: 5293179)								
ED009-X: Bromide	24959-67-9	0.01	mg/L	<0.010	2 mg/L	105	93.0	109
ED009-X: Iodide	20461-54-5	0.01	mg/L	<0.010	0.5 mg/L	85.0	79.0	123
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 5291002)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	109	91.0	110
				<10	2340 mg/L	105	80.8	119
				<10	293 mg/L	107	91.0	110
ED037P: Alkalinity by PC Titrator (QCLot: 5288462)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	108	85.0	116
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5286866)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	90.0	110
				<1	500 mg/L	109	90.0	110
ED045G: Chloride by Discrete Analyser (QCLot: 5286867)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	103	90.0	110
				<1	1000 mg/L	98.3	90.0	110
ED093F: Dissolved Major Cations (QCLot: 5297456)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	95.4	80.0	120
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	100	80.0	120
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	95.5	80.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	93.3	80.0	120
EG020F: Dissolved Metals by ICP-MS (QCLot: 5297453)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	98.7	89.0	111
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	102	83.5	111
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	94.7	83.2	109
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	95.9	83.1	107
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	96.5	84.6	108
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	96.5	84.8	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	95.5	84.3	110
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	97.5	82.3	113
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	105	86.3	112
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	94.1	91.8	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: 5292856)								
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	104	92.8	118
EG035F: Dissolved Mercury by FIMS (QCLot: 5297454)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	86.7	71.6	116
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5289878)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	101	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5286869)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	110	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5289877)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	94.5	90.0	110
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5294251)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	91.0	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5294250)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	91.9	71.9	114
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5286870)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	103	90.0	110
EP002: Dissolved Organic Carbon (DOC) (QCLot: 5289586)								
EP002: Dissolved Organic Carbon	----	1	mg/L	<1	100 mg/L	95.8	83.0	115
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 5287079)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	198 mg/L	102	79.5	122
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5288071)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	4560 µg/L	79.2	47.2	122
EP071: C15 - C28 Fraction	----	100	µg/L	<100	16200 µg/L	78.8	52.9	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8650 µg/L	86.2	50.4	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5288233)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	107	66.2	134
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5288071)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	6190 µg/L	78.2	49.1	125
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	22200 µg/L	78.8	51.6	128
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1520 µg/L	82.4	47.2	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5288233)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	102	66.2	132
EP080: BTEXN (QCLot: 5288233)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	114	68.8	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	108	72.9	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS: Spike Recovery (%)	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP080: BTEXN (QCLot: 5288233) - continued								
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	112	71.7	130
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	114	72.3	136
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	112	75.9	134
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	121	68.3	131

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
ED009: Anions (QCLot: 5293179)							
EM2316083-001	Anonymous	ED009-X: Bromide	24959-67-9	0.2 mg/L	# 69.5	70.0	130
		ED009-X: Iodide	20461-54-5	0.2 mg/L	# 65.5	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5286866)							
EM2316145-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5286867)							
EM2316145-001	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	142
EG020F: Dissolved Metals by ICP-MS (QCLot: 5297453)							
EM2316031-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	100	76.6	124
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	104	74.6	118
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	100	71.0	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	100	76.0	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	94.6	75.0	133
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	99.8	64.0	134
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	97.6	73.0	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	101	75.0	131
EG035F: Dissolved Mercury by FIMS (QCLot: 5297454)							
EM2316031-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	78.9	70.0	120
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5289878)							
EM2316170-002	B4	EK055G: Ammonia as N	7664-41-7	1 mg/L	89.5	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5286869)							

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: 5286869) - continued							
EM2316145-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	# Not Determined	80.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5289877)							
EM2316170-002	B4	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	95.8	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5294251)							
EM2316031-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	97.0	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5294250)							
EM2316031-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	95.0	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5286870)							
EM2316156-002	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	89.8	79.0	123
EP002: Dissolved Organic Carbon (DOC) (QCLot: 5289586)							
EM2316170-001	B2	EP002: Dissolved Organic Carbon	----	100 mg/L	102	75.0	117
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5288233)							
EM2316159-001	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	92.3	33.9	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5288233)							
EM2316159-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	86.0	34.0	122
EP080: BTEXN (QCLot: 5288233)							
EM2316159-001	Anonymous	EP080: Benzene	71-43-2	20 µg/L	104	56.3	133
		EP080: Toluene	108-88-3	20 µg/L	111	60.4	132

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2316170**	Page	: 1 of 9
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 08-Sep-2023
Site	: ----	Issue Date	: 18-Sep-2023
Sampler	: MIGUEL BENAVIDES	No. of samples received	: 4
Order number	: 12564388	No. of samples analysed	: 4

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, 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							
ED009: Anions	EM2316083--001	Anonymous	**Bromide**	24959-67-9	69.5 %	70.0-130%	**Recovery less than lower data quality objective**
ED009: Anions	EM2316083--001	Anonymous	**Iodide**	20461-54-5	65.5 %	70.0-130%	**Recovery less than lower data quality objective**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EM2316145--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.**
ED045G: Chloride by Discrete Analyser	EM2316145--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK057G: Nitrite as N by Discrete Analyser	EM2316145--002	Anonymous	**Nitrite as N**	14797-65-0	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
Method	QC	Regular	Actual	Expected	
	0				
Matrix Spikes (MS)					
Total Metals by ICP-MS - Suite A	0	6	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	9	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)							
B2, B4, B6, B14	**06-Sep-2023**	**----**	----	----	**12-Sep-2023**	13-Sep-2023	✓

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
ED009: Anions							
Clear Plastic Bottle - Natural (ED009-X)							
B2, B4, B6, B14	**06-Sep-2023**	**----**	----	----	**13-Sep-2023**	04-Oct-2023	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
B2, B4, B6, B14	**06-Sep-2023**	**----**	----	----	**12-Sep-2023**	20-Sep-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
B2, B4, B6, B14	**06-Sep-2023**	**----**	----	----	**08-Sep-2023**	04-Oct-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
B2, B4, B6, B14	**06-Sep-2023**	**----**	----	----	**08-Sep-2023**	04-Oct-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F)							
B2, B4, B6, B14	**06-Sep-2023**	**----**	----	----	**14-Sep-2023**	04-Oct-2023	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)							
B2, B4, B6, B14	**06-Sep-2023**	**----**	----	----	**14-Sep-2023**	04-Mar-2024	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
B2, B4, B6, B14	**06-Sep-2023**	**12-Sep-2023**	04-Mar-2024	✓	**12-Sep-2023**	04-Mar-2024	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F)							
B2, B4, B6, B14	**06-Sep-2023**	**----**	----	----	**15-Sep-2023**	04-Oct-2023	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
B2, B4, B6, B14	**06-Sep-2023**	**----**	----	----	**12-Sep-2023**	04-Oct-2023	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
B2, B4, B6, B14	**06-Sep-2023**	**----**	----	----	**08-Sep-2023**	08-Sep-2023	✓

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)							
B2, B4, B6, B14	**06-Sep-2023**	**----**	----	**----**	**12-Sep-2023**	04-Oct-2023	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
B2, B4, B6, B14	**06-Sep-2023**	**14-Sep-2023**	04-Oct-2023	✓	**14-Sep-2023**	04-Oct-2023	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
B2, B4, B6, B14	**06-Sep-2023**	**14-Sep-2023**	04-Oct-2023	✓	**14-Sep-2023**	04-Oct-2023	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
B2, B4, B6, B14	**06-Sep-2023**	**----**	----	**----**	**08-Sep-2023**	08-Sep-2023	✓
EP002: Dissolved Organic Carbon (DOC)							
Amber DOC Filtered- Sulfuric Preserved (EP002)							
B2, B4, B6, B14	**06-Sep-2023**	**----**	----	**----**	**12-Sep-2023**	04-Oct-2023	✓
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030)							
B2, B4, B6, B14	**06-Sep-2023**	**----**	----	**----**	**08-Sep-2023**	08-Sep-2023	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
B2, B4, B6, B14	**06-Sep-2023**	**11-Sep-2023**	13-Sep-2023	✓	**12-Sep-2023**	21-Oct-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
B2, B4, B6, B14	**06-Sep-2023**	**12-Sep-2023**	20-Sep-2023	✓	**12-Sep-2023**	20-Sep-2023	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071)							
B2, B4, B6, B14	**06-Sep-2023**	**11-Sep-2023**	13-Sep-2023	✓	**12-Sep-2023**	21-Oct-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
B2, B4, B6, B14	**06-Sep-2023**	**12-Sep-2023**	20-Sep-2023	✓	**12-Sep-2023**	20-Sep-2023	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080)							
B2, B4, B6, B14	**06-Sep-2023**	**12-Sep-2023**	20-Sep-2023	✓	**12-Sep-2023**	20-Sep-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	16	**12.50**	**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
Biochemical Oxygen Demand (BOD)	EP030	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	19	**10.53**	**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
Dissolved Organic Carbon	EP002	1	5	**20.00**	**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	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Standard Anions -by IC (Extended Method)	ED009-X	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**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 Metals by ICP-MS - Suite A	EG020A-T	2	6	**33.33**	**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	9	**11.11**	**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	1	16	**6.25**	**5.00**	✓	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
Biochemical Oxygen Demand (BOD)	EP030	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	19	**5.26**	**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
Dissolved Organic Carbon	EP002	1	5	**20.00**	**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	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Standard Anions -by IC (Extended Method)	ED009-X	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	3	39	**7.69**	**7.50**	✓	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 Metals by ICP-MS - Suite A	EG020A-T	1	6	**16.67**	**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	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
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
Biochemical Oxygen Demand (BOD)	EP030	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	19	**5.26**	**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
Dissolved Organic Carbon	EP002	1	5	**20.00**	**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	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Standard Anions -by IC (Extended Method)	ED009-X	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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 Metals by ICP-MS - Suite A	EG020A-T	1	6	**16.67**	**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	9	**11.11**	**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	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	19	**5.26**	**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
Dissolved Organic Carbon	EP002	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Standard Anions -by IC (Extended Method)	ED009-X	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**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 Metals by ICP-MS - Suite A	EG020A-T	0	6	**0.00**	**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	9	**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)
Standard Anions -by IC (Extended Method)	ED009-X	WATER	In house: Referenced to APHA 4110B. 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).
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)

Analytical Methods	Method	Matrix	Method Descriptions
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 1030F. This method is compliant with NEPM Schedule B(3)
Dissolved Organic Carbon	EP002	WATER	In house: Referenced to APHA 5310 B. This method is compliant with NEPM Schedule B(3). Samples are combusted at high temperature in the presence of an oxidative catalyst. The evolved carbon dioxide is quantified using an IR detector.
Biochemical Oxygen Demand (BOD)	EP030	WATER	In house: Referenced to APHA 5210 B. The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. 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.

CERTIFICATE OF ANALYSIS

Work Order	: **EM2316173**	Page	: 1 of 4
Amendment	: **1**		
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Peter Ravlic
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 08-Sep-2023 11:45
Order number	: 12564388	Date Analysis Commenced	: 08-Sep-2023
C-O-C number	: ----	Issue Date	: 15-Sep-2023 18:18
Sampler	: MIGUEL BENAVIDES		
Site	: ----		
Quote number	: ME/770/21 V2		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC

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.

- 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 (14/09/2023): This report has been amended to add 8 metals (total and dissolved) to sample #1. A request from Samantha King received on 14/09/2023 at 12:15 via an email. All analysis results are as per the report.
- 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	S1	----	----	----	----
				Sampling date / time	06-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2316173-001	--------	--------	--------	--------
					Result	----	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**7.96**	----	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**397**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		**7**	----	----	----	----
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		**138**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**138**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**27**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**28**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**65**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**5**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**15**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**2**	----	----	----	----
EG020F: Dissolved 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	----	----	----	----
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**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	S1	----	----	----	----
			Sampling date / time	06-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EM2316173-001	--------	--------	--------	--------
				Result	----	----	----	----
EG020T: Total Metals by ICP-MS - Continued								
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	----	----	----	----
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	**0.02**	----	----	----	----
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	**0.83**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.84**	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**0.1**	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	**0.9**	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.03**	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	**0.02**	----	----	----	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**4.11**	----	----	----	----
ø Total Cations	----	0.01	meq/L	**4.36**	----	----	----	----
ø Ionic Balance	----	0.01	%	**2.94**	----	----	----	----
EP030: Biochemical Oxygen Demand (BOD)								
Biochemical Oxygen Demand	----	2	mg/L	**2**	----	----	----	----

QUALITY CONTROL REPORT

Work Order	: **EM2316173**	Page	: 1 of 8
Amendment	: **1**		
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Peter Ravlic
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 08-Sep-2023
Order number	: 12564388	Date Analysis Commenced	: 08-Sep-2023
C-O-C number	: ----	Issue Date	: 15-Sep-2023
Sampler	: MIGUEL BENAVIDES		
Site	: ----		
Quote number	: ME/770/21 V2		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC

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 (%)
EA005P: pH by PC Titrator (QC Lot: 5288357)									
EM2316168-003	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	6.47	6.48	0.2	0% - 20%
EM2316145-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.92	8.01	1.1	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5288360)									
EM2316174-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	603	604	0.0	0% - 20%
EM2316145-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	9380	9420	0.4	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5288348)									
EM2316122-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
EM2316122-012	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	21	21	0.0	No Limit
EM2316156-002	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	8	9	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 5288359)									
EM2316168-003	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	451	455	0.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	451	455	0.8	0% - 20%
EM2316145-001	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	188	191	1.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	188	191	1.1	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5286866)									
EM2316159-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.0	No Limit
EM2316040-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3150	3110	1.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5286867)									
EM2316159-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1730	1740	0.6	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: 5286867) - continued									
EM2316040-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	16700	16500	1.5	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5290051)									
EM2316177-007	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	87	88	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	98	98	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	831	836	0.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	102	103	0.0	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5298595)									
EM2316257-010	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0002	0.0002	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.008	0.008	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: Nickel	7440-02-0	0.001	mg/L	0.007	0.007	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.008	0.008	0.0	No Limit
EM2316173-001	S1	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: 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
EG020T: Total Metals by ICP-MS (QC Lot: 5298524)									
EM2316164-042	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	0.011	0.010	12.1	0% - 50%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.006	0.006	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	0.016	0.016	0.0	0% - 50%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.058	0.058	0.0	0% - 50%
EG035F: Dissolved Mercury by FIMS (QC Lot: 5298596)									
EM2316173-001	S1	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: 5300525)									
EM2316089-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EM2316378-001	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: 5288954)									
EM2316212-003	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.32	0.29	10.1	0% - 50%
EM2316096-001	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: 5286869)									
EM2316145-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	1.00	1.01	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 (%)*
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5286869) - continued									
EM2316162-001	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: 5288955)									
EM2316096-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.41	0.41	0.0	0% - 20%
EM2316212-003	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: 5288524)									
EM2316086-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.0	2.2	10.6	0% - 50%
EM2316088-004	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.2	0.1	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 5288523)									
EM2316086-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	1.81	1.93	6.6	0% - 20%
EM2316088-004	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: 5286870)									
EM2316156-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 5287080)									
EM2316173-001	S1	EP030: Biochemical Oxygen Demand	----	2	mg/L	2	<2	0.0	No Limit
EM2316177-010	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	<8	<8	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
EA005P: pH by PC Titrator (QCLot: 5288357)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.8	101
				----	7 pH Unit	100	99.3	101
EA010P: Conductivity by PC Titrator (QCLot: 5288360)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	104	85.0	119
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5288348)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	103	91.0	109
				<5	825 mg/L	110	84.7	116
				<5	1000 mg/L	94.8	90.3	109
ED037P: Alkalinity by PC Titrator (QCLot: 5288359)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	101	85.0	116
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5286866)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	90.0	110
				<1	500 mg/L	109	90.0	110
ED045G: Chloride by Discrete Analyser (QCLot: 5286867)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	103	90.0	110
				<1	1000 mg/L	98.3	90.0	110
ED093F: Dissolved Major Cations (QCLot: 5290051)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	80.0	120
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.8	80.0	120
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	80.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	100	80.0	120
EG020F: Dissolved Metals by ICP-MS (QCLot: 5298595)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	102	89.0	111
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	94.7	83.5	111
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	92.7	83.2	109
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	98.7	83.1	107
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	100.0	84.6	108
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	97.4	84.3	110
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	106	86.3	112
EG020T: Total Metals by ICP-MS (QCLot: 5298524)								

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: 5298524) - continued								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	102	89.2	115
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	96.0	86.4	115
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	96.2	86.9	112
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	99.0	86.9	111
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	102	88.3	112
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	99.2	87.9	113
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	109	86.7	117
EG035F: Dissolved Mercury by FIMS (QCLot: 5298596)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	104	71.6	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5300525)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	103	73.4	119
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5288954)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	101	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5286869)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	110	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5288955)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	95.3	90.0	110
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5288524)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	76.8	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5288523)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	89.8	71.9	114
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5286870)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	103	90.0	110
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 5287080)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	198 mg/L	99.1	79.5	122

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: 5286866)							
EM2316145-001	Anonymous						

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: 5286866) - continued							
EM2316145-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5286867)							
EM2316145-001	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	142
EG020F: Dissolved Metals by ICP-MS (QCLot: 5298595)							
EM2316173-001	S1	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	94.3	76.6	124
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	91.0	74.6	118
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	88.4	71.0	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	93.3	76.0	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	95.9	75.0	133
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	90.8	73.0	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	95.8	75.0	131
EG020T: Total Metals by ICP-MS (QCLot: 5298524)							
EM2316164-042	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	113	82.0	123
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	110	81.8	123
		EG020A-T: Chromium	7440-47-3	1 mg/L	109	78.9	119
		EG020A-T: Copper	7440-50-8	1 mg/L	117	80.4	118
		EG020A-T: Lead	7439-92-1	1 mg/L	112	80.5	121
		EG020A-T: Nickel	7440-02-0	1 mg/L	113	80.0	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	116	74.0	120
EG035F: Dissolved Mercury by FIMS (QCLot: 5298596)							
EM2316341-001	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	104	70.0	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5300525)							
EM2316159-002	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	109	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5288954)							
EM2316096-002	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	83.7	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5286869)							
EM2316145-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	# Not Determined	80.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5288955)							
EM2316096-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	88.9	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5288524)							
EM2316086-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	80.3	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5288523)							
EM2316086-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	97.4	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*
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5286870)							
EM2316156-002	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	89.8	79.0	123

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2316173**	Page	: 1 of 9
Amendment	: **1**		
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 08-Sep-2023
Site	: ----	Issue Date	: 15-Sep-2023
Sampler	: MIGUEL BENAVIDES	No. of samples received	: 1
Order number	: 12564388	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

