Detailed Site Investigation (Contamination)

Sea Defences Renewal

Prepared for Wellington International Airport Limited
Prepared by Beca Limited

13 November 2025



Contents

Executive Summary **3**

1 Introduction **5**

1.1 Purpose 5

1.2 Scope 5

2 Site Description **7**

2.1 Site Identification 7

2.2 Proposed Works 8

3 Environmental Setting **9**

3.1 Current Land Uses 9

3.2 Surrounding Land Uses 9

3.3 Geology and Hydrogeology 9

3.4 Topography 9

3.5 Sensitive Receptors 10

4 Summary of Preliminary Site Investigation **11**

4.1 Summary of Historical Information 11

4.2 HAIL Activities and Potential Contaminants of Concern 11

4.3 Preliminary Exposure Pathway Assessment 12

5 Site Investigation Scope and Rationale **15**

5.1 Potential contaminants of concern 15

5.2 Investigation rationale 15

5.3 Soil Sampling Methodology 16

5.4 Leachate analysis rational and methodology 18

5.5 Soil Sampling Regulations and Provisions 19

6 Assessment Criteria **20**

6.1 Human Health 20

6.2 Environmental 20

6.3 Background Concentrations 22

6.4 Disposal 22

7 Results **23**

7.1 Fieldwork Observations 23

7.2 Soil Analytical Results 23

7.3 Asphalt Bulk Fragments 25

7.4 Quality Assurance / Quality Control 25
8 Discussion and Risk Assessment 26
8.1 Summary of soil analytical results 26
8.2 Ecological considerations 26
8.3 Limitations of Site Characterisation 30
9 Development Implications 31
9.1 Consenting 31
9.2 Soil Management and Handling 33
10 Assessment of Reuse and Disposal Options 34
10.1 Assessment of Reuse and Stockpiling Options 34
10.2 Off-Site Disposal 35
11 Conclusions & Recommendations 36
11.1 Conclusions 36
11.2 Recommendations 36
12 Limitations 37

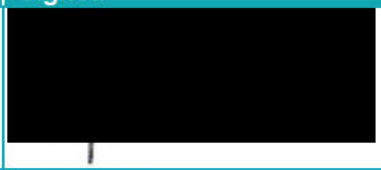
Appendices

Appendix A – Civil Drawings
Appendix B – HAIL Maps
Appendix C – Sampling Location Plans
Appendix D – Chain of Custody
Appendix E – Laboratory Analytical Reports
Appendix F – Test Pit Logs and Hand Pit Summaries
Appendix G – Site Photography
Appendix H – Results Assessment Tables
Appendix I – Revised HAIL Map

Revision History

Revision N°	Prepared By	Description	Date
1	Genevieve Smith	DRAFT for client comment	31 January 2025
2	Genevieve Smith	Final Draft	22 May 2025
3	Genevieve Smith	Revised following Council comment	12 August 2025
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Document Acceptance

Action	Name	Signed	Date
Prepared by	Genevieve Smith		13 November 2025
Reviewed by	Tyler Neve (Certified Environmental Practitioner, General) Sarah Shepherd (Suitably Qualified and Experienced Practitioner)		13 November 2025
Approved by	Jennifer Hart		13 November 2025
on behalf of	Beca Limited		

Code of Conduct, Qualifications and Experience

Preparation and review of this report / Environment Court Code of Conduct

This report has been prepared by Dr Genevieve Smith. Genevieve is an Environmental Scientist with six years of experience in conducting environmental scientific research and contaminated land investigations. She holds a PhD in Environmental Science (Water Quality and Soil Chemistry) from Lincoln University.

The report has been reviewed by Sarah Shepherd. Sarah is a suitably qualified and experienced practitioner (SQEP) with 20 years of experience managing and delivering a wide variety of environmental investigation works in New Zealand, Asia and the United Kingdom. She is experienced in regulatory compliance, oversight of environmental investigations, monitoring and risk assessment, contractor management, preparation and review of technical reports, as well as consultation with stakeholders and regulatory bodies. Sarah holds a Bachelor of Technology (Hons) Environmental Engineering from Massey University and has been a Certified Environmental Practitioner Site Contamination Specialist since 2016.



Genevieve Smith and Sarah Shepherd, have the qualifications and expertise set out above and confirm that we have read the Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2023. This report has been prepared in compliance with that Code, as if it was expert evidence presented in proceedings before the Environment Court. Unless stated otherwise, this report is within our area of expertise, and we have not omitted to consider material facts known to us that might alter or detract from the opinions expressed in this report.

Beca gives its consent, pursuant to the disclaimer and limitations statement in Section 12 of this report, for the panel convened under the Fast-track Approvals Act 2024 to rely on this report to assist it to determine an application for an approval. Beca does not assume any liability or responsibility to the panel that would be greater than any liability or responsibility Beca has to its Client.

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Glossary

Table 1. Glossary of terms (alphabetical)

Term	Definition
ACM	Asbestos-containing material
ACOP	WorkSafe New Zealand Approved Code of Practice for Management and Removal of Asbestos (2016)
ANZG	Australian and New Zealand Guidelines for Fresh & Marine Water Quality
ASL	Above sea level
ASLP	Australian Standard Leaching Procedure
AST	Above-ground storage tank
BTEX	Benzene, toluene, ethylene and xylene
ESCP	Erosion and sediment control plan
CH_4	Methane
CLMG	Contaminated Land Management Guidelines
CO	Carbon monoxide
COC	Chain of custody
CSM	Conceptual site model
CLMP	Contaminated land management plan
DAF	Dilution and attenuation factor
DGV	Default guideline value
DSI	Detailed site investigation
Eco-SGV	Ecological soil guideline value
GAMAS	New Zealand Guidelines for Assessing and Managing Asbestos in Soil
GWRC	Greater Wellington Regional Council
H_2S	Hydrogen sulphide
HAIL	Hazardous Activities and Industries List
HEPA	Heads of EPA Australia and New Zealand
LINZ	Land Information New Zealand
LOR	Limit of Reporting
MfE	Ministry for the Environment
NEMP	PFAS National Environmental Management Plan (Version 3)
NESCS	Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011
NRP	Natural Resources Plan
O_2	Oxygen
OCP	Organochlorine pesticides
RPD	Relative percentage difference
PAH	Polycyclic aromatic hydrocarbons
PFAS	Per- and polyfluoroalkyl substances

Term	Definition
PFHxS	Perfluorohexanesulfonic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonate
PID	Photoionisation detector
PSI	Preliminary site investigation
QA/QC	Quality assurance / quality control
SLUR	Selected Land Use Register
SMF	Sludge Minimisation Facility
SPLP	Synthetic precipitation leachate procedure
SQEP	Suitably Qualified and Experienced Practitioner
SVOC	Semi-volatile organic compounds
TCLP	Toxicity characteristic leachate procedure
TPH	Total petroleum hydrocarbons
USEPA	United States Environmental Protection Agency
VOC	Volatile organic compounds
WAC	Waste acceptance criteria
WCC	Wellington City Council
WIAL	Wellington International Airport Limited
WWTP	Wastewater treatment plant

Executive Summary

Beca Limited (Beca) has been commissioned by Wellington International Airport Limited (WIAL, the Client) to undertake a Detailed Site Investigation (DSI) for the Southern Seawall Renewal project (the Project) on Moa Point Road, Rongotai, Wellington 6022 (the 'site'). The site is comprised of the seawall south of the Airport and Moa Point Road ('the seawall), and the land directly east of the seawall ('Moa Point Construction Yard').

Beca prepared a Preliminary Site Investigation (PSI) for the Project, which identified activities within and adjacent to the site that are included on the Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL). The PSI recommended this DSI be undertaken to assess potential risks to human health and the environment and to inform any consent requirements associated with potentially contaminated soils at the site.

Soil sampling was initially carried out on 28 and 29 November 2024 via machine-excavated test pits and hand-dug pits with additional sampling completed in July 2025. All locations were placed at least 10 m from known services, and to minimise potential vegetation and fauna disturbance. A total of 41 soil samples plus duplicates were collected and analysed for a selection of heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc), asbestos, total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAH), and per- and poly-fluoroalkyl substances (PFAS).

Results

In summary:

- Analytical results identified PFAS in soil samples from three test pits and four hand auger locations in the proposed Moa Point Construction Yard. Concentrations did not exceed human health criteria or direct terrestrial ecological criteria. Concentrations of perfluorooctane sulfonic acid (PFOS) exceeding indirect exposure ecological criteria were detected in samples collected from surface to 1.0 m below ground level (bgl) from the two most eastern test pits (WSS_TP4 and WSS_TP5), in surficial samples from WSD_HA03 and WSD_HA04, and in WSD_HA02 to 0.3 m bgl.
- Concentrations of PFOS in leachate were below the Australian and New Zealand Guidelines value for marine water quality (95% species protection level) with a dilution attenuation factor of 100 applied.
- Concentrations of PFAS in leachate exceeded interim waste acceptance criteria for an unlined landfill scenario but complied with waste acceptance criteria for a double composite lined landfill and specifically Silverstream Landfill waste acceptance criteria.
- Generally, other contaminants of concern (TPH, PAH, heavy metals) were not present at concentrations that exceed human health or environmental assessment criteria. However, copper, zinc and cyanide concentrations were above environmental criteria in a single sample and heavy metal concentrations were above published background concentrations in several samples across the site.
- Asphalt fragments are present throughout the fill at the site, but did not meet the definition of coal tar.
- Asbestos was not detected in soil.

Conclusions

The following conclusions were made based on the analytical results:

- At the concentrations encountered, exposure pathways for human receptors and terrestrial fauna receptors are considered incomplete (meaning that a potential route by which a person can come into contact with a contaminant is not fully established). Indirect ecological exposure is also likely incomplete while PFAS-impacted soil is left undisturbed / buried.

- Soil disturbance volumes for the Project are still to be finalised but are expected to exceed permitted activity volumes and / or duration. Accordingly, a resource consent under the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS) will likely be required.
- Soil contaminant concentrations do not exceed the applicable standard of regulation 7 of the NESCS: therefore, soil disturbance and removal will require a resource consent as a controlled activity under the NESCS.
- The use of a contaminated site requires a resource consent as a restricted discretionary activity under Rule 32.2.1 of the Wellington City Council (WCC) District Plan.
- The leachate results indicate that contaminant concentrations in the soil to be disturbed are not likely to pose an unacceptable risk to the receiving marine environment therefore consent is not required under rules R82 and R83 of the Natural Resources Plan.
- The potential for discharge of contaminants from soil within the site during the soil disturbance works can be readily manged via standard erosion and sediment control measures.

Recommendations

Based on the findings, the following recommendations are made:

- A Contaminated Land Management Plan (CLMP) has been prepared for the site, and should be referred to throughout site development / soil disturbance works. The CLMP includes procedures for handling / management of spoil, and unexpected discoveries.
- An area on site could not be sampled during the July 2025 sampling, as it was being used to stockpile soil that had been scraped from the proposed yard area during seawall maintenance works. It is recommended that the location is sampled to assess the presence of PFAS in surficial soil once the stockpile is removed from the area.
- An erosion and sediment control plan (ESCP) be prepared for works, which includes working with PFAS-impacted material.

1 Introduction

Beca Limited (Beca) has been commissioned by Wellington International Airport Limited (WIAL) to undertake a Detailed Site Investigation (DSI) for the Southern Seawall Renewal project (the Project) on Moa Point Road, Rongotai, Wellington 6022 (the site).

Proposed works include removal and replacement of existing armour units and protection on the Southern Seawall (although the majority of the armour units will remain in place), and preparation of a contractor yard.

Beca has previously prepared a Preliminary Site Investigation (PSI)[1], which should be read in conjunction with this DSI. A summary of the PSI is included in **Section 4** of this report. The PSI encompassed a larger area, including an area to the east of the site, where Project-related activities are no longer proposed. Soil sampling completed in the area to the east of the site and outside of the project area has been reported in a separate DSI[2]. The PSI also covered proposed works in the southern end of the former Miramar Link Golf Course, which will form the Miramar Golf Course Yard (MGC Yard). A DSI for the MGC Yard has been completed and reported separately.

1.1 Purpose

The PSI identified activities within and adjacent to the site that are included on the Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL). The PSI recommended a DSI be undertaken to assess presence of contaminants in soil.

The purpose of the investigation was to:

- Inform the conceptual site model (CSM) and assess potential risks to human health and the environment.
- Assess potential spoil disposal and management options.
- Provide an assessment of the works against the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS), the contaminated land rules of the Greater Wellington Regional Council (GWRC) Natural Resources Plan (NRP), and the contaminated land rules in Chapter 32 of the Wellington City Council (WCC) District Plan.

1.2 Scope

The scope of the DSI included:

- Preparation of health and safety documentation.
- Excavating five test pits and collection of up to four soil samples per machine excavated pit.
- Excavating four pits via spade and / or hand auger and collection of up to four soil samples per pit.
- Field screening of samples for volatile organic compounds (VOC) using a photoionization detector (PID).
- Analysis of soil samples (including a duplicate sample for quality assurance/quality control (QA/QC) purposes) for a combination of:
  - Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc),

[1] Beca, 13 February 2025. Preliminary Site Investigation (Contamination) – Sea Defences Renewal.

[2] Beca, 26 March 2025. Detailed Site Investigation (Contamination) – East of Stewart Duff Drive.

  - Asbestos (presence / absence),
  - Total petroleum hydrocarbons (TPH),
  - Polycyclic aromatic hydrocarbons (PAH), and
  - Per- and poly-fluoroalkyl substances (PFAS).
- Analysis of leachate from select samples for synthetic precipitation leachate procedure (SPLP) to assist with assessing suitability for the on-site reuse of soils and disposal options.
- Preparation of this DSI report.

The assessment was undertaken and reported in general accordance with:

- MfE Contaminated Land Management Guidelines (CLMG) No. 1 – Reporting on Contaminated Sites in New Zealand (2021).
- MfE CLMG No. 5 – Site Investigation and Analysis (2021).
- BRANZ New Zealand Guidelines for Assessing and Managing Asbestos in Soil (2017), referred to in this report as the 'GAMAS'.
- WorkSafe Approved Code of Practice for Management and Removal of Asbestos (2016) also known as the 'ACOP'.
- Heads of EPA Australia and New Zealand (HEPA), 2025. PFAS National Environmental Management Plan Version 3.0'.
- Health and Safety at Work (Asbestos) Regulations 2016 (Asbestos Regulations).

2 Site Description

2.1 Site Identification

Specific identifiers for the site are listed in **Table 2** and the site locations are shown in **Figure 1.** Land ownership of the site is shown in **Figure 2**.

Table 2. Site Identification

Parameter	Seawall
Approximate address	20A Moa Point Road, Rongotai, Wellington 6012
Legal description	Part Lot 3 and Lot 4 DP 78304
Ownership	WCC and the Crown
Approximate coordinates (NZGD 2000, centre of site)	-41.3362997, 174.8064835
Approximate area of the investigated sites	21,700 m^2



Figure 1. Site extent (red polygon) (Source: NearMap)

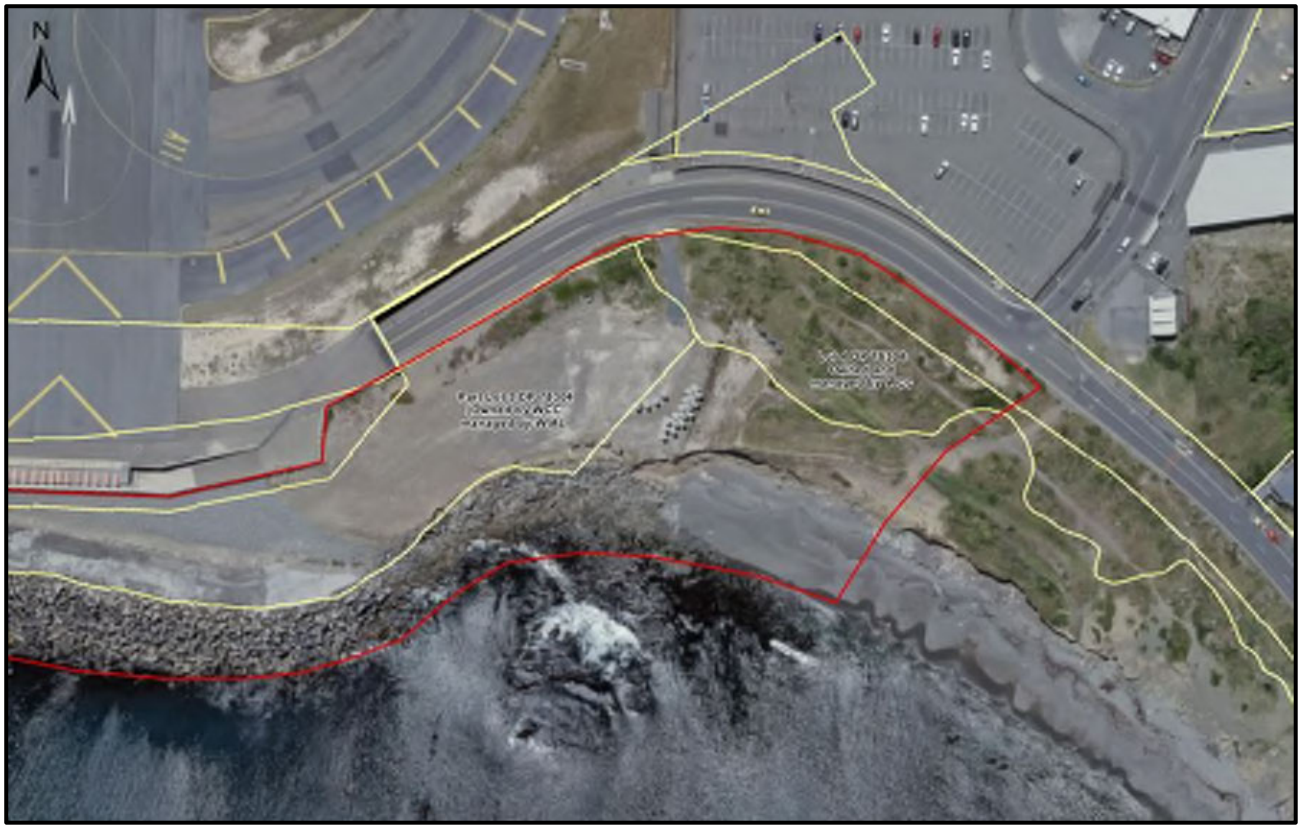


Figure 2. Land ownership

2.2 Proposed Works

At a high level, the key project elements relevant to this DSI include:

- Establishment and use of the Moa Point Construction Yard ("**Moa Point Yard**"), and site facilities at the corner of Stewart Duff Drive and Moa Point Road. Site establishment works, including fencing, vegetation clearance and re-contouring will be undertaken to establish the Moa Point Yard. The location of the Moa Point Yard – directly adjacent to the Southern Seawall working face – is critical to ensure ready access to rocks and armour units as well as plant and equipment once works at Moa Point commence, thus reducing both risks associated with weather and sea state, and construction time.
- Reconstruction of the Southern Seawall. The works involve overlaying the existing seawall with a layer of rock and re-used concrete units ("**underlayer**"), and a layer of concrete armour units ("**armour layer**"), and construction of the seawall toe, and associated works.
- Remediation of the Eastern Bank. The remediation works involve protection of the bank with rock. The rock protection provides a transition between the main Southern Seawall and the unprotected coastline further east, helping to reduce the active erosion of the existing bank.

Upon completion of the Southern Seawall renewal, WIAL may commence the second stage of its coastal renewal works (i.e. the Western Seawall renewal). If this occurs, the western part of the Moa Point Yard may be retained and continue to operate during Western Seawall works, while the eastern part of the yard will be reinstated. Activities associated with the Western Seawall renewal would be subject to a separate consenting process. Refer to **Appendix A** for civil drawings.

For the purposes of this assessment, it has been assumed that the revetment works halt in line with Stewart Duff Drive, as shown in **Figure 1**.

3 Environmental Setting

3.1 Current Land Uses

The central / west portion of the site is owned by WCC and managed by WIAL, and the east portion is managed and owned by WCC and Land Information New Zealand (LINZ). The site comprises of reclaimed land adjacent to Moa Point Road / Moa Point Road tunnel, the Lyall Bay Breakwater, and the existing seawall. According to a seawall structure summary document[3], the existing seawall and the site comprises of:

- Southern Seawall - 12 tonne akmon concrete armour units, constructed in 1972.
- Lyall Bay Breakwater - mass concrete blocks and concrete armour units on southern and western faces, built in 1954-55.
- Western Seawall - steel sheetpile and rock armour, built in 1955-56 and modified between 1983 and 1987.
- Eastern Area - scarp (fill material) with informal rubble protection, constructed in 1972.

3.2 Surrounding Land Uses

The Airport main runway is north of the seawall beyond Moa Point Road. The Wellington Sludge Minimisation Facility (SMF) and wastewater treatment plant (WWTP) are approximately 230 m north-east, and residential properties on Moa Point Road are approximately 160 m south-east. The Cyclotek Pharmaceuticals building, carparking, and various freight and cargo buildings are 100 m north-east.

3.3 Geology and Hydrogeology

According to GNS[4], the geology underlying the seawall comprises:

- Holocene reclaimed land, with fill consisting of domestic waste, sand, boulders and rock.
- Holocene ocean beach deposits, consisting of marine gravel with sand, mud and beach ridges.

Groundwater was measured within the wave trap on the seawall in 2005[5]. It was encountered 8.0 m below the surface of the elevated seawall, and was tidally influenced. Groundwater was measured at 3.4 m below ground level (bgl) in a monitoring well on the site in 2019[6].

It is assumed that groundwater beneath the seawall site flows in a southerly direction towards the coast.

3.4 Topography

The site is approximately 5 m above sea level (asl)[7], with site levels from approximately 0 m NZVD16 to approximately +7 m NZVD16.

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[3] Beca, 2024. Sea Defences Structures Renewal – Summary of Historical Seawall Information.

[4] https://data.gns.cri.nz/geology/

[5] Beca, 2005. WIAL RESA – South End Geotechnical Interpretative Report.

[6] Aurecon, 2020. Groundwater monitoring for PFAS analysis.

[7] Wellington City Council GIS WebMap Viewer

3.5 Sensitive Receptors

Lyall Bay is directly south (and west) of the seawall. There are no recorded abstraction wells within 500 m of the seawall site on the GWRC Web Map Viewer. There are no known wells for potable water in the area. Residential properties are approximately 170 m east of the site, and the land directly east of the site is used for passive recreation.

4 Summary of Preliminary Site Investigation

4.1 Summary of Historical Information

The airport and Southern Seawall site was developed over several decades. The airport was initially reclaimed in the 1950s. The present day Southern Seawall, which extended the original reclamation southward by 180 m, was constructed between 1971 and 1972, using concrete akmon armour units, imported rock, demolition rubble, and dredged reclamation material. The seawall has been maintained with additional armour units over the past 50 years, and, in the mid-1980s, rock fill and armour units were placed to address a breach in the seawall armour. The Moa Point Road tunnel was constructed directly north of the seawall over 2005 and 2006.

The Moa Point WWTP sewer outfall pipeline was installed directly east of the site from 1998. Imagery from the tunnel construction showed stockpiled asphalt on site and a layer of terracotta rubble in the seawall soil profile. Based on photography, the rubble appears to be more than 1 m bgl in the seawall. Based on historical aerial photos and a 1985 airport masterplan, the bank east of the site appears to have been used for fire training purposes in the 1980s. Therefore, the following HAIL code may apply to the site:

- **Potential I** - Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment. Relating to the area of uncontrolled filling.

The following HAIL codes were in draft on the GWRC Selected Land Use Register (SLUR) for entry #SN-05-1447-02:

- **F1** – Airports, including fuel storage, workshops, washdown areas, or fire practice areas. Relating to the potential fire practice area on the east side of the site.
- **G3** – Landfill Sites. The area was used as a landfill prior to the airport. The waste is understood to have been domestic / refuse. It has not been delineated.

At the time of the 2024 site investigations, the site was not shown on the publicly available SLUR, but GWRC had proposed in July 2024 to add it as SLUR SN-05-1447-02 Category I - Verified History of Hazardous Activity or Industry. Based on 2024 site investigations, the land east of Stewart Duff Drive (beyond the project area) was reclassified as SLUR Category III – Contamination Confirmed due to historical fire training[8].

4.2 HAIL Activities and Potential Contaminants of Concern

Identified activities, relevant HAIL codes and potential contaminants of concern from the PSI have been summarised in **Table 3**. As the extent of potential fire training and landfilling activities were not known, the contaminants of concern associated with HAIL codes F1 and G3 have been considered in this DSI.

The PSI HAIL map is available in **Appendix B**.

[8] https://experience.arcgis.com/experience/8ca4cb5241604ee0a981935b9be3fd4c/page/Selected-Land-Use-Register

Table 3. HAIL activities and potential contaminants of concern

Activity	HAIL Code	Contaminants of Concern
Within the site		
• Uncontrolled fill. • Potential for accidental / incidental spraying or spreading of firefighting foams from adjacent suspected fire training area has been considered.	Potentially **I** - Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment.	• Heavy metals • Asbestos • PAH • TPH • PFAS
• Airport activities including fuel storage and fire practices areas located north of Moa Point Road and up hydraulic gradient of the seawall site. This is considered potentially applicable to groundwater and soils at and below the water table only and therefore has not been included in the map in **Appendix F.**	Potentially **H** - Any land that has been subject to the migration of hazardous substances from adjacent land in sufficient quantity that it could be a risk to human health or the environment	• PFAS • Heavy metals • PAH • TPH
• Spray drift from historical fire training activities adjacent to site.	Potentially **H** - Any land that has been subject to the migration of hazardous substances from adjacent land in sufficient quantity that it could be a risk to human health or the environment	• PFAS
Directly adjacent to site		
• Potential fire practice area on the east side of the site.	**F1** – Airports, including fuel storage, workshops, washdown areas, or fire practice areas.	• PFAS • Heavy metals • PAH • TPH • Dioxins

4.3 Preliminary Exposure Pathway Assessment

The preliminary CSM (**Table 4**) was developed to describe the relationship between sources of contamination on site, the human and environmental receptors that may be exposed to those contaminants in the context of soil disturbance, and the pathways by which those receptors may be exposed. Potential risk exists where a receptor is exposed to a contaminant by means of a complete pathway. The level of risk is affected by a combination of factors, including (but not limited to) the type of contaminant, the spatial location and distribution (e.g. near-surface or at depth), and the type of pathway (e.g. via dust inhalation, from hand-to-mouth contact).

Table 4. Preliminary Conceptual Site Model - Seawall

Source	Receptor	Pathway	Pathway Complete?
• Heavy metals • Asbestos • PAH • TPH • PFAS	Construction workers	Exposure of workers to contaminants in soils and groundwater during site redevelopment – dermal contact, ingestion or inhalation of dust/vapours.	**Potentially Complete Pathway** – Contaminants could be present in the east area and eastern bank at levels that may pose a risk to human health. Further investigation is recommended to assess potential risk. Maintenance / excavation workers are not a scenario considered by the NESCS. The Methodology[9] states it was considered more appropriate that exposure be limited through the site-specific controls that are required under health and safety legislation.
	Future site users	Exposure of future site users to contaminants in soils – dermal contact, ingestion or inhalation of dust/vapour.	**Potentially Complete Pathway** – The seawall will receive rock and concrete armour units as part of the renewal. The east area will be covered with geotextile, rock, and concrete armour units. The exposure pathways in these areas will be incomplete. The current vegetated area between the seawall and Stewart Duff Drive will be recontoured with cut material and vegetated. The area is an open space accessible to the public. Contaminants could be present at levels that may pose a risk to human health. Further investigation is recommended to assess potential risk.
	Groundwater resources for public consumption	Leaching and migration of soil contaminants into groundwater.	**Incomplete Pathway** – There are no known registered potable groundwater bores in proximity to the site, and the site is not within a source protection zone.
	Surface water	Sediment and runoff directly into surface water.	**Potentially Complete Pathway** – HAIL activities may have occurred on site. Contaminants may be present at levels that could pose a risk to environmental receptors. Soil disturbance will be subject to standard erosion sediment controls preventing discharge to water.
		Migration of soil contaminants into surface water through	**Potentially Complete Pathway** – Groundwater was previously measured at 3.4 m bgl in a monitoring well within the

[9] MfE, 2011. Methodology for Deriving Standard for Contaminants in Soil to Protect Human Health.

Source	Receptor	Pathway	Pathway Complete?
		shallow groundwater discharging into surface water.	seawall site, and assumed groundwater flow direction is towards the ocean. Groundwater sampling from the monitoring well has identified contaminants above environmental criteria; however, soil disturbance for the project is not expected to extend to the water table.

5 Site Investigation Scope and Rationale

5.1 Potential contaminants of concern

Potential contaminants of concern were selected based on the activities identified in the PSI. The following analytical suite was sampled for:

- Heavy metals
- PAH
- TPH
- PFAS
- Asbestos (presence / absence and semi-quantitative).

Dixons were not included in the analytical suite. Dixons as are associated with combustion and have been identified as potential contaminant of concern for the potential fire practice area to the east of the site but are not considered a contaminant of concern for the site.

5.2 Investigation rationale

The initial intrusive investigation was completed in 2024 via a combination of machine-excavated test pits and hand-dug pits. The following rationale was applied:

- Five test pit locations were evenly distributed throughout the site to view the composition of uncontrolled fill across the site.
- Test pits were excavated up to 1.0 m bgl, and were sampled from surface in 0.5 m increments, unless observations indicated additional sampling was required.
- Hand-excavation locations were distributed in a targeted manner, primarily across mounds of imported fill (unknown origin).
- Locations were placed to minimise disturbance of vegetation and potential avifauna nesting sites and to avoid wastewater and stormwater services.

Additional sampling occurred in July 2025, which was informed by the findings of the 2024 sampling. Sampling was primarily completed by hand, with one machine-excavated test pit. Maintenance works were occurring on the seawall at the time of sampling. The following rationale was applied:

- Five additional locations were hand-dug in the area east of the seawall, to further assess the potential spread and depth of PFAS-impacted soil. Two locations were within the active seawall maintenance yard and were therefore placed in areas that had not been disturbed / scraped yet.
- Two locations were opportunistically sampled in the ‘crest’ of the seawall during the maintenance works. One location was sampled via machine-excavated test pit during crane platform preparation. The location previously had concrete, riprap, geotextile cloth, wire netting, and approximately 1 m of gravels, which was removed prior to the Beca Environmental Scientist arrived. The remaining fill was sampled, and excavated up to 0.5 m bgl to characterise the fill within the seawall. The second crest sample location was an exposed part of the crest wall, where the concrete, riprap and 1 m of gravels were still present. This sample location was selected to characterise the remaining crest wall material.
- The wave trap (between the crest and the Moa Point Road Tunnel) had been scraped between 0.2 m and 0.5 m bgl. The scrape had been stockpiled along the north perimeter of the site. The stockpile was sampled via hand tools in six locations to characterise the stockpiled soil.
- Two hand-dug locations were selected on the west half of the seawall. These sample locations were also included opportunistically during the maintenance work.

5.3 Soil Sampling Methodology

5.3.1 November 2024 Site Investigation

The site investigation was carried out on 28 and 29 November 2024. Conditions were dry, overcast, and windy. Beca Environmental Scientists were on site throughout excavations and sampling and were accompanied by a WIAL contractor (Superintendent, McConnell Dowell Constructors Ltd). Locations were selected during a site walkover on 27 November 2024, attended by a Beca Environmental Scientist and the contractor, based on accessibility, level of vegetation cover, and service identification from plans and manholes on site. All locations were placed at least 10 m from known services, and to minimise potential vegetation and fauna disturbance. A sample location plan is presented in **Appendix C**. A WIAL Wildlife Officer arrived on site prior to works commencing on 28 November to complete a site walkover. The specific locations were shown to the Wildlife Officer, and the intended machine excavator route. Evidence of wildlife (e.g. droppings, tracks) was not sighted.

The excavator was jet washed prior to entering site. Five machine-excavated test pits were progressed to a maximum depth of 1.0 m bgl. Samples were generally collected from three depths per pit. Samples were collected from the centre of the excavator bucket via trowel. Four hand dug pits were progressed via spade. A clean pair of nitrile gloves were worn for each sample to prevent cross-contamination. The hand tools were wiped clean with wipes, water and Decon 90, with a final rinse of water between each sample collection. As a contaminant of concern was PFAS, all equipment was rinsed with laboratory-supplied Type 1 water following cleaning. PFAS soil samples were double bagged. Samples were placed in laboratory-supplied plastic or glass containers and chilled prior to dispatch to RJ Hill Laboratories Ltd (Hills). The samples were dispatched under Chain of Custody (COC), which detailed the required handling and testing instructions. A copy of the COC is available in **Appendix D** and the Hills analytical reports are available in **Appendix E**.

Details of the samples collected are provided in **Table 5**. Complete test pit soil logs with photographs, and summaries of hand pit logs with photographs are available in **Appendix F**. General site photography is available in **Appendix G**.

Table 5. Sample location summary

Test Pit ID	Easting (NZTM)	Northing (NZTM)	Sample Depth (m bgl)
WSS_TP1	1751196.205	5422309.766	• 0.1 • 0.5
WSS_TP2	1751240.920	5422326.420	• 0.1 • 0.5 • 1.0
WSS_TP3	1751273.113	5422331.303	• 0.1 • 0.5 • 1.0
WSS_TP4	1751348.096	5422347.511	• 0.1 • 0.5 • 1.0
WSS_TP5	1751352.700	5422327.422	• 0.1 • 0.5 • 1.0
WSS_HA7	1751322.272	5422346.939	• 0.1 • 0.3
WSS_HA8	1751322.091	5422331.577	• 0.1 • 0.3

Test Pit ID	Easting (NZTM)	Northing (NZTM)	Sample Depth (m bgl)
			• 0.5
WSS_HA9	1751303.764	5422329.183	• 0.1 • 0.3 • 0.5
WSS_HA10	1751338.036	5422333.466	• 0.1 • 0.3

The site was closed to the public (vehicles and foot traffic), with barriers and cones over access tracks, and access gates closed / blocked. Works ceased if pedestrians entered the site or the beach below.

Asbestos personal protective equipment (PPE) and respiratory protective equipment (RPE) was donned by all workers. Eye protection, type 5/6 coveralls, boot covers, nitrile gloves, and P2 masks were worn from the commencement to the termination of works. A decontamination area was established prior to works commencing, and decontamination (equipment, personnel, PPE) occurred upon leaving the work area. All asbestos waste (PPE and sampling consumables) was double bagged upon completion of works.

A GX-6000 gas monitor was kept within the work area throughout the investigation to monitor 4-gas parameters; carbon monoxide (CO), oxygen (O_2), hydrogen sulphide (H_2S) and methane (CH_4) and volatile organic compounds (VOCs). The meter was also used to field screen the headspace of soil samples for VOC, as per Section 5.4 of MfE CLMG No. 5 (2021). Headspace testing was carried out on separately bagged soil samples that were not submitted to the laboratory for analysis (but from the same location as soil collected for laboratory analysis). Ziplock bags were half-filled, sealed, and shaken vigorously. The sample was left to develop for 2-5 minutes before taking the reading.

5.3.2 July 2025 Sampling

The site investigation was carried out on 4 and 9 July 2025. Conditions were foggy and windy. A majority of the proposed sample locations were within the current McConnell Dowell maintenance works yard. The Beca environmental scientist was inducted by the site supervisor, and was escorted while on site.

Where a machine excavator was used, it was operated by the McConnell Dowell operator. Samples were collected from the centre of the excavator bucket via trowel. The seven hand-dug pits and sample location WSD_CR2 were progressed via spade and trowel. The stockpile was sampled via hand tools in six locations to characterise the stockpiled soil.

A clean pair of nitrile gloves were worn for each sample to prevent cross-contamination. The hand tools were wiped clean with wipes, water and Decon 90, with a final rinse of water between each sample collection. As a contaminant of concern was PFAS, all equipment was rinsed with laboratory-supplied Type 1 water following cleaning. PFAS soil samples were double bagged. Samples were placed in laboratory-supplied plastic or glass containers and chilled prior to dispatch to Hills. The samples were dispatched under COC, which detailed the required handling and testing instructions. A copy of the COC is available in **Appendix D** and the Hills analytical reports are available in **Appendix E**.

Details of the samples collected are provided in **Table 6**.

Table 6. Sample location summary

Test Pit ID	Easting (NZTM)	Northing (NZTM)	Sample Depth (m bgl)
WSD_HA01	1751342.815	5422315.04	• 0.1 • 0.3
WSD_HA02	1751327.249	5422364.791	• 0.1 • 0.3
WSD_HA03	1751310.324	5422356.073	• 0.1 • 0.3 • 0.5
WSD_HA04	1751280.23	5422324.675	• 0.1 • 0.25
WSD_HA05	1751265.009	5422364.238	• 0.1 • 0.3 • 0.5
WSD_HA06	1751070.692	5422346.072	• 0.1
WSD_HA07	1751026.29	5422458.437	• 0.1
WSD_CR1	1751179.281	5422294.383	• 0.1 • 0.5
WSD_CR2	1751136.589	5422307.861	• 0.1 • 0.5 • 1.0

Based on the findings of the 2024 sampling, asbestos PPE and gas monitoring equipment were not deployed.

5.4 Leachate analysis rational and methodology

Select samples were analysed for synthetic precipitation leachate procedure (SPLP) to assist with assessing risk to the environment and the suitability for the on-site reuse of soils, and disposal options. SPLP is a method designed to simulate the effects of rainfall on contaminants in soil *in situ*. PFAS concentrations in leachate are typically higher with the un-buffered reagent water used in the SPLP.

The PFAS National Environmental Management Plan (NEMP)[10] states the PFAS leachability should be determined by the Australian Standard Leaching Procedure (ASLP) (AS 44339) and should be conducted using both a pH 5 buffered extractant and un-buffered reagent water. ASLP is not available as an accredited test in New Zealand so, in lieu of this, TCLP and SPLP is used, respectively. AsureQuality use an in-house protocol based on United States Environmental Protection Agency (USEPA) 1311 test TCLP conducted with both pH 5 and un-buffered reagent water consistent with the PFAS NEMP.

Seven individual samples were analysed for PFAS in leachate via SPLP in July 2025.

[10] Heads of EPA Australia and New Zealand, 2025. PFAS National Environmental Management Plan Version 3.0.

5.5 Soil Sampling Regulations and Provisions

5.5.1 NESCS Permitted Activity Provisions

Given activities listed on the HAIL have been undertaken at the site, the NESCS applies with respect to activities, including soil sampling. Soil sampling for the purposes of a contaminated land investigation is a Permitted Activity (Regulation 8(2)). In accordance with Regulation 8(2), measures were in place to minimise human exposure to contaminants before, during and after the sampling program. The sample locations were immediately restored to an erosion-resistant state upon completion of sampling. No soil was removed from the site except for sample analysis.

5.5.2 GWRC Natural Resources Plan

Rule R81 of the NRP allows for a DSI of contaminated land to be undertaken as permitted activity provided the investigation is undertaken in accordance with CLMG No 1 and 5 and the report is provided to GWRC within two months of completion of the investigation.

5.5.1 Health and Safety at Work (Asbestos) Regulations 2016

Sampling for the purpose of identifying if asbestos is present in soil is considered ‘asbestos related work’ as per Figure 28 of the WorkSafe ACOP: Management and Removal of Asbestos 2016. Sampling is not required to be undertaken under the supervision of a licensed asbestos removal supervisor.

6 Assessment Criteria

The laboratory analytical results have been screened against assessment criteria to assess the potential risk to potential receptors. The assessment criteria have been selected in accordance with MfE CLMG No. 2 Hierarchy and Application in New Zealand of Environmental Guideline Values (Revised 2011).

6.1 Human Health

The human health criteria have been selected in accordance with the NESCS, and the hierarchy defined by MfE CLMG No. 2 (MfE, 2011). The NESCS does not apply to the construction / maintenance worker scenario, and the primary receptors are expected to be the general public once the site is recontoured and reinstated. Therefore, recreational criteria have been selected. Where recreational criteria is not available, residential criteria have been applied as the next most applicable available criteria. Criteria are summarised below:

- NESCS – Soil contaminant standards applicable to a 'Recreational' land use scenario.
- Australian National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measure 1999 (updated 2013). Schedule B1, Table 1A(1). Health investigation levels C for a 'Recreational' land use.
- MfE Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand (the Petroleum Hydrocarbon Guidelines) - Module 4, Tables 4.10 and 4.13 (Residential - All Pathways) 4.14 (TPH) for a 'sandy silt soil' type with a surface (<1 m) contamination depth.
- GAMAS soil guideline values for asbestos for recreational land use.
- Heads of EPA Australia and New Zealand (HEPA), 2025. PFAS National Environmental Management Plan Version 3.0, Table 5 - Human health investigation levels for 'public spaces' (HILC) used.

6.2 Environmental

Terrestrial assessment criteria for the site have been obtained from:

- Landcare Research, June 2022[11]. Exploring the implementation of ecological soil guideline values for soil contaminants (Envirolink Grant 2214-MLDC162). Prepared for Marlborough District Council. Ecological soil guideline values (Eco-SGV) for 'Investigation Trigger (80%)' used. For copper and zinc, values for 'typical' and 'aged' used. For TPH, values for 'coarse' soil used. Tables 13, 14, 15 used.
- Canadian Environmental Quality Guidelines (CCME) - Soil Quality Guidelines for the Protection of Environmental and Human Health. Canadian Council of Ministers of the Environment. Values for 'residential/parkland' use have been applied.
- HEPA 2025. PFAS NEMP (Version 3). Table 6 - Ecological guideline values for soil (values for PFOS and PFOA used for direct and indirect exposure. Interim screening value for lizards also used).
- The Eco-SGV provided by Landcare Research do not currently have regulatory status but have been included following the CLMG No. 2 hierarchy.

[11] Landcare Research published *An implementation framework for ecological soil guideline values* in July 2023 which updated some the of Eco-SGV. The 2022 Eco-SGVs were the publicly available version being used at the time of the 2024 site investigations and have not been updated in this report. The updated Eco-SGV would not materially change the outcome of the DSI.

In March 2025 (after the 2024 site works and laboratory analysis were complete), Version 3.0 of the NEMP was released and the indirect terrestrial ecological criteria reduced from 0.01 mg/kg to 0.003 mg/kg for PFOS and PFOA. The human health criteria for public open space and the ecological direct exposure criteria remained unchanged from Version 2.0, but a lower PFOA interim direct exposure screening value (0.005 mg/kg) was added if reptiles may be exposed.

The PFOA ecological direct exposure for reptiles is based on a lowest observed adverse effect level (LOAEL) of 50µg/kg for reduced growth (Zhang et al. 2020), divided by a minimum uncertainty factor of 10 for inter-species differences (Australian Government 1999a). An ecological assessment[12] has been completed for the site; which concluded the ecological values for fauna (i.e., coastal avifauna, lizards, invertebrates) were moderate (for lizards), high (for banded dotterel), and low (for other avifauna and invertebrates).

Criteria to assess potential risk to the aquatic environment were sourced from:

- Australian & New Zealand Guidelines for Fresh & Marine Water Quality (ANZG) 2018 – default guideline values (DGV) for marine water.
- HEPA 2025. PFAS NEMP (Version 3.0). Table 8 - Ecological water quality guideline values (DGV) for perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). Values for 'interim marine' and '95% species protection for slightly to moderately disturbed systems' used.
- ANZG 2023 – Toxicant default guideline values for aquatic ecosystem protection PFOS in freshwater Technical brief.

For bioaccumulative contaminants, which include many PFAS, the ANZG framework specifies that the 99% species protection DGV should be used in:

- Assessing toxicity and bioaccumulation in high conservation value ecosystems
- Assessing bioaccumulation in slightly to moderately disturbed ecosystems.

The coast is downgradient of airport activities, is modified via reclamation and the seawall and is adjacent to the Moa Point wastewater outfall so is not considered a high conservation value ecosystem.

PFAS NEMP (Version 3.0) states guidance should be sought from the environmental regulator to confirm specific jurisdictional requirements. The GWRC NRP Schedule V uses a 95% species protection level for coastal water. The PFAS NEMP directs that freshwater values are to be used on an interim basis until final marine guideline values can be set. The ANZG 2023 interim DGV for PFOS is in the process of being updated following public consultation on the technical brief.

To screen leachate concentrations from the SPLP, the DGV were multiplied by a Dilution and Attenuation Factor (DAF). When deriving waste acceptance criteria (WAC) for managed fills, WasteMINZ[13] adopted a DAF of 20 as representative of the dilution of leaching porewater that will occur as the porewater / leachate travels to a groundwater abstraction point at the down-gradient boundary of the site. This was based on a USEPA (1996) weight of evidence finding that this value is conservative for a range of site conditions.

[12] Bioresearches, 2025. Southern Seawall Renewal Project Terrestrial and Freshwater Ecological Impact Assessment.

[13] WasteMINZ, 2023. Technical Guidelines for Disposal to Land (Revision 3.1).

A further DAF of 5, giving a total DAF of 100, was assumed to be the minimum that would occur in groundwater discharging to a freshwater receiving environment, to account for dilution within a small stream. The coastal environment is a considerably higher energy environment than a small stream and higher dilution and attenuation is likely to occur. However, given the close proximity of the coast and in the absence of deriving a site-specific DAF, a DAF of 100 has conservatively been applied when comparing leachate results.

This approach is consistent with the methodology used by GHD in a previous assessment of on-site disposal and management of PFAS-impacted soil from the Airport Car Park works[14]. The approach has been used to assess Rule R82(c)(ii) of the NRP for discharge into the marine waters.

6.3 Background Concentrations

Background soil concentrations for the site have been obtained from:

- URS New Zealand Ltd, 2003. Determinations of Common Pollutant Background Soil Concentrations for the Wellington Region. Table ES-1: Target analyte background soil concentration ranges for the Wellington region. Values for 'Main Soil Type 2 (Greywacke)' have been selected based on the main geological units provided in the URS document.

6.4 Disposal

In the event that excess spoil requires removal from site, soil analytical results have been compared to waste acceptance criteria from:

- MfE Hazardous Waste Guidelines. Landfill Waste Acceptance Criteria and Landfill Classification, 2004. Values for 'Class A waste acceptance criteria' used indicative of Southern Landfill.
- HEPA, 2025. PFAS NEMP (Version 3.0). Values from Table 11 used. Total concentration (mg/kg)' and leachate concentration (µg/L) used.

PFAS-impacted soil is not accepted by many landfills in New Zealand, and will likely dictate where soil can be transported, if required.

[14] GHD, 5 June 2024. GHD Assessment of Proposed Soil Disposal at Bridge Street from WIAL Golf Course [letter].

7 Results

7.1 Fieldwork Observations

Observations specific to test pits and hand pits are included in the soil logs and hand pit photographs (**Appendix F**). General site photographs are included in **Appendix G**.

7.1.1 November 2024 Site Investigation

The following was observed during fieldwork.

- Generally, soils on site were undifferentiated fill, comprised of silt with fragments of greywacke, concrete, minor terracotta, and asphalt fragments or layers.
- Fragments of black asphalt were present in most test pits and hand pits. Field testing was completed on fragments of asphalt using the WasteMINZ white paint test methodology[15], and samples did not turn the paint yellow indicating the fragments were unlikely to contain coal tar.
- The VOC headspace readings ranged from 0.0 to 0.2 parts per million and are included in the test pit logs.

7.1.2 July 2025 Additional Sampling

Seawall maintenance works were occurring during soil sampling. Changes made to the site as part of maintenance works are also shown and described in **Appendix F**. In the area that is proposed to be the 'Moa Point Construction Yard' approximately 0.2 m to 0.5 m bgl had been scraped and stockpiled separately on the north perimeter under coconut matting. Soil from the wave trap has been stockpiled uncovered on a separate area of the north perimeter. Parts of the crest have been removed to develop the maintenance works crane platform. The following was observed during fieldwork:

- Generally, soils were undifferentiated fill, as identified in the 2024 sampling.
- Blue-green mottles and gravels were encountered at approximately 0.3 m bgl in WSD_HA03. There was also what appeared to be minor black staining at this depth.
- A fragment of brown glass was encountered in WSD_HA05 at approximately 0.3 m bgl.
- Fragments of wire netting and geotextile cloth were visible in the wave trap stockpile, which appeared to originate from the materials used in the crest. Otherwise, no other observations were made in the stockpiled soil.
- The west half of the seawall was inspected. A paint roller and a spray can were encountered on the soil surface beneath graffiti. There were no other observations in the area.

7.2 Soil Analytical Results

The results assessment table, containing soil analytical results compared to screening criteria, can be found in **Appendix H**. For clarity, the sample labelling (e.g. WSS_TP1_0.5) denotes the site (i.e. 'WSS'), sample location (i.e. 'TP1') and sample depth in m bgl (i.e. '0.5').

[15] WasteMINZ, 2023. Guidelines for Assessing and Managing Coal Tar Contamination in Roading (refer to 'Section 5.2 – White Paint Test'). The white paint used did not list acetone, toluene or xylene solvents in the ingredient list. White paint was sprayed onto asphalt surfaces.

7.2.1 Heavy Metals

In total, 38 soil samples were analysed for heavy metals. The heavy metal concentrations did not exceed human health criteria in the samples analysed. One location (WSD_HA03) contained copper and zinc at 0.3 m bgl at concentrations above environmental assessment criteria. No other sample contained heavy metals above environmental assessment criteria. At least one heavy metal was above the published background concentration in most samples, with some only marginally above background and generally commeasure with background.

7.2.2 Cyanide

One sample from the 2025 sampling event (WSD_HA03_0.3) was analysed for cyanide following observations of blue-green gravels in soil. The sample contained 1.8 mg/kg total cyanide which is below human health criteria but above environmental assessment criteria.

7.2.3 Polycyclic Aromatic Hydrocarbons

21 soil samples were analysed for PAH. No samples exceeded human health criteria or environmental criteria. Benzo(a)pyrene concentrations were marginally above background concentrations in three locations (WSD_HA02_0.3, WSD_HA04_0.1 and WSD_HA05_0.5).

7.2.4 Total Petroleum Hydrocarbons

Two soil samples from test pit WSS_TP5 were analysed for TPH. TPH was not detected above the laboratory limit of reporting (LOR). One soil sample from WSD_HA03_0.3 was analysed, and TPH was detected in the C15-C36 band and concentrations below human health and environmental criteria.

7.2.5 Per- and Polyfluoroalkyl Substances

28 soil samples from four test pits (WSS_TP3, WSS_TP4, WSS_TP5 and WSD_CR1) and twenty hand-dug locations were analysed for PFAS. PFAS was detected in three of the four test pit locations (WSS_TP3, WSS_TP4 and WSS_TP5), with concentrations increasing with depth between 0.1 and 1.0 m bgl in WSS_TP4 and TP5. In WSS_TP3 PFAS was detected in the surface sample only being below the laboratory LOR in the sample from 0.5 m bgl.

All samples analysed for PFAS from TP4 and TP5 contained PFOS concentrations that exceeded the indirect ecological exposure criteria. PFOA was detected in two samples from WSS_TP5 but the concentrations were below the interim screening criteria for reptiles and did not exceed human health criteria or direct or indirect ecological exposure criteria.

PFAS was also detected in sample locations WSD_HA01, WSD_HA02, WSD_HA03 and WSD_HA04. Concentrations of PFOS in surficial samples from WSD_HA03 and WSD_HA04, and in WSD_HA02 to 0.3 m bgl exceeded the indirect ecological exposure criteria.

PFAS was not detected in the soil samples collected from the stockpile.

7.2.6 Asbestos

13 soil samples from eight locations were analysed for asbestos (presence / absence). Asbestos was not detected in the samples analysed. Six samples from the stockpile were also analysed, and asbestos was not detected.

7.3 Asphalt Bulk Fragments

Two representative asphalt samples were collected from soil directly adjacent to the site. They were analysed for PAH. The samples contained benzo[g,h,i]perylene marginally above the LOR, but all other contaminants were below the LOR. The samples analysed did not contain PAH at concentrations indicative of coal tar.

7.4 Quality Assurance / Quality Control

7.4.1 Duplicate soil samples

Three duplicate samples were collected and analysed for the same suite of analytes as the primary samples (heavy metals). The relative percentage difference (RPD) between concentrations in the primary and duplicate samples were calculated. WSD_QAQC1 and the primary sample were also analysed for PAH and PFAS, but all analytes were below the laboratory LOR and the RPD could not be calculated.

The RPD for heavy metal concentrations across all samples were between 0-20%. This result indicates an acceptable level of accuracy in the sampling and analytical methods used in this investigation.

7.4.2 Laboratory analytical notes

The following analyst's comment was made in laboratory job number 3934578 in relation to zinc in WSD_HA03_0.3:

"It should be noted that the replicate analyses performed on this sample as part of our in-house Quality Assurance procedures showed greater variation than would normally be expected. This may reflect the heterogeneity of the sample. The average of the results of the replicate analyses has been reported. Replicate 1 = 920mg/kg, replicate 2 = 730mg/kg, replicate 3 = 610mg/kg, replicate 4 = 570mg/kg."

Black residue and blue material were observed while sampling WSD_HA03_0.3. The in-house replicate analysis may reflect the variability of material from soil in this location at 0.3 m bgl.

7.4.3 Equipment rinsate blank

An equipment rinsate blank was collected off tools (spade, hand auger) prior to hand digging using laboratory-supplied Type 1 water. The water sample was analysed for PFAS (trace). PFAS was not detected above the LOR indicating adequate decontamination practices.

Equipment rinsate blanks were collected across each sampling event in July 2025 and dispatched to the laboratory. However, as the analytical results were consistent with previous analytical results the rinsate blanks were not analysed.

8 Discussion and Risk Assessment

8.1 Summary of soil analytical results

In summary:

- Asbestos was not detected in soil within the site.
- Heavy metals and PAHs were not detected at concentrations that exceed human health or environmental assessment criteria, other than one hand pit in the eastern vegetated area where copper and zinc were detected at 0.3m bgl at concentrations above environmental assessment criteria. Some heavy metals and benzo(a)pyrene were present above published background concentrations.
- PFAS, specifically PFOS, was detected a concentration that exceeded the indirect terrestrial ecological criteria in samples from two test pits and two hand pits located in the eastern vegetated area, and one hand pit in on the southern edge of the current seawall yard. The PFAS concentrations complied with human health and direct terrestrial ecological criteria.
- Asphalt fragments are present throughout the fill at the site. Samples were analysed for PAH and heavy metals to assess for the presence of coal tar. According to WasteMINZ (2023), coal tar roading material is defined as being '*roading material with a total PAH concentration of greater than or equal to 20 mg/kg, and BAP toxic equivalency quotient (TEQ) greater than or equal to 1 mg/kg.'* [16] Based on this definition, results indicate that the asphalt samples collected did not contain coal tar.

8.2 Ecological considerations

8.2.1 Lizards

PFOA concentrations were below the NEMP PFAS interim direct criteria for reptiles in all samples analysed (including surficial samples). Lizards will be relocated from the site prior to construction in accordance with a Lizard Management Plan and Wildlife approval.

8.2.2 Kororā

PFOS concentrations above indirect terrestrial ecological criteria were detected in soil samples to 1.0m bgl at five sampling locations in the eastern vegetated area/ proposed Moa Point Yard.

Advice from Dr John Cockrem of Kororā Ornithology Ltd to the project is that:

"Kororā almost never dig burrows into hard ground. Instead, they prefer to use existing cavities or holes. Sometimes they will dig into sand dunes, and might dig for more than 30 cm. I think it extremely unlikely that they would dig into the hard ground of the colony [presently the eastern vegetated area], and even more unlikely that they would dig more than 30 cm. If the ground was covered by 30 cm of clean material, then I am certain that this would be fine for the penguins."

The area will be capped with up to 2 m of clean fill to form landscaped earth mounds plus 15 cm of clean clay and 10 cm of topsoil, as part of the preparation of the kororā stage 2 colony. The colony will be constructed in accordance with the Penguin Management Plan and Wildlife approval.

[16] WasteMINZ, December 2023. Guidelines for Assessing and Managing Coal Tar Contamination in Roading.

8.2.3 Applicability of Ecological Criteria

Samples from the eastern side of the site contain concentrations of PFOS above the indirect exposure criteria for terrestrial receptors, including surficial samples. The indirect exposure ecological criteria accounts for the pathways through which organisms can be exposed whether or not they are in direct contact with PFAS contaminated soil (i.e. exposure through the food chain). The PFAS NEMP states that the indirect exposure value may be over-protective if the area of exposed soil is too small to have any material impact on food chain transfer to secondary consumers such as invertivores and carnivores.

Manaaki Whenua identified that further research is required to identify the depth of soil to which it is appropriate for Eco-SGVs to apply. It is usually considered that the bulk of soil biological activity occurs in the upper 30 cm of soil (USEPA 2015), although soil microbes, invertebrates and plant roots can all be present at greater depths. Roots and worms were not observed below 0.2 m bgl during the site investigation, and organisms were mainly isolated to the areas where vegetation was established in the east side of the site.

When the site is developed into a yard as part of the Project the surface will be compacted aggregate. Manaaki Whenua Landcare Research[17] proposed that Eco-SGV do not apply to any impervious / impermeable surfaces (such as land/soil that is sealed, compacted driveway areas), given the unsuitability of these environments for any ecological receptors regardless of contamination issues. Once the area east of the seawall is reinstated on completion of the construction, the proposed land use is largely similar to present-day conditions, but will include an enhanced kororā area. In the areas of the site that are proposed to be restored to ecological habitat, topsoil will need to be imported to allow for planting. As Manaaki Whenua has proposed that the ecological soil guidelines apply to the upper 30 cm of soil, the indirect ecological exposure pathway will be managed by maintaining at least 30 cm of unimpacted soil.

8.2.4 Marine Environment

The ecological criteria do not account for off-site environmental transport processes. The exposure pathway between the site and the marine environment may be complete via leaching to groundwater and discharge into the marine environment.

- Seven soil samples from four locations (WSD_HA01, WSD_HA02, WSD_HA03 and WSD_HA04) within the site were analysed via SPLP and the leachate analysed for PFAS. Four samples were from the surface, and three were from 0.3 m bgl. In summary: Concentrations of PFOA were below the laboratory LOR in all leachate samples, and therefore did not exceed the 95% species protection level (interim marine) DGV.
- Concentrations of PFOS in leachate exceeded the 95% species protection level (interim marine) DGV in the surface sample from WSD_HA04, and in both the surface sample and 0.3 m sample from WSD_HA02. When the DAF was applied all results complied with the DGVs.

[17] Manaaki Whenua Landcare Research (June 2022) – Exploring the implementation of ecological soil guideline values for soil contaminants (Envirolink Grant 2214-MLDC162). Prepared for Marlborough District Council.

For additional context and comparison, monitoring well A4_07 was installed within the site in 2019[18]. Groundwater at this location was measured at 3.4 m bgl. Three rounds of groundwater sampling occurred in November 2019, March 2020, and July 2020. PFOS was detected at 0.33 µg/L, 0.77 µg/L, and 1.30 µg/L, respectively exceeding the 95% species protection level (interim marine). The approximate location is shown on the sampling location plan (**Appendix C**).

8.2.5 Exposure Pathway Assessment

The preliminary CSM was updated to reflect the findings of the intrusive investigation. The exposure pathways were revised based on the soil contaminants detected and are presented in **Table 7**. Terrestrial ecological receptors have been added to the CSM.

Table 7. Updated Conceptual Site Model

Source	Receptor	Pathway	Pathway Complete?
• Heavy metals • Asbestos • PAH • TPH • PFAS	Construction workers	Exposure of workers to contaminants in soils and groundwater during site redevelopment – dermal contact, ingestion or inhalation of dust/vapours.	**Incomplete Pathway** – Based on the samples analysed, soil contaminant concentrations did not exceed human health assessment criteria.
	Current site users	Public area - exposure to contaminants prior to works commencing.	**Incomplete Pathway** – Based on the samples analysed, soil contaminant concentrations did not exceed human health assessment criteria.
	Future site users	Exposure of future site users to contaminants in soils – dermal contact, ingestion or inhalation of dust/vapour.	**Incomplete Pathway** – Based on the samples analysed, soil contaminant concentrations did not exceed human health assessment criteria.

[18] Wellington International Airport PFAS Assessment, Aurecon, December 2020

Source	Receptor	Pathway	Pathway Complete?
	Terrestrial ecological receptors	Exposure of existing and future terrestrial ecological receptors to contaminants via dermal contact, ingestion, or inhalation of dust/vapour.	**Potentially Incomplete Pathway –** Sample concentrations from surface exceed the ecological guideline values for indirect exposure. The NEMP ecological indirect exposure guideline value is based on dietary exposure of a secondary consumer via soil-dwelling animals and plants that are directly exposed to PFAS contaminated soil. Management and spoil handling / disposal will need to be considered during site works / development to minimise exposure of future terrestrial ecological receptors. This pathway is not applicable while the site is a compacted yard. When the site is reinstated after construction, reinstatement of ecological areas will require import of topsoil, clay and landscaping fill.
	Groundwater resources for public consumption	Leaching and migration of soil contaminants into groundwater.	**Incomplete Pathway** – There are no known registered potable groundwater bores in proximity to the site, and the site is not within a source protection zone.
	Surface water	Sediment and runoff directly into surface water.	**Potentially Incomplete Pathway** – The ecological criteria do not account for movement of PFAS-contaminated soil or PFAS in leachate into surface water. Soil disturbance will be subject to standard erosion sediment controls preventing discharge to water.
		Contaminants leaching to groundwater then discharging to surface water	**Potentially Incomplete Pathway** – Previous groundwater sampling from a monitoring well at the site has identified PFAS concentrations above environmental criteria. Leachate testing on soil containing PFAS within the site has indicated that with a DAF applied the soil to be disturbed will not generate PFAS concentrations that exceed DGV for marine water.

8.3 Limitations of Site Characterisation

Characterisation of subsurface conditions is dependent on the number of sample locations, methods of sampling and the uniformity of subsurface conditions. The accuracy of this characterisation is therefore limited by the scope of works undertaken in accordance with the MfE guidelines. There is the possibility that contamination present on the site has not been identified. Whilst contaminant concentrations may be estimated at chosen sample locations, conditions at any location removed from the specific points of sampling can only be inferred based on geological and hydrogeological conditions and the nature and the extent of identified contamination. Subsurface conditions can vary, resulting in uneven distribution of contaminants across a site which cannot be defined by these investigations. In addition, with time, the site conditions and environmental guidelines could change so that the reported assessments and conclusions are no longer valid. The conclusions of this report are made on the basis that the site conditions revealed by the investigation are representative of the actual conditions across the site at the time of sampling.

9 Development Implications

9.1 Consenting

9.1.1 National Environmental Standard

The NESCS applies to land as per clause 5(7):

"Land covered:

(7) The piece of land is a piece of land that is described by 1 of the following:

(a) an activity or industry described in the HAIL is being undertaken on it

(b) an activity or industry described in the HAIL has been undertaken on it

(c) it is more likely than not that an activity or industry described in the HAIL is being or has been undertaken on it."

The following HAIL code applies to the seawall site:

- **I** – Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment: Uncontrolled filling containing, and accidental / incidental release of foams containing PFAS during fire training activities.
- **H** - Any land that has been subject to the migration of hazardous substances from adjacent land in sufficient quantity that it could be a risk to human health or the environment: Potential accidental release from spray drift from the adjacent fire training area.

An updated HAIL map is provided in **Appendix I** with the HAIL area refined based on the soil results that exceed environmental criteria.

The NESCS applies to five activities taking place on a 'piece of land' where activities listed on the HAIL have been undertaken on a 'more likely than not' basis. For each activity, there are a set of criteria that if met, the activity can proceed as a permitted activity. Where works cannot comply with these permitted activity criteria, land use consent will be required from WCC under the NESCS. **Table 8** details which activities may be triggered for the proposed site works.

Table 8. NESCS Trigger Activities

	Activity	Applicable to the proposed works?
1	Does the proposed activity at the site include the removal or replacement of all, or part of, a fuel storage system?	No
2	Does the proposed activity at the site include soil sampling?	**Yes***
3	Does the proposed activity at the site involve the disturbance of soil?	**Yes**
4	Does the proposed activity at the site involve the subdivision of the land?	No
5	Does the proposed activity involve a change of land use?	No†

*Soil sampling was undertaken in accordance with the permitted activity provisions of the NESCS as outlined in Section 5.3.

† Following the completion of the seawall works, the site will be reinstated to the current land uses (i.e. a seawall and a reserve area enhanced for kororā).

Soil Disturbance

Under Regulation 8(3) of the NESCS, soil disturbance of up to 25 m^3 per 500 m^2 and disposal of up to 5 m^3 per 500 m^2 is allowed as a permitted activity. Additional permitted activity conditions that must be met include:

(a) Controls to minimise the exposure of humans to mobilised contaminants must:
  (i) be in place when the activity begins;
  (ii) be effective while the activity is done;
  (iii) be effective until the soil is reinstated to an erosion-resistant state.
(b) The soil must be reinstated to an erosion-resistant state within 1 month after the serving of the purpose for which the activity was done.
(c) The volume of the disturbance of the soil of the piece of land must be no more than 25 m^3 per 500 m^2.
(d) Soil must not be taken away in the course of the activity, except that:
  (i) For the purpose of laboratory analysis, any amount of soil may be taken away as samples.
  (ii) For all other purposes combined, a maximum of 5 m^3 per 500 m^2 of soil may be taken away per year.
(e) Soil taken away in the course of the activity must be disposed of at a facility authorised to receive soil of that kind.
(f) The duration of the activity must be no longer than 2 months.
(g) The integrity of a structure designed to contain contaminated soil or other contaminated materials must not be compromised.

Soil disturbance is proposed across the entire 'piece of land', and it is likely that earthworks will exceed the permitted activity volume. When design of the proposed works is finalised, the proposed soil disturbance volume should be compared to the permitted activity volume. If the permitted activities standards are exceeded, a resource consent will be required under the NESCS as a controlled activity based on this DSI stating the soil contamination does not exceed the applicable standard of regulation 7.

9.1.2 Wellington City Council Contaminated Land Rules

The relevant provisions within Chapter 32 of the WCC District Plan 2000 have been reviewed and assessed. The 2024 District Plan: Appeals Version does not have rules related to contaminated land, and instead refers to the NESCS.

Under District Plan 2000, the remediation, use, development and subdivision of any contaminated land is a Discretionary Activity (Restricted) in respect of the following:

- The level, nature and extent of contamination in relation to the proposed use, development or subdivision.
- The methods to address the risks posed by contaminants to public health and safety.
- The effects of contamination on built structures, ecological and amenity values, soil quality and the wider environment.
- The approach to the remediation and / or on-going management of the contaminated land and the mitigation measures (including monitoring) proposed to avoid adverse effects on public health, safety, and the environment, including the provision of a Remediation Plan or a Site Management Plan.

The use of a contaminated site will require a resource consent as a restricted discretionary activity under Rule 32.2.1 of the district plan.

9.1.3 Greater Wellington Natural Resources Plan

Under the NRP, discharges of a contaminant from contaminated land where a contaminant may enter water are captured by Rule R82. To meet the permitted activity requirements, a DSI needs to be undertaken and provided to GWRC and the results of the DSI must indicate that the discharge does not pose unacceptable risks to human health or the environment (on- or off-site). Otherwise, resource consent would be required under Rule R83 as a Discretionary Activity.

R82 also specifies that discharge from SLUR Category III land or SLUR Category IV land should not or be likely to result in water quality in a surface water body within 50 m of the source of the discharge exceeding the level specified for the protection of 95% of species. The eastern portion of the site is on the SLUR as Category I - Verified History of Hazardous Activity or Industry. Based on present investigations, the land east of Stewart Duff Drive has been reclassified as Category III – Contamination Confirmed due to historical fire training. However, the historical fire training area is not within the site.

As discussed in **Section 8.2** and **Section 10**, concentrations of PFOS in leachate from two soil sample locations exceeded the DGVs for the marine environment at the 95% species protection level. With a DAF applied, the samples did not exceed the DGVs. Discharges from soil that Project works are anticipated to disturb are not considered to pose unacceptable risks to human health or the environment do not require consent under R83.

9.2 Soil Management and Handling

The CSM details potentially complete and potentially incomplete pathways that should be mitigated and managed through the implementation of specialist controls (via the implementation of management plans) during proposed land disturbance works. A Contaminated Land Management Plan (CLMP) has been prepared to outline those controls following a similar process to the site-wide CLMP that is in place for WIAL owned property in accordance with their site-wide resource consent SR520690 granted under the NESCS.

The CMLP includes general erosion and sediment controls; however a project specific erosion and sediment control plan (ESCP) will need to be prepared once construction methodologies are known to prevent discharges to the marine environment.

10 Assessment of Reuse and Disposal Options

PFAS has been identified in soil up to 1.0 m bgl on the eastern side of the site. The presence of PFAS in soil will be the limiting factor for reuse, management and disposal of the soil.

10.1 Assessment of Reuse and Stockpiling Options

The following requirements from Section 12.1 of the PFAS NEMP has been considered to assess suitability of on-site reuse and stockpiling options:

- PFAS concentrations in soil and in leachate must be sufficiently low as to not pose an increased or unacceptable risk to receptors or to the environmental values of water.
- Leachate criteria should be protective of groundwater and surface water quality and aquatic ecosystems both at the site of reuse and anywhere there is a reasonable possibility that transported PFAS from that site may impact sensitive receptors and environmental values.
- Adding soil with low levels of PFAS to areas that have even lower or no levels of PFAS should be considered only in consultation with the relevant regulatory authority in exceptional circumstances where there is no feasible, practical alternative.

10.1.1 Leachate assessment

To meet the above criteria, analysis was completed on leachate via the methodology outlined in **Section 5.4**. SPLP analysis was completed to simulate potential effects of leaving PFAS-impacted soil in situ. In 2025, seven samples were analysed for SPLP from across four locations.

- Concentrations of PFOS in leachate exceeded the 95% species protection level (interim marine) in two locations within the site. With the DAF applied, the concentrations were below the DGVs.
- All samples analysed exceeded the PFOS and Sum PFHxS+PFOS waste acceptance criteria for an unlined landfill. However, all concentrations were below the double composite lined landfill criteria.

10.1.2 Suitability for reuse on site

Based on the PFAS concentrations encountered from WSS_TP5 across to WSS_TP3 in the yard, the soil in the wider yard area is considered to be suitable to be reused on eastern side of the site, subject to soil being located at least 0.3 m bgl for terrestrial ecological purposes.

10.1.3 On-Site Storage

If temporary storage and stockpiling of PFAS contaminated soil occurs on site, it should be undertaken in such a way that PFAS cannot migrate into the surrounding soil or water and runoff should be monitored for PFAS. Depending on the period of time the soil will be stockpiled for, this may require different levels of controls and infrastructure (e.g. temporarily covering the stockpile on an impervious liner, stockpiling within a sealed and bunded area, or capping and containment for long term management). Long-term monitoring will likely be required if soil is to be stored on site.

10.1.4 Storage off-site on WIAL Property

Soil from the airport fire station works is currently being stored on Bridge Street within the airport site. WIAL has applied for two resource consents to allow for the continued use of this site. These consents provide for:

- The storage of fill material, including contaminated spoil, on the disposal site located on Bridge Street, adjacent to the airport runway; and

- Global earthworks, including for the disposal of contaminated spoil, across the wider Airport landholdings.

If the contaminated soil from the seawall site falls within the parameters defined by these consents (which are subject to change until a decision is issued), or any future consents obtained by WIAL for the disposal of fill material, WIAL will preferentially seek to retain and managed contaminated material on-site.

10.2 Off-Site Disposal

If off-site disposal is required, the presence of PFAS in soil will be the limiting factor. Silverstream landfill has recently recommenced accepting PFAS impacted material subject to GWRC approval on a case by case basis and available airspace at the time of the application for acceptance. The PFAS concentrations detected in the soil meet the Silverstream Landfill waste acceptance criteria. PFAS is not generally being accepted at any other landfills in the lower North Island.

Prior approval must be sought from the landfill prior to works commencing.

11 Conclusions & Recommendations

11.1 Conclusions

The following conclusions were made based on the analytical results:

- At the concentrations encountered, exposure pathways for human receptors and terrestrial fauna receptors are considered incomplete.
- Soil in WSS_TP4, WSS_TP5, WSD_HA02, WSD_HA03 and WSD_HA04 (in the vegetated area) at the site contained PFOS concentrations that exceeded indirect ecological criteria. This criterion is not considered relevant while the area is used by a yard and covered by a compacted surface. Areas to be restored to ecological habitat will require importing of topsoil to allow for planting and a cover of 30 cm should be maintained.
- Soil disturbance volumes for the Project are still to be finalised but are expected to exceed permitted activity volumes and / or duration. Accordingly, a resource consent under the NESCS will likely be required.
- Soil contaminant concentrations do not exceed the applicable standard of regulation 7; therefore, soil disturbance and removal will be a controlled activity under the NESCS.
- The use of a contaminated site requires a resource consent as a restricted discretionary activity under Rule 32.2.1 of the WCC District Plan.
- Discharges associated with soil disturbance at the site for the project should not require consent under rules R82 and R83 of the NRP as the leachate results indicate that contaminant concentrations are not likely to pose an unacceptable risk to the receiving marine environment.
- The potential for discharge of contaminants from soil within the site during the soil disturbance works can be readily manged via the recommended standard erosion and sediment control measures.

11.2 Recommendations

Based on the findings, the following recommendations are made:

- A project-specific CLMP has been prepared for the site, and should be referred to throughout site development / soil disturbance works. The CLMP includes procedures for handling / management of spoil, and unexpected discoveries.
- An area on site could not be sampled during the July 2025 sampling, as it was being used to stockpile soil that had been scraped from the proposed yard area during seawall maintenance works. It is recommended that the location is sampled to assess the presence of PFAS in surficial soil once the stockpile is removed from the area.
- If Project works are to extend past the proposed eastern perimeter of the site, this should be in consultation with a Suitably Qualified and Experienced Practitioner (SQEP).
- An ESCP be prepared for works, which includes working with PFAS-impacted material.