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

Outliers : 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	EM2316145--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.**
ED045G: Chloride by Discrete Analyser	EM2316145--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK057G: Nitrite as N by Discrete Analyser	EM2316145--002	Anonymous	**Nitrite as N**	14797-65-0	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)	Date extracted	Due for extraction	**Days overdue**	Date analysed	Due for analysis	**Days overdue**
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
S1	----	----	----	12-Sep-2023	06-Sep-2023	**6**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
	3				
Laboratory Duplicates (DUP)					
Suspended Solids (High Level)	3	31	9.68	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	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		**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
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
S1	06-Sep-2023	----	----	----	12-Sep-2023	06-Sep-2023	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
S1	06-Sep-2023	----	----	----	12-Sep-2023	04-Oct-2023	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H)							
S1	06-Sep-2023	----	----	----	11-Sep-2023	13-Sep-2023	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
S1	06-Sep-2023	----	----	----	12-Sep-2023	20-Sep-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
S1	06-Sep-2023	----	----	----	08-Sep-2023	04-Oct-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
S1	06-Sep-2023	----	----	----	08-Sep-2023	04-Oct-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F)							
S1	06-Sep-2023	----	----	----	12-Sep-2023	04-Oct-2023	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)							
S1	06-Sep-2023	----	----	----	14-Sep-2023	04-Mar-2024	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
S1	06-Sep-2023	14-Sep-2023	04-Mar-2024	✓	14-Sep-2023	04-Mar-2024	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F)							
S1	06-Sep-2023	----	----	----	15-Sep-2023	04-Oct-2023	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG035T)							
S1	06-Sep-2023	----	----	----	15-Sep-2023	04-Oct-2023	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
S1	06-Sep-2023	----	----	----	12-Sep-2023	04-Oct-2023	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
S1	06-Sep-2023	----	----	----	08-Sep-2023	08-Sep-2023	✓

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)							
S1	**06-Sep-2023**	**----**	----	**----**	**12-Sep-2023**	04-Oct-2023	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
S1	**06-Sep-2023**	**12-Sep-2023**	04-Oct-2023	✓	**12-Sep-2023**	04-Oct-2023	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
S1	**06-Sep-2023**	**12-Sep-2023**	04-Oct-2023	✓	**12-Sep-2023**	04-Oct-2023	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
S1	**06-Sep-2023**	**----**	----	**----**	**08-Sep-2023**	08-Sep-2023	✓
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030)							
S1	**06-Sep-2023**	**----**	----	**----**	**08-Sep-2023**	08-Sep-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
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	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	2	11	**18.18**	**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
Conductivity by Auto Titrator	EA010-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	3	**66.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	31	**9.68**	**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	1	3	**33.33**	**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
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	11	**9.09**	**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
Conductivity by Auto Titrator	EA010-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	31	**9.68**	**7.50**	✓	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	3	**33.33**	**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	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	11	**9.09**	**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
Conductivity by Auto Titrator	EA010-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	31	**6.45**	**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	3	**33.33**	**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
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	12	**8.33**	**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	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**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	3	**33.33**	**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

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
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. 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 1030F. This method is compliant with NEPM Schedule B(3)
Biochemical Oxygen Demand (BOD)	EP030	WATER	In house: Referenced to APHA 5210 B. The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. This method is compliant with 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)
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)

CERTIFICATE OF ANALYSIS

Work Order	: **EM2322268**	Page	: 1 of 6
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Peter Ravlic
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 13-Dec-2023 11:55
Order number	: 12564388	Date Analysis Commenced	: 14-Dec-2023
C-O-C number	: ----	Issue Date	: 20-Dec-2023 18:45
Sampler	: NB		
Site	: ----		
Quote number	: ME/770/21 V2		
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

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*
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Tom Maloney	Laboratory Manager	Melbourne Inorganics, Springvale, VIC

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.

- 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.
- EP030: LCS recovery was below the recommended APHA limits of the Certified ± 30.5mg/L. BOD results may bias low.
- EK067G: EM2322261 #2 Poor duplicate precision for Total Phosphorus as P due to sample matrix. Confirmed by re-extraction and re-analysis.
- 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	S1	S2	S3	S4	S6
			Sampling date / time	12-Dec-2023 00:00	12-Dec-2023 00:00	12-Dec-2023 00:00	12-Dec-2023 00:00	12-Dec-2023 00:00
Compound	CAS Number	LOR	Unit	EM2322268-001	EM2322268-002	EM2322268-003	EM2322268-004	EM2322268-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.79**	**6.66**	**8.63**	**6.68**	**7.95**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**367**	**187**	**622**	**160**	**457**
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**8**	**8**	**51**	<5	**5**
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	**33**	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**135**	**45**	**238**	**34**	**193**
Total Alkalinity as CaCO3	----	1	mg/L	**135**	**45**	**271**	**34**	**193**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**10**	**4**	**7**	**3**	**15**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**26**	**24**	**40**	**24**	**20**
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**50**	**16**	**79**	**10**	**72**
Magnesium	7439-95-4	1	mg/L	**5**	**3**	**11**	**3**	**6**
Sodium	7440-23-5	1	mg/L	**16**	**14**	**29**	**14**	**14**
Potassium	7440-09-7	1	mg/L	**1**	<1	**26**	<1	**1**
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.04**	**0.01**	**0.32**	**0.03**	**0.04**
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	**0.01**	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**0.04**	**0.02**	**0.06**	**0.06**	**0.03**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.05**	**0.02**	**0.06**	**0.06**	**0.03**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	S1	S2	S3	S4	S6
			Sampling date / time	12-Dec-2023 00:00	12-Dec-2023 00:00	12-Dec-2023 00:00	12-Dec-2023 00:00	12-Dec-2023 00:00
Compound	CAS Number	LOR	Unit	EM2322268-001	EM2322268-002	EM2322268-003	EM2322268-004	EM2322268-005
				Result	Result	Result	Result	Result
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser - Continued								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**0.2**	**0.2**	**2.5**	**0.1**	**0.1**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	**0.2**	**0.2**	**2.6**	**0.2**	**0.1**
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.02**	**0.09**	**0.81**	**0.02**	**0.01**
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	**0.01**	**0.02**	**0.03**	**0.02**	**0.01**
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**3.64**	**1.66**	**6.69**	**1.42**	**4.73**
ø Total Cations	----	0.01	meq/L	**3.63**	**1.65**	**6.77**	**1.35**	**4.72**
ø Ionic Balance	----	0.01	%	**0.15**	**----**	**0.63**	**----**	**0.12**
EP030: Biochemical Oxygen Demand (BOD)								
Biochemical Oxygen Demand	----	2	mg/L	<2	<2	**6**	**2**	<2

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QC01	----	----	----	----
				Sampling date / time	12-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2322268-006	--------	--------	--------	--------
					Result	----	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**6.48**	----	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**162**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		**6**	----	----	----	----
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		**33**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**33**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**3**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**23**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**10**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**3**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**14**	----	----	----	----
Potassium	7440-09-7	1	mg/L		<1	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.02**	----	----	----	----
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		**0.06**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.06**	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QC01	----	----	----	----
				Sampling date / time	12-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2322268-006	--------	--------	--------	--------
					Result	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser - Continued									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**0.1**	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**0.2**	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**0.02**	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.02**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**1.37**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**1.35**	----	----	----	----
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L		<2	----	----	----	----

QUALITY CONTROL REPORT

Work Order	: **EM2322268**	Page	: 1 of 5
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Peter Ravlic
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 13-Dec-2023
Order number	: 12564388	Date Analysis Commenced	: 14-Dec-2023
C-O-C number	: ----	Issue Date	: 20-Dec-2023
Sampler	: NB		
Site	: ----		
Quote number	: ME/770/21 V2		
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*
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Tom Maloney	Laboratory Manager	Melbourne Inorganics, Springvale, VIC

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 (%)
EA005P: pH by PC Titrator (QC Lot: 5496055)									
EM2322260-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.21	8.21	0.0	0% - 20%
EM2322205-009	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.75	7.73	0.3	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 5496060)									
EM2322313-009	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.69	7.72	0.4	0% - 20%
EM2322270-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.26	8.27	0.1	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5496056)									
EM2322260-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	14900	14900	0.3	0% - 20%
EM2322205-009	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	812	814	0.2	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5496043)									
EM2322268-004	S4	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
EM2322164-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	7960	7660	3.9	0% - 20%
EM2322221-002	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	316	343	8.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5496059)									
EM2322264-011	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	380	382	0.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	380	382	0.3	0% - 20%
EM2322270-002	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	1130	1120	0.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	1130	1120	0.4	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5492537)									

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: 5492537) - continued									
EM2322268-001	S1	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	10	10	0.0	0% - 50%
ED045G: Chloride by Discrete Analyser (QC Lot: 5492538)									
EM2322268-001	S1	ED045G: Chloride	16887-00-6	1	mg/L	26	26	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5499489)									
EM2322114-001	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	<1000 µg/L	<1	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EM2322268-004	S4	ED093F: Calcium	7440-70-2	1	mg/L	10	10	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	3	3	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	14	14	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5497669)									
EM2322107-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM2322328-003	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.25	0.24	0.0	0% - 20%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5492539)									
EM2322268-001	S1	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: 5497670)									
EM2322107-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	12.1	11.9	1.3	0% - 20%
EM2322328-003	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	6.22	6.21	0.0	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 5497868)									
EM2322268-005	S6	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.1	0.1	0.0	No Limit
EM2322261-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.7	0.5	32.1	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 5497866)									
EM2322107-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.42	0.41	3.6	0% - 20%
EM2322261-002	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.43	# 0.23	62.6	0% - 20%
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5492540)									
EM2322268-001	S1	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.01	<0.01	0.0	No Limit
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 5492667)									
EM2322196-002	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	5	4	0.0	No Limit
EM2322268-001	S1	EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	<2	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 5496055)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.8	101
				----	7 pH Unit	100	99.3	101
EA005P: pH by PC Titrator (QCLot: 5496060)								
EA005-P: pH Value	----	----	pH Unit	----	7 pH Unit	100	98.8	101
				----	9 pH Unit	100	99.3	101
EA010P: Conductivity by PC Titrator (QCLot: 5496056)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	99.1	85.0	119
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5496043)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	106	91.0	109
				<5	825 mg/L	105	84.7	116
				<5	1000 mg/L	105	90.3	109
ED037P: Alkalinity by PC Titrator (QCLot: 5496059)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	99.9	85.0	116
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5492537)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	500 mg/L	109	90.0	110
				<1	25 mg/L	102	90.0	110
ED045G: Chloride by Discrete Analyser (QCLot: 5492538)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	103	90.0	110
				<1	10 mg/L	106	90.0	110
ED093F: Dissolved Major Cations (QCLot: 5499489)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.2	80.0	120
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	100	80.0	120
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	96.8	80.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	94.3	80.0	120
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5497669)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	102	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5492539)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	104	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5497670)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	96.2	90.0	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
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5497868)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	82.0	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5497866)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	92.5	71.9	114
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5492540)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	106	90.0	110
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 5492667)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	198 mg/L	79.8	79.5	122

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: 5492537)							
EM2322268-002	S2	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	104	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5492538)							
EM2322268-002	S2	ED045G: Chloride	16887-00-6	400 mg/L	111	70.0	142
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5497669)							
EM2322268-001	S1	EK055G: Ammonia as N	7664-41-7	1 mg/L	102	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5492539)							
EM2322268-002	S2	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	103	80.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5497670)							
EM2322268-001	S1	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	96.6	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5497868)							
EM2322261-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	96.7	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5497866)							
EM2322219-003	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	92.5	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5492540)							
EM2322268-002	S2	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	107	79.0	123

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2322268**	Page	: 1 of 8
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 13-Dec-2023
Site	: ----	Issue Date	: 20-Dec-2023
Sampler	: NB	No. of samples received	: 6
Order number	: 12564388	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 Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

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
Duplicate (DUP) RPDs							
EK067G: Total Phosphorus as P by Discrete Analyser	EM2322261--002	Anonymous	**Total Phosphorus as P**	----	62.6 %	0% - 20%	**RPD exceeds LOR based limits**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation: Date extracted	Due for extraction	Days overdue	Analysis: Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural							
S1,	S2,	----	----	----	18-Dec-2023	12-Dec-2023	**6**
S3,	S4,						
S6,	QC01						
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural							
S1,	S2,	----	----	----	15-Dec-2023	14-Dec-2023	**1**
S3,	S4,						
S6,	QC01						
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural							
S1,	S2,	----	----	----	15-Dec-2023	14-Dec-2023	**1**
S3,	S4,						
S6,	QC01						

Analysis Holding Time Compliance

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

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

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation: Date extracted	Due for extraction	Evaluation	Analysis: Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator								
Clear Plastic Bottle - Natural (EA005-P)								
S1,	S2,	**12-Dec-2023**	**----**	----	----	**18-Dec-2023**	12-Dec-2023	✘
S3,	S4,							
S6,	QC01							

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
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
S1, S2, S3, S4, S6, QC01	**12-Dec-2023**	**----**	----	----	**18-Dec-2023**	09-Jan-2024	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H)							
S1, S2, S3, S4, S6, QC01	**12-Dec-2023**	**----**	----	----	**15-Dec-2023**	19-Dec-2023	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
S1, S2, S3, S4, S6, QC01	**12-Dec-2023**	**----**	----	----	**18-Dec-2023**	26-Dec-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
S1, S2, S3, S4, S6, QC01	**12-Dec-2023**	**----**	----	----	**15-Dec-2023**	09-Jan-2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
S1, S2, S3, S4, S6, QC01	**12-Dec-2023**	**----**	----	----	**15-Dec-2023**	09-Jan-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
S1, S2, S3, S4, S6, QC01	**12-Dec-2023**	**----**	----	----	**19-Dec-2023**	19-Dec-2023	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
S1, S2, S3, S4, S6, QC01	**12-Dec-2023**	**----**	----	----	**19-Dec-2023**	09-Jan-2024	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
S1, S2, S3, S4, S6, QC01	**12-Dec-2023**	**----**	----	----	**15-Dec-2023**	14-Dec-2023	✘

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)							
S1, S2, S3, S4, S6, QC01	**12-Dec-2023**	**----**	----	----	**19-Dec-2023**	09-Jan-2024	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
S1, S2, S3, S4, S6, QC01	**12-Dec-2023**	**19-Dec-2023**	09-Jan-2024	✓	**19-Dec-2023**	09-Jan-2024	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
S1, S2, S3, S4, S6, QC01	**12-Dec-2023**	**19-Dec-2023**	09-Jan-2024	✓	**19-Dec-2023**	09-Jan-2024	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
S1, S2, S3, S4, S6, QC01	**12-Dec-2023**	**----**	----	----	**15-Dec-2023**	14-Dec-2023	×
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030)							
S1, S2, S3, S4, S6, QC01	**12-Dec-2023**	**----**	----	----	**14-Dec-2023**	14-Dec-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
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	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	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	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	27	**11.11**	**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 Phosphorus as P By Discrete Analyser	EK067G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	6	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	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	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	6	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	27	**11.11**	**7.50**	✓	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 Phosphorus as P By Discrete Analyser	EK067G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	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	14	**7.14**	**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*	
Method Blanks (MB) - Continued							
Nitrite as N by Discrete Analyser	EK057G	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	27	**7.41**	**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 Phosphorus as P By Discrete Analyser	EK067G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	6	**16.67**	**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 Phosphorus as P By Discrete Analyser	EK067G	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
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. 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)
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)

Analytical Methods	Method	Matrix	Method Descriptions
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 1030F. This method is compliant with NEPM Schedule B(3)
Biochemical Oxygen Demand (BOD)	EP030	WATER	In house: Referenced to APHA 5210 B. The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. This method is compliant with 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)

CERTIFICATE OF ANALYSIS

Work Order	: **EM2322269**	Page	: 1 of 19
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Peter Ravlic
Address	: GROUND FLOOR 113 CIMITIERE ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 13-Dec-2023 11:55
Order number	: 12564388	Date Analysis Commenced	: 14-Dec-2023
C-O-C number	: ----	Issue Date	: 27-Dec-2023 14:48
Sampler	: NB		
Site	: ----		
Quote number	: ME/770/21 V2		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- 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
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

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.

- EK086/EK087: Sulfite/thiosulfate for EM2322269 #1 has been diluted prior to analysis due to sample matrix. LORs have been raised accordingly.
- EK057G: EM2322269 #1 Sample required dilution prior Nitrite as N analysis due to sample matrix. LOR value has been adjusted accordingly.
- EA015H: EM2322269 #1 : Sample has been confirmed for total dissolved solids by re-preparation and re-analysis.
- EP075: 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.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP074: Where reported, Total Trihalomethanes is the sum of the reported concentrations of all Trihalomethanes at or above the LOR.
- EP074: Where reported, Total Trimethylbenzenes is the sum of the reported concentrations of 1.2.3-Trimethylbenzene, 1.2.4-Trimethylbenzene and 1.3.5-Trimethylbenzene 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 is recognised that total metals is less than dissolved metals for samples EM2322269 #1 However, the difference is within experimental variation of the methods.
- ED043 : EM2322269 #1 total oxidised sulfur as S required dilution prior analysis due to sample matrix. LORs have been adjusted accordingly.
- EG020-T : EM2322269 #1 has been diluted prior to Metals analysis due to sample interferences. LOR values have been adjusted accordingly.
- EG035T: Particular sample EM2322269-001 required dilution prior to extraction due to reactivity with acids. LOR values have been adjusted accordingly.
- EG035T: EM2322267#1 Poor matrix spike recovery for total mercury due to sample matrix. Confirmed by re-extraction and re-analysis.
- EP030: LCS recovery was below the recommended APHA limits of the Certified ± 30.5mg/L. BOD results may bias low.
- EG035F:EM2322269#1 Particular samples required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium, sodium and ammonia for sample #1.
- EP075: Particular sample EM2322269_01 has LOR raised for Acetophenone due to matrix interferences
- EP068: Unable to determine DEF surrogate recovery due to matrix interferences.
- EP030 (BOD): For sample #1 multiple valid results with a RPD > 30% were obtained for different sample dilutions. The BOD increased with dilution, possibly indicating sample matrix interference. The result range was 130 to 216mg/L. The average of the valid results was reported.
- EP075: Where reported, 'Sum of PAH' is the sum of the USEPA 16 priority PAHs

- 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.
- MBAS (EP050) is calculated as LAS, molecular weight 348 g/mol.
- 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: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	12-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EM2322269-001	--------	--------	--------	--------	
				Result	----	----	----	----	
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L	**10400**	----	----	----	----	
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L	**34**	----	----	----	----	
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	**310**	----	----	----	----	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**7260**	----	----	----	----	
Total Alkalinity as CaCO3	----	1	mg/L	**7570**	----	----	----	----	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**26**	----	----	----	----	
ED043S: Total Oxidised Sulfur as S									
Total Oxidised Sulfur as S	----	10	mg/L	<100	----	----	----	----	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	**3380**	----	----	----	----	
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L	**79**	----	----	----	----	
Magnesium	7439-95-4	1	mg/L	**67**	----	----	----	----	
Sodium	7440-23-5	1	mg/L	**2090**	----	----	----	----	
Potassium	7440-09-7	1	mg/L	**964**	----	----	----	----	
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L	**2.24**	----	----	----	----	
Arsenic	7440-38-2	0.001	mg/L	**0.203**	----	----	----	----	
Cadmium	7440-43-9	0.0001	mg/L	**0.0002**	----	----	----	----	
Chromium	7440-47-3	0.001	mg/L	**0.969**	----	----	----	----	
Copper	7440-50-8	0.001	mg/L	**0.014**	----	----	----	----	
Lead	7439-92-1	0.001	mg/L	**0.007**	----	----	----	----	
Manganese	7439-96-5	0.001	mg/L	**0.449**	----	----	----	----	