12 Limitations

This report has been prepared by Beca Ltd (Beca) for Wellington International Airport Limited (Client). Beca has been requested by the Client to provide a Detailed Site Investigation in regard to proposed works on Moa Point Road, Rongotai, Wellington 6022.

This report is prepared solely for the purpose of assessing potential environmental and human health risk from soils and groundwater at the site (the agreed scope of work) and to support an application by the Client for statutory approvals in relation to renewal of the Southern Seawall at Moa Point Road. The contents of this report may not be used by the Client for any purpose other than in accordance with the stated Scope.

Beca acknowledges the Practice and Procedure Guidance, dated 22 July 2025, provided by the Panel Conveners appointed under the Fast-track Approvals Act 2024, which states that “reports that are intended to be relied on by the panel should not be submitted with a disclaimer stating that the report is not for use by persons other than the applicant”. This report, however, serves a dual purpose; it supports the application for approvals for the Southern Seawall and serves a wider regulatory function, having been prepared under the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS), the contaminated land rules of the Greater Wellington Regional Council (GWRC) Natural Resources Plan (NRP), and the contaminated land rules in Chapter 32 of the Wellington City Council (WCC) District Plan.

This report has been prepared by Beca on the specific instructions of our Client. It is solely for our Client’s use for the purpose for which it is intended in accordance with the agreed scope of work. Any use or reliance by any person contrary to the above, to which Beca has not given its prior written consent, is at that person's own risk and Beca accepts no liability to any other person for their use of or reliance on this report. This report contains information obtained by inspection, sampling, testing or other means of investigation. Unless specifically stated otherwise in this report, Beca has relied on the accuracy, completeness, currency and sufficiency of all information provided to it by, or on behalf of, the Client or any third party, including the information listed above, and has not independently verified the information provided. Beca accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the information provided. Publicly available records are frequently inaccurate or incomplete.

The contents of this report are based upon our understanding and interpretation of current legislation and guidelines (“Standards”) as consulting professionals and should not be construed as legal opinions or advice. Unless special arrangements are made, this report will not be updated to take account of subsequent changes to any such Standards.

This report should be read in full, having regard to all stated assumptions, limitations, and disclaimers.

A

Appendix A – Civil Drawings

WIAL SEA DEFENCE STRUCTURES RENEWAL SOUTHERN SEAWALL

CIVIL ENGINEERING

Prepared for Wellington International Airport Limited (WIAL)
Prepared by Beca Limited (Beca)
At: Wellington International Airport

Project No.: 3324338
29 AUGUST 2025
Issue for Resource Consent



DRAWING LIST		
DRAWING No.	REV	DRAWING TITLE
3324338-CA-SK000	I	COVER SHEET AND DRAWING LIST
3324338-CA-SK001	F	EXISTING BATHYMETRIC AND TOPOGRAPHIC SURVEY
3324338-CA-SK002	H	EXISTING LAYOUT
3324338-CA-SK003	H	EXISTING SECTIONS SHEET 1 OF 3
3324338-CA-SK004	H	EXISTING SECTIONS SHEET 2 OF 3
3324338-CA-SK005	H	EXISTING SECTIONS SHEET 3 OF 3
3324338-CA-SK006	G	EXISTING STRUCTURES TYPICAL SECTIONS
3324338-CA-SK007	I	GENERAL ARRANGEMENT SOUTHERN SEAWALL
3324338-CA-SK008	J	GENERAL ARRANGEMENT EASTERN BANK REMEDIATION
3324338-CA-SK009	L	GENERAL ARRANGEMENT MOA POINT RD YARD
3324338-CA-SK100	H	SOUTHERN SEAWALL SECTIONS SHEET 1 OF 3
3324338-CA-SK101	H	SOUTHERN SEAWALL SECTIONS SHEET 2 OF 3
3324338-CA-SK102	J	SOUTHERN SEAWALL SECTIONS SHEET 3 OF 3
3324338-CA-SK104	J	EASTERN BANK REHABILITATION SECTION
3324338-CA-SK105	F	EXISTING AND PROPOSED SEAWALL TOE AND MHWS LOCATIONS
3324338-CA-SK106	C	LAND USE ZONES PLAN
3324338-CA-SK120	D	STAGE 1 KORORA HABITAT GENERAL ARRANGEMENT & UNDERPASS SECTION
3324338-CA-SK121	C	STAGE 1 KORORA HABITAT UNDERPASS LONG SECTION AND ELEVATION
3324338-CA-SK200	B	MGC CONSTRUCTION YARD EXISTING CONTOURS & SERVICES LAYOUT PLAN
3324338-CA-SK201	B	MGC CONSTRUCTION YARD GENERAL ARRANGEMENT & EXISTING SERVICES
3324338-CA-SK211	B	MGC CONSTRUCTION YARD STORAGE AREAS & STORMWATER DRAINAGE
3324338-CA-SK215	C	MGC CONSTRUCTION YARD LAYOUT PLAN: ROADS, SERVICES & STOCKPILES
3324338-CA-SK216	B	MGC CONSTRUCTION YARD ADDITIONAL EARTHWORKS AREAS
3324338-CA-SK217	C	MGC CONSTRUCTION YARD ISOPACH - CUT AND FILL PLAN
3324338-CA-SK221	C	MGC CONSTRUCTION YARD BULK EARTHWORKS CROSS SECTIONS #1
3324338-CA-SK222	A	MGC CONSTRUCTION YARD BULK EARTHWORKS CROSS SECTIONS #2

make everyday better.

WLG

Creative people together transforming our world

Document No. 3324338-CA-SK000.DWG

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Drawing Plotted: 1:29 pm

NOTES:

1. HORIZONTAL COORDINATE SYSTEM: NEW ZEALAND TRANSVERSE MERCATOR (NZTM2000).
2. VERTICAL DATUM TO NEW ZEALAND VERTICAL DATUM 2016 (NZVD16).
3. BATHYMETRIC SURVEY DATA:
   - DISCOVERY MARINE LIMITED (DML) CONDUCTED APRIL TO MAY 2021.
4. TOPOGRAPHIC DATA:
   - BECA DRONE SURVEY JAN 2024.

LEGEND:

—— 5.0 —— MAJOR CONTOURS (5.0m INTERVALS)

——— MINOR CONTOURS (0.5m INTERVALS)

LYALL BAY BREAKWATER

MOA POINT ROAD

INSTRUMENT LANDING SYSTEM (ILS)

EXISTING WAVE WALL

MOA POINT ROAD

STEWART DUFF DRIVE

SOUTHERN SEAWALL

WAVE TRAP OUTLET

ORIGINAL DRAWING IN COLOUR

RESOURCE CONSENT
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
F	FOR RESOURCE CONSENT	TS	AS	JH	08.04.25
E	FOR RESOURCE CONSENT	AF	AS	JH	28.02.25
D	FOR RESOURCE CONSENT	TS	AS	JH	06.12.24
C	FOR RESOURCE CONSENT	TS	AS	JH	02.12.24

Original Scale (A1) 1:750
Reduced Scale (A3) 1:1500

Design	AS & WP	08.04.25	Approved For Construction*
Drawn	TS	08.04.25	
Dsg Verifier	JH	08.04.25	
Drg Check	JH	08.04.25	Date

* Refer to Revision 1 for Original Signature

Beca

Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: EXISTING BATHYMETRIC AND TOPOGRAPHIC SURVEY

Discipline: CIVIL ENGINEERING

Drawing No.: 3324338-CA-SK001

Rev.: F

Document No.: 332438-CA-SK001.DWG

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DO NOT SCALE FOR SET OUT DIMENSIONS

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Drawing Plotted: 1:29 pm

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NOTES:

1. HORIZONTAL COORDINATE SYSTEM: NEW ZEALAND TRANSVERSE MERCATOR (NZTM2000).
2. VERTICAL DATUM TO NEW ZEALAND VERTICAL DATUM 2016 (NZVD16).
3. BATHYMETRIC SURVEY DATA:
   - DISCOVERY MARINE LIMITED (DML) CONDUCTED APRIL TO MAY 2021.
4. TOPOGRAPHIC DATA:
   - BECA DRONE SURVEY JAN 2024.
5. STORM WATER AND WASTEWATER LOCATIONS EXTRACTED FROM WELLINGTON CITY COUNCIL GIS.
6. STRUCTURE AND TOP OF BANK AS SHOWN ARE INDICATIVE ONLY.

LEGEND:

- 5.0 — MAJOR CONTOURS (5.0m INTERVALS)
- MINOR CONTOURS (0.5m INTERVALS)
- SW — STORMWATER AND MANHOLE
- WW — WASTEWATER AND VALVE
- C — WINDSOCK AND CABLE
- ? — UNKNOWN
- W — WATER
- FO — FIBRE OPTIC
- HV — HIGH VOLTAGE ELECTRICITY
- WAVE TRAP
- INDICATIVE STRUCTURE / BANK TOE
- SURVEY MARK F33P (BDJL NOT SHOWN)

MOA POINT ROAD
SITE ACCESS
LYALL BAY BREAKWATER
TIMBER BARRIER FENCE
FALL
REAR SLOPE PROTECTION
SOUTHERN SEAWALL
INSTRUMENT LANDING SYSTEM (ILS)
SOUTHERN SEAWALL - INFORMAL RUBBLE SLOPE
WAVE TRAP
WAVE TRAP OUTLET
SOUTHERN SEAWALL - AKMON ARMOUR UNITS
STEWART DUFF DRIVE
1 SK003
2 SK003
3 SK004
4 SK004
5 SK005
6 SK005

ORIGINAL DRAWING IN COLOUR

RESOURCE CONSENT
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
H	FOR RESOURCE CONSENT	CFP	JH	JH	28.07.25
G	FOR RESOURCE CONSENT	CFP	JH	JH	30.07.25
F	FOR RESOURCE CONSENT	TS	AS	JH	08.04.25
E	FOR RESOURCE CONSENT	AF	AS	JH	28.02.25

Original Scale (A1)	1:750	Approved For Construction*	
Reduced Scale (A3)	1:1500	* Refer to Revision 1 for Original Signature	

Design	AS & WP	08.04.25	
Drawn	TS	08.04.25	
Dsg Verifier	JH	08.04.25	
Drg Check	JH	08.04.25	Date

Beca

Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: EXISTING LAYOUT

Discipline: CIVIL ENGINEERING

Drawing No.: 3324338-CA-SK002

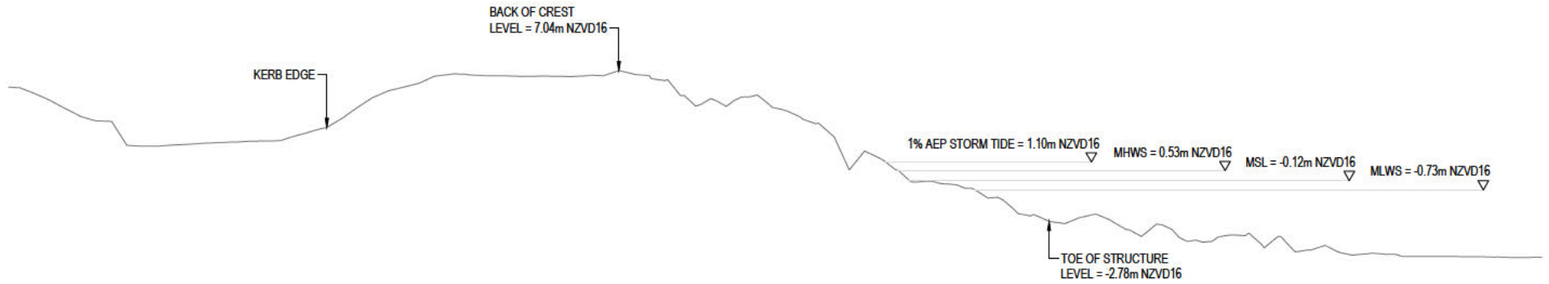
Rev.: H

Document No. 3324338-CA-SK002.DWG

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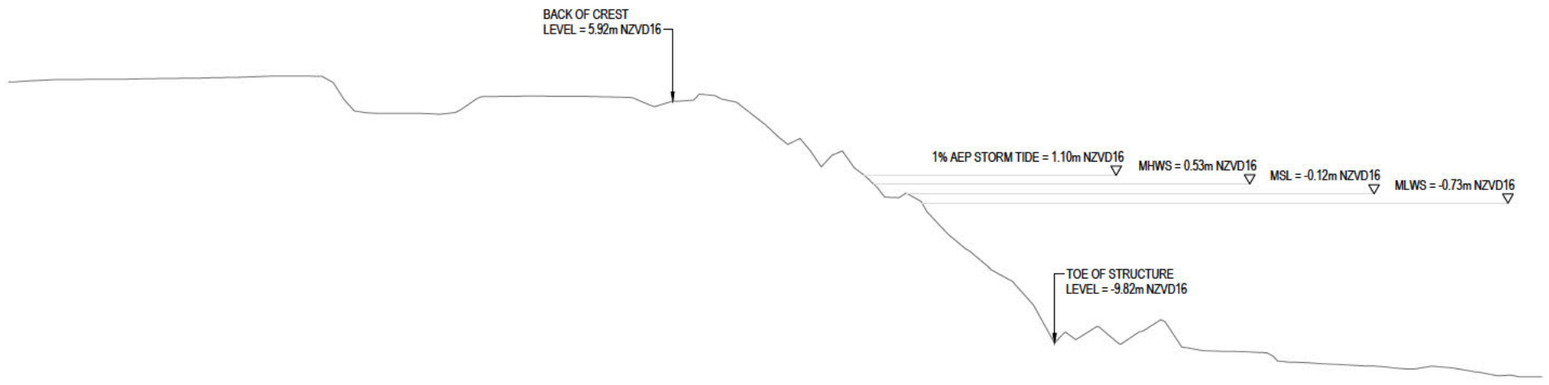
Drawing Plotted: 1:29 pm



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EXISTING SURFACE LEVEL	5.42	4.42	3.75	2.16	2.14	2.26	2.37	2.45	2.57	3.15	4.11	5.40	6.02	6.71	6.78	6.71	6.68	6.67	6.74	7.00	6.51	5.42	5.14	5.33	4.61	3.81	2.38	1.72	0.53	-0.16	-0.46	-1.25	-2.30	-2.80	-2.51	-2.79	-3.67	-3.44	-4.13	-3.67	-4.43	-4.76	-4.41	-4.94	-4.93	-5.07	-5.07	-5.09	-5.13
OLS LEVEL	8.27	8.56	8.86	9.15	9.45	9.74	10.03	10.33	10.62	10.91	11.21	11.50	11.79	12.09	12.38	12.67	12.95	13.23	13.51	13.79	14.07	14.35	14.63	14.91	15.19	15.47	15.75	16.02	16.30	16.58	16.87	17.15	17.44	17.73	18.02	18.30	18.59	18.88	19.16	19.44	19.72	20.00	20.28	20.56	20.84	21.12	21.40	21.68	21.96

1 / SK002 SECTION AT SS-CH 60
SCALE 1:200



Datum -15.00

CHAINAGE	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98
EXISTING SURFACE LEVEL	7.28	7.34	7.36	7.37	7.41	7.43	7.46	7.52	7.58	7.55	5.89	5.14	5.13	5.07	5.72	6.24	6.25	6.23	6.23	6.18	5.61	5.95	6.30	5.46	3.80	3.04	2.52	0.92	-0.36	-1.39	-3.35	-4.98	-6.42	-9.46	-9.38	-9.53	-9.05	-9.31	-10.34	-10.40	-10.46	-11.10	-11.21	-11.31	-11.42	-11.48	-11.45	-11.76	-11.94
OLS LEVEL	8.29	8.31	8.32	8.34	8.36	8.38	8.40	8.42	8.44	8.46	8.48	8.50	8.52	8.54	8.56	8.57	8.59	8.61	8.63	8.65	8.67	9.15	9.18	9.21	9.24	9.27	9.31	9.34	9.37	9.40	9.43	9.46	9.49	9.52	9.55	9.58	9.69	9.88	10.06	10.24	10.42	10.60	10.78	10.96	11.15	11.33	11.50	11.68	11.86

2 / SK002 SECTION AT SS-CH 160
SCALE 1:200

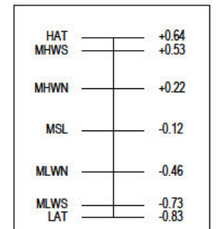
NOTES:

1. HORIZONTAL COORDINATE SYSTEM: NEW ZEALAND TRANSVERSE MERCATOR (NZTM2000).
2. VERTICAL DATUM TO NEW ZEALAND VERTICAL DATUM 2016 (NZVD16).
3. BATHYMETRIC SURVEY DATA:
   - DISCOVERY MARINE LIMITED (DML) CONDUCTED APRIL TO MAY 2021.
4. TOPOGRAPHIC SURVEY DATA:
   - BECA DRONE SURVEY JAN 2024.
5. CREST AND TOE MARKS ARE INDICATIVE ONLY.

LEGEND:

EXISTING GROUND

TIDE LEVELS



TIDE BAR
(m NZVD16)

ORIGINAL DRAWING IN COLOUR

RESOURCE CONSENT
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
H	FOR RESOURCE CONSENT	CFP	JH	JH	14.08.25
G	FOR RESOURCE CONSENT	CFP	JH	JH	28.07.25
F	FOR RESOURCE CONSENT	TS	AS	JH	08.04.25
E	FOR RESOURCE CONSENT	AF	AS	JH	28.02.25

Original Scale (A1) AS SHOWN	Design	AS & WP	08.04.25	Approved For Construction*
	Drawn	TS	08.04.25	
Reduced Scale (A3) HALF SHOWN	Dsg Verifier	JH	08.04.25	
	Drg Check	JH	08.04.25	Date
	* Refer to Revision 1 for Original Signature			

Beca

Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: EXISTING SECTIONS SHEET 1 OF 3

Discipline: CIVIL ENGINEERING

Drawing No.: 3324338-CA-SK003

Rev.: H

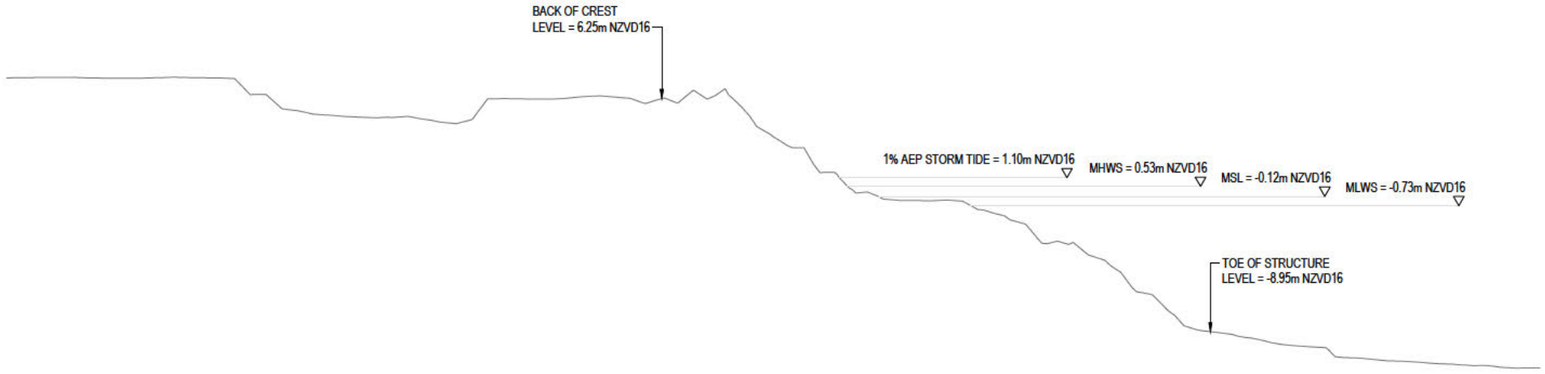
Document No.: 3324338-CA-SK003.DWG

DO NOT SCALE FOR SET OUT DIMENSIONS

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Drawing Plotted: 1:29 pm



Datum -15.00

CHAINAGE	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98
EXISTING SURFACE LEVEL	7.63	7.63	7.59	7.58	7.62	7.63	7.59	6.52	5.58	5.25	5.10	5.00	5.08	4.76	4.79	6.25	6.23	6.24	6.40	6.32	6.03	6.15	6.35	5.62	3.78	3.04	1.45	0.15	-0.37	-0.41	-0.41	-1.11	-1.81	-3.17	-3.48	-4.64	-6.39	-7.76	-8.88	-9.15	-9.54	-9.87	-9.98	-10.66	-10.83	-10.93	-11.05	-11.16	-11.30
OLS LEVEL	8.53	8.56	8.58	8.61	8.63	8.65	8.68	8.70	8.73	8.75	8.78	8.80	8.83	8.85	8.88	8.90	8.92	8.95	8.97	9.00	9.02	9.05	9.07	9.10	9.12	9.15	9.17	9.19	9.22	9.24	9.27	9.29	9.32	9.34	9.37	9.39	9.42	9.44	9.46	9.49	9.51	9.54	9.56	9.59	9.61	9.64	9.66	9.69	9.71

3 / SK002 SECTION AT SS-CH 250
SCALE 1:200

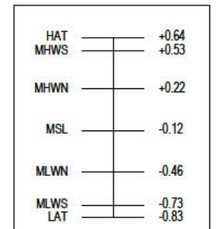
NOTES:

1. HORIZONTAL COORDINATE SYSTEM: NEW ZEALAND TRANSVERSE MERCATOR (NZTM2000).
2. VERTICAL DATUM TO NEW ZEALAND VERTICAL DATUM 2016 (NZVD16).
3. BATHYMETRIC SURVEY DATA:
   - DISCOVERY MARINE LIMITED (DML) CONDUCTED APRIL TO MAY 2021.
4. TOPOGRAPHIC SURVEY DATA:
   - BECA DRONE SURVEY JAN 2024.
5. CREST AND TOE MARKS ARE INDICATIVE ONLY.

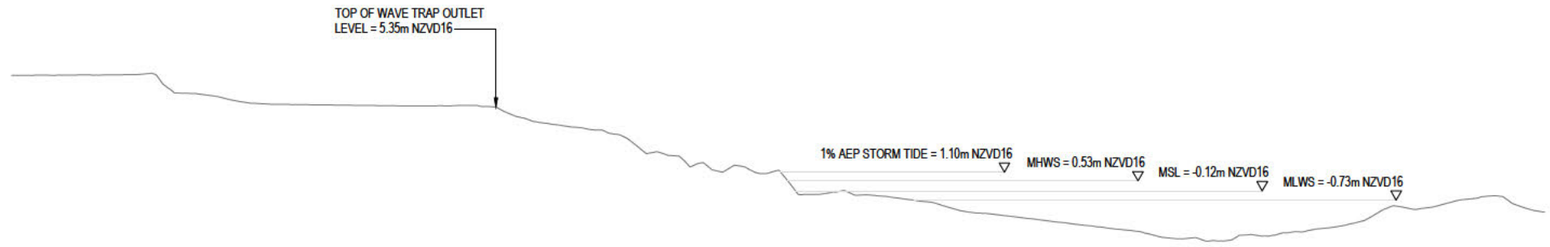
LEGEND:

EXISTING GROUND

TIDE LEVELS



TIDE BAR
(m NZVD16)



Datum -10.00

CHAINAGE	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98
EXISTING SURFACE LEVEL	7.42	7.43	7.44	7.46	6.74	6.22	5.88	5.58	5.51	5.47	5.46	5.43	5.42	5.42	5.45	5.12	4.43	4.12	3.86	3.38	2.41	1.73	1.18	1.35	1.22	-0.35	-0.16	-0.40	-0.62	-0.87	-1.44	-1.65	-1.88	-2.12	-2.36	-2.60	-2.90	-3.24	-3.40	-3.08	-3.06	-2.80	-2.52	-2.11	-1.14	-1.27	-0.84	-0.50	-0.99
OLS LEVEL	8.54	8.56	8.58	8.60	8.62	8.63	8.65	8.67	8.69	8.71	8.73	8.75	8.77	9.15	9.34	9.37	9.40	9.43	9.46	9.49	9.52	9.55	9.58	9.62	9.65	9.68	9.71	9.74	9.77	9.82	10.01	10.19	10.37	10.55	10.74	10.91	11.10	11.28	11.46	11.64	11.82	12.00	12.19	12.37	12.55	12.73	12.91	13.09	13.28

4 / SK002 SECTION AT SS-CH 330
SCALE 1:200

ORIGINAL DRAWING IN COLOUR

RESOURCE CONSENT
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
H	FOR RESOURCE CONSENT	CFP	JH	JH	14.08.25
G	FOR RESOURCE CONSENT	CFP	JH	JH	28.07.25
F	FOR RESOURCE CONSENT	TS	AS	JH	08.04.25
E	FOR RESOURCE CONSENT	AF	AS	JH	28.02.25

Original Scale (A1) AS SHOWN
Reduced Scale (A3) HALF SHOWN

Design	AS & WP	08.04.25	Approved For Construction*
Drawn	TS	08.04.25	
Dsg Verifier	JH	08.04.25	
Drg Check	JH	08.04.25	Date

* Refer to Revision 1 for Original Signature

Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: EXISTING SECTIONS SHEET 2 OF 3

Discipline: CIVIL ENGINEERING

Drawing No.: 3324338-CA-SK004

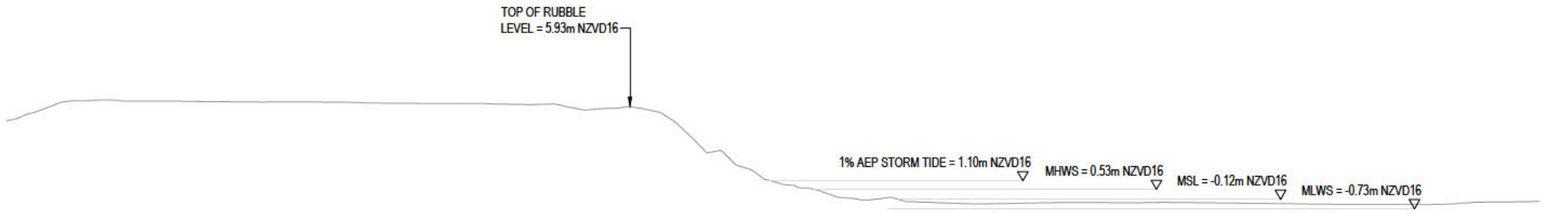
Rev.: H

Document No. 324038-CA-SK004.DWG

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Datum -10.00

CHAINAGE	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98
EXISTING SURFACE LEVEL	5.63	6.28	6.35	6.29	6.29	6.27	6.26	6.24	6.24	6.24	6.21	6.16	6.14	6.12	6.13	6.10	6.06	6.05	5.72	5.85	5.68	4.57	2.97	2.00	1.05	0.63	0.10	-0.17	-0.06	-0.30	-0.38	-0.40	-0.37	-0.33	-0.32	-0.33	-0.33	-0.32	-0.34	-0.36	-0.38	-0.41	-0.44	-0.44	-0.44	-0.44	-0.42	-0.31	-0.29
OLS LEVEL	14.29	14.32	14.34	14.37	14.39	14.41	14.44	14.46	14.48	14.51	14.54	14.57	14.60	14.62	14.65	14.68	14.71	14.74	14.77	14.80	14.83	14.86	14.89	14.91	14.94	14.97	15.00	15.03	15.06	15.08	15.11	15.13	15.16	15.18	15.21	15.24	15.27	15.30	15.33	15.36	15.39	15.42	15.45	15.47	15.50	15.53	15.56	15.59	15.62

5 SK002 SECTION AT SS-CH 380
SCALE 1:200

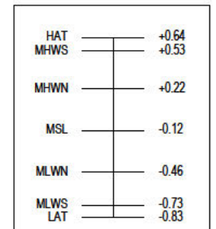
NOTES:

1. HORIZONTAL COORDINATE SYSTEM: NEW ZEALAND TRANSVERSE MERCATOR (NZTM2000).
2. VERTICAL DATUM TO NEW ZEALAND VERTICAL DATUM 2016 (NZVD16).
3. BATHYMETRIC SURVEY DATA:
   - DISCOVERY MARINE LIMITED (DML) CONDUCTED APRIL TO MAY 2021.
4. TOPOGRAPHIC SURVEY DATA:
   - BECA DRONE SURVEY JAN 2024.
5. CREST AND TOE MARKS ARE INDICATIVE ONLY.

LEGEND:

EXISTING GROUND

TIDE LEVELS



TIDE BAR
(m NZVD16)



Datum -10.00

CHAINAGE	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98
EXISTING SURFACE LEVEL	6.80	6.04	5.91	6.61	7.06	7.04	7.06	6.80	6.32	5.84	6.33	6.35	5.88	6.22	6.33	6.28	6.03	6.03	5.87	4.88	3.06	2.81	2.57	2.26	1.99	1.77	1.29	1.00	0.62	0.23	-0.09	-0.36	-0.43	-0.44	-0.45	-0.46	-0.47	-0.48	-0.49	-0.50	-0.51	-0.52	-0.53	-0.54	-0.53	-0.53	-0.53	-0.52	-0.51
OLS LEVEL	28.11	27.99	27.87	27.75	27.63	27.51	27.39	27.27	27.15	27.03	26.91	26.79	26.67	26.55	26.43	26.31	26.19	26.07	25.95	25.83	25.71	25.59	25.47	25.35	25.23	25.11	24.99	24.87	24.75	24.63	24.51	24.39	24.27	24.15	24.03	23.91	23.79	23.67	23.55	23.43	23.31	23.19	23.07	22.95	22.83	22.71	22.59	22.47	22.35

6 SK002 SECTION AT SS-CH 460
SCALE 1:200

ORIGINAL DRAWING IN COLOUR

RESOURCE CONSENT
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
H	FOR RESOURCE CONSENT	CFP	JH	JH	14.08.25
G	FOR RESOURCE CONSENT	CFP	JH	JH	28.07.25
F	FOR RESOURCE CONSENT	TS	AS	JH	08.04.25
E	FOR RESOURCE CONSENT	AF	AS	JH	28.02.25

Original Scale (A1) AS SHOWN	Design	AS & WP	08.04.25
	Drawn	TS	08.04.25
Reduced Scale (A3) HALF SHOWN	Dsg Verifier	JH	08.04.25
	Drg Check	JH	08.04.25

Approved For Construction* Date
* Refer to Revision 1 for Original Signature

Beca

Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: EXISTING SECTIONS SHEET 3 OF 3

Discipline: CIVIL ENGINEERING

Drawing No.: 3324338-CA-SK005

Rev.: H

Document No. 3324338-CA-SK005.DWG

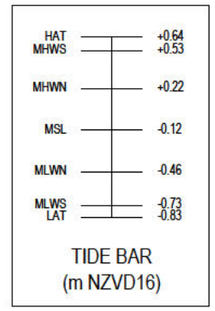
DO NOT SCALE FOR SET OUT DIMENSIONS

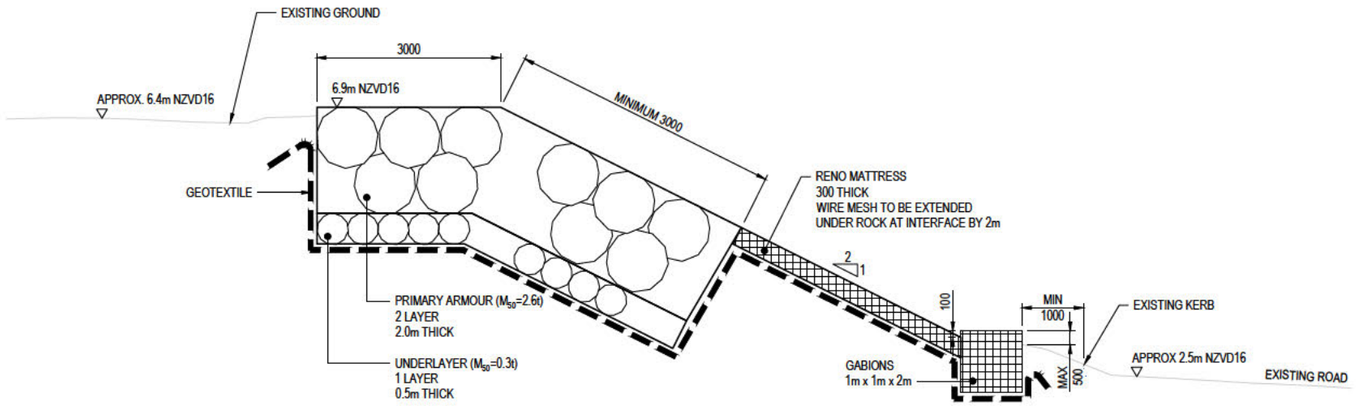
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NOTES:

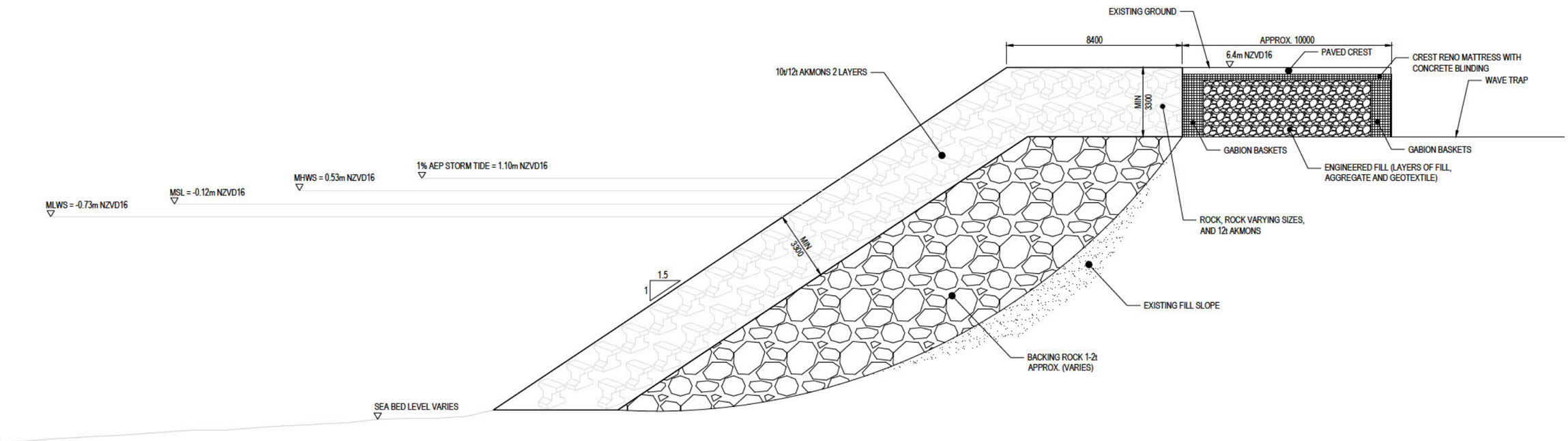
1. VERTICAL DATUM TO NEW ZEALAND VERTICAL DATUM 2016 (NZVD16).
2. ALL DIMENSION ARE IN MILLIMETRES UNLESS STATED OTHERWISE.
3. REAR SLOPE PROTECTION DESIGNED BY BECA IN 2016, TYPICAL SECTION SHOWS DESIGN NOT AS BUILT STRUCTURE.
4. EXISTING AKMON ARMOURED SEAWALL IS INDICATIVE ONLY. THE AS-BUILT DRAWINGS ARE NOT AVAILABLE AND INFORMATION IS LIMITED





TYPICAL DESIGN SECTION OF EXISTING REAR SLOPE PROTECTION

SCALE 1:50



INDICATIVE DESIGN SECTION OF EXISTING SOUTHERN SEAWALL (PRESENT DAY ACTUAL SEAWALL DIFFERS)

SCALE 1:100

RESOURCE CONSENT
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
G	FOR RESOURCE CONSENT	CFP	JH	JH	30.06.25
F	FOR RESOURCE CONSENT	TS	AS	JH	08.04.25
E	FOR RESOURCE CONSENT	AF	AS	JH	28.02.25
D	FOR RESOURCE CONSENT	TS	AS	JH	06.12.24

Original Scale (A1) AS SHOWN	Design	AS & WP	08.04.25
	Drawn	TS	08.04.25
Reduced Scale (A3) HALF SHOWN	Dsg Verifier	JH	08.04.25
	Dsg Check	JH	08.04.25

Approved For Construction* Date

* Refer to Revision 1 for Original Signature

Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: EXISTING STRUCTURES TYPICAL SECTIONS

Discipline: CIVIL ENGINEERING

Drawing No.: 3324338-CA-SK006

Rev.: G

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Document No. 3324338-CA-SK006.DWG

Drawing Plotted: 1:30 pm

LOCATION OF SITE SECURITY FENCE VARIES DURING CONSTRUCTION

LYALL BAY BREAKWATER

REINSTATED BREAKWATER ARMOUR

CREST OF SEAWALL AT 4.8m NZVD16

EXISTING SITE ACCESS

LOCATION OF SITE SECURITY FENCE VARIES DURING CONSTRUCTION

EDGE OF PAVEMENT

MOA POINT ROAD

REAR SLOPE PROTECTION

CREST OF SEAWALL AT 7.4m NZVD16

REINFORCED CONCRETE CREST WALL

INSTRUMENT LANDING SYSTEM (ILS)

SOUTHERN SEAWALL

END OF SOUTHERN SEAWALL / START OF EASTERN BANK REMEDIATION

EASTERN BANK REMEDIATION

INDICATIVE TOE EXTENT (EXCAVATED AND ROCK BERM TOES)

1 SK100

2 SK101

3 SK102

LEGEND:

- 5.0 — MAJOR CONTOURS (5.0m INTERVALS)
- MINOR CONTOURS (0.5m INTERVALS)
- SW — EXISTING STORMWATER AND MANHOLE
- WW — EXISTING WASTEWATER AND VALVE
- C — EXISTING WINDSOCK AND CABLE
- ? — UNKNOWN
- W — EXISTING WATER
- FO — EXISTING FIBRE OPTIC
- SITE SECURITY FENCE DURING CONSTRUCTION

NOTES:

1. HORIZONTAL COORDINATE SYSTEM: NEW ZEALAND TRANSVERSE MERCATOR (NZTM2000).
2. VERTICAL DATUM TO NEW ZEALAND VERTICAL DATUM 2016 (NZVD16).
3. BATHYMETRIC SURVEY DATA:
   - DISCOVERY MARINE LIMITED (DML) CONDUCTED APRIL TO MAY 2021.
   - NIWA 25m AND 50m DEM 2014.
4. TOPOGRAPHIC DATA:
   - BECA DRONE SURVEY JAN 2024.
5. STORM WATER AND WASTEWATER LOCATIONS EXTRACTED FROM WELLINGTON CITY COUNCIL GIS.
6. ROCK TOE BERM CONSTRUCTED BETWEEN APPROX CH 80m AND CH 280m, AND REMAINDER OF TOE EXCAVATED INTO ROCKY SEABED, SUBJECT TO DETAILED DESIGN AND FINAL CONSTRUCTION METHODOLOGY.

ORIGINAL DRAWING IN COLOUR

RESOURCE CONSENT
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
I	FOR RESOURCE CONSENT	CFP	JH	JH	14.08.25
H	FOR RESOURCE CONSENT	CFP	JH	JH	28.07.25
G	FOR RESOURCE CONSENT	CFP	JH	JH	30.06.25
F	FOR RESOURCE CONSENT	TS	AS	JH	08.04.25

Original Scale (A1) 1:500
Reduced Scale (A3) 1:1000

Design	AS & WP	08.04.25	Approved For Construction*
Drawn	TS	08.04.25	
Dsg Verifier	JH	08.04.25	
Drg Check	JH	08.04.25	Date

* Refer to Revision 1 for Original Signature

Beca

Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: GENERAL ARRANGEMENT SOUTHERN SEAWALL

Discipline: CIVIL ENGINEERING

Drawing No.: 3324338-CA-SK007

Rev.: I

Document No. 3324338-CA-SK007.DWG

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Drawing Plotted: 1:30 pm

NOTES:

1. HORIZONTAL COORDINATE SYSTEM: NEW ZEALAND TRANSVERSE MERCATOR (NZTM2000).
2. VERTICAL DATUM TO NEW ZEALAND VERTICAL DATUM 2016 (NZVD16).
3. BATHYMETRIC SURVEY DATA:
   - DISCOVERY MARINE LIMITED (DML) CONDUCTED APRIL TO MAY 2021.
   - NIWA 25m AND 50m DEM 2014.
4. TOPOGRAPHIC DATA:
   - BECA DRONE SURVEY JAN 2024.
5. STORM WATER AND WASTEWATER LOCATIONS EXTRACTED FROM WELLINGTON CITY COUNCIL GIS.

LEGEND:

- 5.0 — MAJOR CONTOURS (5.0m INTERVALS)
- MINOR CONTOURS (0.5m INTERVALS)
- SW — EXISTING STORMWATER AND MANHOLE
- WW — EXISTING WASTEWATER AND VALVE
- W — EXISTING WATER
- FO — EXISTING FIBRE OPTIC
- HV — EXISTING HIGH VOLTAGE ELECTRICITY
- INDICATIVE LOCATION OF KORORĀ AREA
- RESERVE RESTORATION AREA

EDGE OF PAVEMENT

MOA POINT ROAD

STEWART DUFF DRIVE

EXISTING SITE ACCESS

INDICATIVE LOCATION OF KORORĀ AREA TO BE CONFIRMED WITH ECOLOGICAL SPECIALISTS

REINFORCED CONCRETE CREST WALL

END OF SOUTHERN SEAWALL / START OF EASTERN BANK REMEDIATION

MOA POINT OUTFALL WASTEWATER MANHOLE

NEW STORMWATER OUTFALL FROM EXISTING STORMWATER PIPE

INDICATIVE TOE EXTENT (EXCAVATED AND ROCK BERM TOES)

1 SK104

SOUTHERN SEAWALL

EASTERN BANK REMEDIATION LOWER BANK REMEDIATION BURIED BENEATH BEACH. BEACH MATERIAL TO BE REPLACED ON COMPLETION

CREST OF SEAWALL AT 7.4m NZVD16

ORIGINAL DRAWING IN COLOUR

RESOURCE CONSENT NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
J	FOR RESOURCE CONSENT	CFP	JH	JH	25.08.25
I	FOR RESOURCE CONSENT	CFP	JH	JH	14.08.25
H	FOR RESOURCE CONSENT	CFP	JH	JH	28.07.25
G	FOR RESOURCE CONSENT	CFP	JH	JH	30.06.25

Original Scale (A1) 1:500
Reduced Scale (A3) 1:1000

Design	AS & WP	08.04.25	Approved For Construction*
Drawn	TS	08.04.25	
Dsg Verifier	JH	08.04.25	
Drg Check	JH	08.04.25	Date

* Refer to Revision 1 for Original Signature

Beca

Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: GENERAL ARRANGEMENT EASTERN BANK REMEDIATION

Discipline: CIVIL ENGINEERING

Drawing No.: 3324338-CA-SK008

Rev.: J

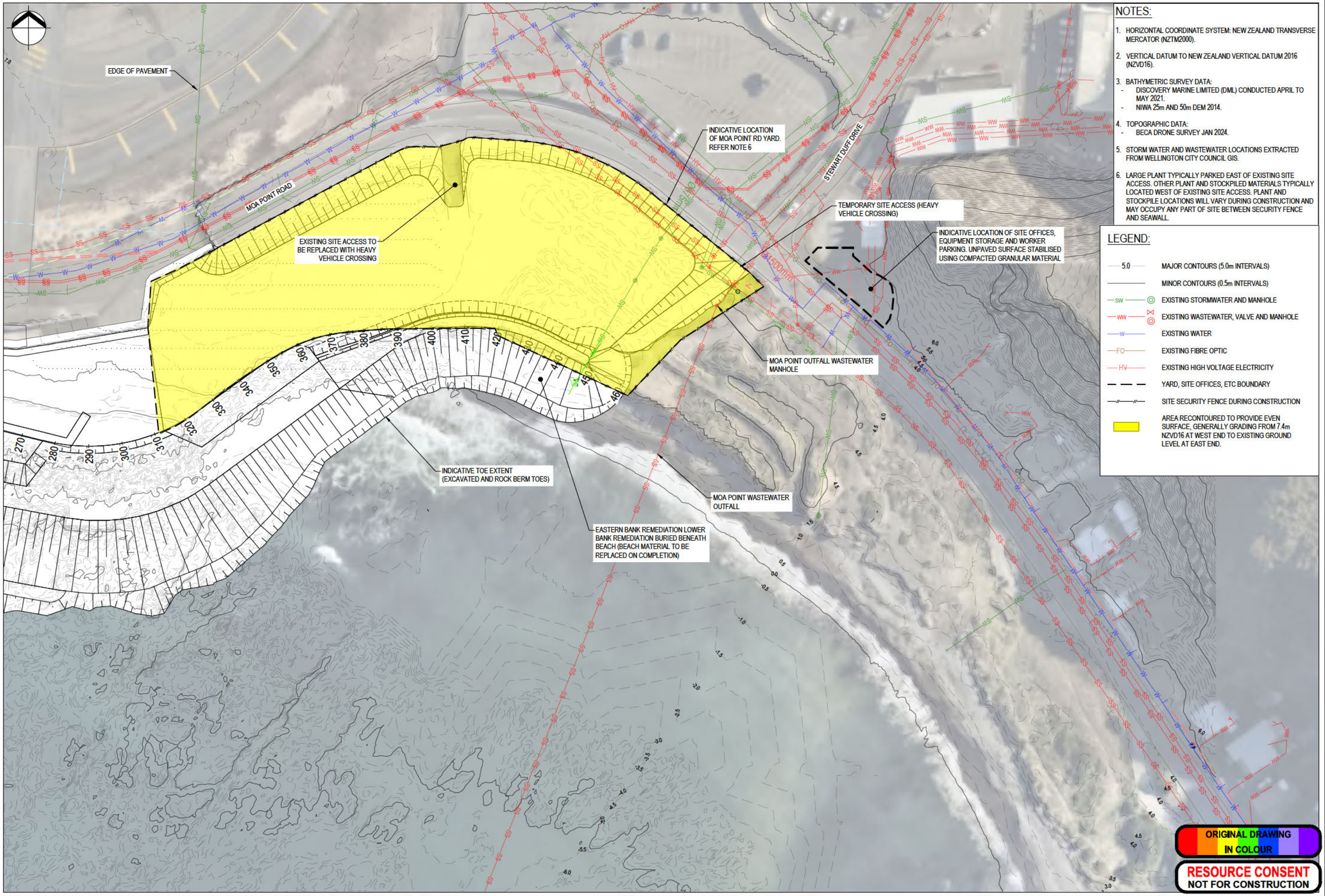
Document No. 3324338-CA-SK008.DWG

DO NOT SCALE FOR SET OUT DIMENSIONS

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Drawing Plotted: 2:08 pm



NOTES:

1. HORIZONTAL COORDINATE SYSTEM: NEW ZEALAND TRANSVERSE MERCATOR (NZTM2000).
2. VERTICAL DATUM TO NEW ZEALAND VERTICAL DATUM 2016 (NZVD16).
3. BATHYMETRIC SURVEY DATA:
   - DISCOVERY MARINE LIMITED (DML) CONDUCTED APRIL TO MAY 2021.
   - NIWA 25m AND 50m DEM 2014.
4. TOPOGRAPHIC DATA:
   - BECA DRONE SURVEY JAN 2024.
5. STORM WATER AND WASTEWATER LOCATIONS EXTRACTED FROM WELLINGTON CITY COUNCIL GIS.
6. LARGE PLANT TYPICALLY PARKED EAST OF EXISTING SITE ACCESS. OTHER PLANT AND STOCKPILED MATERIALS TYPICALLY LOCATED WEST OF EXISTING SITE ACCESS. PLANT AND STOCKPILE LOCATIONS WILL VARY DURING CONSTRUCTION AND MAY OCCUPY ANY PART OF SITE BETWEEN SECURITY FENCE AND SEAWALL.

LEGEND:

- 5.0 — MAJOR CONTOURS (5.0m INTERVALS)
- MINOR CONTOURS (0.5m INTERVALS)
- SW — EXISTING STORMWATER AND MANHOLE
- WW — EXISTING WASTEWATER, VALVE AND MANHOLE
- W — EXISTING WATER
- FO — EXISTING FIBRE OPTIC
- HV — EXISTING HIGH VOLTAGE ELECTRICITY
- YARD, SITE OFFICES, ETC BOUNDARY
- SITE SECURITY FENCE DURING CONSTRUCTION
- AREA RECONTOURED TO PROVIDE EVEN SURFACE, GENERALLY GRADING FROM 7.4m NZVD16 AT WEST END TO EXISTING GROUND LEVEL AT EAST END.

ORIGINAL DRAWING IN COLOUR

RESOURCE CONSENT NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
L	FOR RESOURCE CONSENT	CFP	JH	JH	29.08.25
K	FOR RESOURCE CONSENT	CFP	JH	JH	25.08.25
J	FOR RESOURCE CONSENT	CFP	JH	JH	28.07.25
I	FOR RESOURCE CONSENT	CFP	JH	JH	30.06.25

Original Scale (A1) 1:500
Reduced Scale (A3) 1:1000

Design	AS & WP	08.04.25	Approved For Construction*
Drawn	TS	08.04.25	
Dsg Verifier	JH	08.04.25	
Drg Check	JH	08.04.25	Date

* Refer to Revision 1 for Original Signature

Beca

Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: GENERAL ARRANGEMENT MOA POINT RD YARD

Discipline: CIVIL ENGINEERING

Drawing No.: 3324338-CA-SK009

Rev.: L

DO NOT SCALE FOR SET OUT DIMENSIONS

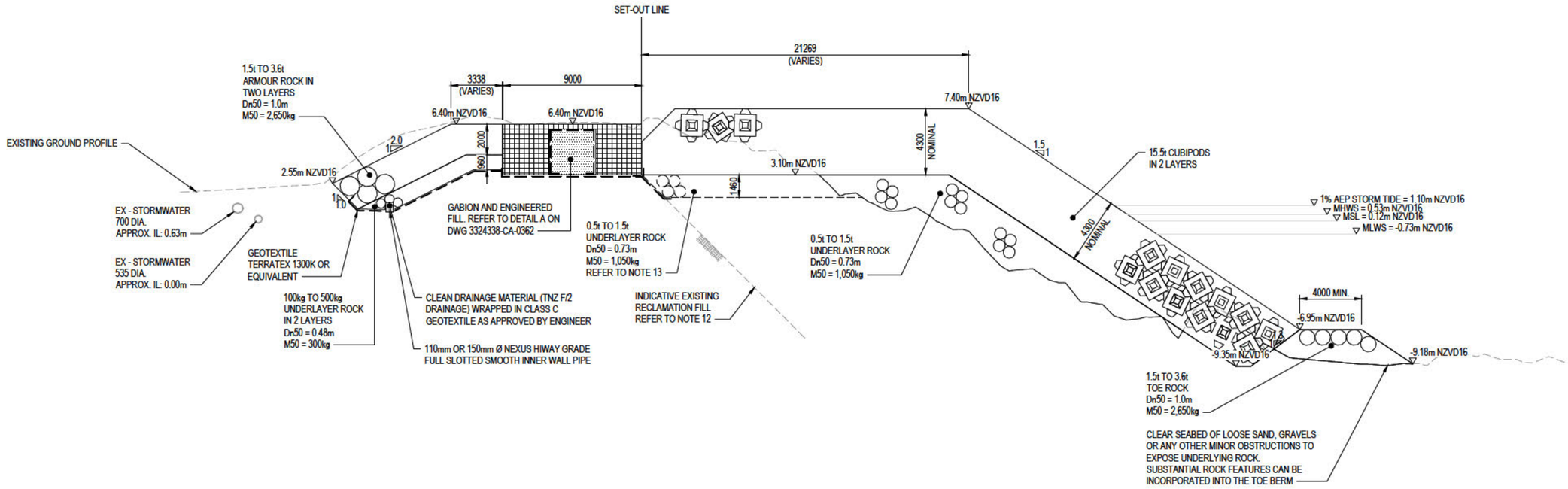
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Document No. 3324338-CA-SK009.DWG

NOTES:

1. VERTICAL DATUM TO NEW ZEALAND VERTICAL DATUM 2016 (NZVD16).
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.
3. BATHYMETRIC SURVEY DATA:
   - DISCOVERY MARINE LIMITED (DML) CONDUCTED APRIL TO MAY 2021.
4. ANY EXCAVATED UNSUITABLE MATERIAL FROM THE BANK TO BE REMOVED OFF SITE AND DISPOSED OF APPROPRIATELY.



1 / SK007 SECTION AT CH90 - REAR SLOPE PROTECTION AND SEAWALL
SCALE 1:150

RESOURCE CONSENT
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
H	FOR RESOURCE CONSENT	CFP	JH	JH	28.07.25
G	FOR RESOURCE CONSENT	CFP	JH	JH	30.06.25
F	FOR RESOURCE CONSENT	TS	AS	JH	08.04.25
E	FOR RESOURCE CONSENT	AF	AS	JH	28.02.25

Original Scale (A1): AS SHOWN
Reduced Scale (A3): HALF SHOWN

Design	AS & WP	08.04.25	Approved For Construction*
Drawn	TS	08.04.25	
Dsg Verifier	JH	08.04.25	
Drg Check	JH	08.04.25	Date

* Refer to Revision 1 for Original Signature

Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: SOUTHERN SEAWALL SECTIONS SHEET 1 OF 3

Discipline: CIVIL ENGINEERING

Drawing No.: 3324338-CA-SK100

Rev.: H

Document No. 3324338-CA-SK100.DWG

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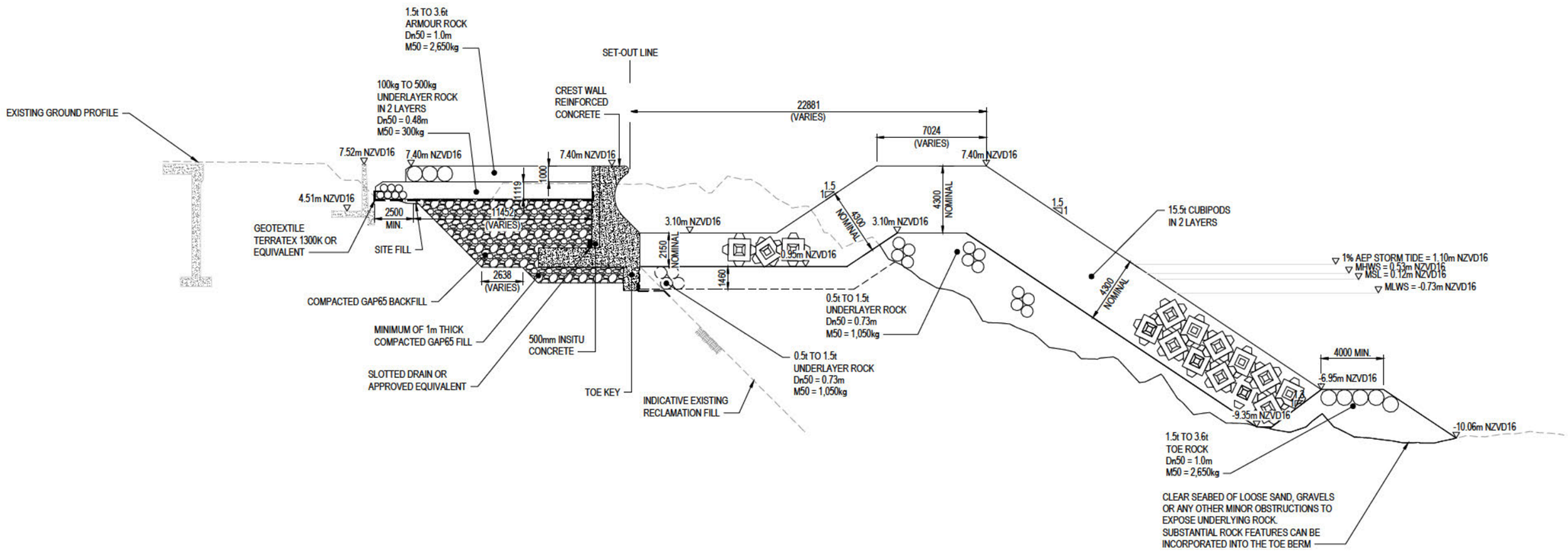
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HAT	+0.64
MHWS	+0.53
MHWN	+0.22
MSL	-0.12
MLWN	-0.46
MLWS	-0.73
LAT	-0.83

TIDE BAR
(m NZVD16)

NOTES:

1. VERTICAL DATUM TO NEW ZEALAND VERTICAL DATUM 2016 (NZVD16).
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.
3. BATHYMETRIC SURVEY DATA:
   - DISCOVERY MARINE LIMITED (DML) CONDUCTED APRIL TO MAY 2021.
4. UNDERLAYER ROCK WILL BE USED TO FORM AN EVEN REGULAR 1V:1.5H SLOPE. THE UNDERLAYER SURFACE MAY HAVE EXPOSED AKMON SURFACES AS WELL AS ROCK.
5. SATO CUBIPOD PLACEMENT GRID AND EXISTING PROFILE TO CONFIRM CREST DIMENSIONS.
6. DEPTH OF SAND AND GRAVEL ABOVE ROCK LEVEL VARIES FROM 0.m TO APPROXIMATELY 0.5m TO 1m.



2 / SK007 SECTION AT CH220 - SOUTHERN SEAWALL
SCALE 1:150

RESOURCE CONSENT
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
H	FOR RESOURCE CONSENT	CFP	JH	JH	28.07.25
G	FOR RESOURCE CONSENT	CFP	JH	JH	30.06.25
F	FOR RESOURCE CONSENT	TS	AS	JH	08.04.25
E	FOR RESOURCE CONSENT	AF	AS	JH	28.02.25

Original Scale (A1) AS SHOWN
Reduced Scale (A3) HALF SHOWN

Design	AS & WP	08.04.25	Approved For Construction*
Drawn	TS	08.04.25	
Dsg Verifier	JH	08.04.25	
Drg Check	JH	08.04.25	Date

* Refer to Revision 1 for Original Signature

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Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: SOUTHERN SEAWALL SECTIONS SHEET 2 OF 3

Discipline: CIVIL ENGINEERING

Drawing No.: 3324338-CA-SK101

Rev.: H

Document No. 3324338-CA-SK101.DWG

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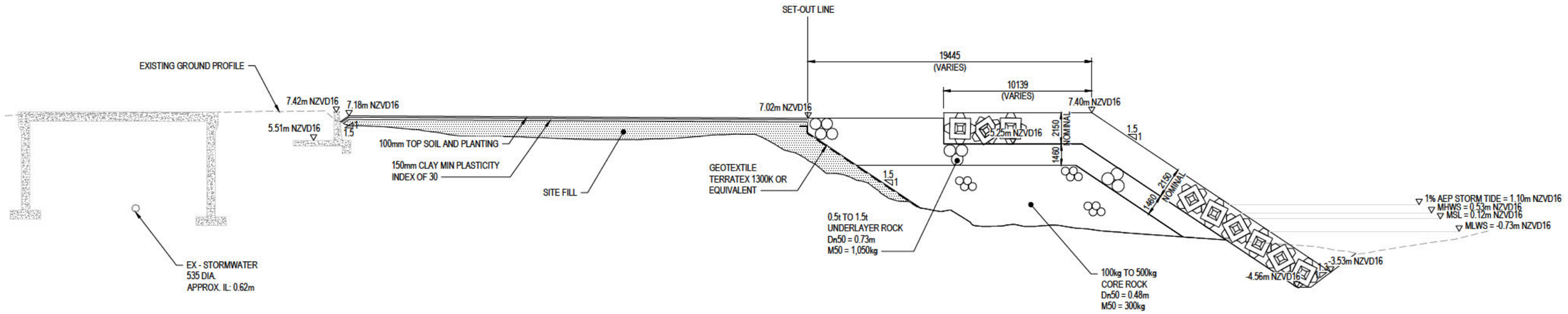
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HAT	+0.64
MHWS	+0.53
MHWN	+0.22
MSL	-0.12
MLWN	-0.46
MLWS	-0.73
LAT	-0.83

TIDE BAR
(m NZVD16)

NOTES:

1. VERTICAL DATUM TO NEW ZEALAND VERTICAL DATUM 2016 (NZVD16).
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.
3. BATHYMETRIC SURVEY DATA:
   - DISCOVERY MARINE LIMITED (DML) CONDUCTED APRIL TO MAY 2021.
4. UNDERLAYER ROCK WILL BE USED TO FORM AN EVEN REGULAR 1V:1.5H SLOPE. THE UNDERLAYER SURFACE MAY HAVE EXPOSED AKMON SURFACES AS WELL AS ROCK.
5. SATO CUBIPOD PLACEMENT GRID AND EXISTING PROFILE TO CONFIRM CREST DIMENSIONS.



3 / SK007 SECTION AT CH330 - SOUTHERN SEAWALL - EAST END
SCALE 1:150

RESOURCE CONSENT
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
J	FOR RESOURCE CONSENT	CFP	JH	JH	25.08.25
I	FOR RESOURCE CONSENT	CFP	JH	JH	28.07.25
H	FOR RESOURCE CONSENT	CFP	JH	JH	30.06.25
G	FOR RESOURCE CONSENT	MJVR	AS	JH	10.06.25

Original Scale (A1): AS SHOWN
Reduced Scale (A3): HALF SHOWN

Design	AS & WP	08.04.25	Approved For Construction*
Drawn	TS	08.04.25	
Dsg Verifier	JH	08.04.25	
Drg Check	JH	08.04.25	Date

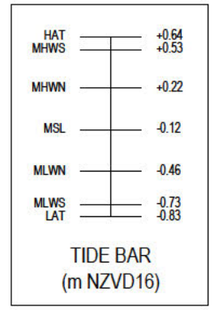
* Refer to Revision 1 for Original Signature

Client: WLG
Project: WIAL SEA DEFENCE STRUCTURES RENEWAL
Title: SOUTHERN SEAWALL SECTIONS SHEET 3 OF 3
Discipline: CIVIL ENGINEERING
Drawing No.: 3324338-CA-SK102
Rev.: J
Document No. 3324338-CA-SK102.DWG

DO NOT SCALE FOR SET OUT DIMENSIONS

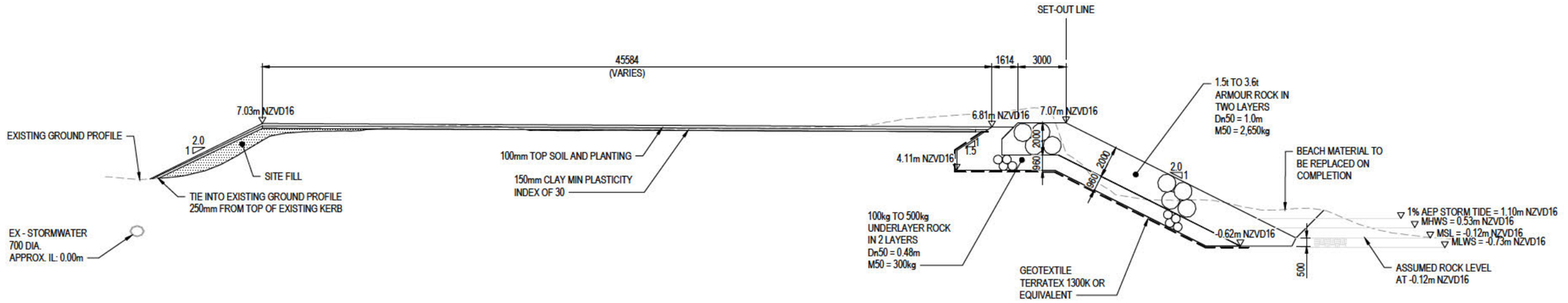
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NOTES:

1. VERTICAL DATUM TO NEW ZEALAND VERTICAL DATUM 2016 (NZVD16).
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.
3. BATHYMETRIC SURVEY DATA:
   - DISCOVERY MARINE LIMITED (DML) CONDUCTED APRIL TO MAY 2021.
4. TOE TO BE A MIN. 1650 BELOW EXISTING BEACH LEVEL IF ROCK SEABED IS ENCOUNTERED KEY TOE IN BY A MIN 0.5Dn50.
5. EXISTING BANK AND HINTERLAND TO BE LANDSCAPED FOR TEMPORARY LAY DOWN AREA AND PENGUIN HABITAT IN THE EXTENTS SHOWN ON SK009.



1 / SK-008 SECTION AT CH 420 - EASTERN BANK REMEDIATION
SCALE 1:150

RESOURCE CONSENT
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
J	FOR RESOURCE CONSENT	CFP	JH	JH	25.08.25
I	FOR RESOURCE CONSENT	CFP	JH	JH	28.07.25
H	FOR RESOURCE CONSENT	CFP	JH	JH	30.06.25
G	FOR RESOURCE CONSENT	MJVR	AS	JH	10.06.25

Original Scale (A1) AS SHOWN	Design	AS & WP	08.04.25	Approved For Construction*
	Drawn	TS	08.04.25	
Reduced Scale (A3) HALF SHOWN	Dsg Verifier	JH	08.04.25	
	Drg Check	JH	08.04.25	Date
	* Refer to Revision 1 for Original Signature			

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Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: EASTERN BANK REHABILITATION SECTION

Discipline: CIVIL ENGINEERING

Drawing No.: 3324338-CA-SK104

Rev.: J

Document No. 324338-CA-SK104.DWG

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Drawing Plotted: 1:30 pm



NOTES:

1. HORIZONTAL COORDINATE SYSTEM: NEW ZEALAND TRANSVERSE MERCATOR (NZTM2000).
2. VERTICAL DATUM TO NEW ZEALAND VERTICAL DATUM 2016 (NZVD16).
3. BATHYMETRIC SURVEY DATA:
   - DISCOVERY MARINE LIMITED (DML) CONDUCTED APRIL TO MAY 2021.
4. TOPOGRAPHIC DATA:
   - BECA DRONE SURVEY JAN 2024 AND WCC LIDAR 2024.
5. TOE, MHWS LINE AND STRUCTURES AS SHOWN ARE INDICATIVE ONLY. EXISTING AND PROPOSED MHWS LINE ON EASTERN BANK REHABILITATION VARY, DEPENDING ON BEACH LEVELS.

LEGEND:

- 5.0 — MAJOR CONTOURS (5.0m INTERVALS)
- MINOR CONTOURS (0.5m INTERVALS)
- WAVE TRAP
- INDICATIVE STRUCTURE / BANK TOE

PARAMETER	QUANTITY
INCREASE IN PROPOSED SEAWALL WIDTH (AT EXISTING FORMAL SEAWALL)	~20-30m
INCREASE IN PROPOSED SEAWALL FOOTPRINT	UP TO 12,000m^2

ORIGINAL DRAWING IN COLOUR

RESOURCE CONSENT
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
F	FOR RESOURCE CONSENT	CFP	JH	JH	28.07.25
E	FOR RESOURCE CONSENT	CFP	JH	JH	30.06.25
D	FOR RESOURCE CONSENT	MJVR	AS	JH	10.06.25
C	FOR RESOURCE CONSENT	TS	AS	JH	08.04.25

Original Scale (A1) 1:750
Reduced Scale (A3) 1:1500

Design	AS & WP	08.04.25	Approved For Construction*
Drawn	TS	08.04.25	
Dsg Verifier	JH	08.04.25	
Drg Check	JH	08.04.25	Date

* Refer to Revision 1 for Original Signature

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Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: EXISTING AND PROPOSED SEAWALL TOE AND MHWS LOCATIONS

Discipline: CIVIL ENGINEERING

Drawing No.: 3324338-CA-SK105

Rev.: F

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Document No. 3324338-CA-SK105.DWG

Drawing Plotted: 1:30 pm

NOTES:

1. HORIZONTAL COORDINATE SYSTEM: NEW ZEALAND TRANSVERSE MERCATOR (NZTM2000).
2. VERTICAL DATUM TO NEW ZEALAND VERTICAL DATUM 2016 (NZVD16).
3. BATHYMETRIC SURVEY DATA:
   - DISCOVERY MARINE LIMITED (DML) CONDUCTED APRIL TO MAY 2021.
4. TOPOGRAPHIC DATA:
   - BECA DRONE SURVEY JAN 2024 AND WCC LIDAR 2024.
5. TOE, MHWS LINE AND STRUCTURES AS SHOWN ARE INDICATIVE ONLY. EXISTING AND PROPOSED MHWS LINE ON EASTERN BANK REHABILITATION VARY, DEPENDING ON BEACH LEVELS.

LEGEND:

- MAJOR CONTOURS (5.0m INTERVALS)
- MINOR CONTOURS (0.5m INTERVALS)
- CADASTRAL BOUNDARY
- GENERAL INDUSTRIAL ZONE
- MEDIUM DENSITY RESIDENTIAL ZONE
- NATURAL OPEN SPACE ZONE
- SPECIAL PURPOSE ZONE (AIRPORT)

MGC YARD

SOUTHERN SEAWALL AND EASTERN BANK REMEDIATION

ORIGINAL DRAWING IN COLOUR

RESOURCE CONSENT NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
C	FOR RESOURCE CONSENT	CFP	JH	JH	28.07.25
B	FOR RESOURCE CONSENT	CFP	JH	JH	30.06.25
A	FOR RESOURCE CONSENT	MJVR	JH	JH	10.06.25

Original Scale (A1) 1:1500	Design	MJVR	10.06.25
	Drawn	MJVR	10.06.25
Reduced Scale (A3) 1:3000	Dsg Verifier	JH	10.06.25
	Drg Check	JH	10.06.25

Approved For Construction* Date

* Refer to Revision 1 for Original Signature

Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: LAND USE ZONES PLAN

Discipline: CIVIL ENGINEERING

Drawing No.: 3324338-CA-SK106

Rev.: C

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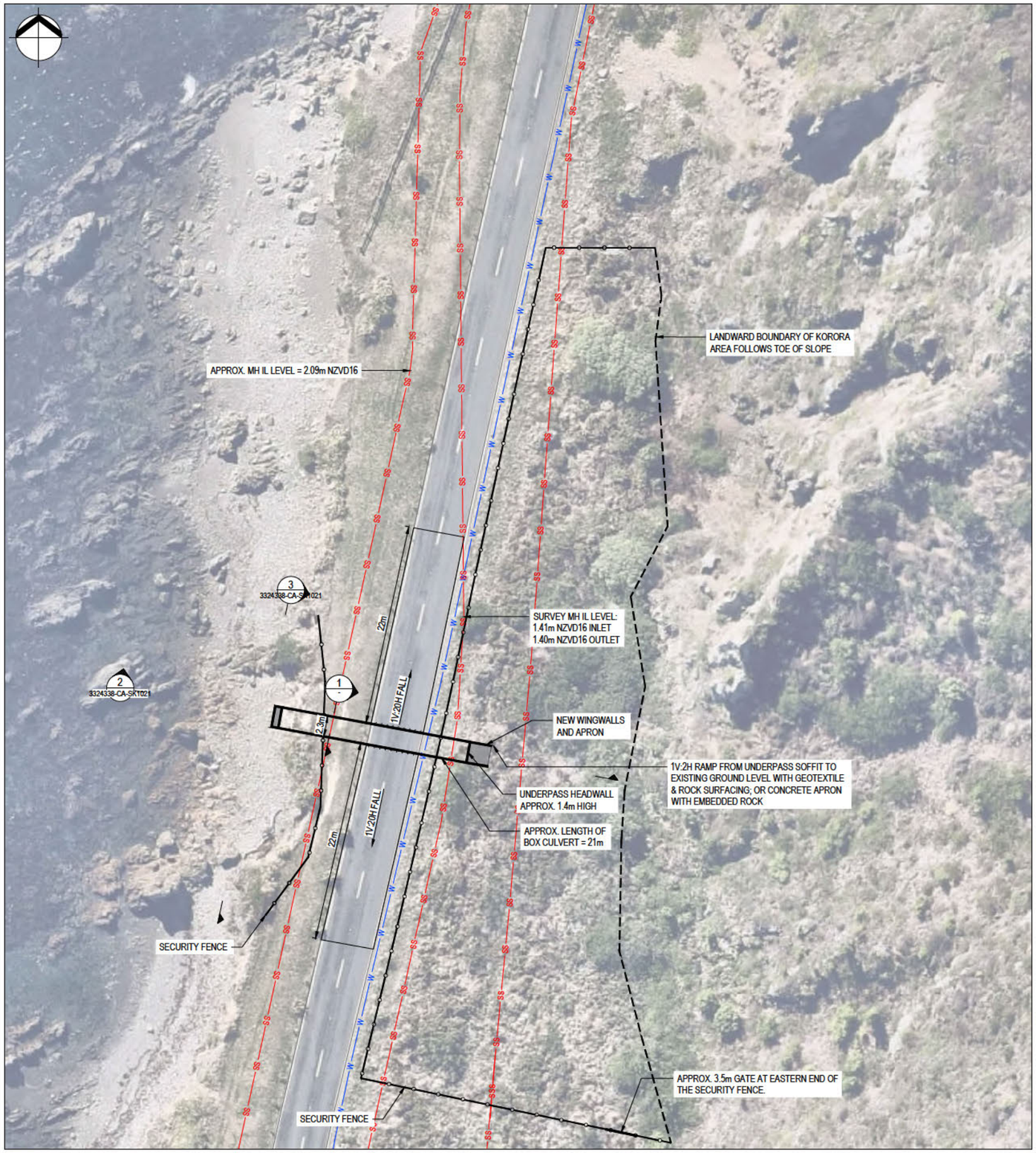
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Document No.: 3324338-CA-SK106.DWG

Drawing Plotted: 1:30 pm



PLAN OF STAGE 1 KORORA HABITAT LOCATION

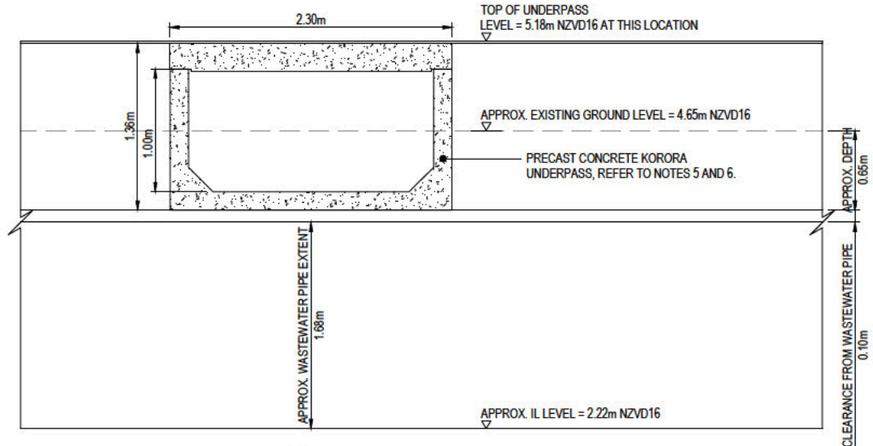
SCALE 1:250

NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. HORIZONTAL COORDINATE SYSTEM: NEW ZEALAND TRANSVERSE MERCATOR (NZTM2000).
3. VERTICAL DATUM TO NEW ZEALAND VERTICAL DATUM 2016 (NZVD16).
4. ALL EXISTING SERVICES SHALL BE LOCATED AND MARKED PRIOR TO START OF CONSTRUCTION ON SITE. ALL EXISTING SERVICES SHALL BE PROTECTED OR RELOCATED TO AVOID DAMAGE DURING AND AFTER CONSTRUCTION.
5. THE KORORA UNDERPASS SHALL BE DESIGNED TO MEET THE KORORA SPECIALIST'S REQUIREMENTS. THE UNDERPASS SHALL BE DESIGNED TO COMPLY WITH THE NZTA BRIDGE MANUAL, NZS 3101:2006: PART 1, AND THE NZ BUILDING CODE. THE UNDERPASS SHALL WITHSTAND HN-HO-72 TRAFFIC LOADING WITH 0mm COVER (20mm AC SURFACING AND TACK COAT LAID DIRECT ON UNDERPASS). THE UNDERPASS DESIGN LIFE SHALL BE MIN. 50 YEARS. CONCRETE SHALL BE MARINE GRADE CONCRETE MIN. 40 MPa. SURFACE FINISHES SHALL COMPLY WITH NZS 3114:1986 F3 UNLESS OTHERWISE REUQIRED BY THE KORORA SPECIALIST. PRECAST MANUFACTURE SHALL COMPLY WITH NZS 3109:1997.
6. UNDERPASS INSTALLATION INCLUDING BEDDING AND BACKFILL SHALL BE IN ACCORDANCE WITH THE UNDERPASS DESIGNER'S SPECIFICATIONS.