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	12-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2322269-001	--------	--------	--------	--------
					Result	----	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued									
Nickel	7440-02-0	0.001	mg/L		**0.209**	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.367**	----	----	----	----
Iron	7439-89-6	0.05	mg/L		**5.06**	----	----	----	----
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		**3.69**	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L		**0.193**	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0010	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		**1.06**	----	----	----	----
Copper	7440-50-8	0.001	mg/L		**0.034**	----	----	----	----
Lead	7439-92-1	0.001	mg/L		**0.022**	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		**0.525**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.236**	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.10	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.580**	----	----	----	----
Iron	7439-89-6	0.05	mg/L		**9.74**	----	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0010	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0010	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	0.004	mg/L		**0.027**	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**1660**	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.02	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser									

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	12-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2322269-001	--------	--------	--------	--------
					Result	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser - Continued									
Nitrate as N	14797-55-8	0.01	mg/L		**0.38**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.38**	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**2020**	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**2020**	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**18.9**	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**16.8**	----	----	----	----
EK085M: Sulfide as S2-									
Sulfide as S2-	18496-25-8	0.1	mg/L		**13.2**	----	----	----	----
EK086: Sulfite as SO3 2-									
Sulfite as SO3 2-	14265-45-3	2	mg/L		<20	----	----	----	----
EK087: Thiosulfate as S2O3 2-									
Thiosulfate as S2O3 2-	----	2	mg/L		<20	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**247**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**244**	----	----	----	----
ø Ionic Balance	----	0.01	%		**0.75**	----	----	----	----
EP002: Dissolved Organic Carbon (DOC)									
Dissolved Organic Carbon	----	1	mg/L		**1480**	----	----	----	----
EP010: Formaldehyde									
Formaldehyde	50-00-0	0.1	mg/L		<0.1	----	----	----	----
EP020: Oil and Grease (O&G)									
Oil & Grease	----	5	mg/L		**15**	----	----	----	----
EP030: Biochemical Oxygen Demand (BOD)									

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	12-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2322269-001	--------	--------	--------	--------
					Result	----	----	----	----
EP030: Biochemical Oxygen Demand (BOD) - Continued									
Biochemical Oxygen Demand	----	2	mg/L		**173**	----	----	----	----
EP050: Anionic Surfactants as MBAS									
Anionic Surfactants as MBAS	----	0.1	mg/L		**3.7**	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)									
^ Total Polychlorinated biphenyls	----	1	µg/L		<1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.5	µg/L		<0.5	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L		<0.5	----	----	----	----
beta-BHC	319-85-7	0.5	µg/L		<0.5	----	----	----	----
gamma-BHC	58-89-9	0.5	µg/L		<0.5	----	----	----	----
delta-BHC	319-86-8	0.5	µg/L		<0.5	----	----	----	----
Heptachlor	76-44-8	0.5	µg/L		<0.5	----	----	----	----
Aldrin	309-00-2	0.5	µg/L		<0.5	----	----	----	----
Heptachlor epoxide	1024-57-3	0.5	µg/L		<0.5	----	----	----	----
trans-Chlordane	5103-74-2	0.5	µg/L		<0.5	----	----	----	----
alpha-Endosulfan	959-98-8	0.5	µg/L		<0.5	----	----	----	----
cis-Chlordane	5103-71-9	0.5	µg/L		<0.5	----	----	----	----
Dieldrin	60-57-1	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDE	72-55-9	0.5	µg/L		<0.5	----	----	----	----
Endrin	72-20-8	0.5	µg/L		<0.5	----	----	----	----
beta-Endosulfan	33213-65-9	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDD	72-54-8	0.5	µg/L		<0.5	----	----	----	----
Endrin aldehyde	7421-93-4	0.5	µg/L		<0.5	----	----	----	----
Endosulfan sulfate	1031-07-8	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDT	50-29-3	2.0	µg/L		<2.0	----	----	----	----
Endrin ketone	53494-70-5	0.5	µg/L		<0.5	----	----	----	----
Methoxychlor	72-43-5	2.0	µg/L		<2.0	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	12-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2322269-001	--------	--------	--------	--------
					Result	----	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued									
^ **Total Chlordane (sum)**	----	0.5	µg/L		<0.5	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.5	µg/L		<0.5	----	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.5	µg/L		<0.5	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.5	µg/L		<0.5	----	----	----	----
Demeton-S-methyl	919-86-8	0.5	µg/L		<0.5	----	----	----	----
Monocrotophos	6923-22-4	2.0	µg/L		<2.0	----	----	----	----
Dimethoate	60-51-5	0.5	µg/L		<0.5	----	----	----	----
Diazinon	333-41-5	0.5	µg/L		<0.5	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L		<0.5	----	----	----	----
Parathion-methyl	298-00-0	2.0	µg/L		<2.0	----	----	----	----
Malathion	121-75-5	0.5	µg/L		<0.5	----	----	----	----
Fenthion	55-38-9	0.5	µg/L		<0.5	----	----	----	----
Chlorpyrifos	2921-88-2	0.5	µg/L		<0.5	----	----	----	----
Parathion	56-38-2	2.0	µg/L		<2.0	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.5	µg/L		<0.5	----	----	----	----
Chlorfenvinphos	470-90-6	0.5	µg/L		<0.5	----	----	----	----
Bromophos-ethyl	4824-78-6	0.5	µg/L		<0.5	----	----	----	----
Fenamiphos	22224-92-6	0.5	µg/L		<0.5	----	----	----	----
Prothiofos	34643-46-4	0.5	µg/L		<0.5	----	----	----	----
Ethion	563-12-2	0.5	µg/L		<0.5	----	----	----	----
Carbophenothion	786-19-6	0.5	µg/L		<0.5	----	----	----	----
Azinphos Methyl	86-50-0	0.5	µg/L		<0.5	----	----	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup									
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		**1220**	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	12-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2322269-001	--------	--------	--------	--------
					Result	----	----	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup - Continued									
C29 - C36 Fraction	----	50	µg/L		**1290**	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		**2510**	----	----	----	----
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup									
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		**2180**	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		**660**	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		**2840**	----	----	----	----
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP074B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	50	µg/L		**1240**	----	----	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	----	----	----	----
1.2-Dichloropropane	78-87-5	5	µg/L		<5	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	----	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	----	----	----	----
Chloromethane	74-87-3	50	µg/L		<50	----	----	----	----
Vinyl chloride	75-01-4	50	µg/L		<50	----	----	----	----
Bromomethane	74-83-9	50	µg/L		<50	----	----	----	----
Chloroethane	75-00-3	50	µg/L		<50	----	----	----	----
Trichlorofluoromethane	75-69-4	50	µg/L		<50	----	----	----	----
1.1-Dichloroethene	75-35-4	5	µg/L		<5	----	----	----	----
Iodomethane	74-88-4	5	µg/L		<5	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	----	----	----	----
1.1-Dichloroethane	75-34-3	5	µg/L		<5	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	12-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2322269-001	--------	--------	--------	--------
					Result	----	----	----	----
EP074E: Halogenated Aliphatic Compounds - Continued									
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	----	----	----	----
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	----	----	----	----
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	----	----	----	----
Carbon Tetrachloride	56-23-5	5	µg/L		<5	----	----	----	----
1.2-Dichloroethane	107-06-2	5	µg/L		<5	----	----	----	----
Trichloroethene	79-01-6	5	µg/L		<5	----	----	----	----
Dibromomethane	74-95-3	5	µg/L		<5	----	----	----	----
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	----	----	----	----
1.3-Dichloropropane	142-28-9	5	µg/L		<5	----	----	----	----
Tetrachloroethene	127-18-4	5	µg/L		<5	----	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	----	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	----	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	----	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	----	----	----	----
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	----	----	----	----
Pentachloroethane	76-01-7	5	µg/L		<5	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	----	----	----	----
Hexachlorobutadiene	87-68-3	5	µg/L		<5	----	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	----	----	----	----
Bromobenzene	108-86-1	5	µg/L		<5	----	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L		<5	----	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L		<5	----	----	----	----
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	----	----	----	----
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	----	----	----	----
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	12-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2322269-001	--------	--------	--------	--------
					Result	----	----	----	----
EP074F: Halogenated Aromatic Compounds - Continued									
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	----	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	----	----	----	----
Bromodichloromethane	75-27-4	5	µg/L		<5	----	----	----	----
Dibromochloromethane	124-48-1	5	µg/L		<5	----	----	----	----
Bromoform	75-25-2	5	µg/L		<5	----	----	----	----
EP075A: Phenolic Compounds									
Phenol	108-95-2	2	µg/L		**80**	----	----	----	----
2-Chlorophenol	95-57-8	2	µg/L		<2	----	----	----	----
2-Methylphenol	95-48-7	2	µg/L		**46**	----	----	----	----
3- & 4-Methylphenol	1319-77-3	4	µg/L		**109**	----	----	----	----
2-Nitrophenol	88-75-5	2	µg/L		<2	----	----	----	----
2.4-Dimethylphenol	105-67-9	2	µg/L		<2	----	----	----	----
2.4-Dichlorophenol	120-83-2	2	µg/L		<2	----	----	----	----
2.6-Dichlorophenol	87-65-0	2	µg/L		<2	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	2	µg/L		<2	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	2	µg/L		<2	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	2	µg/L		<2	----	----	----	----
Pentachlorophenol	87-86-5	4	µg/L		<4	----	----	----	----
EP075B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	2	µg/L		<2	----	----	----	----
2-Methylnaphthalene	91-57-6	2	µg/L		<2	----	----	----	----
2-Chloronaphthalene	91-58-7	2	µg/L		<2	----	----	----	----
Acenaphthylene	208-96-8	2	µg/L		<2	----	----	----	----
Acenaphthene	83-32-9	2	µg/L		<2	----	----	----	----
Fluorene	86-73-7	2	µg/L		<2	----	----	----	----
Phenanthrene	85-01-8	2	µg/L		<2	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	12-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2322269-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075B: Polynuclear Aromatic Hydrocarbons - Continued									
Anthracene	120-12-7	2	µg/L		<2	----	----	----	----
Fluoranthene	206-44-0	2	µg/L		<2	----	----	----	----
Pyrene	129-00-0	2	µg/L		<2	----	----	----	----
N-2-Fluorenyl Acetamide	53-96-3	2	µg/L		<2	----	----	----	----
Benz(a)anthracene	56-55-3	2	µg/L		<2	----	----	----	----
Chrysene	218-01-9	2	µg/L		<2	----	----	----	----
Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	4	µg/L		<4	----	----	----	----
7.12-Dimethylbenz(a)anthracene	57-97-6	2	µg/L		<2	----	----	----	----
Benzo(a)pyrene	50-32-8	2	µg/L		<2	----	----	----	----
3-Methylcholanthrene	56-49-5	2	µg/L		<2	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	2	µg/L		<2	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	2	µg/L		<2	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	2	µg/L		<2	----	----	----	----
^ Sum of PAHs	----	2	µg/L		<2	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	2	µg/L		<2	----	----	----	----
EP075C: Phthalate Esters									
Dimethyl phthalate	131-11-3	2	µg/L		<2	----	----	----	----
Diethyl phthalate	84-66-2	2	µg/L		<2	----	----	----	----
Di-n-butyl phthalate	84-74-2	2	µg/L		<2	----	----	----	----
Butyl benzyl phthalate	85-68-7	2	µg/L		<2	----	----	----	----
bis(2-ethylhexyl) phthalate	117-81-7	10	µg/L		**12**	----	----	----	----
Di-n-octylphthalate	117-84-0	2	µg/L		<2	----	----	----	----
EP075D: Nitrosamines									
N-Nitrosomethylethylamine	10595-95-6	2	µg/L		<2	----	----	----	----
N-Nitrosodiethylamine	55-18-5	2	µg/L		<2	----	----	----	----
N-Nitrosopyrrolidine	930-55-2	4	µg/L		<4	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	12-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2322269-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075D: Nitrosamines - Continued									
N-Nitrosomorpholine	59-89-2	2	µg/L		<2	----	----	----	----
N-Nitrosodi-n-propylamine	621-64-7	2	µg/L		<2	----	----	----	----
N-Nitrosopiperidine	100-75-4	2	µg/L		<2	----	----	----	----
N-Nitrosodibutylamine	924-16-3	2	µg/L		<2	----	----	----	----
N-Nitrosodiphenyl & Diphenylamine	86-30-6 122-39-4	4	µg/L		<4	----	----	----	----
Methapyrilene	91-80-5	2	µg/L		<2	----	----	----	----
EP075E: Nitroaromatics and Ketones									
2-Picoline	109-06-8	2	µg/L		8	----	----	----	----
Acetophenone	98-86-2	2	µg/L		<8	----	----	----	----
Nitrobenzene	98-95-3	2	µg/L		<2	----	----	----	----
Isophorone	78-59-1	2	µg/L		<2	----	----	----	----
2.6-Dinitrotoluene	606-20-2	4	µg/L		<4	----	----	----	----
2.4-Dinitrotoluene	121-14-2	4	µg/L		<4	----	----	----	----
1-Naphthylamine	134-32-7	2	µg/L		<2	----	----	----	----
4-Nitroquinoline-N-oxide	56-57-5	2	µg/L		<2	----	----	----	----
5-Nitro-o-toluidine	99-55-8	2	µg/L		<2	----	----	----	----
Azobenzene	103-33-3	2	µg/L		<2	----	----	----	----
1.3.5-Trinitrobenzene	99-35-4	2	µg/L		<2	----	----	----	----
Phenacetin	62-44-2	2	µg/L		<2	----	----	----	----
4-Aminobiphenyl	92-67-1	2	µg/L		<2	----	----	----	----
Pentachloronitrobenzene	82-68-8	2	µg/L		<2	----	----	----	----
Pronamide	23950-58-5	2	µg/L		<2	----	----	----	----
Dimethylaminoazobenzene	60-11-7	2	µg/L		<2	----	----	----	----
Chlorobenzilate	510-15-6	2	µg/L		<2	----	----	----	----
EP075F: Haloethers									
Bis(2-chloroethyl) ether	111-44-4	2	µg/L		<2	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	12-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2322269-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075F: Haloethers - Continued									
Bis(2-chloroethoxy) methane	111-91-1	2	µg/L		<2	----	----	----	----
4-Chlorophenyl phenyl ether	7005-72-3	2	µg/L		<2	----	----	----	----
4-Bromophenyl phenyl ether	101-55-3	2	µg/L		<2	----	----	----	----
EP075G: Chlorinated Hydrocarbons									
1.3-Dichlorobenzene	541-73-1	2	µg/L		<2	----	----	----	----
1.4-Dichlorobenzene	106-46-7	2	µg/L		<2	----	----	----	----
1.2-Dichlorobenzene	95-50-1	2	µg/L		<2	----	----	----	----
Hexachloroethane	67-72-1	2	µg/L		<2	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	2	µg/L		<2	----	----	----	----
Hexachloropropylene	1888-71-7	2	µg/L		<2	----	----	----	----
Hexachlorobutadiene	87-68-3	2	µg/L		<2	----	----	----	----
Hexachlorocyclopentadiene	77-47-4	10	µg/L		<10	----	----	----	----
Pentachlorobenzene	608-93-5	2	µg/L		<2	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	4	µg/L		<4	----	----	----	----
EP075H: Anilines and Benzidines									
Aniline	62-53-3	2	µg/L		**48**	----	----	----	----
4-Chloroaniline	106-47-8	2	µg/L		<2	----	----	----	----
2-Nitroaniline	88-74-4	4	µg/L		<4	----	----	----	----
3-Nitroaniline	99-09-2	4	µg/L		<4	----	----	----	----
Dibenzofuran	132-64-9	2	µg/L		<2	----	----	----	----
4-Nitroaniline	100-01-6	2	µg/L		<2	----	----	----	----
Carbazole	86-74-8	2	µg/L		<2	----	----	----	----
3.3`-Dichlorobenzidine	91-94-1	2	µg/L		<2	----	----	----	----
EP075I: Organochlorine Pesticides									
alpha-BHC	319-84-6	2	µg/L		<2	----	----	----	----
beta-BHC	319-85-7	2	µg/L		<2	----	----	----	----
gamma-BHC	58-89-9	2	µg/L		<2	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	12-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2322269-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075I: Organochlorine Pesticides - Continued									
delta-BHC	319-86-8	2	µg/L		<2	----	----	----	----
Heptachlor	76-44-8	2	µg/L		<2	----	----	----	----
Aldrin	309-00-2	2	µg/L		<2	----	----	----	----
Heptachlor epoxide	1024-57-3	2	µg/L		<2	----	----	----	----
alpha-Endosulfan	959-98-8	2	µg/L		<2	----	----	----	----
4.4`-DDE	72-55-9	2	µg/L		<2	----	----	----	----
Dieldrin	60-57-1	2	µg/L		<2	----	----	----	----
Endrin	72-20-8	2	µg/L		<2	----	----	----	----
beta-Endosulfan	33213-65-9	2	µg/L		<2	----	----	----	----
4.4`-DDD	72-54-8	2	µg/L		<2	----	----	----	----
Endosulfan sulfate	1031-07-8	2	µg/L		<2	----	----	----	----
4.4`-DDT	50-29-3	4	µg/L		<4	----	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	4	µg/L		<4	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	4	µg/L		<4	----	----	----	----
EP075J: Organophosphorus Pesticides									
Dichlorvos	62-73-7	2	µg/L		<2	----	----	----	----
Dimethoate	60-51-5	2	µg/L		<2	----	----	----	----
Diazinon	333-41-5	2	µg/L		<2	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	2	µg/L		<2	----	----	----	----
Malathion	121-75-5	2	µg/L		<2	----	----	----	----
Fenthion	55-38-9	2	µg/L		<2	----	----	----	----
Chlorpyrifos	2921-88-2	2	µg/L		<2	----	----	----	----
Pirimphos-ethyl	23505-41-1	2	µg/L		<2	----	----	----	----
Chlorfenvinphos	470-90-6	2	µg/L		<2	----	----	----	----
Prothiofos	34643-46-4	2	µg/L		<2	----	----	----	----
Ethion	563-12-2	2	µg/L		<2	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	12-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2322269-001	--------	--------	--------	--------
					Result	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		120	----	----	----	----
C10 - C14 Fraction	----	50	µg/L		2840	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		7080	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		1910	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		11800	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		100	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		90	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		3340	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		7660	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		860	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		11900	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		3340	----	----	----	----
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		4	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		2	----	----	----	----
^ Total Xylenes	----	2	µg/L		6	----	----	----	----
^ Sum of BTEX	----	1	µg/L		6	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP202A: Phenoxyacetic Acid Herbicides by LCMS									
4-Chlorophenoxy acetic acid	122-88-3	10	µg/L		<10	----	----	----	----
2.4-DB	94-82-6	10	µg/L		<10	----	----	----	----
Dicamba	1918-00-9	10	µg/L		<10	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	12-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2322269-001	--------	--------	--------	--------
					Result	----	----	----	----
EP202A: Phenoxyacetic Acid Herbicides by LCMS - Continued									
Mecoprop	93-65-2	10	µg/L		<10	----	----	----	----
MCPA	94-74-6	10	µg/L		<10	----	----	----	----
2.4-DP	120-36-5	10	µg/L		<10	----	----	----	----
2.4-D	94-75-7	10	µg/L		<10	----	----	----	----
Triclopyr	55335-06-3	10	µg/L		<10	----	----	----	----
Silvex (2.4.5-TP/Fenoprop)	93-72-1	10	µg/L		<10	----	----	----	----
2.4.5-T	93-76-5	10	µg/L		<10	----	----	----	----
MCPB	94-81-5	10	µg/L		<10	----	----	----	----
Picloram	1918-02-1	10	µg/L		<10	----	----	----	----
Clopyralid	1702-17-6	10	µg/L		<10	----	----	----	----
Fluroxypyr	69377-81-7	10	µg/L		<10	----	----	----	----
2.6-D	575-90-6	10	µg/L		<10	----	----	----	----
2.4.6-T	575-89-3	10	µg/L		<10	----	----	----	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	1	%		**74.4**	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.5	%		**84.5**	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.5	%		**Not Determined**	----	----	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	5	%		**110**	----	----	----	----
Toluene-D8	2037-26-5	5	%		**116**	----	----	----	----
4-Bromofluorobenzene	460-00-4	5	%		**109**	----	----	----	----
EP075S: Acid Extractable Surrogates									
2-Fluorophenol	367-12-4	2	%		**38.7**	----	----	----	----
Phenol-d6	13127-88-3	2	%		**39.7**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	2	%		**68.2**	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	Landfill leachate	----	----	----	----
				Sampling date / time	12-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2322269-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075S: Acid Extractable Surrogates - Continued									
2.4.6-Tribromophenol	118-79-6	2	%		**86.3**	----	----	----	----
EP075T: Base/Neutral Extractable Surrogates									
Nitrobenzene-D5	4165-60-0	2	%		**74.8**	----	----	----	----
1.2-Dichlorobenzene-D4	2199-69-1	2	%		**56.9**	----	----	----	----
2-Fluorobiphenyl	321-60-8	2	%		**71.0**	----	----	----	----
Anthracene-d10	1719-06-8	2	%		**75.0**	----	----	----	----
4-Terphenyl-d14	1718-51-0	2	%		**49.1**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**103**	----	----	----	----
Toluene-D8	2037-26-5	2	%		**112**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**110**	----	----	----	----
EP202S: Phenoxyacetic Acid Herbicide Surrogate									
2.4-Dichlorophenyl Acetic Acid	19719-28-9	10	%		**119**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: LEACHATE		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	41	125
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	117
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	51	127
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72	132
Toluene-D8	2037-26-5	77	132
4-Bromofluorobenzene	460-00-4	67	131
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	6	83
Phenol-d6	13127-88-3	10	65
2-Chlorophenol-D4	93951-73-6	22	112
2.4.6-Tribromophenol	118-79-6	22	125
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	37	115
1.2-Dichlorobenzene-D4	2199-69-1	32	99
2-Fluorobiphenyl	321-60-8	39	116
Anthracene-d10	1719-06-8	49	123
4-Terphenyl-d14	1718-51-0	47	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129
EP202S: Phenoxyacetic Acid Herbicide Surrogate			
2.4-Dichlorophenyl Acetic Acid	19719-28-9	64	140