LEGEND:

- LAND PARCEL BOUNDARY
- SS — EXISTING WASTEWATER
- W — EXISTING WATER
- FENCING
- ROAD GRADIENT
- SECURITY FENCING
- LANDWARD BOUNDARY OF KORORA AREA



1 - CROSS SECTION THROUGH UNDERPASS

SCALE 1:25

ORIGINAL DRAWING IN COLOUR

FOR PRICING
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
D	FOR RESOURCE CONSENT	CFP	JH	JH	14.08.25
C	FOR RESOURCE CONSENT	CFP	JH	JH	28.07.25
B	FOR RESOURCE CONSENT	CFP	JH	JH	11.07.25
A	FOR PRICING (2025)	WP	AS	JH	08.07.24

Original Scale (A1): AS SHOWN
Reduced Scale (A3): HALF SHOWN

Design	WP/AS	08.07.24	Approved For Construction* Date
Drawn	WP	08.07.24	
Dsg Verifier	JH	08.07.24	
Drg Check	WN	08.07.24	

* Refer to Revision 1 for Original Signature

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Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: STAGE 1 KORORA HABITAT GENERAL ARRANGEMENT & UNDERPASS SECTION

Discipline: CIVIL ENGINEERING

Drawing No.: 3324338-CA-SK120

Rev.: D

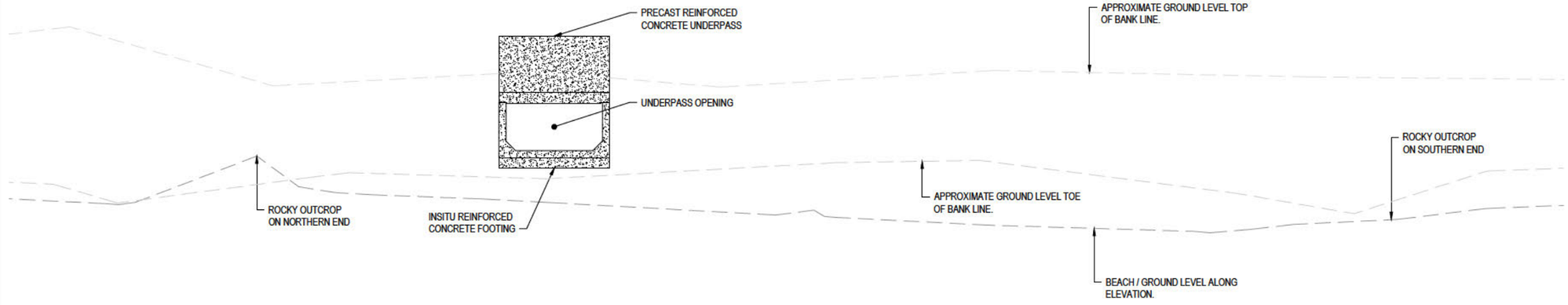
Document No. 3324338-CA-SK120.DWG

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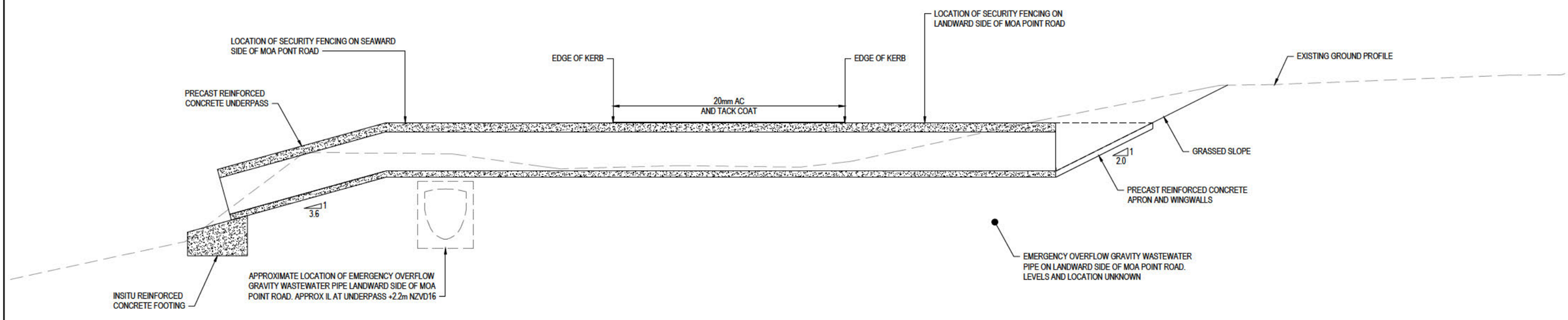
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NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. HORIZONTAL COORDINATE SYSTEM: NEW ZEALAND TRANSVERSE MERCATOR (NZTM2000).
3. VERTICAL DATUM TO NEW ZEALAND VERTICAL DATUM 2016 (NZVD16).
4. ALL EXISTING SERVICES SHALL BE LOCATED AND MARKED PRIOR TO START OF CONSTRUCTION ON SITE. ALL EXISTING SERVICES SHALL BE PROTECTED OR RELOCATED TO AVOID DAMAGE DURING AND AFTER CONSTRUCTION.
5. THE KORORA UNDERPASS SHALL BE DESIGNED TO MEET THE KORORA SPECIALIST'S REQUIREMENTS. THE UNDERPASS SHALL BE DESIGNED TO COMPLY WITH THE NZTA BRIDGE MANUAL, NZS 3101:2006: PART 1, AND THE NZ BUILDING CODE. THE UNDERPASS SHALL WITHSTAND HN-HO-72 TRAFFIC LOADING WITH 0mm COVER (PAVEMENT LAID DIRECT ON UNDERPASS). THE UNDERPASS DESIGN LIFE SHALL BE MIN. 50 YEARS. CONCRETE SHALL BE MARINE GRADE CONCRETE MIN. 40 MPa. SURFACE FINISHES SHALL COMPLY WITH NZS 3114:1986 F3 UNLESS OTHERWISE REUQIRED BY THE KORORA SPECIALIST. PRECAST MANUFACTURE SHALL COMPLY WITH NZS 3109:1997.
6. UNDERPASS INSTALLATION INCLUDING BEDDING AND BACKFILL SHALL BE IN ACCORDANCE WITH THE UNDERPASS DESIGNER'S SPECIFICATIONS.



2 LONG SECTION THROUGH UNDERPASS
3324338-CA-0501 SCALE 1:50

ORIGINAL DRAWING IN COLOUR

FOR PRICING
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
C	FOR RESOURCE CONSENT	CFP	JH	JH	28.07.25
B	FOR RESOURCE CONSENT	CFP	JH	JH	11.07.25
A	FOR PRICING (2025)	WP	AS	JH	08.07.24

Original Scale (A1) AS SHOWN	Design	WP/AS	08.07.24
	Drawn	WP	08.07.24
Reduced Scale (A3) HALF SHOWN	Dsg Verifier	JH	08.07.24
	Drg Check	WN	08.07.24

Approved For Construction* Date
* Refer to Revision 1 for Original Signature

Beca

Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: STAGE 1 KORORA HABITAT UNDERPASS LONG SECTION AND ELEVATION

Discipline: CIVIL ENGINEERING

Drawing No.: 3324338-CA-SK121

Rev.: C

Document No. 3324338-CA-SK121.DWG

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Drawing Plotted: 1:31 pm

NOTES:

1. CADASTRAL INFORMATION FROM LINZ DATA BASE AND IN NEW ZEALAND TRANSVERSE MERCATOR 2000 (NZTM2000) COORDINATE SYSTEM.
2. MODEL BASED ON EXISTING SURFACE DTM FROM 2013 LIDAR DATA & HISTORIC AIRFIELD TOPOGRAPHIC SURVEY WHERE AVAILABLE AND HEIGHT ADJUSTED TO NZVD2016 BY REDUCING LEVELS BY 0.488m MANUALLY FOR THIS EXERCISE. LEVELS ARE TO BE CONFIRMED BY A REGISTERED SURVEYOR.
3. INFORMATION ARE ADOPTED FROM WELLINGTON AIRPORT RECORDS, WELLINGTON CITY COUNCIL GIS, AND BEFORE U DIG INFORMATION. SOME SERVICES MIGHT BE DUPLICATED WHICH ARE RETRIEVED FROM VARIOUS SOURCES. NO GUARANTEE IS GIVEN TO THE COMPLETENESS OF SERVICES INFORMATION. CONTRACTOR TO VERIFY SERVICES LOCATION ON SITE PRIOR TO CONSTRUCTION.

LEGEND:

- CONSTRUCTION YARD DEMARCATION
- EAST SIDE AREA ACCESS AND CARPARKS
- EXISTING SECURITY FENCE (APPROX)
- EXISTING SANITARY SEWER
- EXISTING STORMWATER
- EXISTING WATER
- EXISTING 11kV HV CABLE
- EXISTING COMMUNICATIONS

EAST SIDE AREA ADDITIONAL RENTAL CAR PARK
REFER HOLMES DRAWINGS

NOT FOR USE BY SEA DEFENCES PROJECT
RENTAL CAR PARK

EXISTING STORMWATER

EXISTING STORMWATER POND

PROPOSED EAST SIDE AREA ACCESS TO ADDITIONAL RENTAL CARPARK AREA

STEWART DUFF DRIVE

MIRAMAR GOLF COURSE PROPERTY BOUNDARY

EXISTING SHED WITH POWER, SEWER & WATER CONNECTIONS

SITE YARD / LAYDOWN YARD
APPROX. AREA - UP TO 4.54 ha

EXISTING HV, LV & FO TO BE RELOCATED

EXISTING SECURITY FENCE

EXISTING HV SUBSTATION

EXISTING SEWER , HV & STORMWATER

WELLINGTON INTERNATIONAL AIRPORT

STEWART DUFF DRIVE

MOA POINT
WWTP

ORIGINAL DRAWING IN COLOUR

FOR PRICING
NOT FOR CONSTRUCTION

FULL SIZE 1:1000, HALF SIZE 1:2000
SCALE (m) 0 10 20 40 60

No.	Revision	By	Chk	Appd	Date
B	FOR RESOURCE CONSENT	CFP	JH	JH	11.07.25
A	FOR RESOURCE CONSENT	SZ	TNM	JH	08.04.25

Original Scale (A1) 1:1000
Reduced Scale (A3) 1:2000

Design	TNM	08.04.25
Drawn	SZ	08.04.25
Dsg Verifier	CJB	08.04.25
Drg Check	CGK	08.04.25

Approved For Construction* Date

* Refer to Revision 1 for Original Signature

Beca

Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: MGC CONSTRUCTION YARD EXISTING CONTOURS & SERVICES LAYOUT PLAN

Discipline: CIVIL ENGINEERING

Drawing No.: 3324338-CA-SK200

Rev.: B

Document No.: 3324338-CA-SK200.DWG

DO NOT SCALE FOR SET OUT DIMENSIONS

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Drawing Plotted: 1:31 pm

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NOTES:

1. CADASTRAL INFORMATION FROM LINZ DATA BASE AND IN NEW ZEALAND TRANSVERSE MERCATOR 2000 (NZTM2000) COORDINATE SYSTEM.
2. MODEL BASED ON EXISTING SURFACE DTM FROM 2013 LIDAR DATA & HISTORIC AIRFIELD TOPOGRAPHIC SURVEY WHERE AVAILABLE AND HEIGHT ADJUSTED TO NZVD2016 BY REDUCING LEVELS BY 0.488m MANUALLY FOR THIS EXERCISE. LEVELS ARE TO BE CONFIRMED BY A REGISTERED SURVEYOR.
3. INFORMATION ARE ADOPTED FROM WELLINGTON AIRPORT RECORDS, WELLINGTON CITY COUNCIL GIS, AND BEFORE U DIG INFORMATION. SOME SERVICES MIGHT BE DUPLICATED WHICH ARE RETRIEVED FROM VARIOUS SOURCES. NO GUARANTEE IS GIVEN TO THE COMPLETENESS OF SERVICES INFORMATION. CONTRACTOR TO VERIFY SERVICES LOCATION ON SITE PRIOR TO CONSTRUCTION.

LEGEND:

- CONSTRUCTION YARD DEMARCATION
- MGC YARD
- EAST SIDE AREA ACCESS AND CARPARKS
- EXISTING SECURITY FENCE (APPROX)
- EXISTING SANITARY SEWER
- EXISTING STORMWATER
- EXISTING WATER
- EXISTING 11kV HV CABLE
- EXISTING COMMUNICATIONS

PROPOSED STORMWATER CUT-OFF DRAIN
PROPOSED TOPSOIL STOCKPILE AREA
ADDITIONAL CARPARK AREA REFER HOLMES DRAWINGS
EXISTING STORMWATER
PROPOSED STORMWATER CUT-OFF DRAIN
SITE YARD / LAYDOWN YARD APPROX. AREA - UP TO 4.54 ha
EXISTING STORMWATER POND
PROPOSED STORMWATER CUT-OFF DRAIN ON BENCH
NOT FOR USE BY SEA DEFENCES PROJECT RENTAL CARPARK
NOT FOR USE BY SEA DEFENCES PROJECT - ADDITIONAL CARPARK AREA
EXISTING SEWER , HV & STORMWATER
PROPOSED EAST SIDE AREA ACCESS TO ADDITIONAL RENTAL CARPARK AREA
EXISTING SHED WITH SEWER , WATER & POWER CONNECTIONS
PROPOSED STORMWATER CUT-OFF BUND ON PERIMETER
STORAGE YARD
MGC YARD PLATFORM
STEWART DUFF DRIVE
EXISTING SECURITY FENCE
EXISTING SEWER , HV & STORMWATER TO BE PROTECTED UNDER CUBIPOD STORAGE YARD
EXISTING HV SUBSTATION
EXISTING HV, FO & LV TO BE RELOCATED
PROPOSED SHARED ACCESS TO MGC YARD AND ESA RENTAL CARPARK AREA
PROPOSED STORMWATER CUT-OFF DRAIN
PROPOSED ACCESS TO MGC YARD
3H : 1V SOFT CUT SLOPE
PROPOSED DECANTING EARTH BUND AT OUTLET OF DRAIN HS1
STEWART DUFF DRIVE

0 10 20 40 60
FULL SIZE 1:1000, HALF SIZE 1:2000
SCALE (m)

ORIGINAL DRAWING IN COLOUR

FOR PRICING
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
B	FOR RESOURCE CONSENT	CFP	JH	JH	11.07.25
A	FOR RESOURCE CONSENT	SZ	CGK	JH	08.04.25

Original Scale (A1) 1:1000	Design	TNM	08.04.25
	Drawn	SZ	08.04.25
Reduced Scale (A3) 1:2000	Dsg Verifier	CJB	08.04.25
	Drg Check	CGK	08.04.25

Approved For Construction* Date

* Refer to Revision 1 for Original Signature

Beca

Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: MGC CONSTRUCTION YARD GENERAL ARRANGEMENT & EXISTING SERVICES

Discipline: CIVIL ENGINEERING

Drawing No.: 3324338-CA-SK201

Rev.: B

Document No. 3324338-CA-SK201.DWG

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NOTES:

1. CADASTRAL INFORMATION FROM LINZ DATA BASE AND IN NEW ZEALAND TRANSVERSE MERCATOR 2000 (NZTM2000) COORDINATE SYSTEM.
2. MODEL BASED ON EXISTING SURFACE DTM FROM 2013 LIDAR DATA & HISTORIC AIRFIELD TOPOGRAPHIC SURVEY WHERE AVAILABLE AND HEIGHT ADJUSTED TO NZVD2016 BY REDUCING LEVELS BY 0.488m MANUALLY FOR THIS EXERCISE. LEVELS ARE TO BE CONFIRMED BY A REGISTERED SURVEYOR.
3. INFORMATION ARE ADOPTED FROM WELLINGTON AIRPORT RECORDS, WELLINGTON CITY COUNCIL GIS, AND BEFORE U DIG INFORMATION. SOME SERVICES MIGHT BE DUPLICATED WHICH ARE RETRIEVED FROM VARIOUS SOURCES. NO GUARANTEE IS GIVEN TO THE COMPLETENESS OF SERVICES INFORMATION. CONTRACTOR TO VERIFY SERVICES LOCATION ON SITE PRIOR TO CONSTRUCTION.

LEGEND:

- CONSTRUCTION YARD DEMARCATION
- MGC YARD
- MAJOR CONTOURS @ 2.5m INTERVALS
- MINOR CONTOURS @ 0.5m INTERVALS

EXISTING HV
EXISTING WASTEWATER
EXISTING STORMWATER
STORMWATER CUT-OFF DRAIN HS4 AREA = 1,400m²
TOPSOIL STOCKPILE AREA = 3,300m²
STORMWATER CUT-OFF DRAIN HS3 AREA = 570m²
STORMWATER CUT-OFF DRAIN HS2 ON BENCH AREA = 420m²
EXISTING SECURITY FENCE
EXISTING STORMWATER DISCHARGING TO POND WITHIN EASEMENT
45° ROCK CUT SLOPE WITH 3m BENCH AT ≈7.5 TO 10m ABOVE BASE
ROCK CUT SLOPE AT 45°
3H : 1V SOFT CUT SLOPE
EXISTING SHED WITH SEWER , WATER & POWER CONNECTIONS
MGC YARD PLATFORM AREA = 20,900m²
PLATFORM GRADING TO 2040 MASTERPLAN GRADING LEVELS PLUS 1m
PROPOSED EAST SIDE AREA ACCESS TO ADDITIONAL RENTAL CARPARK AREA
STORAGE AREA AREA = 2,800m²
EXISTING HV, LV & FO TO BE RELOCATED
STORMWATER CUT-OFF DRAIN HS1 AREA = 500m²
NOT FOR USE BY SEA DEFENCES PROJECT
300mm HIGH STORMWATER CUT-OFF BUND ON PERIMETER
STEWART DUFF DRIVE
3H : 1V SOFT CUT SLOPE
EXISTING SEWER , HV & STORMWATER TO BE PROTECTED UNDER CUBIPOD STORAGE YARD
PROPOSED EXIT
EXISTING HV SUBSTATION
PROPOSED SHARED ACCESS TO MGC YARD AND ADDITIONAL ESA RENTAL CARPARK
STORMWATER CUT-OFF DRAIN HS1 ROCK LINED DOWN EMBANKMENT AND TO DISCHARGE TO DECANTING EARTH BUND (IN ACCORDANCE WITH E&SC PLAN)

ORIGINAL DRAWING IN COLOUR

FOR PRICING
NOT FOR CONSTRUCTION

FULL SIZE 1:500; HALF SIZE 1:1000
SCALE (m) 0 5 10 20 30

No.	Revision	By	Chk	Appd	Date
B	FOR RESOURCE CONSENT	CFP	JH	JH	11.07.25
A	FOR RESOURCE CONSENT	SZ	CGK	JH	08.04.25

Original Scale (A1) 1:500	Design	TNM	08.04.25
	Drawn	SZ	08.04.25
Reduced Scale (A3) 1:1000	Dsg Verifier	CJB	08.04.25
	Drg Check	CGK	08.04.25

Approved For Construction* Date
* Refer to Revision 1 for Original Signature

Beca

Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: MGC CONSTRUCTION YARD STORAGE AREAS & STORMWATER DRAINAGE

Discipline: CIVIL ENGINEERING

Drawing No.: 3324338-CA-SK211

Rev.: B

Document No. 3324338-CA-SK211.DWG

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Drawing Plotted: 1:31 pm

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NOTES:

1. REFER DRAWING 3324338-CA-0217 FOR EARTHWORKS VOLUMES
2. REFER DRAWING 3324338-CA-0221 FOR CROSS SECTIONS

LEGEND:

- CONSTRUCTION YARD DEMARCATION
- MGC YARD
- MAJOR CONTOURS @ 2.5m INTERVALS
  MINOR CONTOURS @ 0.5m INTERVALS

STORMWATER CUT-OFF DRAIN HS4
AREA = 1,400m²

TOPSOIL STOCKPILE
AREA ≈3,300m²
FILL CAPACITY ≈5,900m³
AT 3m TO 5m HIGH

STORMWATER CUT-OFF DRAIN HS3
AREA = 570m²

EXISTING STORMWATER POND

EXISTING SHED WITH SEWER , WATER & POWER CONNECTIONS

ROCK CUT SLOPE AT 45° WITH 3m BENCH

ROCK STOCKPILE 1
AREA 3,390m²
STORAGE ≈5m TO 6m HIGH

STORMWATER CUT-OFF DRAIN HS2 ON BENCH
AREA = 420m²

EXISTING SECURITY FENCE

ROCK STOCKPILE 2
AREA 2,130m²
STORAGE ≈5m TO 6m HIGH

8m WIDE HARDFILL SURFACED ACCESS ROADS

MGC YARD PLATFORM
AREA = 20,900m²

ROCK STOCKPILE 3
AREA 1,840m²
STORAGE ≈5m TO 6m HIGH

STORAGE YARD
AREA 2,800m²
CUT 810m³
FILL 210m³

ROCK STOCKPILE 4
AREA 2,800m²
STORAGE ≈4m TO 5m HIGH

PROPOSED ACCESS TO EAST SIDE AREA ADDITIONAL RENTAL CARPARK

NOT FOR USE BY SEA DEFENCES PROJECT RENTAL CARPARK AREA

25m x 200Ø uPVC SN16 DIRTY WATER DISCHARGE PIPE FROM WHEEL WASH TO DEB POND

STORMWATER CUT-OFF DRAIN HS1
AREA = 500m²

PROPOSED WHEEL WASH

CONTRACTOR'S LAYDOWN AREA AND/OR OFFICE ±1,050m²

3H : 1V SOFT CUT SLOPE

STORMWATER MANHOLE EXPOSED BY EARTHWORKS TO BE PROTECTED

CONCRETE VEHICLE CROSSING AT ENTRANCE WITH 8m GATE

CHAINAGE -20
CHAINAGE 0
CHAINAGE 20
CHAINAGE 40
CHAINAGE 60
CHAINAGE 80
CHAINAGE 100
CHAINAGE 120
CHAINAGE 140
CHAINAGE 160
CHAINAGE -60
CHAINAGE -40

PROPOSED SHARED ACCESS TO MGC YARD AND ESA RENTAL CARPARK

PEDESTRIAN GATE

CONCRETE VEHICLE CROSSING AT EXIT WITH 8m GATE

NEW SERVICES CONNECTIONS AT LAYDOWN AREA:
DN25 (32Ø PE) POTABLE WATER CONNECTION WITH GATE VALVES, STRAINER, BACKFLOW PREVENTOR
DN50 GATE VALVE ON RECYCLED WATER (63Ø PE100) AT WHEEL WASH
OPTIONAL WASTEWATER CONNECTION:
E/One SIMPLEX 2010P - SINGLE PUMP BY ECOFLOW PRESSURE SEWER SYSTEM WITH 110Ø uPVC CONNECTION FOR OFFICES AND 50Ø PE100 DISCHARGE CONNECTED TO EXISTING WASTEWATER MANHOLE

NEW SERVICES:
200m POTABLE WATER 32Ø PE100 SDR13.6 PN12.5 PIPE (BLACK OR ROYAL BLUE)
220m RECYCLED WATER 63Ø PE100 SDR17 PN10 (LILAC) FROM POND FOR WHEEL WASH
300m POWER CABLE DUCTS 110Ø PE SDR21 PN8 (ORANGE)
180m COMMS CABLE DUCTS 110Ø PE SDR21 PN8 (GREEN)
160m WASTEWATER LOW PRESSURE DISCHARGE 50Ø PE100 SDR17 PN10 (CREAM) (OPTIONAL)

STORMWATER CUT-OFF DRAIN HS1 ROCK LINED DOWN EMBANKMENT AND TO DISCHARGE TO DECANTING EARTH BUND (IN ACCORDANCE WITH E&SC PLAN)

ORIGINAL DRAWING IN COLOUR

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NOT FOR CONSTRUCTION

FULL SIZE 1:500; HALF SIZE 1:1000
SCALE (m) 0 5 10 20 30

No.	Revision	By	Chk	Appd	Date
C	FOR RESOURCE CONSENT	CFP	JH	JH	28.07.25
B	FOR RESOURCE CONSENT	CFP	JH	JH	11.07.25
A	FOR RESOURCE CONSENT	SZ	CGK	JH	08.04.25

Original Scale (A1) 1:500
Reduced Scale (A3) 1:1000

Design	TNM	08.04.25	Approved For Construction* Date
Drawn	SZ	08.04.25	
Dsg Verifier	CJB	08.04.25	
Drg Check	CGK	08.04.25	

* Refer to Revision 1 for Original Signature

Beca

Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: MGC CONSTRUCTION YARD LAYOUT PLAN: ROADS, SERVICES & STOCKPILES

Discipline: CIVIL ENGINEERING

Drawing No. 3324338-CA-SK215 Rev. C

Document No. 3324338-CA-SK215.DWG

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LEGEND:

- CONSTRUCTION YARD DEMARCATION
- MGC YARD
- MAJOR CONTOURS @ 2.5m INTERVALS
- MINOR CONTOURS @ 0.5m INTERVALS

ADDITIONAL CARPARK AREA
REFER HOLMES DRAWINGS

NORTHERN EXTRA STORAGE
PLATFORM AREA 4,200m²
CUT ≈1,690m³
FILL ≈250m³

PROPOSED TOPSOIL
STOCKPILE AREA

RENTAL CAR PARKING
NOT FOR USE BY SEA
DEFENCES PROJECT

PROPOSED ACCESS TO EAST SIDE
AREA ADDITIONAL RENTAL CARPARK

ADDITIONAL RENTAL
CAR PARKING

STORAGE YARD

MGC YARD ROCK ARMOUR STOCKPILE
AND CONSTRUCTION YARD

PROPOSED SHARED ACCESS TO MGC YARD
AND ADDITIONAL RENTAL CARPARK AREA

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FULL SIZE 1:1000, HALF SIZE 1:2000
SCALE (m)
0 10 20 40 60

ORIGINAL DRAWING
IN COLOUR

FOR PRICING
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No.	Revision	By	Chk	Appd	Date
B	FOR RESOURCE CONSENT	CFP	JH	JH	11.07.25
A	FOR RESOURCE CONSENT	SZ	CGK	JH	08.04.25

Original Scale (A1) 1:1000	Design: TNM	08.04.25	Approved For Construction*
Reduced Scale (A3) 1:2000	Drawn: SZ	08.04.25	
	Dsg Verifier: CJB	08.04.25	
	Drg Check: CGK	08.04.25	Date

* Refer to Revision 1 for Original Signature

Beca

Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: MGC CONSTRUCTION YARD ADDITIONAL EARTHWORKS AREAS

Discipline: CIVIL ENGINEERING

Drawing No.: 3324338-CA-SK216

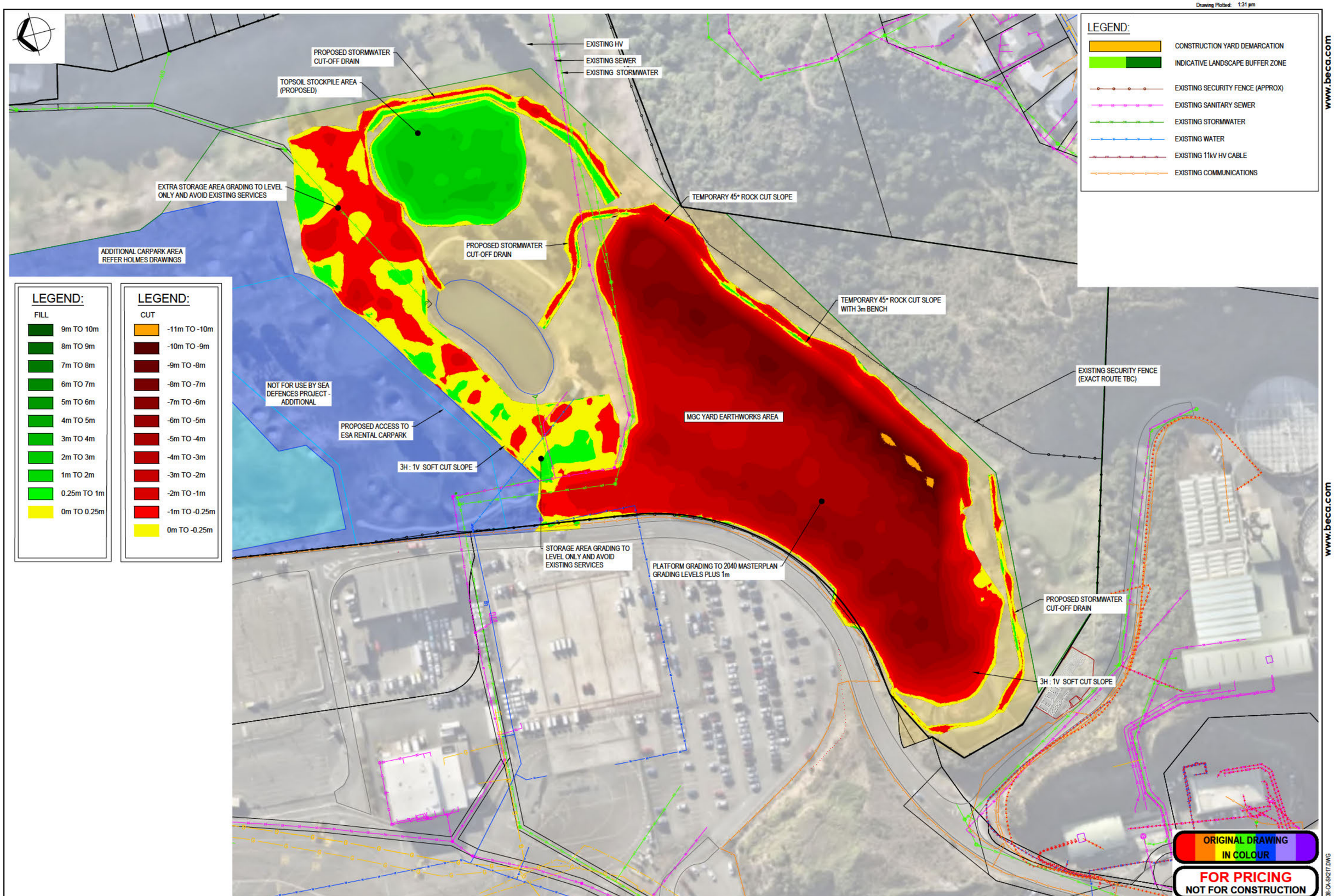
Rev.: B

Document No.: 3324338-CA-SK216.DWG

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ORIGINAL DRAWING IN COLOUR

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No.	Revision	By	Chk	Appd	Date
C	FOR RESOURCE CONSENT	CFP	JH	JH	28.07.25
B	FOR RESOURCE CONSENT	CFP	JH	JH	11.07.25
A	FOR RESOURCE CONSENT	SZ	CGK	JH	08.04.25

Original Scale (A1) 1:750
Reduced Scale (A3) 1:1500

Design	TNM	08.04.25	Approved For Construction* Date
Drawn	SZ	08.04.25	
Dsg Verifier	CJB	08.04.25	
Drg Check	CGK	08.04.25	

* Refer to Revision 1 for Original Signature

Beca

Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: MGC CONSTRUCTION YARD ISOPACH - CUT AND FILL PLAN

Discipline: CIVIL ENGINEERING

Drawing No.: 3324338-CA-SK217

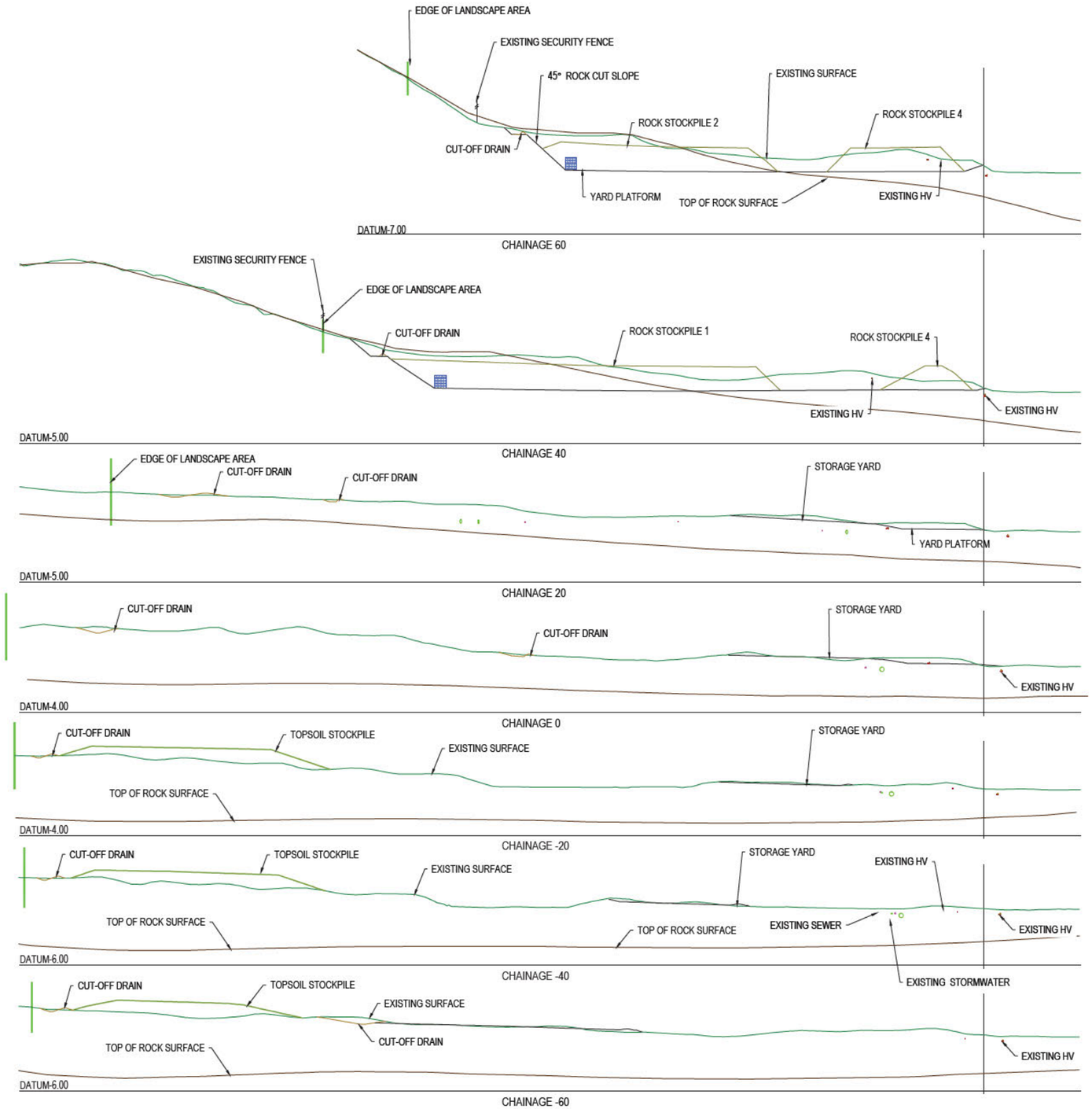
Rev.: C

Document No. 3324338-CA-SK217.DWG

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NOTES:

1. REFER TO 3324338-CA-0001 FOR DRAWING LIST.
2. REFER TO 3324338-CA-0002 FOR GENERAL NOTES AND LEGEND.
3. REFER TO DRAWING 3324338-CA-0215 FOR CROSS SECTION LOCATIONS.
4. MAXIMUM CUT SLOPE IN ROCK IS 1V:1H UP TO A MAXIMUM CUT SLOPE HEIGHT OF 10m; AND 1V:1.5H FOR CUT SLOPE HEIGHT GREATER THAN 10m. MAXIMUM CUT SLOPE IN OVERLYING FILL OR COLLUVIUM IS 1V:1.5H UP TO A MAXIMUM BATTER SLOPE HEIGHT OF 3m. OVERLYING FILL OR COLLUVIUM GREATER THAN 3m IN THICKNESS SHALL BE BENCHED WITH MINIMUM BENCH WIDTH OF 3m .
5. SEPARATION BUNDS (E.G. SHIPPING CONTAINERS) AT THE TOE OF THE CUT SLOPES ARE REQUIRED AT ALL TIMES DURING YARD OPERATION DUE TO THE RISK OF ROCKFALL FROM THE CUT FACES.
6. AN ENGINEERING GEOLOGIST OR GEOTECHNICAL ENGINEER APPOINTED BY THE PRINCIPAL WILL MONITOR EXCAVATION OF THE CUT SLOPES. DEPENDING ON ACTUAL CONDITIONS ENCOUNTERED ON SITE (E.G. GROUNDWATER SEEPAGES, LOCATION OF ROCK, THICKNESSES OF OVERLYING FILL/COLLUVIUM), WORK MAY BE PAUSED TO ALLOW FOR GEOTECHNICAL REVIEW, AND SLOPE AND BENCHING REQUIREMENTS MAY BE REVISED.
7. DEWATERING SHOULD BE ALLOWED FOR DURING EXCAVATION.
8. CUT SLOPES SHALL BE HYDROSEEDED AFTER COMPLETION.