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP020: Oil and Grease (O&G)

(WATER) EP202A: Phenoxyacetic Acid Herbicides by LCMS

(WATER) EP202S: Phenoxyacetic Acid Herbicide Surrogate

(WATER) EP050: Anionic Surfactants as MBAS

QUALITY CONTROL REPORT

Work Order	: **EM2322269**	Page	: 1 of 20
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Contact	: Peter Ravlic
Address	: GROUND FLOOR 113 CIMITIERE ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 13-Dec-2023
Order number	: 12564388	Date Analysis Commenced	: 14-Dec-2023
C-O-C number	: ----	Issue Date	: 27-Dec-2023
Sampler	: NB		
Site	: ----		
Quote number	: ME/770/21 V2		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

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: 5495175)									
EM2322282-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	659	645	2.1	0% - 20%
EM2322343-005	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	71300	72100	1.1	0% - 20%
EM2322200-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	355	335	6.0	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5495176)									
EM2322219-012	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	57	61	7.2	0% - 50%
EM2322200-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	20	22	7.1	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 5500611)									
EM2322357-003	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	257	246	4.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	257	246	4.1	0% - 20%
EM2322267-001	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	200	203	1.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	200	203	1.3	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5492330)									
EM2322269-001	Landfill leachate	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1 (2)*	mg/L	26	23	13.6	0% - 50%
EM2322241-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1810	1780	1.8	0% - 20%
ED043S: Total Oxidised Sulfur as S (QC Lot: 5495220)									
EM2322092-001	Anonymous	ED043S: Total Oxidised Sulfur as S	----	10	mg/L	730	830	12.1	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: 5492329)									
EM2322241-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	4410	4400	0.2	0% - 20%
EM2322200-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	23	23	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5495002)									
EM2322241-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	120	121	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	418	416	0.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1360	1350	0.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	8	8	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5495003)									
EM2322241-001	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	0.003	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	0.637	0.640	0.4	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.019	0.019	0.0	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.067	0.070	3.7	0% - 50%
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.88	1.06	17.8	0% - 20%
EG020T: Total Metals by ICP-MS (QC Lot: 5498505)									
EM2322322-005	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	<0.001	<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: Manganese	7439-96-5	0.001	mg/L	0.340	0.387	12.9	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.009	0.009	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.047	0.056	16.5	0% - 50%
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.02	0.02	0.0	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	1.44	1.37	4.8	0% - 20%
EM2322267-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001 (0.0002)*	mg/L	<0.0002	<0.0002	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001 (0.002) *	mg/L	0.006	0.005	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001 (0.002) *	mg/L	0.002	0.002	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: 5498505) - continued									
EM2322267-001	Anonymous	EG020A-T: Copper	7440-50-8	0.001 (0.002) *	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001 (0.002) *	mg/L	<0.002	<0.002	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001 (0.002) *	mg/L	0.100	0.099	1.1	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001 (0.002) *	mg/L	0.003	0.003	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005 (0.010) *	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01 (0.02)*	mg/L	0.06	0.05	0.0	No Limit
		EG020A-T: Selenium	7782-49-2	0.01 (0.02)*	mg/L	<0.02	<0.02	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	5.94	5.86	1.4	0% - 20%
EG035F: Dissolved Mercury by FIMS (QC Lot: 5495004)									
EM2322253-001	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: 5502971)									
EM2322091-005	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EM2322526-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK026SF: Total CN by Segmented Flow Analyser (QC Lot: 5502489)									
EM2322269-001	Landfill leachate	EK026SF: Total Cyanide	57-12-5	0.004 (0.020) *	mg/L	0.027	0.024	12.7	No Limit
EM2322522-008	Anonymous	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5500829)									
EM2322269-001	Landfill leachate	EK055G: Ammonia as N	7664-41-7	0.01 (0.10)*	mg/L	1660	1560	6.3	0% - 20%
EM2322413-012	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.08	0.09	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5492331)									
EM2322241-003	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01 (0.05)*	mg/L	<0.05	<0.05	0.0	No Limit
EM2322269-001	Landfill leachate	EK057G: Nitrite as N	14797-65-0	0.01 (0.02)*	mg/L	<0.02	<0.02	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5500828)									
EM2322269-001	Landfill leachate	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.38	0.38	0.0	0% - 20%
EM2322413-012	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: 5501861)									
EM2322253-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	12.1	11.0	9.5	0% - 20%
EM2322459-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.4	2.3	0.0	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 5501860)									
EM2322253-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	2.22	2.03	8.8	0% - 20%
EM2322459-002	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	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 (%)
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5492327)									
EM2322200-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	1.82	1.78	2.2	0% - 20%
EK085M: Sulfide as S2- (QC Lot: 5502421)									
EM2322164-001	Anonymous	EK085: Sulfide as S2-	18496-25-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EM2322378-001	Anonymous	EK085: Sulfide as S2-	18496-25-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EK086: Sulfite as SO3 2- (QC Lot: 5492506)									
EM2322259-001	Anonymous	EK086: Sulfite as SO3 2-	14265-45-3	2 (40)*	mg/L	<40	<40	0.0	No Limit
EK087: Thiosulfate as S2O3 2- (QC Lot: 5492507)									
EM2322259-001	Anonymous	EK087: Thiosulfate as S2O3 2-	----	2 (40)*	mg/L	<40	<40	0.0	No Limit
EP002: Dissolved Organic Carbon (DOC) (QC Lot: 5502976)									
EM2322269-001	Landfill leachate	EP002: Dissolved Organic Carbon	----	1 (10)*	mg/L	1480	1660	11.8	0% - 20%
EP010: Formaldehyde (QC Lot: 5492604)									
EM2322079-001	Anonymous	EP010: Formaldehyde	50-00-0	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 5492667)									
EM2322196-002	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	5	4	0.0	No Limit
EM2322268-001	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	<2	0.0	No Limit
EP050: Anionic Surfactants as MBAS (QC Lot: 5497432)									
ES2343675-001	Anonymous	EP050: Anionic Surfactants as MBAS		0.1	mg/L	<0.1	<0.1	0.0	No Limit
EP074B: Oxygenated Compounds (QC Lot: 5498855)									
EM2322269-001	Landfill leachate	EP074: 2-Propanone (Acetone)	67-64-1	50	µg/L	1240	1240	0.0	0% - 20%
EP074D: Fumigants (QC Lot: 5498855)									
EM2322269-001	Landfill leachate	EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 5498855)									
EM2322269-001	Landfill leachate	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	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 (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 5498855) - continued									
EM2322269-001	Landfill leachate	EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 5498855)									
EM2322269-001	Landfill leachate	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
EP074G: Trihalomethanes (QC Lot: 5498855)									
EM2322269-001	Landfill leachate	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5498856)									
EM2322269-001	Landfill leachate	EP080: C6 - C9 Fraction	----	20	µg/L	120	110	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5498856)									
EM2322269-001	Landfill leachate	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	100	100	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: 5498856)									
EM2322269-001	Landfill leachate	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	4	4	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
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QC Lot: 5499023)									
EM2322269-001	Landfill leachate	EP202-SL: 4-Chlorophenoxy acetic acid	122-88-3	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: 2.4-DB	94-82-6	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Dicamba	1918-00-9	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Mecoprop	93-65-2	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: MCPA	94-74-6	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: 2.4-DP	120-36-5	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: 2.4-D	94-75-7	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Triclopyr	55335-06-3	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Silvex (2.4.5-TP/Fenoprop)	93-72-1	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: 2.4.5-T	93-76-5	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: MCPB	94-81-5	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Picloram	1918-02-1	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Clopyralid	1702-17-6	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Fluroxypyr	69377-81-7	10	µg/L	<10	<10	0.0	No Limit
WN2315008-001	Anonymous	EP202-SL: 4-Chlorophenoxy acetic acid	122-88-3	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: 2.4-DB	94-82-6	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Dicamba	1918-00-9	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Mecoprop	93-65-2	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: MCPA	94-74-6	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: 2.4-DP	120-36-5	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: 2.4-D	94-75-7	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Triclopyr	55335-06-3	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Silvex (2.4.5-TP/Fenoprop)	93-72-1	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: 2.4.5-T	93-76-5	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: MCPB	94-81-5	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Picloram	1918-02-1	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Clopyralid	1702-17-6	10	µg/L	<10	<10	0.0	No Limit
		EP202-SL: Fluroxypyr	69377-81-7	10	µg/L	<10	<10	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: 5495175)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	100	91.0	110
				<10	2340 mg/L	111	80.8	119
				<10	293 mg/L	101	91.0	110
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5495176)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	98.7	91.0	109
				<5	825 mg/L	105	84.7	116
				<5	1000 mg/L	95.0	90.3	109
ED037P: Alkalinity by PC Titrator (QCLot: 5500611)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	90.6	85.0	116
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5492330)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	500 mg/L	110	90.0	110
				<1	25 mg/L	102	90.0	110
ED043S: Total Oxidised Sulfur as S (QCLot: 5495220)								
ED043S: Total Oxidised Sulfur as S	----	10	mg/L	<10	167 mg/L	107	77.5	119
ED045G: Chloride by Discrete Analyser (QCLot: 5492329)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	104	90.0	110
				<1	10 mg/L	104	90.0	110
ED093F: Dissolved Major Cations (QCLot: 5495002)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	96.0	80.0	120
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	100	80.0	120
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	97.7	80.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.2	80.0	120
EG020F: Dissolved Metals by ICP-MS (QCLot: 5495003)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	99.5	90.4	111
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	104	89.0	111
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	106	83.5	111
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.3	83.2	109
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	99.3	83.1	107
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	98.8	84.6	108
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	98.6	84.8	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	100	84.3	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
EG020F: Dissolved Metals by ICP-MS (QCLot: 5495003) - continued								
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	109	82.3	113
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	108	86.3	112
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	103	91.8	112
EG020T: Total Metals by ICP-MS (QCLot: 5498505)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	103	90.8	115
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	100	89.2	115
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	96.8	86.4	115
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.6	86.9	112
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	96.7	86.9	111
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	102	88.3	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	99.1	88.7	113
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	101	87.9	113
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	101	84.8	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	107	86.7	117
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	99.2	92.8	118
EG035F: Dissolved Mercury by FIMS (QCLot: 5495004)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	98.2	71.6	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5502971)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	105	73.4	119
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 5502489)								
EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.2 mg/L	112	77.7	116
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5500829)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	103	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5492331)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	104	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5500828)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	102	90.0	110
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5501861)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	99.5	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5501860)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	89.7	71.9	114
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5492327)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	105	90.0	110
EK085M: Sulfide as S2- (QCLot: 5502421)								

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
EK085M: Sulfide as S2- (QCLot: 5502421) - continued								
EK085: Sulfide as S2-	18496-25-8	0.1	mg/L	<0.1	0.5 mg/L	104	81.9	116
EK086: Sulfite as SO3 2- (QCLot: 5492506)								
EK086: Sulfite as SO3 2-	14265-45-3	2	mg/L	<2	100 mg/L	95.0	91.8	101
EK087: Thiosulfate as S2O3 2- (QCLot: 5492507)								
EK087: Thiosulfate as S2O3 2-	----	2	mg/L	<2	100 mg/L	91.0	90.6	106
EP002: Dissolved Organic Carbon (DOC) (QCLot: 5502976)								
EP002: Dissolved Organic Carbon	----	1	mg/L	<1	100 mg/L	96.8	83.0	115
EP010: Formaldehyde (QCLot: 5492604)								
EP010: Formaldehyde	50-00-0	0.1	mg/L	<0.1	5 mg/L	96.2	85.1	107
EP020: Oil and Grease (O&G) (QCLot: 5508475)								
EP020: Oil & Grease	----	5	mg/L	<5	5000 mg/L	97.0	81.0	121
				<5	4000 mg/L	98.2	70.0	110
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 5492667)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	198 mg/L	79.8	79.5	122
EP050: Anionic Surfactants as MBAS (QCLot: 5497432)								
EP050: Anionic Surfactants as MBAS		0.1	mg/L	<0.1	1 mg/L	80.0	74.0	118
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 5492850)								
EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	79.9	52.0	136
EP068A: Organochlorine Pesticides (OC) (QCLot: 5492851)								
EP068: alpha-BHC	319-84-6	0.5	µg/L	<0.5	2.5 µg/L	76.2	50.6	119
EP068: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	2.5 µg/L	68.7	44.2	117
EP068: beta-BHC	319-85-7	0.5	µg/L	<0.5	2.5 µg/L	77.4	53.7	119
EP068: gamma-BHC	58-89-9	0.5	µg/L	<0.5	2.5 µg/L	75.5	47.7	117
EP068: delta-BHC	319-86-8	0.5	µg/L	<0.5	2.5 µg/L	77.1	52.5	117
EP068: Heptachlor	76-44-8	0.5	µg/L	<0.5	2.5 µg/L	72.9	46.9	118
EP068: Aldrin	309-00-2	0.5	µg/L	<0.5	2.5 µg/L	72.7	48.0	115
EP068: Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	2.5 µg/L	77.0	51.1	119
EP068: trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	2.5 µg/L	76.9	48.4	120
EP068: alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	2.5 µg/L	95.3	50.1	122
EP068: cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	2.5 µg/L	78.8	51.0	118
EP068: Dieldrin	60-57-1	0.5	µg/L	<0.5	2.5 µg/L	78.2	48.4	116
EP068: 4.4`-DDE	72-55-9	0.5	µg/L	<0.5	2.5 µg/L	77.0	49.3	116
EP068: Endrin	72-20-8	0.5	µg/L	<0.5	2.5 µg/L	80.7	47.1	130
EP068: beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	2.5 µg/L	78.7	51.6	118

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
EP068A: Organochlorine Pesticides (OC) (QCLot: 5492851) - continued								
EP068: 4.4`-DDD	72-54-8	0.5	µg/L	<0.5	2.5 µg/L	76.8	48.6	122
EP068: Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	2.5 µg/L	67.9	49.4	128
EP068: Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	2.5 µg/L	78.7	49.1	123
EP068: 4.4`-DDT	50-29-3	2	µg/L	<2.0	2.5 µg/L	86.7	45.6	126
EP068: Endrin ketone	53494-70-5	0.5	µg/L	<0.5	2.5 µg/L	77.9	52.8	117
EP068: Methoxychlor	72-43-5	2	µg/L	<2.0	2.5 µg/L	88.0	47.1	126
EP068B: Organophosphorus Pesticides (OP) (QCLot: 5492851)								
EP068: Dichlorvos	62-73-7	0.5	µg/L	<0.5	2.5 µg/L	70.9	47.4	133
EP068: Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	2.5 µg/L	74.1	46.4	129
EP068: Monocrotophos	6923-22-4	2	µg/L	<2.0	2.5 µg/L	15.1	10.0	42.9
EP068: Dimethoate	60-51-5	0.5	µg/L	<0.5	2.5 µg/L	77.2	41.7	131
EP068: Diazinon	333-41-5	0.5	µg/L	<0.5	2.5 µg/L	78.1	50.5	122
EP068: Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	2.5 µg/L	77.4	52.4	123
EP068: Parathion-methyl	298-00-0	2	µg/L	<2.0	2.5 µg/L	77.4	52.0	132
EP068: Malathion	121-75-5	0.5	µg/L	<0.5	2.5 µg/L	77.3	51.8	133
EP068: Fenthion	55-38-9	0.5	µg/L	<0.5	2.5 µg/L	77.7	52.3	123
EP068: Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	2.5 µg/L	78.1	48.7	122
EP068: Parathion	56-38-2	2	µg/L	<2.0	2.5 µg/L	77.4	49.5	136
EP068: Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	2.5 µg/L	78.5	50.4	123
EP068: Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	2.5 µg/L	80.1	50.9	131
EP068: Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	2.5 µg/L	76.2	47.5	126
EP068: Fenamiphos	22224-92-6	0.5	µg/L	<0.5	2.5 µg/L	76.4	46.5	138
EP068: Prothiofos	34643-46-4	0.5	µg/L	<0.5	2.5 µg/L	79.4	49.2	119
EP068: Ethion	563-12-2	0.5	µg/L	<0.5	2.5 µg/L	79.3	50.0	126
EP068: Carbophenothion	786-19-6	0.5	µg/L	<0.5	2.5 µg/L	84.4	50.0	131
EP068: Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	2.5 µg/L	85.4	41.7	147
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup (QCLot: 5492853)								
EP071SG: C10 - C14 Fraction	----	50	µg/L	<50	4840 µg/L	50.2	38.6	119
EP071SG: C15 - C28 Fraction	----	100	µg/L	<100	15400 µg/L	56.6	36.8	130
EP071SG: C29 - C36 Fraction	----	50	µg/L	<50	8450 µg/L	54.4	53.1	128
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup (QCLot: 5492853)								
EP071SG: >C10 - C16 Fraction	----	100	µg/L	<100	6590 µg/L	50.4	49.0	132
EP071SG: >C16 - C34 Fraction	----	100	µg/L	<100	20400 µg/L	60.4	59.0	134
EP071SG: >C34 - C40 Fraction	----	100	µg/L	<100	1500 µg/L	56.8	52.6	102

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
EP074B: Oxygenated Compounds (QCLot: 5498855)								
EP074: 2-Propanone (Acetone)	67-64-1	50	µg/L	<50	200 µg/L	97.7	39.9	142
EP074D: Fumigants (QCLot: 5498855)								
EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	20 µg/L	89.8	71.1	118
EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	20 µg/L	102	78.5	117
EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	20 µg/L	93.8	75.7	115
EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	20 µg/L	86.9	76.4	115
EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	20 µg/L	100	77.1	118
EP074E: Halogenated Aliphatic Compounds (QCLot: 5498855)								
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	200 µg/L	93.2	51.9	140
EP074: Chloromethane	74-87-3	50	µg/L	<50	200 µg/L	113	63.2	134
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	200 µg/L	105	58.1	135
EP074: Bromomethane	74-83-9	50	µg/L	<50	200 µg/L	99.8	54.4	130
EP074: Chloroethane	75-00-3	50	µg/L	<50	200 µg/L	111	69.4	129
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	200 µg/L	107	70.1	126
EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	20 µg/L	106	68.4	125
EP074: Iodomethane	74-88-4	5	µg/L	<5	20 µg/L	91.9	30.9	126
EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	20 µg/L	106	70.8	122
EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	20 µg/L	108	76.6	121
EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	20 µg/L	107	79.1	120
EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	20 µg/L	99.2	72.5	120
EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	20 µg/L	100	69.4	120
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	20 µg/L	95.4	67.8	120
EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	20 µg/L	104	78.4	120
EP074: Trichloroethene	79-01-6	5	µg/L	<5	20 µg/L	102	73.1	120
EP074: Dibromomethane	74-95-3	5	µg/L	<5	20 µg/L	103	78.3	119
EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	20 µg/L	103	81.1	120
EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	20 µg/L	106	80.3	120
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	20 µg/L	106	73.1	118
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	20 µg/L	97.0	76.9	111
EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	20 µg/L	95.2	70.0	122
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	20 µg/L	80.2	62.4	118
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	20 µg/L	104	77.9	128
EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	20 µg/L	105	78.5	124
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	20 µg/L	91.6	68.5	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
EP074E: Halogenated Aliphatic Compounds (QCLot: 5498855) - continued								
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	20 µg/L	93.7	70.7	116
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	20 µg/L	119	60.0	134
EP074F: Halogenated Aromatic Compounds (QCLot: 5498855)								
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	20 µg/L	106	82.6	116
EP074: Bromobenzene	108-86-1	5	µg/L	<5	20 µg/L	106	79.3	115
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	20 µg/L	108	75.5	116
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	20 µg/L	106	75.0	115
EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	20 µg/L	104	76.9	116
EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	20 µg/L	108	78.4	118
EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	20 µg/L	105	82.2	113
EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	20 µg/L	115	67.4	124
EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	20 µg/L	114	70.4	124
EP074G: Trihalomethanes (QCLot: 5498855)								
EP074: Chloroform	67-66-3	5	µg/L	<5	20 µg/L	108	79.6	120
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	20 µg/L	104	76.3	117
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	20 µg/L	99.6	73.5	113
EP074: Bromoform	75-25-2	5	µg/L	<5	20 µg/L	94.4	68.5	113
EP075A: Phenolic Compounds (QCLot: 5492852)								
EP075: Phenol	108-95-2	2	µg/L	<2	10 µg/L	32.4	19.5	48.1
EP075: 2-Chlorophenol	95-57-8	2	µg/L	<2	10 µg/L	68.9	46.3	101
EP075: 2-Methylphenol	95-48-7	2	µg/L	<2	10 µg/L	71.2	41.1	94.4
EP075: 3- & 4-Methylphenol	1319-77-3	2	µg/L	<2	10 µg/L	64.6	35.1	88.8
EP075: 2-Nitrophenol	88-75-5	2	µg/L	<2	10 µg/L	74.9	45.3	113
EP075: 2.4-Dimethylphenol	105-67-9	2	µg/L	<2	10 µg/L	106	47.6	108
EP075: 2.4-Dichlorophenol	120-83-2	2	µg/L	<2	10 µg/L	76.0	48.2	110
EP075: 2.6-Dichlorophenol	87-65-0	2	µg/L	<2	10 µg/L	71.8	48.9	107
EP075: 4-Chloro-3-methylphenol	59-50-7	2	µg/L	<2	10 µg/L	78.2	47.2	110
EP075: 2.4.6-Trichlorophenol	88-06-2	2	µg/L	<2	10 µg/L	71.6	45.2	112
EP075: 2.4.5-Trichlorophenol	95-95-4	2	µg/L	<2	10 µg/L	71.9	42.4	113
EP075: Pentachlorophenol	87-86-5	4	µg/L	<4	10 µg/L	18.1	14.2	124
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 5492852)								
EP075: Naphthalene	91-20-3	2	µg/L	<2	10 µg/L	58.0	50.9	107
EP075: 2-Methylnaphthalene	91-57-6	2	µg/L	<2	10 µg/L	62.2	50.3	111
EP075: 2-Chloronaphthalene	91-58-7	2	µg/L	<2	10 µg/L	66.7	50.8	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
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 5492852) - continued								
EP075: Acenaphthylene	208-96-8	2	µg/L	<2	10 µg/L	76.8	52.9	111
EP075: Acenaphthene	83-32-9	2	µg/L	<2	10 µg/L	82.6	54.5	109
EP075: Fluorene	86-73-7	2	µg/L	<2	10 µg/L	83.8	55.7	110
EP075: Phenanthrene	85-01-8	2	µg/L	<2	10 µg/L	86.4	55.4	112
EP075: Anthracene	120-12-7	2	µg/L	<2	10 µg/L	84.6	55.9	111
EP075: Fluoranthene	206-44-0	2	µg/L	<2	10 µg/L	89.3	55.9	112
EP075: Pyrene	129-00-0	2	µg/L	<2	10 µg/L	87.6	56.5	112
EP075: N-2-Fluorenyl Acetamide	53-96-3	2	µg/L	<2	10 µg/L	86.2	50.0	118
EP075: Benz(a)anthracene	56-55-3	2	µg/L	<2	10 µg/L	85.3	55.5	114
EP075: Chrysene	218-01-9	2	µg/L	<2	10 µg/L	89.4	56.0	114
EP075: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	4	µg/L	<4	20 µg/L	98.4	55.4	120
EP075: 7.12-Dimethylbenz(a)anthracene	57-97-6	2	µg/L	<2	10 µg/L	94.7	54.4	121
EP075: Benzo(a)pyrene	50-32-8	2	µg/L	<2	10 µg/L	98.9	53.9	121
EP075: 3-Methylcholanthrene	56-49-5	2	µg/L	<2	10 µg/L	96.6	51.9	121
EP075: Indeno(1.2.3.cd)pyrene	193-39-5	2	µg/L	<2	10 µg/L	91.9	54.4	114
EP075: Dibenz(a.h)anthracene	53-70-3	2	µg/L	<2	10 µg/L	88.5	54.0	115
EP075: Benzo(g.h.i)perylene	191-24-2	2	µg/L	<2	10 µg/L	85.8	51.7	116
EP075C: Phthalate Esters (QCLot: 5492852)								
EP075: Dimethyl phthalate	131-11-3	2	µg/L	<2	10 µg/L	85.5	56.5	115
EP075: Diethyl phthalate	84-66-2	2	µg/L	<2	10 µg/L	95.4	58.0	113
EP075: Di-n-butyl phthalate	84-74-2	2	µg/L	<2	10 µg/L	87.5	57.6	120
EP075: Butyl benzyl phthalate	85-68-7	2	µg/L	<2	10 µg/L	89.5	56.3	119
EP075: bis(2-ethylhexyl) phthalate	117-81-7	10	µg/L	<10	10 µg/L	95.0	57.6	122
EP075: Di-n-octylphthalate	117-84-0	2	µg/L	<2	10 µg/L	95.2	56.5	122
EP075D: Nitrosamines (QCLot: 5492852)								
EP075: N-Nitrosomethylethylamine	10595-95-6	2	µg/L	<2	10 µg/L	46.8	23.9	106
EP075: N-Nitrosodiethylamine	55-18-5	2	µg/L	<2	10 µg/L	67.0	46.1	108
EP075: N-Nitrosopyrrolidine	930-55-2	4	µg/L	<4	10 µg/L	57.6	36.6	83.2
EP075: N-Nitrosomorpholine	59-89-2	2	µg/L	<2	10 µg/L	51.8	34.6	79.0
EP075: N-Nitrosodi-n-propylamine	621-64-7	2	µg/L	<2	10 µg/L	77.8	53.1	114
EP075: N-Nitrosopiperidine	100-75-4	2	µg/L	<2	10 µg/L	74.7	51.0	111
EP075: N-Nitrosodibutylamine	924-16-3	2	µg/L	<2	10 µg/L	65.5	37.0	111
EP075: N-Nitrosodiphenyl & Diphenylamine	86-30-6 122-39-4	4	µg/L	<4	10 µg/L	94.1	51.3	113

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
EP075D: Nitrosamines (QCLot: 5492852) - continued								
EP075: Methapyrilene	91-80-5	2	µg/L	<2	10 µg/L	32.9	10.0	125
EP075E: Nitroaromatics and Ketones (QCLot: 5492852)								
EP075: 2-Picoline	109-06-8	2	µg/L	<2	10 µg/L	58.4	18.8	108
EP075: Acetophenone	98-86-2	2	µg/L	<2	10 µg/L	72.3	52.5	111
EP075: Nitrobenzene	98-95-3	2	µg/L	<2	10 µg/L	71.6	50.6	109
EP075: Isophorone	78-59-1	2	µg/L	<2	10 µg/L	79.8	53.7	113
EP075: 2.6-Dinitrotoluene	606-20-2	4	µg/L	<4	10 µg/L	87.8	54.0	115
EP075: 2.4-Dinitrotoluene	121-14-2	4	µg/L	<4	10 µg/L	96.3	53.3	109
EP075: 1-Naphthylamine	134-32-7	2	µg/L	<2	10 µg/L	115	10.9	119
EP075: 4-Nitroquinoline-N-oxide	56-57-5	2	µg/L	<2	10 µg/L	114	27.3	147
EP075: 5-Nitro-o-toluidine	99-55-8	2	µg/L	<2	10 µg/L	101	44.6	119
EP075: Azobenzene	103-33-3	2	µg/L	<2	10 µg/L	88.1	55.6	110
EP075: 1.3.5-Trinitrobenzene	99-35-4	2	µg/L	<2	10 µg/L	102	37.6	124
EP075: Phenacetin	62-44-2	2	µg/L	<2	10 µg/L	93.1	44.8	101
EP075: 4-Aminobiphenyl	92-67-1	2	µg/L	<2	10 µg/L	92.1	24.0	149
EP075: Pentachloronitrobenzene	82-68-8	2	µg/L	<2	10 µg/L	91.0	54.6	111
EP075: Pronamide	23950-58-5	2	µg/L	<2	10 µg/L	86.8	56.5	113
EP075: Dimethylaminoazobenzene	60-11-7	2	µg/L	<2	10 µg/L	86.3	53.8	112
EP075: Chlorobenzilate	510-15-6	2	µg/L	<2	10 µg/L	92.3	55.0	113
EP075F: Haloethers (QCLot: 5492852)								
EP075: Bis(2-chloroethyl) ether	111-44-4	2	µg/L	<2	10 µg/L	67.7	45.3	112
EP075: Bis(2-chloroethoxy) methane	111-91-1	2	µg/L	<2	10 µg/L	77.8	52.7	111
EP075: 4-Chlorophenyl phenyl ether	7005-72-3	2	µg/L	<2	10 µg/L	90.7	55.8	110
EP075: 4-Bromophenyl phenyl ether	101-55-3	2	µg/L	<2	10 µg/L	94.1	55.7	114
EP075G: Chlorinated Hydrocarbons (QCLot: 5492852)								
EP075: 1.4-Dichlorobenzene	106-46-7	2	µg/L	<2	10 µg/L	45.3	43.2	104
EP075: 1.3-Dichlorobenzene	541-73-1	2	µg/L	<2	10 µg/L	44.5	42.7	103
EP075: 1.2-Dichlorobenzene	95-50-1	2	µg/L	<2	10 µg/L	44.5	44.4	104
EP075: Hexachloroethane	67-72-1	2	µg/L	<2	10 µg/L	42.6	41.5	105
EP075: 1.2.4-Trichlorobenzene	120-82-1	2	µg/L	<2	10 µg/L	55.6	46.1	107
EP075: Hexachloropropylene	1888-71-7	2	µg/L	<2	10 µg/L	46.6	41.4	109
EP075: Hexachlorobutadiene	87-68-3	2	µg/L	<2	10 µg/L	44.7	43.9	108
EP075: Hexachlorocyclopentadiene	77-47-4	10	µg/L	<10	10 µg/L	82.1	14.6	133
EP075: Pentachlorobenzene	608-93-5	2	µg/L	<2	10 µg/L	87.7	53.3	109

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
EP075G: Chlorinated Hydrocarbons (QCLot: 5492852) - continued								
EP075: Hexachlorobenzene (HCB)	118-74-1	4	µg/L	<4	10 µg/L	98.2	48.4	116
EP075H: Anilines and Benzidines (QCLot: 5492852)								
EP075: Aniline	62-53-3	2	µg/L	<2	10 µg/L	74.5	21.2	116
EP075: 4-Chloroaniline	106-47-8	2	µg/L	<2	10 µg/L	77.5	14.5	126
EP075: 2-Nitroaniline	88-74-4	4	µg/L	<4	10 µg/L	81.6	49.5	111
EP075: 3-Nitroaniline	99-09-2	4	µg/L	<4	10 µg/L	101	28.4	125
EP075: Dibenzofuran	132-64-9	2	µg/L	<2	10 µg/L	84.6	55.4	110
EP075: 4-Nitroaniline	100-01-6	2	µg/L	<2	10 µg/L	91.9	37.3	112
EP075: Carbazole	86-74-8	2	µg/L	<2	10 µg/L	91.8	51.6	116
EP075: 3.3`-Dichlorobenzidine	91-94-1	2	µg/L	<2	10 µg/L	102	42.3	142
EP075I: Organochlorine Pesticides (QCLot: 5492852)								
EP075: alpha-BHC	319-84-6	2	µg/L	<2	10 µg/L	87.4	56.2	112
EP075: beta-BHC	319-85-7	2	µg/L	<2	10 µg/L	96.1	56.2	113
EP075: gamma-BHC	58-89-9	2	µg/L	<2	10 µg/L	98.6	55.2	113
EP075: delta-BHC	319-86-8	2	µg/L	<2	10 µg/L	83.1	52.6	117
EP075: Heptachlor	76-44-8	2	µg/L	<2	10 µg/L	82.4	53.4	111
EP075: Aldrin	309-00-2	2	µg/L	<2	10 µg/L	83.7	54.0	112
EP075: Heptachlor epoxide	1024-57-3	2	µg/L	<2	10 µg/L	91.3	54.2	113
EP075: alpha-Endosulfan	959-98-8	2	µg/L	<2	10 µg/L	89.1	49.3	122
EP075: 4.4`-DDE	72-55-9	2	µg/L	<2	10 µg/L	88.5	56.0	121
EP075: Dieldrin	60-57-1	2	µg/L	<2	10 µg/L	85.7	55.2	118
EP075: Endrin	72-20-8	2	µg/L	<2	10 µg/L	97.6	52.7	121
EP075: beta-Endosulfan	33213-65-9	2	µg/L	<2	10 µg/L	81.6	55.1	119
EP075: 4.4`-DDD	72-54-8	2	µg/L	<2	10 µg/L	86.2	55.4	120
EP075: Endosulfan sulfate	1031-07-8	2	µg/L	<2	10 µg/L	88.0	49.6	123
EP075: 4.4`-DDT	50-29-3	4	µg/L	<4	10 µg/L	89.2	47.8	127
EP075J: Organophosphorus Pesticides (QCLot: 5492852)								
EP075: Dichlorvos	62-73-7	2	µg/L	<2	10 µg/L	81.1	50.1	115
EP075: Dimethoate	60-51-5	2	µg/L	<2	10 µg/L	96.6	40.8	108
EP075: Diazinon	333-41-5	2	µg/L	<2	10 µg/L	87.0	55.4	118
EP075: Chlorpyrifos-methyl	5598-13-0	2	µg/L	<2	10 µg/L	85.8	53.0	118
EP075: Malathion	121-75-5	2	µg/L	<2	10 µg/L	105	54.6	122
EP075: Fenthion	55-38-9	2	µg/L	<2	10 µg/L	91.0	55.1	119
EP075: Chlorpyrifos	2921-88-2	2	µg/L	<2	10 µg/L	89.0	55.3	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
EP075J: Organophosphorus Pesticides (QCLot: 5492852) - continued								
EP075: Pirimphos-ethyl	23505-41-1	2	µg/L	<2	10 µg/L	88.8	55.8	118
EP075: Chlorfenvinphos	470-90-6	2	µg/L	<2	10 µg/L	102	45.8	118
EP075: Prothiofos	34643-46-4	2	µg/L	<2	10 µg/L	90.7	56.1	118
EP075: Ethion	563-12-2	2	µg/L	<2	10 µg/L	95.5	57.7	119
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5492849)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	4840 µg/L	55.4	47.2	122
EP071: C15 - C28 Fraction	----	100	µg/L	<100	15400 µg/L	62.7	52.9	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8450 µg/L	64.0	50.4	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5498856)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	96.5	66.2	134
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5492849)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	6590 µg/L	56.3	49.1	125
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	20400 µg/L	63.2	51.6	128
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1500 µg/L	60.0	47.2	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5498856)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	96.0	66.2	132
EP080: BTEXN (QCLot: 5498856)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	95.8	68.8	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	95.2	72.9	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	96.1	71.7	130
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	99.3	72.3	136
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	102	75.9	134
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	101	68.3	131
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QCLot: 5499023)								
EP202-SL: 4-Chlorophenoxy acetic acid	122-88-3	10	µg/L	<10	100 µg/L	105	82.0	136
EP202-SL: 2.4-DB	94-82-6	10	µg/L	<10	100 µg/L	103	65.0	147
EP202-SL: Dicamba	1918-00-9	10	µg/L	<10	100 µg/L	101	83.0	137
EP202-SL: Mecoprop	93-65-2	10	µg/L	<10	100 µg/L	104	75.0	143
EP202-SL: MCPA	94-74-6	10	µg/L	<10	100 µg/L	104	76.0	140
EP202-SL: 2.4-DP	120-36-5	10	µg/L	<10	100 µg/L	103	76.0	144
EP202-SL: 2.4-D	94-75-7	10	µg/L	<10	100 µg/L	105	77.0	139
EP202-SL: Triclopyr	55335-06-3	10	µg/L	<10	100 µg/L	108	77.0	141
EP202-SL: Silvex (2.4.5-TP/Fenoprop)	93-72-1	10	µg/L	<10	100 µg/L	108	75.0	143