FULL SIZE 1:500; HALF SIZE 1:1000
SCALE (m) 0 5 10 20 30

ORIGINAL DRAWING IN COLOUR

FOR PRICING
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No.	Revision	By	Chk	Appd	Date
C	FOR RESOURCE CONSENT	CFP	JH	JH	28.07.25
B	FOR RESOURCE CONSENT	CFP	JH	JH	11.07.25
A	FOR RESOURCE CONSENT	SZ	CGK	JH	08.04.25

Original Scale (A1) 1:500
Reduced Scale (A3) 1:1000

Design	TNM	08.04.25	Approved For Construction* Date
Drawn	SZ	08.04.25	
Dsg Verifier	CJB	08.04.25	
Drg Check	CGK	08.04.25	

* Refer to Revision 1 for Original Signature

Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: MGC CONSTRUCTION YARD BULK EARTHWORKS CROSS SECTIONS #1

Discipline: CIVIL ENGINEERING

Drawing No.: 3324338-CA-SK221

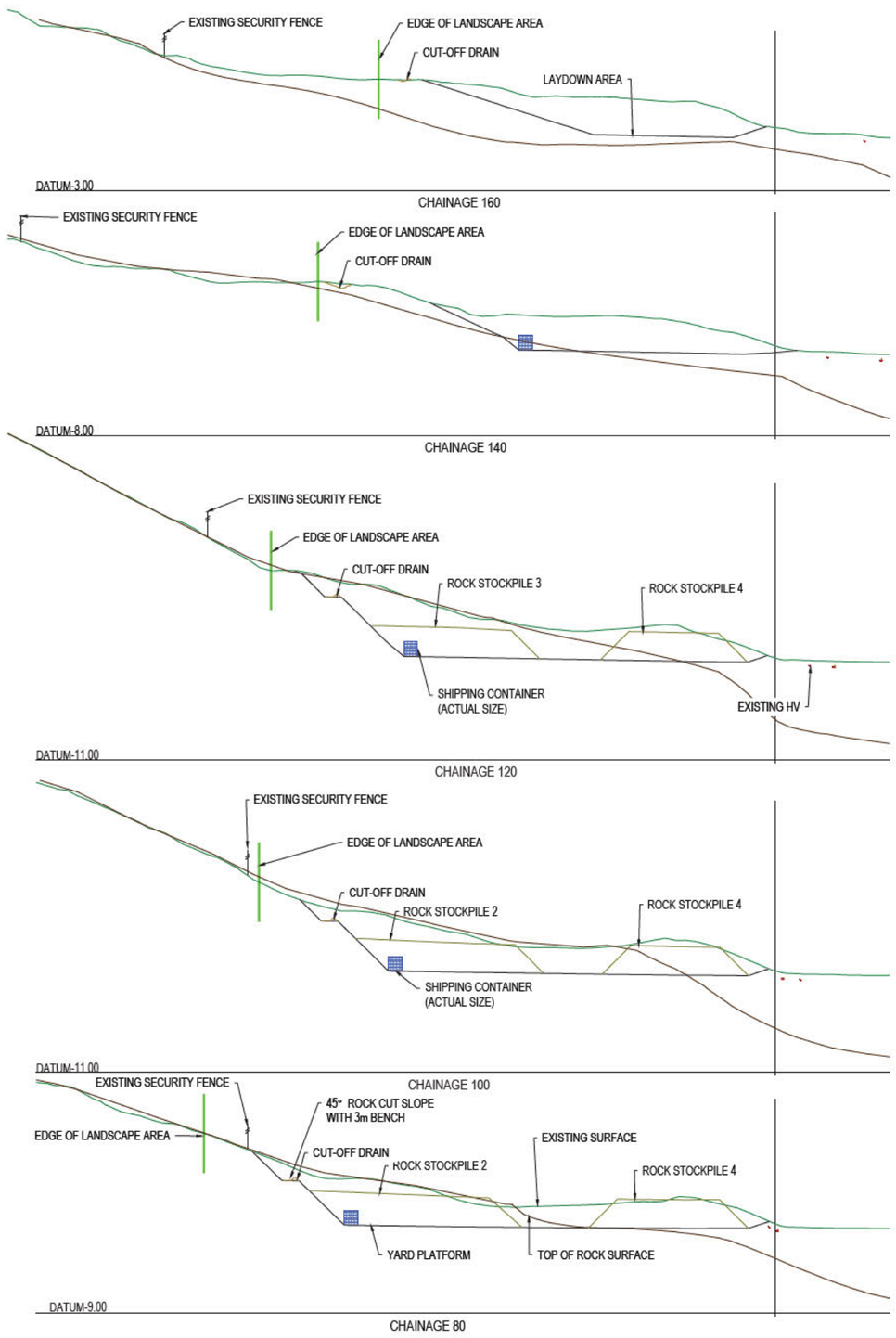
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NOTES:

1. REFER TO 3324338-CA-0001 FOR DRAWING LIST.
2. REFER TO 3324338-CA-0002 FOR GENERAL NOTES AND LEGEND.
3. REFER TO DRAWING 3324338-CA-0215 FOR CROSS SECTION LOCATIONS.
4. MAXIMUM CUT SLOPE IN ROCK IS 1V:1H UP TO A MAXIMUM CUT SLOPE HEIGHT OF 10m; AND 1V:1.5H FOR CUT SLOPE HEIGHT GREATER THAN 10m. MAXIMUM CUT SLOPE IN OVERLYING FILL OR COLLUVIUM IS 1V:1.5H UP TO A MAXIMUM BATTER SLOPE HEIGHT OF 3m. OVERLYING FILL OR COLLUVIUM GREATER THAN 3m IN THICKNESS SHALL BE BENCHED WITH MINIMUM BENCH WIDTH OF 3m .
5. SEPARATION BUNDS (E.G. SHIPPING CONTAINERS) AT THE TOE OF THE CUT SLOPES ARE REQUIRED AT ALL TIMES DURING YARD OPERATION DUE TO THE RISK OF ROCKFALL FROM THE CUT FACES.
6. AN ENGINEERING GEOLOGIST OR GEOTECHNICAL ENGINEER APPOINTED BY THE PRINCIPAL WILL MONITOR EXCAVATION OF THE CUT SLOPES. DEPENDING ON ACTUAL CONDITIONS ENCOUNTERED ON SITE (E.G. GROUNDWATER SEEPAGES, LOCATION OF ROCK, THICKNESSES OF OVERLYING FILL/COLLUVIUM), WORK MAY BE PAUSED TO ALLOW FOR GEOTECHNICAL REVIEW, AND SLOPE AND BENCHING REQUIREMENTS MAY BE REVISED.
7. DEWATERING SHOULD BE ALLOWED FOR DURING EXCAVATION.
8. CUT SLOPES SHALL BE HYDROSEEDED AFTER COMPLETION.

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0 5 10 20 30
FULL SIZE 1:500; HALF SIZE 1:1000
SCALE (m)

ORIGINAL DRAWING IN COLOUR

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No.	Revision	By	Chk	Appd	Date
A	FOR RESOURCE CONSENT	CFP	JH	JH	23.07.25

Original Scale (A1) 1:500
Reduced Scale (A3) 1:1000

Design	TNM	08.04.25	Approved For Construction*
Drawn	SZ	08.04.25	
Dsg Verifier	CJB	08.04.25	
Drg Check	CGK	08.04.25	Date

* Refer to Revision 1 for Original Signature

Client: WLG

Project: WIAL SEA DEFENCE STRUCTURES RENEWAL

Title: MGC CONSTRUCTION YARD BULK EARTHWORKS CROSS SECTIONS #2

Discipline: CIVIL ENGINEERING

Drawing No.: 3324338-CA-SK222

Rev.: A

Document No. 3324338-CA-SK222.DWG

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B

Appendix B - PSI HAIL Map

Legend

- Site boundary
- **A10** - Persistent pesticide use, and **G5** - Waste disposal to land
- **F1** - Airports including fuel storage, workshops, washdown areas or fire practice areas
- **Potential I** - Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment

Map Scale @ A3:

A10 & G5 - Golf course sprayed with agrichemicals and irrigated with treated wastewater

F1 - Historical NAC apron

F1 - Potential fire training area

Potential I - Uncontrolled filling & accidental / incidental release from fire training area

Revision	Drawer	Verified	Approved	Date
1	GJS			01.10.24
2	GJS			07.08.25

Title: **HAIL MAP**

Client: WELLINGTON INTERNATIONAL AIRPORT LIMITED

Project: SEA DEFENCES STRUCTURES RENEWAL

Beca

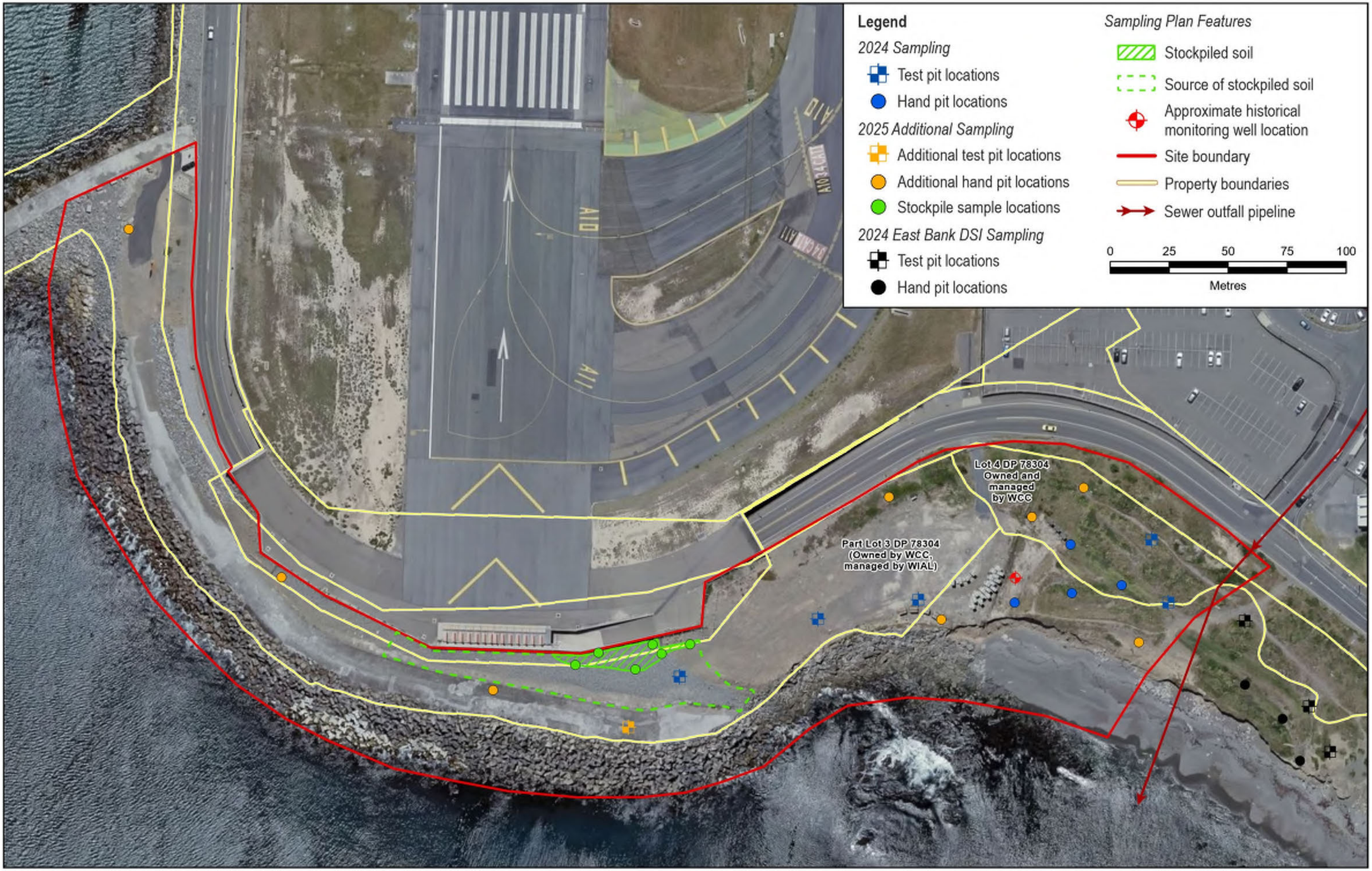
Discipline: ENVIRONMENTAL

Drawing No.: APPENDIX F

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C

Appendix C – Sampling Location Plans



Revision	Drawer	Verified	Approved	Date
1	GJS			01.10.24
2	GJS			11.04.25
3	GJS			07.08.25

N

Title: **SAMPLING LOCATION PLAN (ENTIRE SITE)**

Client: WELLINGTON INTERNATIONAL AIRPORT LIMITED

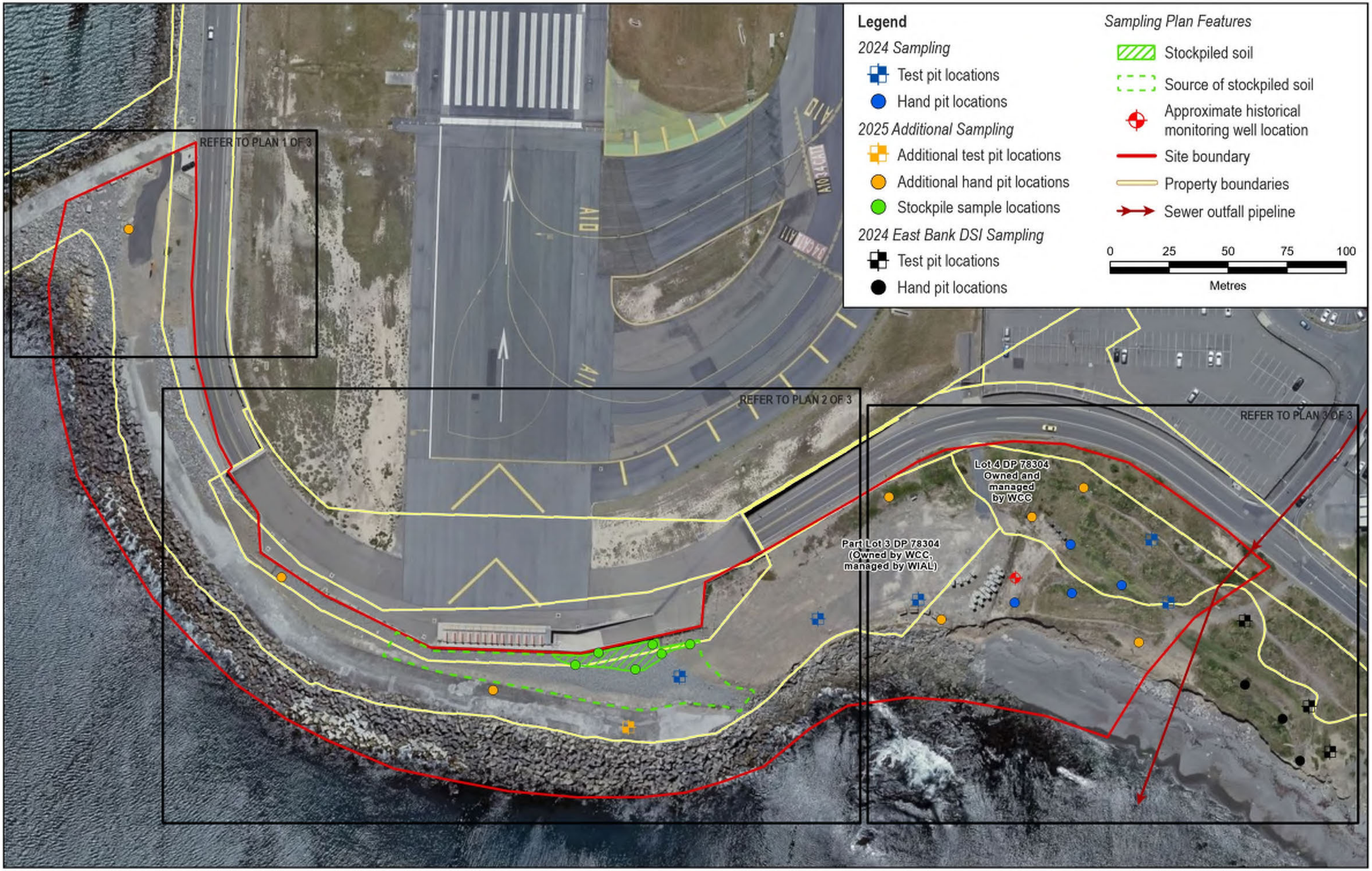
Project: SEA DEFENCES STRUCTURES RENEWAL

Beca

Discipline: ENVIRONMENTAL

Drawing No.: 3324338-3

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N

Revision	Drawer	Verified	Approved	Date
1	GJS			01.10.24
2	GJS			11.04.25
3	GJS			07.08.25

Title: **SAMPLING LOCATION PLAN (ENTIRE SITE)**

Client: WELLINGTON INTERNATIONAL AIRPORT LIMITED

Project: SEA DEFENCES STRUCTURES RENEWAL

Beca

Discipline: ENVIRONMENTAL

Drawing No.: 3324338-3

This map contains data derived in part or wholly from sources other than Beca, and therefore, no representations or warranties are made by Beca as to the accuracy or completeness of this information. Map intended for distribution as an A3 PDF document, the scale may be incorrect if printed at different scales. Contains Crown Copyright Data. Crown Copyright Reserved. Basemap source: Wellington City Council, Land Information New Zealand



Legend

2024 Sampling
- Test pit locations
- Hand pit locations

2025 Additional Sampling
- Additional test pit locations
- Additional hand pit locations
- Stockpile sample locations

2024 East Bank DSI Sampling
- Test pit locations
- Hand pit locations

Sampling Plan Features
- Stockpiled soil
- Source of stockpiled soil
- Approximate historical monitoring well location
- Site boundary
- Property boundaries
- Sewer outfall pipeline

0 10 20 30 40
Metres

N

Revision	Drawer	Verified	Approved	Date
1	GJS			01.10.24
2	GJS			11.04.25
3	GJS			07.08.25

Title: **SAMPLING LOCATION PLAN (PLAN 1 OF 3)**

Client: WELLINGTON INTERNATIONAL AIRPORT LIMITED

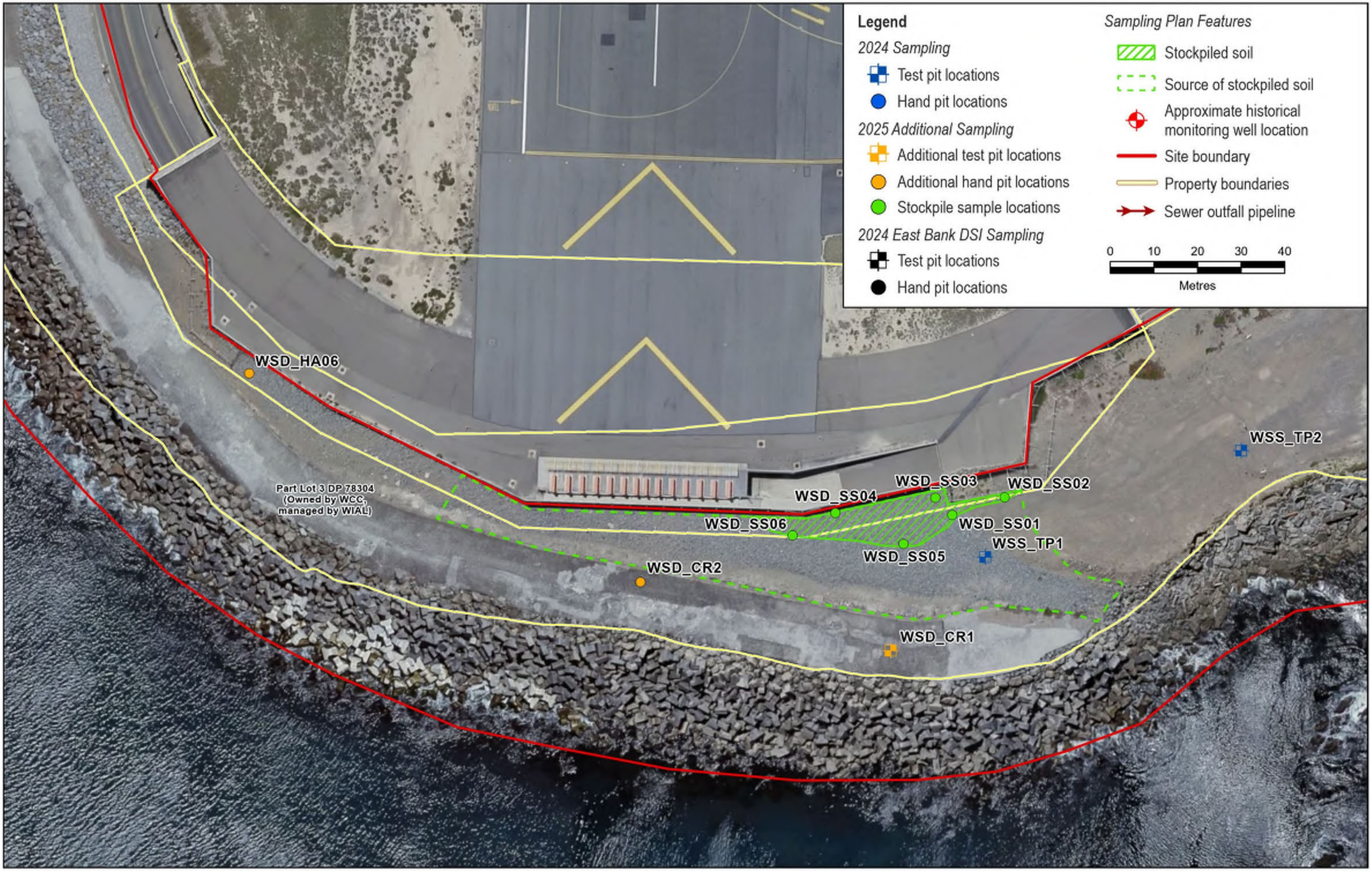
Project: SEA DEFENCES STRUCTURES RENEWAL

Beca

Discipline: ENVIRONMENTAL

Drawing No.: 3324338-3.1

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N	Revision	Drawer	Verified	Approved	Date	Title:	Client:	Discipline:
	1	GJS			01.10.24	SAMPLING LOCATION PLAN (PLAN 2 OF 3)	WELLINGTON INTERNATIONAL AIRPORT LIMITED WLG	ENVIRONMENTAL
	2	GJS			11.04.25		Project: SEA DEFENCES STRUCTURES RENEWAL	Drawing No. 3324338-3.2
	3	GJS			07.08.25			

Beca

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Revision	Drawer	Verified	Approved	Date
1	GJS			01.10.24
2	GJS			11.04.25
3	GJS			07.08.25

Title: **SAMPLING LOCATION PLAN (PLAN 3 OF 3)**

Client: WELLINGTON INTERNATIONAL AIRPORT LIMITED

Project: SEA DEFENCES STRUCTURES RENEWAL

Beca

Discipline: ENVIRONMENTAL

Drawing No. 3324338-3.3

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D

Appendix D – Chain of Custody

Hill Labs

ANALYSIS REQUEST

R J Hill Laboratories Limited
221A Ellis Street, Hamilton 3204
Private Bag 3205
Hamilton 3240, New Zealand

0508 HILL LAB (44 555 22)
+64 7 858 2000
mail@hill-labs.co.nz
www.hill-labs.co.nz

Job No: **393 1181**
Date Recv: 04-Jul-25 14:10
Received by: Tyler Ritchie
ENV

Quote No

Primary Contact Genevieve Jessica Smith

Submitted By " "

Client Name Beca Ltd

Address 85 Molesworth Street, Thorndon, Wellington *Postcode* 6011

Phone *Mobile* [redacted]

Email [redacted]

Charge To [redacted]

Client Reference Seawall

Order No

Results To *Reports will be emailed to Primary Contact by default. Additional Reports will be sent as specified below.*

☑ Email Primary Contact ☐ Email Submitter ☐ Email Client
☑ Email Other [redacted]
☐ Other

CHAIN OF CUSTODY RECORD

Sent to Hill Labs
☑ *Tick if you require COC to be emailed back*
Date & Time: 4/7/25 @
Name: Genevieve Jessica Smith
Signature [redacted]

Received at Hill Labs *(Refer to Lab created Job No above)*
Date & Time:
Name:
Signature:

Condition ☐ Room Temp ☐ Chilled ☐ Frozen
Temp: 8.2

ADDITIONAL INFORMATION / KNOWN HAZARDS

Priority ☐ Low ☑ Normal ☐ High
☑ **Urgent** (ASAP, extra charge applies, please contact lab first)
↳ where viable to do so.
Requested Reporting Date:

No.	Sample Name	Sample Date	Sample Time	Sample Type	Tests Required (if not as per Quote)
1	WSD_CR1_0.0	4/7/25		ES	Heavy metals, PAH, asbestos PA, PFAS in soil
2	WSD_CR1_0.3				HOLD COLD
3	WSD_SS01				Heavy metals, PAH, asbestos PA, PFAS
4	WSD_SS02				
5	WSD_SS03				
6	WSD_SS04				
7	WSD_SS05				
8	WSD_SS06				
9	WSD_CRQA			water	HOLD COLD.
10					
11					
12					

Continued on next page

HillLabs

ANALYSIS REQUEST

R J Hill Laboratories Limited
221A Ellis Street, Hamilton 3204
Private Bag 3205
Hamilton 3240, New Zealand

0508 HILL LAB (44 555 22)
+64 7 858 2000
mail@hill-labs.co.nz
www.hill-labs.co.nz

Job No: **393 1182**

Date Recv: 04-Jul-25 14:10

Received by: Tyler Ritchie

313931823

Quote No

Primary Contact Genevieve Jessica Smith

Submitted By

Client Name Becca Ltd

Address 85 Molesworth Street,
Thorndon, Wellington *Postcode* 6011

Phone *Mobile* [redacted]

Email [redacted]

Charge To [redacted]

Client Reference Seawall

Order No

Results To *Reports will be emailed to Primary Contact by default. Additional Reports will be sent as specified below.*

☑ *Email Primary Contact* ☐ *Email Submitter* ☐ *Email Client*

☑ *Email Other* [redacted]

☐ *Other*

CHAIN OF CUSTODY RECORD

Sent to Hill Labs

Date & Time: 4/7/25 @

Name: Genevieve Jessica Smith

☑ *Tick if you require COC to be emailed back*

Signature: [redacted]

Received at Hill Labs *(Refer to Lab created Job No above)*

Date & Time:

Name:

Signature:

Condition ☐ *Room Temp* ☐ *Chilled* ☐ *Frozen*

Temp: 8.2

ADDITIONAL INFORMATION / KNOWN HAZARDS

Priority ☐ Low ☑ Normal ☐ High

☑ **Urgent** (ASAP, extra charge applies, please contact lab first)
↳ where viable to do so.

Requested Reporting Date:

No.	Sample Name	Sample Date	Sample Time	Sample Type	Tests Required (if not as per Quote)
1	WSD_CR1_0.0	4/7/25		ES	Heavy metals, PAH, asbestos PA, PFAS in soil
2	WSD_CR1_0.3				HOLD COLD
3	WSD_SS01				Heavy metals, PAH, asbestos PA, PFAS
4	WSD_SS02				
5	WSD_SS03				
6	WSD_SS04				
7	WSD_SS05				
8	WSD_SS06				
9	WSD_CRQA			water	HOLD COLD.
10					
11					
12					

Continued on next page

HillLabs

ANALYSIS REQUEST

R J Hill Laboratories Limited
221A Ellis Street, Hamilton 3204
Private Bag 3205
Hamilton 3240, New Zealand

0508 HILL LAB (44 555 22)
+64 7 858 2000
mail@hill-labs.co.nz
www.hill-labs.co.nz

Job No: **393 4578**

Date Recv: 09-Jul-25 16:53

Received by: Emma Morrison

3139345787

Quote No

Primary Contact Genevieve Jessica Smith

Submitted By

Client Name Becca

Address 85 Molesworth Street

Postcode

Phone *Mobile* [redacted]

Email [redacted]

Charge To [redacted]

Client Reference seawall

Order No

Results To *Reports will be emailed to Primary Contact by default. Additional Reports will be sent as specified below*

☑ *Email Primary Contact* ☐ *Email Submitter* ☐ *Email Client*

☐ *Email Other*

☐ *Other*

CHAIN OF CUSTODY RECORD

Sent to Hill Labs

Date & Time: 9/7/25 1650

Name: Genevieve Smith

☑ *Tick if you require COC to be emailed back*

Signature: [redacted]

Received at Hill Labs *(Refer to Lab created Job No above)*

Date & Time:

Name:

Signature:

Condition ☐ *Room Temp* ☐ *Chilled* ☐ *Frozen*

Temp: 10.6 °C

ADDITIONAL INFORMATION / KNOWN HAZARDS

uneven #s of containers - aren't missing

Priority ☐ Low ☒ Normal ☐ High

☑ **Urgent** (ASAP, extra charge applies, please contact lab first)
↳ for PFAS where possible

Requested Reporting Date:

No.	Sample Name	Sample Date	Sample Time	Sample Type	Tests Required (if not as per Quote)
1	WSD_HA01_0-1	9/7/25		ES	HOLD - will email instructions.
2	WSD_HA01_0-3				
3	WSD_HA02_0-1				
4	WSD_HA02_0-3				
5	WSD_HA03_0-1				
6	WSD_HA03_0-3				
7	WSD_HA03_0-5				
8	WSD_HA04_0-1				
9	WSD_HA04_0-25				
10	WSD_HA05_0-1				
11	WSD_HA05_0-3				
12	WSD_HA05_0-5				

Continued on next page

No.	Sample Name	Sample Date	Sample Time	Sample Type	Tests Required (if not as per Quote)
13	WSD_HA06_0.1	9/7/25		ES	↓
14	WSD_HA07_0.1	↓		↓	↓
15	WSD_CR2_0.2				
16	WSD_CR2_0.5				
17	WSD_CR2_1.0				
18	WSD_QAQC1				
19	WSD_QAQC2			↓	
20	WSD_~~QA1~~ ~~QA2~~QAR2			water	
21	WSD_QAR3	↓		water	↓
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					

HillLabs

ANALYSIS REQUEST

R J Hill Laboratories Limited
221A Ellis Street, Hamilton 3204
Private Bag 3205
Hamilton 3240, New Zealand

0508 HILL LAB (44 555 22)
+64 7 858 2000
mail@hill-labs.co.nz
www.hill-labs.co.nz

Job No: **393 4969**

Date Recv: 10-Jul-25 08:43

Received by: Tyler Ritchie

Quote No

Primary Contact Genevieve Jessica Smith

Submitted By

Client Name Becca

Address 85 Molesworth Street

Phone *Mobile* [redacted]

Email [redacted]

Charge To [redacted]

Client Reference seawall

Order No

Results To *Reports will be emailed to Primary Contact by default. Additional Reports will be sent as specified below.*

☑ *Email Primary Contact* ☐ *Email Submitter* ☐ *Email Client*

☐ *Email Other*

☐ *Other*

CHAIN OF CUSTODY RECORD

Sent to Hill Labs

☑ *Tick if you require COC to be emailed back*

Date & Time: 9/7/25 1650

Name: Genevieve Smith

Signature: [redacted]

Received at Hill Labs
(Refer to Lab created Job No above)

Date & Time:

Name:

Signature:

Condition

☐ *Room Temp* ☐ *Chilled* ☐ *Frozen*

Temp: 10.6 °C

ADDITIONAL INFORMATION / KNOWN HAZARDS

uneven #s of containers - aren't missing

Priority ☐ **Low** ☒ **Normal** ☐ **High**

☑ **Urgent** (ASAP, extra charge applies, please contact lab first)
↳ for PFAS w/ care possible

Requested Reporting Date:

No.	Sample Name	Sample Date	Sample Time	Sample Type	Tests Required (if not as per Quote)
1	WSD_HA01_0.1	9/7/25		ES	HOLD - will email instructions.
2	WSD_HA01_0.3				
3	WSD_HA02_0.1				
4	WSD_HA02_0.3				
5	WSD_HA03_0.1				
6	WSD_HA03_0.3				
7	WSD_HA03_0.5				
8	WSD_HA04_0.1				
9	WSD_HA04_0.25				
10	WSD_HA05_0.1				
11	WSD_HA05_0.3				
12	WSD_HA05_0.5				

Continued on next page

No.	Sample Name	Sample Date	Sample Time	Sample Type	Tests Required (if not as per Quote)
13	WSD_HA06_0.1	9/7/25		ES	2 7
14	WSD_HA07_0.1	↓		↓	↓
15	WSD_CR2_0.2				
16	WSD_CR2_0.5				
17	WSD_CR2_1.0				
18	WSD_QAQC1				
19	WSD_QAQC2				
20	WSD_~~QA1~~ ~~QAR~~QAR2			water	
21	WSD_QAR3			water	
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					

PHOTOCOPY BOX 3/4

Hill Laboratories
TRIED, TESTED AND TRUSTED

ANALYSIS REQUEST

R J Hill Laboratories Limited
28 Duke Street, Hamilton 3204
Private Bag 3205
Hamilton 3240, New Zealand

T 0508 HILL LAB (44 555 22)
T +64 7 858 2000
E mail@hill-labs.co.nz
W www.hill-laboratories.com

Job No: **372 7361**
Date Recv: 28-Nov-24 15:44
Received by: Emma Morrison
3137273615

Quote No
Primary Contact Genevieve Jessica Smith
Submitted By
Client Name Beca Ltd
Address 85 Molesworth Street
Thorndon *Postcode* 6011
Phone *Mobile* [redacted]
Email [redacted]
Charge To [redacted]
Client Reference Old Southern Seawall.
Additional Ref (Consultant Project ID)
Order No

Results To *Reports will be emailed to Primary Contact by default. Additional Reports will be sent as specified below.*

☑ Email Primary Contact ☐ Email Submitter ☐ Email Client
☑ Email Other Tyler.Neve@beca.com
☐ Other

Dates of testing are not routinely included in the Certificates of Analysis. Please inform the Laboratory if you would like this information reported.

CHAIN OF CUSTODY RECORD

Sent to Hill Laboratories
Date & Time: 28/11/24 @ 1530
Name: Genevieve Smith
Signature: [redacted]
☑ *Tick if you require COC to be emailed back*

Received at Hill Laboratories *(Refer to Lab created Job No above)*
Date & Time:
Name:
Signature:

Condition ☐ Room Temp ☐ Chilled ☐ Frozen
Temp:

ADDITIONAL INFORMATION / KNOWN HAZARDS

Completed as asbestos-related works. AS01250, GSoil, 125Asb, 500Asb, PFAS, plastic bags.

Priority ☐ Low ☒ Normal ☑ High
☐ **Urgent** (ASAP, extra charge applies, please contact lab first)

Requested Reporting Date:

No.	Sample Name	Sample Date	Sample Time	Sample Type	Tests Required (if not as per Quote)
1	WSS_TP1_0.1	28/11/24		Soil	Hold cold - will send
2	WSS_TP1_0.5				analysis via email.
3	WSS_TP2_0.1				
4	WSS_TP2_0.5				
5	WSS_TP2_1.0				
6	WSS_TP3_0.1				
7	WSS_TP3_0.5				
8	WSS_TP3_1.0				
9	WSS_TP4_0.1				
10	WSS_TP4_0.5				
11	WSS_TP4_1.0				
12	WSS_TP5_0.1				

Continued on next page

No.	Sample Name	Sample Date	Sample Time	Sample Type	Tests Required (if not as per Quote)
13	WSS_TP5_0.5	28/11/24		Soil	Hold cold - will send
14	WSS - TP5_1.0				analysis via email.
15	WSS_TP6_0.1				
16	WSS_TP6_0.5				
17	WSS - TP6_1.0				
18	WSS_TP7_0.1				
19	WSS_TP7_0.3				
20	WSS - TP7_0.5				
21	WSS_TP7_1.0				
22	WSS - TP7_1.3				
23	WSS_TP8_0.5CT	28/11/24		Reading material	
24	WSS_TP7_0.4_CT			" "	
25	WSS_TP6_CT.			" "	
26	WSS_TP8_0.5_BF			Bulk Fragment	
27	WSS_TP2_BF1			Bulk Frag.	
28	WSS_QA1	28/11/24		Soil	
29	WSS_QA2	28/11/24		Soil.	
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					

R J Hill Laboratories Limited
28 Duke Street Frankton 3204
Private Bag 3205
Hamilton 3240 New Zealand

0508 HILL LAB (44 555 22)
+64 7 858 2000
mail@hill-labs.co.nz
www.**hill-labs**.co.nz

Job Information Summary

Client:	Beca Limited	**Lab No:**	3727361
Contact:	Genevieve Jessica Smith C/- Beca Limited PO Box 3942 Wellington 6140	**Date Registered:**	30-Nov-2024 11:54 am
		Priority:	High
		Quote No:	96766
		Order No:	
		Client Reference:	Southern Seawell
		Add. Client Ref:	
		Submitted By:	Genevieve Jessica Smith
		Charge To:	Beca Limited
		Target Date:	02-Dec-2024 4:30 pm

Samples

No	Sample Name	Sample Type	Containers	Tests Requested
1	WSS_TP1_0.1 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb	Hold Cold
2	WSS_TP1_0.5 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb	Hold Cold
3	WSS_TP2_0.1 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb	Hold Cold
4	WSS_TP2_0.5 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb	Hold Cold
5	WSS_TP2_1.0 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb	Hold Cold
6	WSS_TP3_0.1 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb	Hold Cold
7	WSS_TP3_0.5 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb	Hold Cold
8	WSS_TP3_1.0 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb	Hold Cold
9	WSS_TP4_0.1 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb	Hold Cold
10	WSS_TP4_0.5 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb	Hold Cold
11	WSS_TP4_1.0 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb	Hold Cold
12	WSS_TP5_0.1 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb, PSoil125Asb	Hold Cold
13	WSS_TP5_0.5 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb	Hold Cold
14	WSS_TP5_1.0 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb	Hold Cold
15	WSS_TP6_0.1 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb	Hold Cold
16	WSS_TP6_0.5 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb	Hold Cold
17	WSS_TP6_1.0 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb	Hold Cold
18	WSS_TP7_0.1 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb	Hold Cold
19	WSS_TP7_0.3 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb	Hold Cold
20	WSS_TP7_0.5 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb	Hold Cold
21	WSS_TP7_1.0 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb, PSoil125Asb	Hold Cold
22	WSS_TP7_1.3 28-Nov-2024	Soil	PSoil125Asb	Hold Cold
23	WSS_TP8_0.1 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb	Hold Cold

Samples

No	Sample Name	Sample Type	Containers	Tests Requested
24	WSS_TP8_0.5 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb	Hold Cold
25	WSS_TP8_1.0 28-Nov-2024	Soil	PSoil500Asb, PSoil125Asb	Hold Cold

Hill Laboratories
TRIED, TESTED AND TRUSTED

ANALYSIS REQUEST

R J Hill Laboratories Limited
Ground Floor, 28 Heather Stre
Parnell
Auckland 1052, New Zealand

T 0508 HILL LAB (44 555 2:
T +64 7 858 2000
E mail@hill-labs.co.nz
W www.hill-laboratories.com

Job No: **372 8491**
Date Recv: 29-Nov-24 16:38
Received by: Emma Morrison

3137284911

Quote No

Primary Contact Genevieve Smith

Submitted By Genevieve Smith

Client Name Beca

Address 85 Molesworth Street
Wellington Postcode 6011

Phone Mobile [redacted]

Email [redacted]

Charge To [redacted]

Client Reference Southern Seawall

Order No

Results To Reports will be emailed to Primary Contact by default. Additional Reports will be sent as specified below.

☑ Email Primary Contact ☐ Email Submitter ☐ Email Client
☑ Email Other [redacted]
☐ Other

CHAIN OF CUSTODY RECORD

Sent to Hill Laboratories

Date & Time: 4:20 29/11

Name: Mio Akiyama

☐ Tick if you require COC to be emailed back

Signature: [redacted]

Samples will be processed at a Hill Laboratories site with the appropriate testing capability and capacity. Please inform the Laboratory if you wish samples to be retained and analysed at the site of receipt.

Received at Hill Laboratories

Date & Time:

Name:

Signature:

ADDITIONAL INFORMATION

Soil samples x 18
Turf fragments x 5

Priority ☐ Low ☐ Normal ☐ High
☐ Urgent (ASAP extra charge applies, please contact lab first)

Requested Reporting Date:

Please ensure all asbestos samples are individually double bagged upon submission to the laboratory.

No.	Sample Name	Sample Material	Sample Location	Sample Date	Tests Required (If not as per Quote)
1	WSS - HA1 - 0.1	soil		29/11	hold cold
2	WSS - HA1 - 0.3				
3	WSS - HA1 - 0.5				
4	WSS - HA2 - 0.1				
5	WSS - HA3 - 0.1				
6	WSS - HA3 - 0.3				
7	WSS - HA4 - 0.1				
8	WSS - HA4 - 0.3				
9	WSS - HA4 - 0.5				
10	WSS - HA4 - 0.7				

11	WSS_HA5_0.1	soil		2u/11	hold cold
12	WSS_HA5_0.3				
13	WSS_HA5_0.5				
14	WSS_HA6_0.1				
15	WSS_HA6_0.3				
16	WSS_HA7_0.1				
17	WSS_HA7_0.3				
18	WSS_BF3	bulk fragment			
19	WSS_BF4				
20	WSS_BF5				
21	WSS_BF6				
22	WSS_BF7				
23	WSS_QA3	soil			
24					
25					
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38					
39					
40					

Hill Laboratories
TRIED, TESTED AND TRUSTED

ANALYSIS REQUEST

R J Hill Laboratories Limited
Ground Floor, 29 Heather Stre
Parnell
Auckland 1052, New Zealand

T 0508 HILL LAB (44 555 2
T +64 7 858 2000
E mail@hill-labs.co.nz
W www.hill-laboratories.com

Job No: **372 8491**

Date Recv: 29-Nov-24 16:38

Received by: Emma Morrison

3137284911

AN 11:45
19.9 03/12/24

Quote No

Primary Contact Genevieve Smith

Submitted By Genevieve Smith

Client Name Beca

Address 85 Molesworth Street
Whanganui *Postcode* 4011

Phone *Mobile* [redacted]

Email [redacted]

Charge To [redacted]

Client Reference Southern Seawall

Order No

Results To *Reports will be emailed to Primary Contact by default. Additional Reports will be sent as specified below.*

☑ *Email Primary Contact* ☐ *Email Submitter* ☐ *Email Client*

☑ *Email Other* [redacted]

☐ *Other*

CHAIN OF CUSTODY RECORD

Sent to Hill Laboratories

Date & Time: 4:20 29/11

Name: Miss Alimyamic

☐ *Tick if you require COC to be emailed back*

Signature: [redacted]

Samples will be processed at a Hill Laboratories site with the appropriate testing capability and capacity. Please inform the Laboratory if you wish samples to be retained and analysed at the site of receipt.

Received at Hill Laboratories

Date & Time:

Name:

Signature:

ADDITIONAL INFORMATION

Soil samples x18
Bulk fragments x5

Priority ☐ Low ☐ Normal ☐ High

☐ **Urgent** (ASAP extra charge applies, please contact lab first)

Requested Reporting Date:

Please ensure all asbestos samples are individually double bagged upon submission to the laboratory.

No.	Sample Name	Sample Material	Sample Location	Sample Date	Tests Required (if not as per Quote)
1	WSS - HA1 - 0.1	soil		29/11	hold bold
2	WSS_HA1_0.3				
3	WSS_HA1_0.5				
4	WSS_HA2_0.1				
5	WSS_HA3_0.1				
6	WSS_HA3_0.3				
7	WSS_HA4_0.1				
8	WSS_HA4_0.3				
9	WSS_HA4_0.5				
10	WSS_HA4_0.7				

11	WSS_HA5_0.1	soil		29/11	hold cold
12	WSS_HA5_0.3				
13	WSS_HA5_0.5				
14	WSS_HA6_0.1				
15	WSS_HA6_0.3				
16	WSS_HA7_0.1				
17	WSS_HA7_0.3				
18	WSS_BF3	bulk fragment			
19	WSS_BF4				
20	WSS_BF5				
21	WSS_BF6				
22	WSS_BF7				
23	WSS_QA3	soil			
24					
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ANALYSIS REQUEST

R J Hill Laboratories Limited
221A Ellis Street, Hamilton 3204
Private Bag 3205
Hamilton 3240, New Zealand

0508 HILL LAB (44 555 22)
+64 7 858 2000
mail@hill-labs.co.nz
www.hill-labs.co.nz

Job No: **372 9107**

Date Recv: 02-Dec-24 08:44

Received by: Tyler Ritchie

3137291070

Quote No

Primary Contact Genevieve Jessica Smith

Submitted By

Client Name Beca Ltd

Address 85 Molesworth Street, Thorndon, Wellington *Postcode* 6011

Phone *Mobile* [redacted]

Email [redacted]

Charge To [redacted]

Client Reference Southern Seawall.

Order No

Results To *Reports will be emailed to Primary Contact by default. Additional Reports will be sent as specified below.*

☑ Email Primary Contact ☐ Email Submitter ☐ Email Client

☑ Email Other [redacted]

☐ Other

CHAIN OF CUSTODY RECORD

Sent to Hill Labs

Date & Time: 02/12/24 @

Name: Genevieve Smith

☑ *Tick if you require COC to be emailed back*

Signature: [redacted]

Received at Hill Labs *(Refer to Lab created Job No above)*

Date & Time:

Name:

Signature:

Condition ☐ Room Temp ☐ Chilled ☐ Frozen

Temp: 6.8 °C

ADDITIONAL INFORMATION / KNOWN HAZARDS

Gsoil, Psoil250, 125Asb, 500Asb, PFAS soil.

Priority ☐ Low ☒ Normal ☑ High ☐ Urgent (ASAP, extra charge applies, please contact lab first)

Requested Reporting Date:

No.	Sample Name	Sample Date	Sample Time	Sample Type	Tests Required (if not as per Quote)
1	WSS_HA8_0.1	29/11/24		S	HOLD COLD
2	WSS_HA8_0.3				
3	WSS_HA8_0.5				
4	WSS_HA9_0.1				
5	WSS_HA9_0.3				
6	WSS_HA9_0.5				
7	WSS_HA10_0.1				
8	WSS_HA10_0.5				
9	WSS				
10					
11					
12					

Continued on next page

Sample ID	Sample type	Asbestos Job Number	Metals/Glass Job Number	PFAS Job Number	Analysis request
WSS_TP1_0.1	Soil	3727361	3727360	Pending	HM, asbestos PA, PAH
WSS_TP1_0.5	Soil	3727361	3727360	Pending	HM, asbestos PA, PAH
WSS_TP2_0.1	Soil	3727361	3727360	Pending	HM
WSS_TP2_0.5	Soil	3727361	3727360	Pending	Hold Cold
WSS_TP2_1.0	Soil	3727361	3727360	Pending	Hold Cold
WSS_TP3_0.1	Soil	3727361	3727360	Pending	HM
WSS_TP3_0.5	Soil	3727361	3727360	Pending	Hold Cold
WSS_TP3_1.0	Soil	3727361	3727360	Pending	Hold Cold
WSS_TP4_0.1	Soil	3727361	3727360	Pending	HM, Asbestos PA
WSS_TP4_0.5	Soil	3727361	3727360	Pending	HM, asbestos PA, PAH
WSS_TP4_1.0	Soil	3727361	3727360	Pending	Hold Cold
WSS_TP5_0.1	Soil	3727361	3727360	Pending	HM, TPH, asbestos PA, PAH, PFAS
WSS_TP5_0.5	Soil	3727361	3727360	Pending	HM, asbestos PA, PAH, TPH, PFAS
WSS_TP5_1.0	Soil	3727361	3727360	Pending	Hold cold
WSS_TP6_0.1	Soil	3727361	3727360	Pending	HM
WSS_TP6_0.5	Soil	3727361	3727360	Pending	HM, PAH, asbestos semi-quant
WSS_TP6_1.0	Soil	3727361	3727360	Pending	HM, PAH, asbestos semi-quant
WSS_TP7_0.1	Soil	3727361	3727360	Pending	HM, SVOC trace, PFAS in soil, TPH, asbestos PA
WSS_TP7_0.3	Soil	3727361	3727360	Pending	HM, SVOC trace, PFAS in soil, TPH, asbestos PA
WSS_TP7_0.5	Soil	3727361	3727360	Pending	HM, SVOC trace, PFAS in soil, TPH, asbestos PA
WSS_TP7_1.0	Soil	3727361	3727360	Pending	HM, SVOC trace, PFAS in soil, TPH, Asbestos semi-quant
WSS_TP7_1.3	Soil	3727361	3727360	Pending	HM, SVOC trace, PFAS in soil, TPH, asbestos PA
WSS_TP8_0.1	Soil	3727361	3727360	Pending	HM, asbestos PA
WSS_TP8_0.5	Soil	3727361	3727360	Pending	HM, SVOC trace, PFAS in soil, TPH, Asbestos semi-quant
WSS_TP8_1.0	Soil	3727361	3727360	Pending	HM, SVOC trace, PFAS in soil, TPH, asbestos semi-quant
WSS_QA1	Soil duplicate of TP2_0.1	3727361	3727360	Pending	HM
WSS_QA2	Soil duplicate of TP7_0.1	3727361	3727360	Pending	HM, SVOC trace, PFAS in soil, TPH, asbestos PA
WSS_TP6_CT	Roading material	-	3727360	Pending	HM, PAH
WSS_TP8_0.5CT	Roading material	-	3727360	Pending	HM, PAH
WSS_TP7_0.4_CT	Roading material	-	3727360	Pending	Hold Cold
WSS_TP8_0.5_BF	Building material	3727370	-	Pending	Asbestos PA
WSS_TP2_BF1	Building material	3727370	-	Pending	Hold Cold
WSS_BF3	Building material	3728486	-	Pending	Asbestos PA
WSS_BF4	Building material	3728486	-	Pending	Hold Cold
WSS_BF5	Building material	3728486	-	Pending	Hold Cold
WSS_BF6	Building material	3728486	-	Pending	Hold Cold
WSS_BF7	Building material	3728486	-	Pending	Asbestos PA
WSS_HA1_0.1	Soil	Pending	Pending	Pending	HM, asbestos PA, PAH
WSS_HA1_0.3	Soil	Pending	Pending	Pending	HM, asbestos PA, PAH
WSS_HA1_0.5	Soil	Pending	Pending	Pending	HM
WSS_HA2_0.1	Soil	Pending	Pending	Pending	HM
WSS_HA3_0.1	Soil	Pending	Pending	Pending	HM
WSS_HA3_0.3	Soil	Pending	Pending	Pending	HM, asbestos PA, PAH
WSS_HA4_0.1	Soil	Pending	Pending	Pending	HM, SVOC trace, PFAS in soil, TPH, asbestos PA
WSS_HA4_0.3	Soil	Pending	Pending	Pending	HM, SVOC trace, PFAS in soil, TPH, asbestos PA
WSS_HA4_0.5	Soil	Pending	Pending	Pending	HM, SVOC trace, PFAS in soil, TPH, asbestos PA
WSS_HA4_0.7	Soil	Pending	Pending	Pending	HM, SVOC trace, PFAS in soil, TPH, asbestos PA
WSS_HA5_0.1	Soil	Pending	Pending	Pending	HM, SVOC trace, PFAS in soil, TPH, asbestos PA
WSS_HA5_0.3	Soil	Pending	Pending	Pending	HM
WSS_HA5_0.5	Soil	Pending	Pending	Pending	HM, SVOC trace, PFAS in soil, TPH, asbestos PA
WSS_HA6_0.1	Soil	Pending	Pending	Pending	HM, SVOC trace, PFAS in soil, TPH, asbestos PA
WSS_HA6_0.3	Soil	Pending	Pending	Pending	HM, SVOC trace, PFAS in soil, TPH, asbestos PA
WSS_HA7_0.1	Soil	Pending	Pending	Pending	HM
WSS_HA7_0.3	Soil	Pending	Pending	Pending	HM, asbestos PA, PAH
WSS_HA8_0.1	Soil	Pending	Pending	Pending	HM, Asbestos PA
WSS_HA8_0.3	Soil	Pending	Pending	Pending	HM
WSS_HA8_0.5	Soil	Pending	Pending	Pending	HM, Asbestos PA
WSS_HA9_0.1	Soil	Pending	Pending	Pending	HM, Asbestos PA
WSS_HA9_0.3	Soil	Pending	Pending	Pending	HM
WSS_HA9_0.5	Soil	Pending	Pending	Pending	HM, Asbestos PA
WSS_HA10_0.1	Soil	Pending	Pending	Pending	HM, Asbestos PA
WSS_HA10_0.3	Soil	Pending	Pending	Pending	HM
WSS_QA3	Soil duplicate of WSS_HA2_0.1	Pending	Pending	Pending	HM, Asbestos PA
Rinsate Blank 1	Water	Pending	Pending	Pending	Hold Cold
Rinsate Blank 2	Water	Pending	Pending	Pending	Hold Cold

HillLabs

ANALYSIS REQUEST

R J Hill Laboratories Limited
221A Ellis Street, Hamilton 3204
Private Bag 3205
Hamilton 3240, New Zealand

0508 HILL LAB (44 555 22)
+64 7 858 2000
mail@hill-labs.co.nz
www.hill-labs.co.nz

Job No: **372 9107**

Date Recv: 02-Dec-24 08:44

Received by: Tyler Ritchie

3137291079

AM 11:40 02/12/24 213

Quote No

Primary Contact Genevieve Jessica Smith

Submitted By

Client Name Beca Ltd

Address 85 Molesworth Street, Thorndon, Wellington *Postcode* 6011

Phone *Mobile* [redacted]

Email [redacted]

Charge To [redacted]

Client Reference Southern Seawall

Order No

Results To *Reports will be emailed to Primary Contact by default. Additional Reports will be sent as specified below.*

☑ Email Primary Contact ☐ Email Submitter ☐ Email Client

☑ Email Other [redacted]

☐ Other

CHAIN OF CUSTODY RECORD

Sent to Hill Labs

☑ Tick if you require COC to be emailed back

Date & Time: 02/12/24 @

Name: Genevieve Smith

Signatu [redacted]

Received at Hill Labs (Refer to Lab created Job No above)

Date &

Name:

Signature:

Condition ☐ Room Temp ☐ Chilled ☐ Frozen

Temp: 6.8 °C

ADDITIONAL INFORMATION / KNOWN HAZARDS

GSoil, PSoil250, 125ASb, 500ASb, PFAS soil

Priority ☐ Low ☒ Normal ☑ High

☐ **Urgent** (ASAP, extra charge applies, please contact lab first)

Requested Reporting Date:

No.	Sample Name	Sample Date	Sample Time	Sample Type	Tests Required (if not as per Quote)
1	WSS_HA8_0.1	29/11/24		S	HOLD COLD
2	WSS_HA8_0.3				
3	WSS_HA8_0.5				
4	WSS_HA9_0.1				
5	WSS_HA9_0.3				
6	WSS_HA9_0.5				
7	WSS_HA10_0.1				
8	WSS_HA10_0.5				
9	WSS				
10					
11					
12					

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ANALYSIS REQUEST

R J Hill Laboratories Limited
221A Ellis Street, Hamilton 3204
Private Bag 3205
Hamilton 3240, New Zealand

0508 HILL LAB (44 555 22)
+64 7 858 2000
mail@hill-labs.co.nz
www.hill-labs.co.nz

Job No: **372 9105**

Date Recv: 02-Dec-24 08:43

Received by: Tyler Ritchie

3137291056

Quote No

Primary Contact Genevieve Jessica Smith

Submitted By

Client Name Beca Ltd

Address 85 Molesworth Street,
Thorndon, Wellington *Postcode* 6011

Phone *Mobile* [redacted]

Email [redacted]

Charge To [redacted]

Client Reference Southern seawall.

Order No

Results To *Reports will be emailed to Primary Contact by default. Additional Reports will be sent as specified below.*

☑ Email Primary Contact ☐ Email Submitter ☐ Email Client

☑ Email Other [redacted]

☐ Other

CHAIN OF CUSTODY RECORD

Sent to Hill Labs

☑ *Tick if you require COC to be emailed back*

Date & Time: 02/12/24 @

Name: Genevieve Smith

Signat [redacted]

Received at Hill Labs *(Refer to Lab created Job No above)*

Date & Time:

Name:

Signature:

Condition ☐ Room Temp ☐ Chilled ☐ Frozen

Temp: 6.8°C

ADDITIONAL INFORMATION / KNOWN HAZARDS

Gsoil, PSoil250, 125ASb, 500ASb, PFAS soil.

Priority ☐ Low ☒ Normal ☑ High

☐ **Urgent** (ASAP, extra charge applies, please contact lab first)

Requested Reporting Date:

No.	Sample Name	Sample Date	Sample Time	Sample Type	Tests Required (if not as per Quote)
1	WSS_HA8_0.1	29/11/24		S	HOLD COLD
2	WSS_HA8_0.3				
3	WSS_HA8_0.5				
4	WSS_HA9_0.1				
5	WSS_HA9_0.3				
6	WSS_HA9_0.5				
7	WSS_HA10_0.1				
8	WSS_HA10_0.5				
9	WSS				
10					
11					
12					

Continued on next page

Hill Laboratories
TRIED, TESTED AND TRUSTED

ANALYSIS REQUEST

R J Hill Laboratories Limited
Ground Floor, 28 Heather Street
Parnell
Auckland 1052, New Zealand

T 0508 HILL LAB (44 555 22)
T +64 7 856 2000
E mail@hill-labs.co.nz
W www.hill-laboratories.com

Job No: **372 8481**

Date Recv: 29-Nov-24 16:28

Received by: Emma Morrison

3137264810

17.0°C

Quote No

Primary Contact Genevieve Smith

Submitted By Genevieve Smith

Client Name Beca

Address 85 Molesworth Street

Wellington Postcode 6011

Phone Mobile [redacted]

Email [redacted]

Charge To [redacted]

Client Reference Southern Seawall

Order No

CHAIN OF CUSTODY RECORD

Sent to Hill Laboratories

Date & Time: 4:20 29/11

Name: Mio Akiyama

☐ Tick if you require COC to be emailed back

Signature: [redacted]

Samples will be processed at a Hill Laboratories site with the appropriate testing capability and capacity. Please inform the Laboratory if you wish samples to be retained and analysed at the site of receipt.

Received at Hill Laboratories

Date & Time:

Name:

Signature:

Results To *Reports will be emailed to Primary Contact by default. Additional Reports will be sent as specified below.*

☑ Email Primary Contact ☐ Email Submitter ☐ Email Client

☑ Email Other [redacted]

☐ Other

ADDITIONAL INFORMATION

Soil samples x18

Buf fragments x5

Priority ☐ Low ☐ Normal ☐ High

☐ Urgent (ASAP extra charge applies, please contact lab first)

Requested Reporting Date:

Please ensure all asbestos samples are individually double bagged upon submission to the laboratory.

No.	Sample Name	Sample Material	Sample Location	Sample Date	Tests Required (if not as per Quote)
1	WSS - HA1 - 0.1	soil		29/11	hold cold
2	WSS - HA1 - 0.3				
3	WSS - HA1 - 0.5				
4	WSS - HA2 - 0.1				
5	WSS - HA3 - 0.1				
6	WSS - HA3 - 0.3				
7	WSS - HA4 - 0.1				
8	WSS - HA4 - 0.3				
9	WSS - HA4 - 0.5				
10	WSS - HA4 - 0.7				

11	WSS_HA5_0.1	soil		2a/11	hold cold
12	WSS_HA5_0.3				
13	WSS_HA5_0.5				
14	WSS_HA6_0.1				
15	WSS_HA6_0.3				
16	WSS_HA7_0.1				
17	WSS_HA7_0.3				
18	WSS_BF3	bulk fragment			
19	WSS_BF4				
20	WSS_BF5				
21	WSS_BF6				
22	WSS_BF7				
23	WSS_QA3	soil			
24					
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R J Hill Laboratories Limited
28 Duke Street Frankton 3204
Private Bag 3205
Hamilton 3240 New Zealand

0508 HILL LAB (44 555 22)
+64 7 858 2000
mail@hill-labs.co.nz
www.hill-labs.co.nz

Job Information Summary

Client:	Beca Limited	**Lab No:**	3728481
Contact:	Genevieve Jessica Smith C/- Beca Limited PO Box 3942 Wellington 6140	**Date Registered:**	03-Dec-2024 8:10 am
		Priority:	Urgent
		Quote No:	
		Order No:	
		Client Reference:	Southern Seawall
		Add. Client Ref:	3324228/09/09
		Submitted By:	Genevieve Jessica Smith
		Charge To:	Beca Limited
		Target Date:	17-Dec-2024 4:30 pm

Samples

No	Sample Name	Sample Type	Containers	Tests Requested
1	WSS_HA1_0.1 29-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level, Polycyclic Aromatic Hydrocarbons Screening in Soil
2	WSS_HA1_0.3 29-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level, Polycyclic Aromatic Hydrocarbons Screening in Soil
3	WSS_HA1_0.5 29-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level
4	WSS_HA2_0.1 29-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level
5	WSS_HA3_0.1 29-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level
6	WSS_HA3_0.3 29-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level, Polycyclic Aromatic Hydrocarbons Screening in Soil
7	WSS_HA4_0.1 29-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level, PFAS in Soil, Semivolatile Organic Compounds Trace in Soil by GC-MS, Total Petroleum Hydrocarbons in Soil
8	WSS_HA4_0.3 29-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level, PFAS in Soil, Semivolatile Organic Compounds Trace in Soil by GC-MS, Total Petroleum Hydrocarbons in Soil
9	WSS_HA4_0.5 29-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level, PFAS in Soil, Semivolatile Organic Compounds Trace in Soil by GC-MS, Total Petroleum Hydrocarbons in Soil
10	WSS_HA4_0.8 29-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas, SubAsQualPFAS_SoilLH	Heavy Metals with Mercury, Screen Level, PFAS in Soil, Semivolatile Organic Compounds Trace in Soil by GC-MS, Total Petroleum Hydrocarbons in Soil, Poly- and Perfluorinated Alkyl Substances in TCLP Reagent Water, Poly- and Perfluorinated Alkyl Substances in TCLP pH5 Acetate Buffer
11	WSS_HA5_0.1 29-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level, PFAS in Soil, Semivolatile Organic Compounds Trace in Soil by GC-MS, Total Petroleum Hydrocarbons in Soil

Samples

No	Sample Name	Sample Type	Containers	Tests Requested
12	WSS_HA5_0.3 29-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level
13	WSS_HA5_0.5 29-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level, PFAS in Soil, Semivolatile Organic Compounds Trace in Soil by GC-MS, Total Petroleum Hydrocarbons in Soil
14	WSS_HA6_0.1 29-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level, PFAS in Soil, Semivolatile Organic Compounds Trace in Soil by GC-MS, Total Petroleum Hydrocarbons in Soil
15	WSS_HA6_0.3 29-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level, PFAS in Soil, Semivolatile Organic Compounds Trace in Soil by GC-MS, Total Petroleum Hydrocarbons in Soil
16	WSS_HA7_0.1 29-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level
17	WSS_HA7_0.3 29-Nov-2024	Soil	GSoil300, PSoil125pfas, PSoil125pfas, cPSoil250	Heavy Metals with Mercury, Screen Level, Polycyclic Aromatic Hydrocarbons Screening in Soil
18	WSS_QA3 29-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level
19	[Unlabelled Soil Sample]	Soil	PSoil250	Hold Cold
20	Rinsate Blank 1	Blank	SubAsQualTrizP250	Poly- and Perfluorinated Alkyl Substances in Water
21	Rinsate Blank 2	Blank	SubAsQualTrizP250	Hold Cold
22	Composite of WSS_HA5_0.1, WSS_HA5_0.3 & WSS_HA5_0.5	Soil	OrgComp	SPLP Profile, TCLP Profile
23	Composite of WSS_HA5_0.1, WSS_HA5_0.3 & WSS_HA5_0.5 [TCLP Extract]	TCLP Extract	TCLPext	Total Lead, Total Zinc
24	Composite of WSS_HA5_0.1, WSS_HA5_0.3 & WSS_HA5_0.5 [SPLP Extract]	SPLP Extract	SPLPext	Total Lead, Total Zinc
25	Composite of WSS_HA5_0.1, WSS_HA5_0.3 & WSS_HA5_0.5	Soil	SubAsQualPFAS_SoilLH	Poly- and Perfluorinated Alkyl Substances in TCLP Reagent Water, Poly- and Perfluorinated Alkyl Substances in TCLP pH5 Acetate Buffer
26	Composite of WSS_HA04_0.1, WSS_HA04_0.3 & WSS_HA04_0.5	Soil	SubAsQualPFAS_SoilLH	Poly- and Perfluorinated Alkyl Substances in TCLP Reagent Water, Poly- and Perfluorinated Alkyl Substances in TCLP pH5 Acetate Buffer

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request.
Unless otherwise indicated, analyses were performed at Hill Labs, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Individual Tests			
Environmental Solids Sample Drying	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	1-18
Total of Reported PAHs in Soil	Sonication extraction, GC-MS/MS analysis. In-house based on US EPA 8270.	0.03 mg/kg dry wt	1-2, 6, 17
Poly- and Perfluorinated Alkyl Substances in TCLP Reagent Water	Analysis by LC-MS/MS. Subcontracted to AsureQuality, Lower Hutt.	-	10, 25-26
Poly- and Perfluorinated Alkyl Substances in TCLP pH5 Acetate Buffer	Analysis by LC-MS/MS. Subcontracted to AsureQuality, Lower Hutt.	-	10, 25-26

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Dry Matter	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	1-2, 6-11, 13-15, 17
Dry Matter	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	0.10 g/100g as rcvd	7-11, 13-15
Composite Environmental Solid Samples	Individual sample fractions mixed together to form a composite fraction.	-	11-13
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES	BaP Potency Equivalence calculated from; Benzo(a) anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(j) fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a) pyrene x 1.0 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Fluoranthene x 0.01 + Indeno(1,2,3-c,d)pyrene x 0.1. Ministry for the Environment. 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.	0.024 mg/kg dry wt	1-2, 6, 17
Benzo[a]pyrene Toxic Equivalence (TEF)	Benzo[a]pyrene Toxic Equivalence (TEF) calculated from; Benzo[a]pyrene x 1.0 + Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Indeno(1,2,3-c,d)pyrene x 0.1. Guidelines for assessing and managing contaminated gasworks sites in New Zealand (GMG) (MfE, 1997).	0.024 mg/kg dry wt	1-2, 6, 17
Heavy Metals with Mercury, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	1-18
Polycyclic Aromatic Hydrocarbons Screening in Soil	Sonication extraction, GC-MS/MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.010 - 0.05 mg/kg dry wt	1-2, 6, 17
Semivolatile Organic Compounds Trace in Soil by GC-MS	Sonication extraction, GC-MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.10 - 6 mg/kg dry wt	7-11, 13-15
SPLP Profile	Extraction at 30 +/- 2 rpm for 18 +/- 2 hours, (Ratio 1g sample : 20g extraction fluid). US EPA 1312.	-	22
TCLP Profile	Extraction at 30 +/- 2 rpm for 18 +/- 2 hours, (Ratio 1g sample : 20g extraction fluid). US EPA 1311.	-	22
PFAS in Soil	Solvent extraction. LC-MS/MS analysis. Tested on as received sample. In-house based on ASTM D7968.	0.0010 - 0.046 mg/kg dry wt	7-11, 13-15
Total Petroleum Hydrocarbons in Soil			
Client Chromatogram for TPH by FID	Small peaks associated with QC compounds may be visible in chromatograms with low TPH concentrations. QC peaks are as follows: one peak in the C12 - 14 band, the C21 - 25 band and the C30 - 36 band. All QC peaks are corrected for in the reported TPH concentrations.	-	8-10, 13, 15
C7 - C9	Solvent extraction, GC-FID analysis. In-house based on US EPA 8015.	20 mg/kg dry wt	7-11, 13-15
C10 - C14	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	20 mg/kg dry wt	7-11, 13-15
C15 - C36	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	40 mg/kg dry wt	7-11, 13-15
Total hydrocarbons (C7 - C36)	Calculation: Sum of carbon bands from C7 to C36. In-house based on US EPA 8015.	70 mg/kg dry wt	7-11, 13-15
SPLP Profile			
SPLP Sample Weight	Gravimetric. US EPA 1312.	0.1 g	22
SPLP Extractant Type	US EPA 1312 (Modified for New Zealand conditions to use De-ionised Water unless otherwise specified).	-	22
SPLP Final pH	pH meter. US EPA 1312.	0.1 pH Units	22
TCLP Profile			
TCLP Weight of Sample Taken	Gravimetric. US EPA 1311.	0.1 g	22
TCLP Initial Sample pH	pH meter. US EPA 1311.	0.1 pH Units	22
TCLP Acid Adjusted Sample pH	pH meter. US EPA 1311.	0.1 pH Units	22
TCLP Extractant Type	US EPA 1311.	-	22
TCLP Extraction Fluid pH	pH meter. US EPA 1311.	0.1 pH Units	22
TCLP Post Extraction Sample pH	pH meter. US EPA 1311.	0.1 pH Units	22

Sample Type: Aqueous			
Test	**Method Description**	**Default Detection Limit**	**Sample No**

Sample Type: Aqueous			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Individual Tests			
Poly- and Perfluorinated Alkyl Substances in Water	Analysis by LC-MS/MS. Subcontracted to AsureQuality, Lower Hutt.	-	20
Total Digestion of Extracted Samples	Nitric acid digestion. APHA 3030 E (modified) : Online Edition.	-	23-24
Total Lead	Nitric acid digestion, ICP-MS, screen level. APHA 3125 B : Online Edition.	0.0021 g/m^3	23
Total Lead	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition / US EPA 200.8.	0.00011 g/m^3	24
Total Zinc	Nitric acid digestion, ICP-MS, screen level. APHA 3125 B : Online Edition.	0.053 g/m^3	23
Total Zinc	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition / US EPA 200.8.	0.0011 g/m^3	24

PHOTOCOPY BOX 2/4

Hill Laboratories
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ANALYSIS REQUEST

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Hamilton 3240, New Zealand

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Job No: **372 7360**
Date Recv: 28-Nov-24 15:44
Received by: Emma Morrison
3137273603

Quote No

Primary Contact Genevieve Jessica Smith

Submitted By "

Client Name Beca Ltd

Address 85 Molesworth Street
Thorndon Postcode 6011

Phone Mobile [redacted]

Email [redacted]

Charge To [redacted]

Client Reference ~~GBH~~ Southern seawall.

Additional Ref (Consultant Project ID)

Order No

Results To Reports will be emailed to Primary Contact by default. Additional Reports will be sent as specified below.

☑ Email Primary Contact ☐ Email Submitter ☐ Email Client
☑ Email Other [redacted]
☐ Other

Dates of testing are not routinely included in the Certificates of Analysis. Please inform the Laboratory if you would like this information reported.

CHAIN OF CUSTODY RECORD

Sent to Hill Laboratories
Date & Time: 28/11/24 @ 1530
Name: Genevieve Smith
☑ Tick if you require COC to be emailed back
Signature: [redacted]

Received at Hill Laboratories (Refer to Lab created Job No above)
Date & Time:
Name:
Signature:

Condition ☐ Room Temp ☐ Chilled ☐ Frozen
Temp: 17.9 °C

ADDITIONAL INFORMATION / KNOWN HAZARDS

Completed as asbestos-related works. As0il250, GSoil, 125Asb, 500Asb, PFAS, plastic bags.