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
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QCLot: 5499023) - continued								
EP202-SL: 2.4.5-T	93-76-5	10	µg/L	<10	100 µg/L	106	78.0	140
EP202-SL: MCPB	94-81-5	10	µg/L	<10	100 µg/L	101	69.2	139
EP202-SL: Picloram	1918-02-1	10	µg/L	<10	100 µg/L	108	70.0	144
EP202-SL: Clopyralid	1702-17-6	10	µg/L	<10	100 µg/L	103	70.0	145
EP202-SL: Fluroxypyr	69377-81-7	10	µg/L	<10	100 µg/L	112	77.0	145

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: 5492330)							
EM2322241-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED043S: Total Oxidised Sulfur as S (QCLot: 5495220)							
EM2322095-001	Anonymous	ED043S: Total Oxidised Sulfur as S	----	167 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5492329)							
EM2322200-002	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	118	70.0	142
EG020F: Dissolved Metals by ICP-MS (QCLot: 5495003)							
EM2322241-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	111	76.6	124
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	102	74.6	118
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	117	71.0	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	122	76.0	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	112	75.0	133
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	122	64.0	134
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	123	73.0	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	129	75.0	131
EG020T: Total Metals by ICP-MS (QCLot: 5498505)							
EM2322267-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	111	82.0	123
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	104	81.8	123
		EG020A-T: Chromium	7440-47-3	1 mg/L	96.2	78.9	119
		EG020A-T: Copper	7440-50-8	1 mg/L	100	80.4	118
		EG020A-T: Lead	7439-92-1	1 mg/L	95.7	80.5	121
		EG020A-T: Manganese	7439-96-5	1 mg/L	95.6	73.0	123

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: 5498505) - continued							
EM2322267-001	Anonymous	EG020A-T: Nickel	7440-02-0	1 mg/L	104	80.0	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	103	74.0	120
EG035F: Dissolved Mercury by FIMS (QCLot: 5495004)							
EM2322267-001	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	88.8	70.0	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5502971)							
EM2322267-001	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	# 60.1	70.0	130
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 5502489)							
EM2322271-001	Anonymous	EK026SF: Total Cyanide	57-12-5	0.2 mg/L	102	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5500829)							
EM2322413-002	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	98.8	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5492331)							
EM2322241-004	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	105	80.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5500828)							
EM2322413-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	106	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5501861)							
EM2322267-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	91.6	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5501860)							
EM2322267-001	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	89.8	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5492327)							
EM2322200-002	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	102	79.0	123
EK085M: Sulfide as S2- (QCLot: 5502421)							
--------		EK085: Sulfide as S2-	18496-25-8	25 mg/L	97.0	70.0	130
EP002: Dissolved Organic Carbon (DOC) (QCLot: 5502976)							
EM2322285-001	Anonymous	EP002: Dissolved Organic Carbon	----	100 mg/L	108	75.0	117
EP010: Formaldehyde (QCLot: 5492604)							
EM2322079-002	Anonymous	EP010: Formaldehyde	50-00-0	2.5 mg/L	82.0	73.0	130
EP050: Anionic Surfactants as MBAS (QCLot: 5497432)							
ES2343675-002	Anonymous	EP050: Anionic Surfactants as MBAS		1 mg/L	79.0	70.0	130
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QCLot: 5499023)							
EM2322269-001	Landfill leachate	EP202-SL: Mecoprop	93-65-2	100 µg/L	105	75.0	143
		EP202-SL: MCPA	94-74-6	100 µg/L	106	76.0	140
		EP202-SL: 2.4-D	94-75-7	100 µg/L	106	77.0	139
		EP202-SL: Triclopyr	55335-06-3	100 µg/L	113	77.0	141
		EP202-SL: 2.4.5-T	93-76-5	100 µg/L	106	78.0	140

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QCLot: 5499023) - continued							
EM2322269-001	Landfill leachate	EP202-SL: Picloram	1918-02-1	100 µg/L	113	70.0	144
		EP202-SL: Clopyralid	1702-17-6	100 µg/L	108	70.0	145

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2322269**	Page	: 1 of 14
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM KING	Telephone	: +6138549 9645
Project	: 12564388	Date Samples Received	: 13-Dec-2023
Site	: ----	Issue Date	: 27-Dec-2023
Sampler	: NB	No. of samples received	: 1
Order number	: 12564388	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : 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	EM2322241--004	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED043S: Total Oxidised Sulfur as S	EM2322095--001	Anonymous	**Total Oxidised Sulfur as S**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG035T: Total Recoverable Mercury by FIMS	EM2322267--001	Anonymous	**Mercury**	7439-97-6	60.1 %	70.0-130%	**Recovery less than lower data quality objective**

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)						
Pesticides by GCMS	EP068	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	21	9.52	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
Pesticides by GCMS	EP068	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	0	1	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)							
Landfill leachate	**12-Dec-2023**	**----**	----	**----**	**15-Dec-2023**	19-Dec-2023	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H)							
Landfill leachate	**12-Dec-2023**	**----**	----	**----**	**15-Dec-2023**	19-Dec-2023	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
Landfill leachate	**12-Dec-2023**	**----**	----	**----**	**19-Dec-2023**	26-Dec-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
Landfill leachate	**12-Dec-2023**	**----**	----	**----**	**14-Dec-2023**	09-Jan-2024	✓
ED043S: Total Oxidised Sulfur as S							
Clear Plastic Bottle - Natural (ED043S)							
Landfill leachate	**12-Dec-2023**	**15-Dec-2023**	09-Jan-2024	✓	**15-Dec-2023**	09-Jan-2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
Landfill leachate	**12-Dec-2023**	**----**	----	**----**	**14-Dec-2023**	09-Jan-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F)							
Landfill leachate	**12-Dec-2023**	**----**	----	**----**	**15-Dec-2023**	09-Jan-2024	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)							
Landfill leachate	**12-Dec-2023**	**----**	----	**----**	**15-Dec-2023**	09-Jun-2024	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
Landfill leachate	**12-Dec-2023**	**18-Dec-2023**	09-Jun-2024	✓	**18-Dec-2023**	09-Jun-2024	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F)							
Landfill leachate	**12-Dec-2023**	**----**	----	**----**	**15-Dec-2023**	09-Jan-2024	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG035T)							
Landfill leachate	**12-Dec-2023**	**----**	----	**----**	**19-Dec-2023**	09-Jan-2024	✓
EK026SF: Total CN by Segmented Flow Analyser							
Black Opaque Plastic Bottle - NaOH (EK026SF)							
Landfill leachate	**12-Dec-2023**	**----**	----	**----**	**20-Dec-2023**	26-Dec-2023	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
Landfill leachate	**12-Dec-2023**	**----**	----	**----**	**19-Dec-2023**	09-Jan-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
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) Landfill leachate	**12-Dec-2023**	**----**	----	**----**	**14-Dec-2023**	14-Dec-2023	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) Landfill leachate	**12-Dec-2023**	**----**	----	**----**	**19-Dec-2023**	09-Jan-2024	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) Landfill leachate	**12-Dec-2023**	**20-Dec-2023**	09-Jan-2024	✓	**21-Dec-2023**	09-Jan-2024	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) Landfill leachate	**12-Dec-2023**	**20-Dec-2023**	09-Jan-2024	✓	**21-Dec-2023**	09-Jan-2024	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) Landfill leachate	**12-Dec-2023**	**----**	----	**----**	**14-Dec-2023**	14-Dec-2023	✓
EK085M: Sulfide as S2-							
Clear Plastic Bottle - Zinc Acetate/NaOH (EK085) Landfill leachate	**12-Dec-2023**	**----**	----	**----**	**19-Dec-2023**	19-Dec-2023	✓
EK086: Sulfite as SO3 2-							
Clear Plastic Bottle - EDTA/Zinc Acetate (EK086) Landfill leachate	**12-Dec-2023**	**----**	----	**----**	**14-Dec-2023**	14-Dec-2023	✓
EK087: Thiosulfate as S2O3 2-							
Clear Plastic Bottle - EDTA/Zinc Acetate (EK087) Landfill leachate	**12-Dec-2023**	**----**	----	**----**	**14-Dec-2023**	14-Dec-2023	✓
EP002: Dissolved Organic Carbon (DOC)							
Amber DOC Filtered- Sulfuric Preserved (EP002) Landfill leachate	**12-Dec-2023**	**----**	----	**----**	**22-Dec-2023**	09-Jan-2024	✓
EP010: Formaldehyde							
Clear Plastic Bottle - Natural (EP010) Landfill leachate	**12-Dec-2023**	**----**	----	**----**	**14-Dec-2023**	14-Dec-2023	✓
EP020: Oil and Grease (O&G)							
Amber Jar - Sulfuric Acid or Sodium Bisulfate (EP020) Landfill leachate	**12-Dec-2023**	**----**	----	**----**	**21-Dec-2023**	09-Jan-2024	✓
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030) Landfill leachate	**12-Dec-2023**	**----**	----	**----**	**14-Dec-2023**	14-Dec-2023	✓
EP050: Anionic Surfactants as MBAS							
Pres. with Formaldehyde on receipt (EP050) Landfill leachate	**12-Dec-2023**	**----**	----	**----**	**16-Dec-2023**	16-Dec-2023	✓

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
EP066: Polychlorinated Biphenyls (PCB)							
Amber Glass Bottle - Unpreserved (EP066)							
Landfill leachate	**12-Dec-2023**	**14-Dec-2023**	19-Dec-2023	✓	**19-Dec-2023**	23-Jan-2024	✓
EP068A: Organochlorine Pesticides (OC)							
Amber Glass Bottle - Unpreserved (EP068)							
Landfill leachate	**12-Dec-2023**	**14-Dec-2023**	19-Dec-2023	✓	**18-Dec-2023**	23-Jan-2024	✓
EP068B: Organophosphorus Pesticides (OP)							
Amber Glass Bottle - Unpreserved (EP068)							
Landfill leachate	**12-Dec-2023**	**14-Dec-2023**	19-Dec-2023	✓	**18-Dec-2023**	23-Jan-2024	✓
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071SG)							
Landfill leachate	**12-Dec-2023**	**14-Dec-2023**	19-Dec-2023	✓	**18-Dec-2023**	23-Jan-2024	✓
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071SG)							
Landfill leachate	**12-Dec-2023**	**14-Dec-2023**	19-Dec-2023	✓	**18-Dec-2023**	23-Jan-2024	✓
EP074B: Oxygenated Compounds							
Amber VOC Vial - Sulfuric Acid (EP074)							
Landfill leachate	**12-Dec-2023**	**18-Dec-2023**	26-Dec-2023	✓	**18-Dec-2023**	26-Dec-2023	✓
EP074D: Fumigants							
Amber VOC Vial - Sulfuric Acid (EP074)							
Landfill leachate	**12-Dec-2023**	**18-Dec-2023**	26-Dec-2023	✓	**18-Dec-2023**	26-Dec-2023	✓
EP074E: Halogenated Aliphatic Compounds							
Amber VOC Vial - Sulfuric Acid (EP074)							
Landfill leachate	**12-Dec-2023**	**18-Dec-2023**	26-Dec-2023	✓	**18-Dec-2023**	26-Dec-2023	✓
EP074F: Halogenated Aromatic Compounds							
Amber VOC Vial - Sulfuric Acid (EP074)							
Landfill leachate	**12-Dec-2023**	**18-Dec-2023**	26-Dec-2023	✓	**18-Dec-2023**	26-Dec-2023	✓
EP074G: Trihalomethanes							
Amber VOC Vial - Sulfuric Acid (EP074)							
Landfill leachate	**12-Dec-2023**	**18-Dec-2023**	26-Dec-2023	✓	**18-Dec-2023**	26-Dec-2023	✓
EP075A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved (EP075)							
Landfill leachate	**12-Dec-2023**	**14-Dec-2023**	19-Dec-2023	✓	**18-Dec-2023**	23-Jan-2024	✓
EP075B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075)							
Landfill leachate	**12-Dec-2023**	**14-Dec-2023**	19-Dec-2023	✓	**18-Dec-2023**	23-Jan-2024	✓
EP075C: Phthalate Esters							
Amber Glass Bottle - Unpreserved (EP075)							
Landfill leachate	**12-Dec-2023**	**14-Dec-2023**	19-Dec-2023	✓	**18-Dec-2023**	23-Jan-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
EP075D: Nitrosamines							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**12-Dec-2023**	**14-Dec-2023**	19-Dec-2023	✓	**18-Dec-2023**	23-Jan-2024	✓
EP075E: Nitroaromatics and Ketones							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**12-Dec-2023**	**14-Dec-2023**	19-Dec-2023	✓	**18-Dec-2023**	23-Jan-2024	✓
EP075F: Haloethers							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**12-Dec-2023**	**14-Dec-2023**	19-Dec-2023	✓	**18-Dec-2023**	23-Jan-2024	✓
EP075G: Chlorinated Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**12-Dec-2023**	**14-Dec-2023**	19-Dec-2023	✓	**18-Dec-2023**	23-Jan-2024	✓
EP075H: Anilines and Benzidines							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**12-Dec-2023**	**14-Dec-2023**	19-Dec-2023	✓	**18-Dec-2023**	23-Jan-2024	✓
EP075I: Organochlorine Pesticides							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**12-Dec-2023**	**14-Dec-2023**	19-Dec-2023	✓	**18-Dec-2023**	23-Jan-2024	✓
EP075J: Organophosphorus Pesticides							
Amber Glass Bottle - Unpreserved (EP075) Landfill leachate	**12-Dec-2023**	**14-Dec-2023**	19-Dec-2023	✓	**18-Dec-2023**	23-Jan-2024	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) Landfill leachate	**12-Dec-2023**	**14-Dec-2023**	19-Dec-2023	✓	**18-Dec-2023**	23-Jan-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) Landfill leachate	**12-Dec-2023**	**18-Dec-2023**	26-Dec-2023	✓	**18-Dec-2023**	26-Dec-2023	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) Landfill leachate	**12-Dec-2023**	**14-Dec-2023**	19-Dec-2023	✓	**18-Dec-2023**	23-Jan-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) Landfill leachate	**12-Dec-2023**	**18-Dec-2023**	26-Dec-2023	✓	**18-Dec-2023**	26-Dec-2023	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) Landfill leachate	**12-Dec-2023**	**18-Dec-2023**	26-Dec-2023	✓	**18-Dec-2023**	26-Dec-2023	✓
EP202A: Phenoxyacetic Acid Herbicides by LCMS							
Amber Glass Bottle - Unpreserved (EP202-SL) Landfill leachate	**12-Dec-2023**	----	----	----	**18-Dec-2023**	19-Dec-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
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	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Anionic Surfactants as MBAS	EP050	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Organic Carbon	EP002	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	0	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202-SL	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	0	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	0	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfide as S2-	EK085	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfite as SO3 2-	EK086	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	21	**9.52**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Thiosulfate as S2O3 2-	EK087	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	3	24	**12.50**	**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 Oxidised Sulfur as S	ED043S	1	4	**25.00**	**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	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	0	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	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							
Ammonia as N by Discrete analyser	EK055G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Anionic Surfactants as MBAS	EP050	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Organic Carbon	EP002	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Oil and Grease	EP020	4	50	**8.00**	**8.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202-SL	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfide as S2-	EK085	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfite as SO3 2-	EK086	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	21	**14.29**	**7.50**	✓	NEPM 2013 B3 & ALS QC Standard
Thiosulfate as S2O3 2-	EK087	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	3	24	**12.50**	**7.50**	✓	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 Oxidised Sulfur as S	ED043S	1	4	**25.00**	**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	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Anionic Surfactants as MBAS	EP050	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	4	**25.00**	**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*	
Method Blanks (MB) - Continued							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Organic Carbon	EP002	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Oil and Grease	EP020	3	50	**6.00**	**6.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202-SL	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfide as S2-	EK085	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfite as SO3 2-	EK086	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Thiosulfate as S2O3 2-	EK087	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	24	**8.33**	**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 Oxidised Sulfur as S	ED043S	1	4	**25.00**	**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	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Anionic Surfactants as MBAS	EP050	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Organic Carbon	EP002	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	0	1	**0.00**	**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*	
Matrix Spikes (MS) - Continued							
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202-SL	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfide as S2-	EK085	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total 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 Oxidised Sulfur as S	ED043S	1	4	**25.00**	**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	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
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)
Total Oxidised Sulfur as S	ED043S	WATER	In house: The sample is treated with Peroxide to convert all Sulfur species to Sulfate. Sulfate in the sample can then be determined by ICPAES and reported as TOS as S.
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.

Analytical Methods	Method	Matrix	Method Descriptions
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).
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).
Total Cyanide by Segmented Flow Analyser	EK026SF	WATER	In house: Referenced to APHA 4500-CN C&O / ASTM D7511 / ISO 14403. Sodium hydroxide preserved samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM Schedule B(3)
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)

Analytical Methods	Method	Matrix	Method Descriptions
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)
Sulfide as S2-	EK085	WATER	In house: Referenced to APHA 4500-S2- D. Sulfide species present in water samples are immediately precipitated when collected in pretreated caustic/zinc acetate preserved sample containers. The sulphides are coloured using methylene blue indicator. Non-detects may be screened by comparison against a standard at half-LOR, otherwise samples are measured using UV-VIS detection at 664nm. This method is compliant with NEPM Schedule B(3)
Sulfite as SO3 2-	EK086	WATER	In house: Referenced to APHA 4500-SO32- B. Sulfite is determined by standardised Iodate / Iodide titration.
Thiosulfate as S2O3 2-	EK087	WATER	In house: Thiosulfate is determined by standardised Iodate / Iodide titration following formalehyde pretreatment.
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Dissolved Organic Carbon	EP002	WATER	In house: Referenced to APHA 5310 B. This method is compliant with NEPM Schedule B(3). Samples are combusted at high temperature in the presence of an oxidative catalyst. The evolved carbon dioxide is quantified using an IR detector.
Formaldehyde	EP010	WATER	In house: Referenced to ASTM D 6303-98. s
Oil and Grease	EP020	WATER	In house: Referenced to APHA 5520 B. Oil & grease is a gravimetric procedure to determine the amount of dissolved or emulsified oil & grease residue in an aqueous sample. The sample is serially extracted three times n-hexane. The resultant extracts are combined, dehydrated and concentrated prior to gravimetric determination. This method is compliant with NEPM Schedule B(3)
Biochemical Oxygen Demand (BOD)	EP030	WATER	In house: Referenced to APHA 5210 B. The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. This method is compliant with NEPM Schedule B(3).
Anionic Surfactants as MBAS	EP050	WATER	In house: Referenced to APHA 5540 B&C. This method comprises three successive extractions from acid aqueous medium containing excess methylene blue, into chloroform, followed by an aqueous backwash and measurement of the colour by spectrophotometry at 652nm. This method is compliant with NEPM Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
Pesticides by GCMS	EP068	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. 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 - Total Recoverable Hydrocarbons - Silica Gel Cleanup	EP071SG	WATER	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM Schedule B(3).

Analytical Methods	Method	Matrix	Method Descriptions
Volatile Organic Compounds	EP074	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. This method is compliant with NEPM Schedule B(3)
Semivolatile Organic Compounds	EP075	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS 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)
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202-SL	WATER	In house: LCMS (Electrospray in negative mode). After adding surrogate and acetic acid, water samples are injected on a C18 column for LC/MS determination.

Preparation Methods	Method	Matrix	Method Descriptions
Total Oxidisable Sulfur as SO4 2- Prep	ED043-PR	WATER	In house
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.

CERTIFICATE OF ANALYSIS

Work Order	: **ES2310811**	Page	: 1 of 4
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: SAMANTHA KING	Contact	: Sarah Mathew
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 12564388	Date Samples Received	: 31-Mar-2023 14:30
Order number	: 12564388	Date Analysis Commenced	: 31-Mar-2023
C-O-C number	: ----	Issue Date	: 11-Apr-2023 13:23
Sampler	: ----		
Site	:		
Quote number	: EN/005		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- 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.
- EN055: Ionic Balance out of acceptable limits for sample ES2310811-#001 due to analytes not quantified in this report.
- 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.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QQC1	----	----	----	----
				Sampling date / time	28-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2310811-001	--------	--------	--------	--------
					Result	----	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**6.72**	----	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**239**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		**607**	----	----	----	----
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		**96**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**96**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**26**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**22**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**14**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**8**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**19**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**9**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS									
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		**0.007**	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		**0.040**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.005**	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
Iron	7439-89-6	0.05	mg/L		**0.21**	----	----	----	----
EG020T: Total Metals by ICP-MS									
Cadmium	7440-43-9	0.0001	mg/L		**0.0008**	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		**0.298**	----	----	----	----
Copper	7440-50-8	0.001	mg/L		**0.249**	----	----	----	----
Lead	7439-92-1	0.001	mg/L		**0.195**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QQC1	----	----	----	----
				Sampling date / time	28-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2310811-001	--------	--------	--------	--------
					Result	----	----	----	----
EG020T: Total Metals by ICP-MS - Continued									
Manganese	7439-96-5	0.001	mg/L		**2.52**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.309**	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.773**	----	----	----	----
Iron	7439-89-6	0.05	mg/L		**176**	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.55**	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		**0.12**	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.38**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.50**	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**30.5**	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**31.0**	----	----	----	----
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser									
Filtered Total Phosphorus as P	----	0.01	mg/L		**6.35**	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**14.2**	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.33**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**3.08**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**2.41**	----	----	----	----
ø Ionic Balance	----	0.01	%		**12.1**	----	----	----	----
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L		**3**	----	----	----	----

QUALITY CONTROL REPORT

Work Order	: **ES2310811**	Page	: 1 of 7
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: SAMANTHA KING	Contact	: Sarah Mathew
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 12564388	Date Samples Received	: 31-Mar-2023
Order number	: 12564388	Date Analysis Commenced	: 31-Mar-2023
C-O-C number	: ----	Issue Date	: 11-Apr-2023
Sampler	: ----		
Site	:		
Quote number	: EN/005		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

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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 (%)*
EA005P: pH by PC Titrator (QC Lot: 4967217)									
ES2310805-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.19	8.21	0.2	0% - 20%
EW2301455-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	6.61	6.68	1.1	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4967211)									
ES2307591-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	22600	22600	0.2	0% - 20%
ES2307591-011	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	<1	0.0	No Limit
ES2310804-010	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	125	125	0.0	0% - 20%
EW2301456-011	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	<1	0.0	No Limit
ES2310804-005	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	115	114	0.0	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 4968738)									
ES2310644-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	1130	1240	9.1	0% - 20%
ES2310811-001	QQC1	EA025H: Suspended Solids (SS)	----	5	mg/L	607	662	8.6	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4967216)									
EW2301455-001	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	3	2	0.0	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	3	2	0.0	No Limit
ES2310804-005	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	47	46	2.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	47	46	2.4	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4967189)									
ES2310619-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1	1	0.0	No Limit
ES2310810-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	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 (%)*
ED045G: Chloride by Discrete Analyser (QC Lot: 4967190)									
ES2310619-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1	1	0.0	No Limit
ES2310810-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	19	20	0.0	0% - 50%
ED093F: Dissolved Major Cations (QC Lot: 4969772)									
ES2310719-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	356	353	0.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	269	270	0.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	86	87	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	10	10	0.0	0% - 50%
ES2310720-009	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	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	12	12	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 4969773)									
ES2310719-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	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	0.225	0.228	1.3	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.014	0.015	0.0	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.016	0.017	6.7	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
ES2310720-009	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	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	0.032	0.033	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	0.420	0.423	0.6	0% - 20%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.36	0.38	3.6	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 4968291)									
ES2310720-015	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	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: Manganese	7439-96-5	0.001	mg/L	0.046	0.047	0.0	0% - 20%
		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	0.014	0.010	35.2	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.27	0.26	0.0	No Limit
ES2310804-010	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	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	0.004	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: 4968291) - continued									
ES2310804-010	Anonymous	EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.045	0.046	0.0	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.005	0.006	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.007	0.007	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	1.86	1.91	2.9	0% - 20%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 4970846)									
ES2310811-001	QQC1	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.55	0.54	0.0	0% - 20%
ES2311083-004	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: 4967192)									
ES2310829-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2310810-001	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: 4970847)									
ES2310936-006	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2310811-001	QQC1	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.50	0.54	8.5	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 4970850)									
ES2310811-001	QQC1	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	30.5	28.4	7.0	0% - 50%
ES2310936-008	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<1.0	<1.0	0.0	No Limit
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser (QC Lot: 4970845)									
ES2310811-001	QQC1	EK067FG: Filtered Total Phosphorus as P	----	0.01	mg/L	6.35	7.31	14.1	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 4970849)									
ES2310811-001	QQC1	EK067G: Total Phosphorus as P	----	0.01	mg/L	14.2	13.6	4.4	0% - 20%
ES2310936-008	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.36	0.41	13.7	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4967191)									
ES2310773-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.02	0.02	0.0	No Limit
ES2310813-003	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.31	0.31	0.0	0% - 20%
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 4967187)									
ES2310811-001	QQC1	EP030: Biochemical Oxygen Demand	----	2	mg/L	3	2	40.0	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
EA005P: pH by PC Titrator (QCLot: 4967217)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.8	101
				----	7 pH Unit	99.8	99.2	101
EA010P: Conductivity by PC Titrator (QCLot: 4967211)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	95.0	89.9	110
				<1	2100 µS/cm	91.6	90.2	111
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 4968738)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	98.7	83.0	129
				<5	1000 mg/L	93.3	82.0	110
				<5	825 mg/L	102	83.0	118
ED037P: Alkalinity by PC Titrator (QCLot: 4967216)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	99.9	81.0	111
				----	50 mg/L	105	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4967189)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	105	82.0	122
				<1	500 mg/L	101	82.0	122
ED045G: Chloride by Discrete Analyser (QCLot: 4967190)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	98.9	80.9	127
				<1	1000 mg/L	97.3	80.9	127
ED093F: Dissolved Major Cations (QCLot: 4969772)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.6	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	104	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: 4969773)								
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	95.1	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	94.0	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	94.2	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	95.2	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	92.9	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	97.8	81.0	117

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
EG020F: Dissolved Metals by ICP-MS (QCLot: 4969773) - continued								
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	94.2	82.0	112
EG020T: Total Metals by ICP-MS (QCLot: 4968291)								
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.1	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	101	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	103	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	99.7	85.0	115
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	102	85.0	113
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	103	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	102	79.0	117
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	103	85.0	117
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4970846)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	97.7	90.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4967192)								
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: 4970847)								
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: 4970850)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	93.9	69.0	101
				<0.1	1 mg/L	98.4	70.0	118
				<0.1	5 mg/L	102	70.0	130
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser (QCLot: 4970845)								
EK067FG: Filtered Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	82.0	71.0	115
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4970849)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	89.0	71.3	126
				<0.01	0.442 mg/L	102	71.3	126
				<0.01	1 mg/L	102	71.3	126
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4967191)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	96.2	85.0	117
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 4967187)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	200 mg/L	98.5	74.0	112

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4967189)							
ES2310619-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	105	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4967190)							
ES2310619-001	Anonymous	ED045G: Chloride	16887-00-6	50 mg/L	100	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 4969773)							
ES2310719-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.25 mg/L	97.2	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	96.3	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	93.5	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	94.2	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	95.7	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4968291)							
ES2310804-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.25 mg/L	125	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	129	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	129	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	123	70.0	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	130	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	127	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	126	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4970846)							
ES2310811-001	QQC1	EK055G: Ammonia as N	7664-41-7	1 mg/L	74.7	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4967192)							
ES2310810-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	96.5	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4970847)							
ES2310811-001	QQC1	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	72.5	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4970850)							
ES2310855-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	# Not Determined	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4970849)							
ES2310855-001	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	# Not Determined	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4967191)							
ES2310773-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	93.7	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2310811**	Page	: 1 of 8
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: SAMANTHA KING	Telephone	: +61-2-8784 8555
Project	: 12564388	Date Samples Received	: 31-Mar-2023
Site	:	Issue Date	: 11-Apr-2023
Sampler	: ----	No. of samples received	: 1
Order number	: 12564388	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

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

Outliers : 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							
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser	ES2310855--001	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	ES2310855--001	Anonymous	**Total Phosphorus as P**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
QQC1	----	----	----	31-Mar-2023	28-Mar-2023	**3**
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural						
QQC1	----	----	----	01-Apr-2023	30-Mar-2023	**2**
EK071G: Reactive Phosphorus as P by discrete analyser						
Clear Plastic Bottle - Natural						
QQC1	----	----	----	01-Apr-2023	30-Mar-2023	**2**
EP030: Biochemical Oxygen Demand (BOD)						
Clear Plastic Bottle - Natural						
QQC1	----	----	----	31-Mar-2023	30-Mar-2023	**1**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count: QC	Count: Regular	Rate (%): Actual	Rate (%): Expected	Quality Control Specification
Matrix Spikes (MS)					
Filtered Total Phosphorus as P By Discrete Analy	0	1	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
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
QQC1	**28-Mar-2023**	**----**	----	----	**31-Mar-2023**	28-Mar-2023	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
QQC1	**28-Mar-2023**	**----**	----	----	**31-Mar-2023**	25-Apr-2023	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H)							
QQC1	**28-Mar-2023**	**----**	----	----	**03-Apr-2023**	04-Apr-2023	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
QQC1	**28-Mar-2023**	**----**	----	----	**31-Mar-2023**	11-Apr-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
QQC1	**28-Mar-2023**	**----**	----	----	**01-Apr-2023**	25-Apr-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
QQC1	**28-Mar-2023**	**----**	----	----	**01-Apr-2023**	25-Apr-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F)							
QQC1	**28-Mar-2023**	**----**	----	----	**03-Apr-2023**	25-Apr-2023	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)							
QQC1	**28-Mar-2023**	**----**	----	----	**03-Apr-2023**	24-Sep-2023	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
QQC1	**28-Mar-2023**	**03-Apr-2023**	24-Sep-2023	✓	**03-Apr-2023**	24-Sep-2023	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
QQC1	**28-Mar-2023**	**----**	----	----	**05-Apr-2023**	25-Apr-2023	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
QQC1	**28-Mar-2023**	**----**	----	----	**01-Apr-2023**	30-Mar-2023	×
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
QQC1	**28-Mar-2023**	**----**	----	----	**05-Apr-2023**	25-Apr-2023	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
QQC1	**28-Mar-2023**	**04-Apr-2023**	25-Apr-2023	✓	**05-Apr-2023**	25-Apr-2023	✓

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
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067FG)							
QQC1	**28-Mar-2023**	**04-Apr-2023**	25-Apr-2023	✓	**04-Apr-2023**	25-Apr-2023	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
QQC1	**28-Mar-2023**	**04-Apr-2023**	25-Apr-2023	✓	**05-Apr-2023**	25-Apr-2023	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
QQC1	**28-Mar-2023**	**----**	----	----	**01-Apr-2023**	30-Mar-2023	×
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030)							
QQC1	**28-Mar-2023**	**----**	----	----	**31-Mar-2023**	30-Mar-2023	×

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
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
Biochemical Oxygen Demand (BOD)	EP030	1	5	**20.00**	**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
Conductivity by Auto Titrator	EA010-P	5	46	**10.87**	**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
Filtered Total Phosphorus as P By Discrete Analy	EK067FG	1	1	**100.00**	**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
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	19	**10.53**	**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 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
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
Biochemical Oxygen Demand (BOD)	EP030	1	5	**20.00**	**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
Conductivity by Auto Titrator	EA010-P	4	46	**8.70**	**8.33**	✓	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
Filtered Total Phosphorus as P By Discrete Analy	EK067FG	1	1	**100.00**	**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
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	19	**15.79**	**15.00**	✓	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 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	3	20	**15.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							

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*	
Method Blanks (MB) - Continued							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	5	**20.00**	**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
Conductivity by Auto Titrator	EA010-P	1	46	**2.17**	**1.67**	✓	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
Filtered Total Phosphorus as P By Discrete Analy	EK067FG	1	1	**100.00**	**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	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	1	19	**5.26**	**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 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
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 Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Filtered Total Phosphorus as P By Discrete Analy	EK067FG	0	1	**0.00**	**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	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**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 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

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
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. 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.
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)

Analytical Methods	Method	Matrix	Method Descriptions
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)
Filtered Total Phosphorus as P By Discrete Analy	EK067FG	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a filtered 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)
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 1030F. This method is compliant with NEPM Schedule B(3)
Biochemical Oxygen Demand (BOD)	EP030	WATER	In house: Referenced to APHA 5210 B. The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. This method is compliant with 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)
TKN/TP (filtered) Digestion	EK061F/EK067F	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)

CERTIFICATE OF ANALYSIS

Work Order	: **ES2322157**	Page	: 1 of 4
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: SAM KING	Contact	: Sarah Mathew
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 12564388	Date Samples Received	: 04-Jul-2023 12:45
Order number	: 12564388	Date Analysis Commenced	: 04-Jul-2023
C-O-C number	: ----	Issue Date	: 10-Jul-2023 19:05
Sampler	: ----		
Site	: ----		
Quote number	: ME/770/21 V2		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- 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.
- 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.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QQC1	----	----	----	----
				Sampling date / time	29-Jun-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2322157-001	--------	--------	--------	--------
					Result	----	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**7.31**	----	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**402**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		**9**	----	----	----	----
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		**137**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**137**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**33**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**25**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**67**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**5**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**14**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**1**	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.02**	----	----	----	----
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		**1.40**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**1.40**	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**0.3**	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**1.7**	----	----	----	----
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser									
Filtered Total Phosphorus as P	----	0.01	mg/L		<0.01	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QQC1	----	----	----	----
				Sampling date / time	29-Jun-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2322157-001	--------	--------	--------	--------
					Result	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		<0.01	**----**	**----**	**----**	**----**
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**4.13**	**----**	**----**	**----**	**----**
ø **Total Cations**	----	0.01	meq/L		**4.39**	**----**	**----**	**----**	**----**
ø **Ionic Balance**	----	0.01	%		**3.05**	**----**	**----**	**----**	**----**
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L		<2	**----**	**----**	**----**	**----**

QUALITY CONTROL REPORT

Work Order	: **ES2322157**	Page	: 1 of 5
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: SAM KING	Contact	: Sarah Mathew
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 12564388	Date Samples Received	: 04-Jul-2023
Order number	: 12564388	Date Analysis Commenced	: 04-Jul-2023
C-O-C number	: ----	Issue Date	: 10-Jul-2023
Sampler	: ----		
Site	: ----		
Quote number	: ME/770/21 V2		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA005P: pH by PC Titrator (QC Lot: 5157333)									
ES2322135-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.17	8.18	0.1	0% - 20%
ES2322157-001	QQC1	EA005-P: pH Value	----	0.01	pH Unit	7.31	7.47	2.2	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5157334)									
ES2322135-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	6550	6750	3.0	0% - 20%
ES2322157-001	QQC1	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	402	425	5.6	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5156745)									
ES2321893-004	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	7410	7210	2.7	0% - 20%
ES2322176-002	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	56	62	8.5	0% - 50%
ES2322383-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ES2322437-005	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 5157336)									
ES2322135-001	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	1720	1720	0.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	1720	1720	0.2	0% - 20%
ES2322157-001	QQC1	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	137	138	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	137	138	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5151892)									
EW2302953-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	5	5	0.0	No Limit
ES2322157-001	QQC1	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	33	33	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5151893)									

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: 5151893) - continued									
ES2322245-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	7	7	0.0	No Limit
ES2322157-001	QQC1	ED045G: Chloride	16887-00-6	1	mg/L	25	25	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5155199)									
ES2322091-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	122	124	1.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	283	285	0.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	2170	2190	0.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	38	39	0.0	0% - 20%
ES2322133-009	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	6	6	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	7	7	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	44	43	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	4	3	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5158357)									
ES2322157-001	QQC1	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.05	58.9	No Limit
EW2302944-002	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.09	0.08	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5151894)									
ES2322157-001	QQC1	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: 5158358)									
ES2322157-001	QQC1	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	1.40	1.41	0.0	0% - 20%
EW2302944-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	20.8	20.5	1.5	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 5158356)									
ES2322157-001	QQC1	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.3	0.3	0.0	No Limit
EW2302952-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.2	0.2	0.0	No Limit
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser (QC Lot: 5158359)									
ES2322157-001	QQC1	EK067FG: Filtered Total Phosphorus as P	----	0.01	mg/L	<0.01	0.02	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 5158355)									
ES2322157-001	QQC1	EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	0.01	0.0	No Limit
EW2302952-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 5151461)									
ES2322157-001	QQC1	EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	<2	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 5157333)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.8	101
				----	7 pH Unit	100	99.2	101
EA010P: Conductivity by PC Titrator (QCLot: 5157334)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	94.6	89.9	110
				<1	2100 µS/cm	94.0	90.2	111
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5156745)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	113	83.0	129
				<5	1000 mg/L	101	82.0	110
				<5	926 mg/L	95.8	83.0	118
ED037P: Alkalinity by PC Titrator (QCLot: 5157336)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	91.7	81.0	115
				----	50 mg/L	96.0	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5151892)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	95.8	82.0	122
				<1	500 mg/L	98.2	82.0	122
ED045G: Chloride by Discrete Analyser (QCLot: 5151893)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	104	80.9	127
				<1	1000 mg/L	98.8	80.9	127
ED093F: Dissolved Major Cations (QCLot: 5155199)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	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	100	82.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	100	85.0	113
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5158357)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	96.0	90.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5151894)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	101	82.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5158358)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	99.7	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5158356)								

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
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5158356) - continued								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	82.8	69.0	101
				<0.1	1 mg/L	98.2	70.0	118
				<0.1	5 mg/L	90.1	70.0	130
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser (QCLot: 5158359)								
EK067FG: Filtered Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	92.6	71.0	115
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5158355)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	86.8	71.3	126
				<0.01	0.442 mg/L	88.4	71.3	126
				<0.01	1 mg/L	96.3	70.0	130
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 5151461)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	200 mg/L	94.5	74.0	112

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: 5151892)							
ES2322157-001	QQC1	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	88.8	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5151893)							
ES2322157-001	QQC1	ED045G: Chloride	16887-00-6	50 mg/L	116	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5158357)							
ES2322157-001	QQC1	EK055G: Ammonia as N	7664-41-7	1 mg/L	92.4	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5151894)							
ES2322157-001	QQC1	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	103	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5158358)							
ES2322157-001	QQC1	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	101	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5158356)							
ES2322269-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	# Not Determined	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5158355)							
ES2322269-002	Anonymous	EK067G: Total Phosphorus as P	----	10 mg/L	96.4	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2322157**	Page	: 1 of 8
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: SAM KING	Telephone	: +61-2-8784 8555
Project	: 12564388	Date Samples Received	: 04-Jul-2023
Site	: ----	Issue Date	: 10-Jul-2023
Sampler	: ----	No. of samples received	: 1
Order number	: 12564388	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

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

Outliers : 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							
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser	ES2322269--002	Anonymous	**Total Kjeldahl Nitrogen as N**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Due for extraction	Days overdue	Analysis: Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
QQC1	----	----	----	06-Jul-2023	29-Jun-2023	**7**
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural						
QQC1	----	----	----	05-Jul-2023	01-Jul-2023	**4**
EP030: Biochemical Oxygen Demand (BOD)						
Clear Plastic Bottle - Natural						
QQC1	----	----	----	04-Jul-2023	01-Jul-2023	**3**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count: QC	Regular	Rate (%): Actual	Expected	Quality Control Specification
Matrix Spikes (MS)					
Filtered Total Phosphorus as P By Discrete Analy	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Due for extraction	Evaluation	Analysis: 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
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
QQC1	29-Jun-2023	----	----	----	06-Jul-2023	29-Jun-2023	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
QQC1	29-Jun-2023	----	----	----	06-Jul-2023	27-Jul-2023	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H)							
QQC1	29-Jun-2023	----	----	----	06-Jul-2023	06-Jul-2023	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
QQC1	29-Jun-2023	----	----	----	06-Jul-2023	13-Jul-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
QQC1	29-Jun-2023	----	----	----	05-Jul-2023	27-Jul-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
QQC1	29-Jun-2023	----	----	----	05-Jul-2023	27-Jul-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
QQC1	29-Jun-2023	----	----	----	06-Jul-2023	06-Jul-2023	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
QQC1	29-Jun-2023	----	----	----	07-Jul-2023	27-Jul-2023	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
QQC1	29-Jun-2023	----	----	----	05-Jul-2023	01-Jul-2023	×
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
QQC1	29-Jun-2023	----	----	----	07-Jul-2023	27-Jul-2023	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
QQC1	29-Jun-2023	07-Jul-2023	27-Jul-2023	✓	07-Jul-2023	27-Jul-2023	✓
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067FG)							
QQC1	29-Jun-2023	07-Jul-2023	27-Jul-2023	✓	07-Jul-2023	27-Jul-2023	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
QQC1	29-Jun-2023	07-Jul-2023	27-Jul-2023	✓	07-Jul-2023	27-Jul-2023	✓

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
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030)							
QQC1	**29-Jun-2023**	**----**	----	**----**	**04-Jul-2023**	01-Jul-2023	×

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	1	**100.00**	**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
Conductivity by Auto Titrator	EA010-P	2	10	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Filtered Total Phosphorus as P By Discrete Analy	EK067FG	1	1	**100.00**	**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	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	14	**14.29**	**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 Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	1	**100.00**	**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
Conductivity by Auto Titrator	EA010-P	2	10	**20.00**	**8.33**	✓	NEPM 2013 B3 & ALS QC Standard
Filtered Total Phosphorus as P By Discrete Analy	EK067FG	1	1	**100.00**	**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	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	14	**14.29**	**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 Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	14	**21.43**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	3	14	**21.43**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	1	**100.00**	**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
Conductivity by Auto Titrator	EA010-P	1	10	**10.00**	**1.67**	✓	NEPM 2013 B3 & ALS QC Standard
Filtered Total Phosphorus as P By Discrete Analy	EK067FG	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

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*	
Method Blanks (MB) - Continued							
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	14	**7.14**	**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 Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	13	**7.69**	**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
Filtered Total Phosphorus as P By Discrete Analy	EK067FG	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	14	**7.14**	**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
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. 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)
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)

Analytical Methods	Method	Matrix	Method Descriptions
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)
Filtered Total Phosphorus as P By Discrete Analy	EK067FG	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a filtered 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)
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)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Biochemical Oxygen Demand (BOD)	EP030	WATER	In house: Referenced to APHA 5210 B. The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. This method is compliant with 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)
TKN/TP (filtered) Digestion	EK061F/EK067F	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)

CERTIFICATE OF ANALYSIS

Work Order	: **ES2331006**	Page	: 1 of 4
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: SAM KING	Contact	: Sarah Mathew
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 12564388 Dulverton Landfill Water Monitoring (SW 6 monthly)	Date Samples Received	: 12-Sep-2023 12:50
Order number	: 12564388	Date Analysis Commenced	: 13-Sep-2023
C-O-C number	: ----	Issue Date	: 19-Sep-2023 18:18
Sampler	: MIGUEL BENAVIDES		
Site	:		
Quote number	: EN/005		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- 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.
- EN055: Ionic Balance out of acceptable limits for sample ES2331006-#001 due to analytes not quantified in this report.
- 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	QQC1	----	----	----	----
				Sampling date / time	06-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2331006-001	--------	--------	--------	--------
					Result	----	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**7.90**	----	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**404**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		**11**	----	----	----	----
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		**155**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**155**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**27**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**23**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**59**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**4**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**12**	----	----	----	----
Potassium	7440-09-7	1	mg/L		<1	----	----	----	----
EG020F: Dissolved Metals by ICP-MS									
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	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		**0.007**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
Iron	7439-89-6	0.05	mg/L		<0.05	----	----	----	----
EG020T: Total Metals by ICP-MS									
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	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QQC1	----	----	----	----
				Sampling date / time	06-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2331006-001	--------	--------	--------	--------
					Result	----	----	----	----
EG020T: Total Metals by ICP-MS - Continued									
Manganese	7439-96-5	0.001	mg/L		**0.014**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.001**	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
Iron	7439-89-6	0.05	mg/L		**0.16**	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.03**	----	----	----	----
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		**0.92**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.92**	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**0.2**	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ **Total Nitrogen as N**	----	0.1	mg/L		**1.1**	----	----	----	----
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser									
Filtered Total Phosphorus as P	----	0.01	mg/L		<0.01	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		<0.01	----	----	----	----
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**4.31**	----	----	----	----
ø **Total Cations**	----	0.01	meq/L		**3.80**	----	----	----	----
ø **Ionic Balance**	----	0.01	%		**6.32**	----	----	----	----
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L		<2	----	----	----	----

QUALITY CONTROL REPORT

Work Order	: **ES2331006**	Page	: 1 of 7
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: SAM KING	Contact	: Sarah Mathew
Address	: 21-23 PATERSON ST LAUNCESTON TAS, AUSTRALIA 7250	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 12564388 Dulverton Landfill Water Monitoring (SW 6 monthly)	Date Samples Received	: 12-Sep-2023
Order number	: 12564388	Date Analysis Commenced	: 13-Sep-2023
C-O-C number	: ----	Issue Date	: 19-Sep-2023
Sampler	: MIGUEL BENAVIDES		
Site	:		
Quote number	: EN/005		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA005P: pH by PC Titrator (QC Lot: 5295075)									
ES2330251-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	6.09	6.10	0.2	0% - 20%
ES2330984-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	9.45	9.48	0.3	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5295076)									
EW2304016-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	670	669	0.0	0% - 20%
ES2330251-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	2	2	0.0	No Limit
ES2331062-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	103000	104000	1.4	0% - 20%
ES2331070-004	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	2070	2070	0.1	0% - 20%
ES2330984-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	278	280	0.7	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5295901)									
ES2331006-001	QQC1	EA025H: Suspended Solids (SS)	----	5	mg/L	11	10	9.8	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 5295078)									
ES2331062-002	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	60	60	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	60	60	0.0	0% - 20%
ES2330984-002	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	56	57	1.8	0% - 20%
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	76	76	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	133	133	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5294262)									
EW2304078-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	8	8	0.0	No Limit
ES2330955-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1	1	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 5294261)									

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: 5294261) - continued									
EW2304078-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	30	30	0.0	0% - 20%
ES2330955-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1590	1600	0.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5299357)									
ES2331006-001	QQC1	ED093F: Calcium	7440-70-2	1	mg/L	59	62	5.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	4	5	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	12	12	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
ES2330947-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	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	11	11	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5299356)									
ES2331006-001	QQC1	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	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	0.007	0.007	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
ES2330947-003	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	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	0.051	0.051	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	0.069	0.073	5.3	0% - 50%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.19	0.19	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 5300773)									
ES2331055-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0010	<0.0010	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		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	<0.010	<0.010	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.597	0.569	4.7	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.052	<0.052	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.70	0.64	9.0	No Limit
ES2330955-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	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	0.003	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: 5300773) - continued									
ES2330955-001	Anonymous	EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.186	0.188	1.2	0% - 20%
		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	0.029	0.030	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.44	0.57	25.7	0% - 50%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5302155)									
ES2330835-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	164	162	1.6	0% - 20%
ES2330985-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	38.8	38.1	1.7	0% - 20%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5294258)									
ES2330967-003	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.09	0.09	0.0	No Limit
ES2330832-021	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: 5302156)									
ES2331006-001	QQC1	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.92	0.91	1.6	0% - 20%
ES2331080-004	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: 5302153)									
ES2331006-001	QQC1	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.2	0.2	0.0	No Limit
ES2331080-003	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.2	0.2	0.0	No Limit
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser (QC Lot: 5302158)									
ES2331046-001	Anonymous	EK067FG: Filtered Total Phosphorus as P	----	0.01	mg/L	3280 µg/L	3.61	9.5	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 5302152)									
ES2331006-001	QQC1	EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2331080-003	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.03	0.05	46.3	No Limit
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 5295017)									
ES2330842-001	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	381	336	12.6	0% - 20%
ES2331003-001	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	<2	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 5295075)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.8	101
				----	7 pH Unit	100	99.2	101
EA010P: Conductivity by PC Titrator (QCLot: 5295076)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	96.1	89.9	110
				<1	2100 µS/cm	93.8	90.2	111
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5295901)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	90.7	83.0	129
				<5	1000 mg/L	88.1	82.0	110
				<5	931 mg/L	100	83.0	118
ED037P: Alkalinity by PC Titrator (QCLot: 5295078)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	93.2	81.0	115
				----	50 mg/L	97.8	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5294262)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	96.3	82.0	122
				<1	500 mg/L	98.4	82.0	122
ED045G: Chloride by Discrete Analyser (QCLot: 5294261)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	94.6	80.9	127
				<1	1000 mg/L	94.6	80.9	127
ED093F: Dissolved Major Cations (QCLot: 5299357)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.1	80.0	114
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.6	90.0	116
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	102	82.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.4	85.0	113
EG020F: Dissolved Metals by ICP-MS (QCLot: 5299356)								
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	99.9	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	96.8	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	94.6	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	97.2	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	93.8	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	95.3	81.0	117

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
EG020F: Dissolved Metals by ICP-MS (QCLot: 5299356) - continued								
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	95.5	82.0	112
EG020T: Total Metals by ICP-MS (QCLot: 5300773)								
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	100	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.5	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	102	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	109	85.0	115
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	103	85.0	113
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	98.2	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	104	79.0	117
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	106	85.0	117
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5302155)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	91.9	90.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5294258)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	97.6	82.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5302156)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	98.2	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5302153)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	95.6	69.0	101
				<0.1	1 mg/L	106	70.0	118
				<0.1	5 mg/L	98.6	70.0	130
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser (QCLot: 5302158)								
EK067FG: Filtered Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	85.8	71.0	115
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5302152)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	87.8	71.3	126
				<0.01	0.442 mg/L	95.9	71.3	126
				<0.01	1 mg/L	93.8	70.0	130
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 5295017)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	200 mg/L	92.7	74.0	112

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Matrix Spike (MS) Report: Spike	SpikeRecovery(%)	Acceptable Limits (%)

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: 5294262)							
ES2330955-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	114	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5294261)							
ES2330955-001	Anonymous	ED045G: Chloride	16887-00-6	50 mg/L	# Not Determined	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 5299356)							
ES2330947-004	Anonymous	EG020A-F: Cadmium	7440-43-9	0.5 mg/L	88.6	70.0	130
		EG020A-F: Chromium	7440-47-3	2 mg/L	87.9	70.0	130
		EG020A-F: Copper	7440-50-8	2 mg/L	83.6	70.0	130
		EG020A-F: Lead	7439-92-1	2 mg/L	94.5	70.0	130
		EG020A-F: Manganese	7439-96-5	2 mg/L	87.3	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	87.0	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5300773)							
ES2331002-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.25 mg/L	96.0	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	97.4	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	97.1	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	93.7	70.0	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	102	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	92.6	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	93.8	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5302155)							
ES2330835-001	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	# Not Determined	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5294258)							
ES2330832-021	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: 5302156)							
ES2331006-001	QQC1	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	116	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5302153)							
ES2331008-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	97.5	70.0	130
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser (QCLot: 5302158)							
ES2331046-001	Anonymous	EK067FG: Filtered Total Phosphorus as P	----	1 mg/L	101	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5302152)							
ES2331008-001	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	77.8	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2331006**	Page	: 1 of 8
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: SAM KING	Telephone	: +61-2-8784 8555
Project	: 12564388 Dulverton Landfill Water Monitoring (SW 6 monthly)	Date Samples Received	: 12-Sep-2023
Site	:	Issue Date	: 19-Sep-2023
Sampler	: MIGUEL BENAVIDES	No. of samples received	: 1
Order number	: 12564388	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

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							
ED045G: Chloride by Discrete Analyser	ES2330955--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK055G: Ammonia as N by Discrete Analyser	ES2330835--001	Anonymous	**Ammonia as N**	7664-41-7	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
QQC1	----	----	----	13-Sep-2023	06-Sep-2023	**7**
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural						
QQC1	----	----	----	13-Sep-2023	08-Sep-2023	**5**
EP030: Biochemical Oxygen Demand (BOD)						
Clear Plastic Bottle - Natural						
QQC1	----	----	----	13-Sep-2023	08-Sep-2023	**5**

Analysis Holding Time Compliance

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

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

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
QQC1	**06-Sep-2023**	**----**	----	**----**	**13-Sep-2023**	06-Sep-2023	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
QQC1	**06-Sep-2023**	**----**	----	**----**	**13-Sep-2023**	04-Oct-2023	✓

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
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H)							
QQC1	06-Sep-2023	----	----	----	13-Sep-2023	13-Sep-2023	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
QQC1	06-Sep-2023	----	----	----	13-Sep-2023	20-Sep-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
QQC1	06-Sep-2023	----	----	----	13-Sep-2023	04-Oct-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
QQC1	06-Sep-2023	----	----	----	13-Sep-2023	04-Oct-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F)							
QQC1	06-Sep-2023	----	----	----	15-Sep-2023	04-Oct-2023	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)							
QQC1	06-Sep-2023	----	----	----	15-Sep-2023	04-Mar-2024	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
QQC1	06-Sep-2023	15-Sep-2023	04-Mar-2024	✓	15-Sep-2023	04-Mar-2024	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
QQC1	06-Sep-2023	----	----	----	17-Sep-2023	04-Oct-2023	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
QQC1	06-Sep-2023	----	----	----	13-Sep-2023	08-Sep-2023	×
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
QQC1	06-Sep-2023	----	----	----	17-Sep-2023	04-Oct-2023	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
QQC1	06-Sep-2023	16-Sep-2023	04-Oct-2023	✓	17-Sep-2023	04-Oct-2023	✓
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067FG)							
QQC1	06-Sep-2023	16-Sep-2023	04-Oct-2023	✓	17-Sep-2023	04-Oct-2023	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
QQC1	06-Sep-2023	16-Sep-2023	04-Oct-2023	✓	17-Sep-2023	04-Oct-2023	✓

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
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030)							
QQC1	**06-Sep-2023**	**----**	----	**----**	**13-Sep-2023**	08-Sep-2023	×

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
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
Biochemical Oxygen Demand (BOD)	EP030	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
Conductivity by Auto Titrator	EA010-P	5	38	**13.16**	**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
Filtered Total Phosphorus as P By Discrete Analy	EK067FG	1	2	**50.00**	**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	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	7	**28.57**	**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
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
Biochemical Oxygen Demand (BOD)	EP030	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
Conductivity by Auto Titrator	EA010-P	4	38	**10.53**	**8.33**	✓	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
Filtered Total Phosphorus as P By Discrete Analy	EK067FG	1	2	**50.00**	**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	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	5	**60.00**	**12.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	18	**16.67**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	7	**14.29**	**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
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	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*	
Method Blanks (MB) - Continued							
Chloride by Discrete Analyser	ED045G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	1	38	**2.63**	**1.67**	✓	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
Filtered Total Phosphorus as P By Discrete Analy	EK067FG	1	2	**50.00**	**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	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	7	**14.29**	**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
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 Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Filtered Total Phosphorus as P By Discrete Analy	EK067FG	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	7	**14.29**	**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

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
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. 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.
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)

Analytical Methods	Method	Matrix	Method Descriptions
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)
Filtered Total Phosphorus as P By Discrete Analy	EK067FG	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a filtered 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)
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)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Biochemical Oxygen Demand (BOD)	EP030	WATER	In house: Referenced to APHA 5210 B. The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. This method is compliant with 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)
TKN/TP (filtered) Digestion	EK061F/EK067F	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)

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