Priority ☐ Low ☒ Normal ☑ High
☐ Urgent (ASAP, extra charge applies, please contact lab first)

Requested Reporting Date:

No.	Sample Name	Sample Date	Sample Time	Sample Type	Tests Required (if not as per Quote)
1	WSS_TP1_0.1	28/11/24		Soil	Hold cold - will send
2	WSS_TP1_0.5				analysis via email.
3	WSS_TP2_0.1				
4	WSS_TP2_0.5				
5	WSS_TP2_1.0				
6	WSS_TP3_0.1				
7	WSS_TP3_0.5				
8	WSS_TP3_1.0				
9	WSS_TP4_0.1				
10	WSS_TP4_0.5				
11	WSS_TP4_1.0				
12	WSS_TP5_0.1				

Continued on next page

No.	Sample Name	Sample Date	Sample Time	Sample Type	Tests Required (if not as per Quote)
13	WSS_TP5_0.5	28/11/24		Soil	Hold cold - will send
14	WSS_TP5_1.0				analysis via email.
15	WSS_TP6_0.1				
16	WSS_TP6_0.5				
17	WSS_TP6_1.0				
18	WSS_TP7_0.1				
19	WSS_TP7_0.3				
20	WSS_TP7_0.5				
21	WSS_TP7_1.0				
22	WSS_TP7_1.3				
23	WSS_TP8_0.5CT	28/11/24		Reading material	
24	WSS_TP7_0.4_CT			" "	
25	WSS_TP6_CT.			" "	
26	WSS_TP8_0.5_BF			Bulk Fragment	
27	WSS_TP2_BF1			Bulk Frag.	
28	WSS_QA1	28/11/24		Soil	
29	WSS_QA2	28/11/24		Soil.	
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					

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Job Information Summary

Client:	Beca Limited	**Lab No:**	3727360
Contact:	Genevieve Jessica Smith C/- Beca Limited PO Box 3942 Wellington 6140	**Date Registered:**	29-Nov-2024 12:14 pm
		Priority:	Urgent
		Quote No:	
		Order No:	
		Client Reference:	Southern Seawall
		Add. Client Ref:	3324228/09/09
		Submitted By:	Genevieve Jessica Smith
		Charge To:	Beca Limited
		Target Date:	23-Dec-2024 4:30 pm

Samples

No	Sample Name	Sample Type	Containers	Tests Requested
1	WSS_TP1_0.1 28-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level, Polycyclic Aromatic Hydrocarbons Screening in Soil
2	WSS_TP1_0.5 28-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level, Polycyclic Aromatic Hydrocarbons Screening in Soil
3	WSS_TP2_0.1 28-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level
4	WSS_TP2_0.5 28-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Hold Cold
5	WSS_TP2_1.0 28-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Hold Cold
6	WSS_TP3_0.1 28-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level
7	WSS_TP3_0.5 28-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Hold Cold
8	WSS_TP3_1.0 28-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Hold Cold
9	WSS_TP4_0.1 28-Nov-2024	Soil	GSoil300, PSoil250	Heavy Metals with Mercury, Screen Level
10	WSS_TP4_0.5 28-Nov-2024	Soil	GSoil300, PSoil250	Heavy Metals with Mercury, Screen Level, Polycyclic Aromatic Hydrocarbons Screening in Soil
11	WSS_TP4_1.0 28-Nov-2024	Soil	GSoil300, PSoil250	Hold Cold
12	WSS_TP5_0.1 28-Nov-2024	Soil	GSoil300, cPSoil125pfas	Heavy Metals with Mercury, Screen Level, PFAS in Soil, TPH Oil Industry Profile + PAHscreen
13	WSS_TP5_0.5 28-Nov-2024	Soil	GSoil300, cPSoil125pfas	Heavy Metals with Mercury, Screen Level, PFAS in Soil, TPH Oil Industry Profile + PAHscreen
14	WSS_TP5_1.0 28-Nov-2024	Soil	GSoil300, PSoil250, cPSoil125pfas	PFAS in Soil
15	WSS_TP6_0.1 28-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level

Samples

No	Sample Name	Sample Type	Containers	Tests Requested
16	WSS_TP6_0.5 28-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level, Polycyclic Aromatic Hydrocarbons Screening in Soil
17	WSS_TP6_1.0 28-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level, PFAS in Soil, Polycyclic Aromatic Hydrocarbons Screening in Soil
18	WSS_TP7_0.1 28-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level, PFAS in Soil, Semivolatile Organic Compounds Trace in Soil by GC-MS, Total Petroleum Hydrocarbons in Soil
19	WSS_TP7_0.3 28-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level, PFAS in Soil, Semivolatile Organic Compounds Trace in Soil by GC-MS, Total Petroleum Hydrocarbons in Soil
20	WSS_TP7_0.5 28-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level, PFAS in Soil, Semivolatile Organic Compounds Trace in Soil by GC-MS, Total Petroleum Hydrocarbons in Soil
21	WSS_TP7_1.0 28-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	SPLP Profile, TCLP Profile, Heavy Metals with Mercury, Screen Level, PFAS in Soil, Semivolatile Organic Compounds Trace in Soil by GC-MS, Total Petroleum Hydrocarbons in Soil
22	WSS_TP7_1.3 28-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level, PFAS in Soil, Semivolatile Organic Compounds Trace in Soil by GC-MS, Total Petroleum Hydrocarbons in Soil
23	WSS_TP8_0.5CT 28-Nov-2024	Roading Material	GSoil300	Polycyclic Aromatic Hydrocarbons Screening in Rock, Heavy metals, MacroDig, screen, As,Cd,Cr,Cu,Ni,Pb,Zn, Total Recoverable Mercury
24	WSS_TP7_0.4_CT 28-Nov-2024	Roading Material	GSoil300	Hold Cold
25	WSS_TP6_CT 28-Nov-2024	Roading Material	GSoil300	Polycyclic Aromatic Hydrocarbons Screening in Rock, Heavy metals, MacroDig, screen, As,Cd,Cr,Cu,Ni,Pb,Zn, Total Recoverable Mercury
26	WSS_QA1 28-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level
27	WSS_QA2 28-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level, PFAS in Soil, Semivolatile Organic Compounds Trace in Soil by GC-MS, Total Petroleum Hydrocarbons in Soil
28	WSS_TP8_0.1 28-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level
29	WSS_TP8_0.5 28-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level, PFAS in Soil, Semivolatile Organic Compounds Trace in Soil by GC-MS, Total Petroleum Hydrocarbons in Soil
30	WSS_TP8_1.0 28-Nov-2024	Soil	GSoil300, PSoil250, PSoil125pfas, PSoil125pfas	Heavy Metals with Mercury, Screen Level, PFAS in Soil, Semivolatile Organic Compounds Trace in Soil by GC-MS, Total Petroleum Hydrocarbons in Soil
31	WSS_TP5_0.1 PFAS [A] 28-Nov-2024	Soil	PSoil125pfas, PSoil125pfas	Hold Cold
32	WSS_TP5_0.1 PFAS [B] 28-Nov-2024	Soil	PSoil125pfas, PSoil125pfas	Hold Cold
33	WSS_TP5_0.5 PFAS [A] 28-Nov-2024	Soil	PSoil125pfas, PSoil125pfas	Hold Cold
34	WSS_TP5_0.5 PFAS [B] 28-Nov-2024	Soil	PSoil125pfas, PSoil125pfas	Hold Cold
35	WSS_TP5_1.0 PFAS [A] 28-Nov-2024	Soil	PSoil125pfas, PSoil125pfas	Hold Cold
36	WSS_TP5_1.0 PFAS [B] 28-Nov-2024	Soil	PSoil125pfas, PSoil125pfas	Hold Cold
37	WSS_TP7_1.0 [TCLP Extract]	TCLP Extract	TCLPext	Total Lead, Total Zinc
38	WSS_TP7_1.0 [SPLP Extract]	SPLP Extract	SPLPext	Total Lead, Total Zinc

Samples

No	Sample Name	Sample Type	Containers	Tests Requested
39	Composite of WSS_TP7_0.1, WSS_TP7_0.3 and WSS_TP7_0.5	Soil	SubAsQualPFAS_SoilLH	Poly- and Perfluorinated Alkyl Substances in TCLP Reagent Water
40	Composite of WSS_TP7_1.0 and WSS_TP7_1.3	Soil	SubAsQualPFAS_SoilLH	Poly- and Perfluorinated Alkyl Substances in TCLP Reagent Water

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request.
Unless otherwise indicated, analyses were performed at Hill Labs, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Individual Tests			
Environmental Solids Sample Drying	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	1-3, 6, 9-10, 12-13, 15-22, 26-30
Total of Reported PAHs in Soil	Sonication extraction, GC-MS/MS analysis. In-house based on US EPA 8270.	0.03 mg/kg dry wt	1-2, 10, 12-13, 16-17
Poly- and Perfluorinated Alkyl Substances in TCLP Reagent Water	Analysis by LC-MS/MS. Subcontracted to AsureQuality, Lower Hutt.	-	39-40
Dry Matter	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	1-2, 10, 12-13, 16-22, 27, 29-30
Dry Matter	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	0.10 g/100g as rcvd	12-14, 17-22, 27, 29-30
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES	BaP Potency Equivalence calculated from; Benzo(a) anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(j) fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a) pyrene x 1.0 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Fluoranthene x 0.01 + Indeno(1,2,3-c,d)pyrene x 0.1. Ministry for the Environment. 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.	0.024 mg/kg dry wt	1-2, 10, 12-13, 16-17
Benzo[a]pyrene Toxic Equivalence (TEF)	Benzo[a]pyrene Toxic Equivalence (TEF) calculated from; Benzo[a]pyrene x 1.0 + Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Indeno(1,2,3-c,d)pyrene x 0.1. Guidelines for assessing and managing contaminated gasworks sites in New Zealand (GMG) (MfE, 1997).	0.024 mg/kg dry wt	1-2, 10, 12-13, 16-17
TPH Oil Industry Profile + PAHscreen	Sonication extraction, GC-FID and GC-MS/MS analysis. Tested on as received sample. In-house based on US EPA 8015 and US EPA 8270.	0.010 - 70 mg/kg dry wt	12-13
Heavy Metals with Mercury, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	1-3, 6, 9-10, 12-13, 15-22, 26-30
Polycyclic Aromatic Hydrocarbons Screening in Soil	Sonication extraction, GC-MS/MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.010 - 0.05 mg/kg dry wt	1-2, 10, 16-17
Semivolatile Organic Compounds Trace in Soil by GC-MS	Sonication extraction, GC-MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.10 - 6 mg/kg dry wt	18-22, 27, 29-30
SPLP Profile	Extraction at 30 +/- 2 rpm for 18 +/- 2 hours, (Ratio 1g sample : 20g extraction fluid). US EPA 1312.	-	21
TCLP Profile	Extraction at 30 +/- 2 rpm for 18 +/- 2 hours, (Ratio 1g sample : 20g extraction fluid). US EPA 1311.	-	21
PFAS in Soil	Solvent extraction. LC-MS/MS analysis. Tested on as received sample. In-house based on ASTM D7968.	0.0010 - 0.046 mg/kg dry wt	12-14, 17-22, 27, 29-30
Total Petroleum Hydrocarbons in Soil			
Client Chromatogram for TPH by FID	Small peaks associated with QC compounds may be visible in chromatograms with low TPH concentrations. QC peaks are as follows: one peak in the C12 - 14 band, the C21 - 25 band and the C30 - 36 band. All QC peaks are corrected for in the reported TPH concentrations.	-	19-22, 27

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
C7 - C9	Solvent extraction, GC-FID analysis. In-house based on US EPA 8015.	20 mg/kg dry wt	12-13, 18-22, 27, 29-30
C10 - C14	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	20 mg/kg dry wt	12-13, 18-22, 27, 29-30
C15 - C36	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	40 mg/kg dry wt	12-13, 18-22, 27, 29-30
Total hydrocarbons (C7 - C36)	Calculation: Sum of carbon bands from C7 to C36. In-house based on US EPA 8015.	70 mg/kg dry wt	12-13, 18-22, 27, 29-30
SPLP Profile			
SPLP Sample Weight	Gravimetric. US EPA 1312.	0.1 g	21
SPLP Extractant Type	US EPA 1312 (Modified for New Zealand conditions to use De-ionised Water unless otherwise specified).	-	21
SPLP Final pH	pH meter. US EPA 1312.	0.1 pH Units	21
TCLP Profile			
TCLP Weight of Sample Taken	Gravimetric. US EPA 1311.	0.1 g	21
TCLP Initial Sample pH	pH meter. US EPA 1311.	0.1 pH Units	21
TCLP Acid Adjusted Sample pH	pH meter. US EPA 1311.	0.1 pH Units	21
TCLP Extractant Type	US EPA 1311.	-	21
TCLP Extraction Fluid pH	pH meter. US EPA 1311.	0.1 pH Units	21
TCLP Post Extraction Sample pH	pH meter. US EPA 1311.	0.1 pH Units	21

Sample Type: Aqueous			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Individual Tests			
Total Digestion of Extracted Samples	Nitric acid digestion. APHA 3030 E (modified) : Online Edition.	-	37-38
Total Lead	Nitric acid digestion, ICP-MS, screen level. APHA 3125 B : Online Edition.	0.0021 g/m^3	37
Total Lead	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition / US EPA 200.8.	0.00011 g/m^3	38
Total Zinc	Nitric acid digestion, ICP-MS, screen level. APHA 3125 B : Online Edition.	0.053 g/m^3	37
Total Zinc	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition / US EPA 200.8.	0.0011 g/m^3	38

Sample Type: Roading Material			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Individual Tests			
SHOC Macro Extraction 10x Dilution		-	23, 25
Macro Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	23, 25
Total Recoverable Arsenic	Tested on as received sample. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	2 mg/kg as rcvd	23, 25
Total Recoverable Cadmium	Tested on as received sample. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	0.10 mg/kg as rcvd	23, 25
Total Recoverable Chromium	Tested on as received sample. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	2 mg/kg as rcvd	23, 25
Total Recoverable Copper	Tested on as received sample. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	2 mg/kg as rcvd	23, 25
Total Recoverable Lead	Tested on as received sample. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	0.4 mg/kg as rcvd	23, 25
Total Recoverable Mercury	Dried sample, Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	0.10 mg/kg dry wt	23, 25
Total Recoverable Nickel	Tested on as received sample. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	2 mg/kg as rcvd	23, 25
Total Recoverable Zinc	Tested on as received sample. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	4 mg/kg as rcvd	23, 25
Heavy metals, MacroDig, screen, As,Cd,Cr,Cu,Ni,Pb,Zn	Tested on as received sample. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	0.10 - 4 mg/kg as rcvd	23, 25
Polycyclic Aromatic Hydrocarbons Screening in Rock	Sonication extraction, GC-MS/MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.002 - 0.3 mg/kg as rcvd	23, 25

E

Appendix E – Laboratory Analytical Reports

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Certificate of Analysis

Client:	Beca Limited	**Lab No:**	3727361	A2Pv1
Contact:	Genevieve Jessica Smith	**Date Received:**	28-Nov-2024	
	C/- Beca Limited	**Date Reported:**	04-Dec-2024	
	PO Box 3942	**Quote No:**		
	Wellington 6140	**Order No:**		
		Client Reference:	Southern Seawell	
		Add. Client Ref:	3324228/09/09	
		Submitted By:	Genevieve Jessica Smith	

Sample Type: Soil

Sample Name	Lab Number	As Received Weight Presence / Absence Testing (g)	Dry Weight Presence / Absence Testing (g)	<2mm Subsample Weight Presence / Absence Testing (g dry wt)	Asbestos Presence / Absence from Presence / Absence Testing	Description of Asbestos Form Presence / Absence Testing
WSS_TP1_0.1	3727361.1	228.4	219.9	54.4	Asbestos NOT detected.	-
WSS_TP1_0.5	3727361.2	230.7	217.3	52.6	Asbestos NOT detected.	-
WSS_TP4_0.1	3727361.9	244.0	235.0	51.9	Asbestos NOT detected.	-
WSS_TP4_0.5	3727361.10	216.8	205.0	57.0	Asbestos NOT detected.	-
WSS_TP5_0.1	3727361.12	231.0	223.0	46.2	Asbestos NOT detected.	-
WSS_TP5_0.5	3727361.13	235.6	221.1	55.6	Asbestos NOT detected.	-
WSS_TP7_0.1	3727361.18	251.2	245.3	55.2	Asbestos NOT detected.	-
WSS_TP7_0.3	3727361.19	222.9	211.8	53.8	Asbestos NOT detected.	-
WSS_TP7_0.5	3727361.20	251.6	238.9	37.3	Asbestos NOT detected.	-
WSS_TP7_1.3	3727361.22	222.5	204.2	51.3	Asbestos NOT detected.	-
WSS_TP8_0.1	3727361.23	253.0	244.5	49.9	Asbestos NOT detected.	-

Sample Type: Soil

Sample Name:		WSS_TP6_0.5 28-Nov-2024	WSS_TP6_1.0 28-Nov-2024	WSS_TP7_1.0 28-Nov-2024	WSS_TP8_0.5 28-Nov-2024	WSS_TP8_1.0 28-Nov-2024
Lab Number:		3727361.16	3727361.17	3727361.21	3727361.24	3727361.25
Asbestos Presence / Absence		Asbestos NOT detected.	Asbestos NOT detected.	Chrysotile (White Asbestos) detected.	Asbestos NOT detected.	Asbestos NOT detected.
Description of Asbestos Form		-	-	Fibre board and ACM debris	-	-
Asbestos in ACM as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	0.065	< 0.001	< 0.001
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w	< 0.001	< 0.001	0.045	< 0.001	< 0.001
Asbestos as Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	0.020	< 0.001	< 0.001
As Received Weight	g	933.8	1,002.1	1,045.8	969.1	1,058.1
Dry Weight	g	884.5	949.4	934.7	902.1	975.6
Moisture*	%	5	5	11	7	8
Sample Fraction >10mm	g dry wt	279.5	275.5	139.0	438.1	204.3
Sample Fraction <10mm to >2mm	g dry wt	321.7	389.5	323.8	355.8	440.0
Sample Fraction <2mm	g dry wt	282.5	283.8	470.4	107.6	330.0
<2mm Subsample Weight	g dry wt	52.8	56.5	56.2	53.0	54.7
Weight of Asbestos in ACM (Non-Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001

This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.
The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

Sample Type: Soil						
Sample Name:		WSS_TP6_0.5 28-Nov-2024	WSS_TP6_1.0 28-Nov-2024	WSS_TP7_1.0 28-Nov-2024	WSS_TP8_0.5 28-Nov-2024	WSS_TP8_1.0 28-Nov-2024
Lab Number:		3727361.16	3727361.17	3727361.21	3727361.24	3727361.25
Weight of Asbestos as Fibrous Asbestos (Friable)	g dry wt	< 0.00001	< 0.00001	0.4162	< 0.00001	< 0.00001
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt	< 0.00001	< 0.00001	0.19126	< 0.00001	< 0.00001

Glossary of Terms

• Loose fibres (Minor) - One or two fibres/fibre bundles identified during analysis by stereo microscope/PLM.
• Loose fibres (Major) - Three or more fibres/fibre bundles identified during analysis by stereo microscope/PLM.
• ACM Debris (Minor) - One or two small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
• ACM Debris (Major) - Large (>2mm) piece, or more than three small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
• Unknown Mineral Fibres - Mineral fibres of unknown type detected by polarised light microscopy including dispersion staining. The fibres detected may or may not be asbestos fibres. To confirm the identities, another independent analytical technique may be required.
• Trace - Trace levels of asbestos, as defined by AS4964-2004.
For further details, please contact the Asbestos Team.

Please refer to the BRANZ New Zealand Guidelines for Assessing and Managing Asbestos in Soil.
https://www.branz.co.nz/asbestos

The following assumptions have been made:

1. Asbestos Fines in the <2mm fraction, after homogenisation, is evenly distributed throughout the fraction
2. The weight of asbestos in the sample is unaffected by the ashing process.

Results are representative of the sample provided to Hill Laboratories only.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Labs, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Asbestos in Soil			
As Received Weight Presence / Absence Testing	Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g	1-2, 9-10, 12-13, 18-20, 22-23
Dry Weight Presence / Absence Testing	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g	1-2, 9-10, 12-13, 18-20, 22-23
<2mm Subsample Weight Presence / Absence Testing	Sample dried at 100 to 105°C, weight of <2mm sample fraction taken for asbestos identification if less than entire fraction. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	-	1-2, 9-10, 12-13, 18-20, 22-23
Asbestos Presence / Absence from Presence / Absence Testing	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	1-2, 9-10, 12-13, 18-20, 22-23
Description of Asbestos Form Presence / Absence Testing	Description of asbestos form and/or shape if present.	-	1-2, 9-10, 12-13, 18-20, 22-23
New Zealand Guidelines Semi Quantitative Asbestos in Soil			
As Received Weight	Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g	16-17, 21, 24-25
Dry Weight	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g	16-17, 21, 24-25
Moisture*	Sample dried at 100 to 105°C. Calculation = (As received weight - Dry weight) / as received weight x 100.	1 %	16-17, 21, 24-25
Sample Fraction >10mm	Sample dried at 100 to 105°C, 10mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g dry wt	16-17, 21, 24-25

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Sample Fraction <10mm to >2mm	Sample dried at 100 to 105°C, 10mm and 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g dry wt	16-17, 21, 24-25
Sample Fraction <2mm	Sample dried at 100 to 105°C, 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g dry wt	16-17, 21, 24-25
Asbestos Presence / Absence	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	16-17, 21, 24-25
Description of Asbestos Form	Description of asbestos form and/or shape if present.	-	16-17, 21, 24-25
Weight of Asbestos in ACM (Non-Friable)	Measurement on analytical balance, from the >10mm Fraction. Weight of asbestos based on assessment of ACM form. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	16-17, 21, 24-25
Asbestos in ACM as % of Total Sample*	Calculated from weight of asbestos in ACM and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	16-17, 21, 24-25
Weight of Asbestos as Fibrous Asbestos (Friable)	Measurement on analytical balance, from the >10mm Fraction. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	16-17, 21, 24-25
Asbestos as Fibrous Asbestos as % of Total Sample*	Calculated from weight of fibrous asbestos and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	16-17, 21, 24-25
Weight of Asbestos as Asbestos Fines (Friable)*	Measurement on analytical balance, from the <10mm Fractions. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	16-17, 21, 24-25
Asbestos as Asbestos Fines as % of Total Sample*	Calculated from weight of asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	16-17, 21, 24-25
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	Calculated from weight of fibrous asbestos plus asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	16-17, 21, 24-25
Asbestos in Soil Presence / Absence Testing ESdat Electronic Transfer			
Amosite Presence / Absence Testing	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Presence / Absence testing.	0 Detect	1-2, 9-10, 12-13, 18-20, 22-23
Chrysotile Presence / Absence Testing	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Presence / Absence testing.	0 Detect	1-2, 9-10, 12-13, 18-20, 22-23
Crocidolite Presence / Absence Testing	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Presence / Absence testing.	0 Detect	1-2, 9-10, 12-13, 18-20, 22-23

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 03-Dec-2024 and 04-Dec-2024. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

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Certificate of Analysis

Client:	Beca Limited	**Lab No:**	3728491	A2Pv1
Contact:	Genevieve Jessica Smith	**Date Received:**	29-Nov-2024	
	C/- Beca Limited	**Date Reported:**	05-Dec-2024	
	PO Box 3942	**Quote No:**	96766	
	Wellington 6140	**Order No:**		
		Client Reference:	Southern Seawall	
		Add. Client Ref:	3324228/09/09	
		Submitted By:	Genevieve Jessica Smith	

Sample Type: Soil

Sample Name	Lab Number	As Received Weight Presence / Absence Testing (g)	Dry Weight Presence / Absence Testing (g)	<2mm Subsample Weight Presence / Absence Testing (g dry wt)	Asbestos Presence / Absence from Presence / Absence Testing	Description of Asbestos Form Presence / Absence Testing
WSS_HA1_0.1	3728491.1	196.0	178.8	58.8	Asbestos NOT detected.	-
WSS_HA1_0.3	3728491.2	214.4	194.4	52.2	Asbestos NOT detected.	-
WSS_HA3_0.3	3728491.6	195.0	183.5	52.3	Asbestos NOT detected.	-
WSS_HA4_0.1	3728491.7	261.5	249.2	59.6	Asbestos NOT detected.	-
WSS_HA4_0.3	3728491.8	254.6	230.8	51.9	Asbestos NOT detected.	-
WSS_HA4_0.5	3728491.9	276.4	243.6	52.5	Asbestos NOT detected.	-
WSS_HA4_0.7	3728491.10	216.1	191.2	55.6	Asbestos NOT detected.	-
WSS_HA5_0.1	3728491.11	226.0	182.4	50.7	Asbestos NOT detected.	-
WSS_HA5_0.5	3728491.13	208.4	188.1	46.6	Asbestos NOT detected.	-
WSS_HA6_0.1	3728491.14	222.6	176.6	52.0	Asbestos NOT detected.	-
WSS_HA6_0.3	3728491.15	241.8	222.7	40.4	Asbestos NOT detected.	-
WSS_HA7_0.3	3728491.17	199.9	184.8	50.9	Asbestos NOT detected.	-

Glossary of Terms

- Loose fibres (Minor) - One or two fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- Loose fibres (Major) - Three or more fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- ACM Debris (Minor) - One or two small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- ACM Debris (Major) - Large (>2mm) piece, or more than three small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- Unknown Mineral Fibres - Mineral fibres of unknown type detected by polarised light microscopy including dispersion staining. The fibres detected may or may not be asbestos fibres. To confirm the identities, another independent analytical technique may be required.
- Trace - Trace levels of asbestos, as defined by AS4964-2004.

For further details, please contact the Asbestos Team.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request.
Unless otherwise indicated, analyses were performed at Hill Labs, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Asbestos in Soil			
As Received Weight Presence / Absence Testing	Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g	1-2, 6-11, 13-15, 17
Dry Weight Presence / Absence Testing	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g	1-2, 6-11, 13-15, 17

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The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
<2mm Subsample Weight Presence / Absence Testing	Sample dried at 100 to 105°C, weight of <2mm sample fraction taken for asbestos identification if less than entire fraction. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	-	1-2, 6-11, 13-15, 17
Asbestos Presence / Absence from Presence / Absence Testing	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	1-2, 6-11, 13-15, 17
Description of Asbestos Form Presence / Absence Testing	Description of asbestos form and/or shape if present.	-	1-2, 6-11, 13-15, 17
Asbestos in Soil Presence / Absence Testing ESdat Electronic Transfer			
Amosite Presence / Absence Testing	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Presence / Absence testing.	0 Detect	1-2, 6-11, 13-15, 17
Chrysotile Presence / Absence Testing	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Presence / Absence testing.	0 Detect	1-2, 6-11, 13-15, 17
Crocidolite Presence / Absence Testing	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Presence / Absence testing.	0 Detect	1-2, 6-11, 13-15, 17

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed on 05-Dec-2024. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

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Christchurch 8024 New Zealand

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www.hill-labs.co.nz

Certificate of Analysis

Client:	Beca Limited	**Lab No:**	3729107	A2Pv1
Contact:	Genevieve Jessica Smith	**Date Received:**	02-Dec-2024	
	C/- Beca Limited	**Date Reported:**	05-Dec-2024	
	PO Box 3942	**Quote No:**	96766	
	Wellington 6140	**Order No:**		
		Client Reference:	Southern Seawall	
		Add. Client Ref:	3324228/09/09	
		Submitted By:	Genevieve Jessica Smith	

Sample Type: Soil

Sample Name	Lab Number	As Received Weight Presence / Absence Testing (g)	Dry Weight Presence / Absence Testing (g)	<2mm Subsample Weight Presence / Absence Testing (g dry wt)	Asbestos Presence / Absence from Presence / Absence Testing	Description of Asbestos Form Presence / Absence Testing
WSS_HA8_0.1	3729107.1	201.2	188.5	56.3	Asbestos NOT detected.	-
WSS_HA8_0.5	3729107.3	242.8	230.0	57.5	Asbestos NOT detected.	-
WSS_HA9_0.1	3729107.4	208.2	198.5	51.5	Asbestos NOT detected.	-
WSS_HA9_0.5	3729107.6	235.9	225.1	54.6	Asbestos NOT detected.	-
WSS_HA10_0.1	3729107.7	187.2	172.1	52.2	Asbestos NOT detected.	-

Glossary of Terms

- Loose fibres (Minor) - One or two fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- Loose fibres (Major) - Three or more fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- ACM Debris (Minor) - One or two small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- ACM Debris (Major) - Large (>2mm) piece, or more than three small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- Unknown Mineral Fibres - Mineral fibres of unknown type detected by polarised light microscopy including dispersion staining. The fibres detected may or may not be asbestos fibres. To confirm the identities, another independent analytical technique may be required.
- Trace - Trace levels of asbestos, as defined by AS4964-2004.

For further details, please contact the Asbestos Team.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Labs, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Asbestos in Soil			
As Received Weight Presence / Absence Testing	Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g	1, 3-4, 6-7
Dry Weight Presence / Absence Testing	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g	1, 3-4, 6-7
<2mm Subsample Weight Presence / Absence Testing	Sample dried at 100 to 105°C, weight of <2mm sample fraction taken for asbestos identification if less than entire fraction. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	-	1, 3-4, 6-7
Asbestos Presence / Absence from Presence / Absence Testing	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	1, 3-4, 6-7
Description of Asbestos Form Presence / Absence Testing	Description of asbestos form and/or shape if present.	-	1, 3-4, 6-7

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Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Asbestos in Soil Presence / Absence Testing ESdat Electronic Transfer			
Amosite Presence / Absence Testing	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Presence / Absence testing.	0 Detect	1, 3-4, 6-7
Chrysotile Presence / Absence Testing	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Presence / Absence testing.	0 Detect	1, 3-4, 6-7
Crocidolite Presence / Absence Testing	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Presence / Absence testing.	0 Detect	1, 3-4, 6-7

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed on 05-Dec-2024. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

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[redacted]

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Laboratory Technician - Asbestos

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Hamilton 3240 New Zealand

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mail@hill-labs.co.nz
www.hill-labs.co.nz

Certificate of Analysis

Client:	Beca Limited	**Lab No:**	3729105 SPv1
Contact:	Genevieve Jessica Smith C/- Beca Limited PO Box 3942 Wellington 6140	**Date Received:**	02-Dec-2024
		Date Reported:	05-Dec-2024
		Quote No:	
		Order No:	
		Client Reference:	Southern Seawall
		Add. Client Ref:	3324228/09/09
		Submitted By:	Genevieve Jessica Smith

Sample Type: Soil

Sample Name:		WSS_HA8_0.1 29-Nov-2024	WSS_HA8_0.3 29-Nov-2024	WSS_HA8_0.5 29-Nov-2024	WSS_HA9_0.1 29-Nov-2024	WSS_HA9_0.3 29-Nov-2024
Lab Number:		3729105.1	3729105.2	3729105.3	3729105.4	3729105.5
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	5	5	6	5	5
Total Recoverable Cadmium	mg/kg dry wt	0.10	0.10	0.11	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	15	15	16	14	16
Total Recoverable Copper	mg/kg dry wt	15	17	17	20	27
Total Recoverable Lead	mg/kg dry wt	41	42	48	27	30
Total Recoverable Mercury	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Nickel	mg/kg dry wt	11	12	13	13	14
Total Recoverable Zinc	mg/kg dry wt	86	82	89	75	75

Sample Name:		WSS_HA9_0.5 29-Nov-2024	WSS_HA10_0.1 29-Nov-2024	WSS_HA10_0.3 29-Nov-2024
Lab Number:		3729105.6	3729105.7	3729105.8
Heavy Metals with Mercury, Screen Level				
Total Recoverable Arsenic	mg/kg dry wt	5	6	7
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	0.12	< 0.10
Total Recoverable Chromium	mg/kg dry wt	16	16	16
Total Recoverable Copper	mg/kg dry wt	22	20	20
Total Recoverable Lead	mg/kg dry wt	27	28	28
Total Recoverable Mercury	mg/kg dry wt	< 0.10	< 0.10	< 0.10
Total Recoverable Nickel	mg/kg dry wt	15	16	19
Total Recoverable Zinc	mg/kg dry wt	72	101	86

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Labs, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	1-8
Heavy Metals with Mercury, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	1-8

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These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 03-Dec-2024 and 05-Dec-2024. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.



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Certificate of Analysis

Client:	Beca Limited	**Lab No:**	3727360	SPv7
Contact:	Genevieve Jessica Smith	**Date Received:**	28-Nov-2024	
	C/- Beca Limited	**Date Reported:**	29-Jan-2025	**(Amended)**
	PO Box 3942	**Quote No:**		
	Wellington 6140	**Order No:**		
		Client Reference:	Southern Seawall	
		Add. Client Ref:	3324228/09/09	
		Submitted By:	Genevieve Jessica Smith	

Sample Type: Soil

Sample Name:		WSS_TP1_0.1 28-Nov-2024	WSS_TP1_0.5 28-Nov-2024	WSS_TP2_0.1 28-Nov-2024	WSS_TP3_0.1 28-Nov-2024	WSS_TP3_0.5 28-Nov-2024
Lab Number:		3727360.1	3727360.2	3727360.3	3727360.6	3727360.7
Individual Tests						
Dry Matter	g/100g as rcvd	94	93	-	-	-
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	8	4	5	8	-
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Total Recoverable Chromium	mg/kg dry wt	15	17	16	16	-
Total Recoverable Copper	mg/kg dry wt	22	12	19	20	-
Total Recoverable Lead	mg/kg dry wt	25	19.4	25	26	-
Total Recoverable Mercury	mg/kg dry wt	< 0.10	< 0.10	< 0.10	0.11	-
Total Recoverable Nickel	mg/kg dry wt	21	15	13	18	-
Total Recoverable Zinc	mg/kg dry wt	88	67	81	79	-
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.3	0.3	-	-	-
1-Methylnaphthalene	mg/kg dry wt	< 0.011	< 0.011	-	-	-
2-Methylnaphthalene	mg/kg dry wt	< 0.014	< 0.014	-	-	-
Acenaphthylene	mg/kg dry wt	< 0.011	< 0.011	-	-	-
Acenaphthene	mg/kg dry wt	< 0.011	< 0.011	-	-	-
Anthracene	mg/kg dry wt	< 0.011	< 0.011	-	-	-
Benzo[a]anthracene	mg/kg dry wt	< 0.011	0.020	-	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.011	0.028	-	-	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.026	0.041	-	-	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.026	0.041	-	-	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	< 0.011	0.033	-	-	-
Benzo[e]pyrene	mg/kg dry wt	< 0.011	0.020	-	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.011	0.021	-	-	-
Benzo[k]fluoranthene	mg/kg dry wt	< 0.011	0.013	-	-	-
Chrysene	mg/kg dry wt	< 0.011	0.021	-	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.011	< 0.011	-	-	-
Fluoranthene	mg/kg dry wt	< 0.011	0.034	-	-	-
Fluorene	mg/kg dry wt	< 0.011	< 0.011	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.011	0.019	-	-	-
Naphthalene	mg/kg dry wt	< 0.06	< 0.06	-	-	-
Perylene	mg/kg dry wt	< 0.011	< 0.011	-	-	-
Phenanthrene	mg/kg dry wt	< 0.011	0.018	-	-	-
Pyrene	mg/kg dry wt	< 0.011	0.038	-	-	-

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Sample Type: Soil						
Sample Name:		WSS_TP4_0.1 28-Nov-2024	WSS_TP4_0.5 28-Nov-2024	WSS_TP4_1.0 28-Nov-2024	WSS_TP5_0.1 28-Nov-2024	WSS_TP5_0.5 28-Nov-2024
Lab Number:		3727360.9	3727360.10	3727360.11	3727360.12	3727360.13
Individual Tests						
Dry Matter	g/100g as rcvd	-	93	-	96	93
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	7	5	-	5	5
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	-	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	16	15	-	14	15
Total Recoverable Copper	mg/kg dry wt	15	15	-	15	15
Total Recoverable Lead	mg/kg dry wt	28	27	-	25	27
Total Recoverable Mercury	mg/kg dry wt	< 0.10	< 0.10	-	< 0.10	< 0.10
Total Recoverable Nickel	mg/kg dry wt	14	13	-	13	14
Total Recoverable Zinc	mg/kg dry wt	72	70	-	72	69
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	-	0.6	-	0.5	0.5
1-Methylnaphthalene	mg/kg dry wt	-	< 0.011	-	< 0.011	< 0.011
2-Methylnaphthalene	mg/kg dry wt	-	< 0.013	-	< 0.013	< 0.013
Acenaphthylene	mg/kg dry wt	-	0.013	-	0.011	< 0.011
Acenaphthene	mg/kg dry wt	-	< 0.011	-	< 0.011	< 0.011
Anthracene	mg/kg dry wt	-	< 0.011	-	< 0.011	< 0.011
Benzo[a]anthracene	mg/kg dry wt	-	0.034	-	0.034	0.034
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	0.051	-	0.047	0.051
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	-	0.077	-	0.073	0.076
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	-	0.077	-	0.072	0.075
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	-	0.062	-	0.060	0.060
Benzo[e]pyrene	mg/kg dry wt	-	0.033	-	0.031	0.032
Benzo[g,h,i]perylene	mg/kg dry wt	-	0.044	-	0.042	0.039
Benzo[k]fluoranthene	mg/kg dry wt	-	0.026	-	0.025	0.027
Chrysene	mg/kg dry wt	-	0.036	-	0.033	0.039
Dibenzo[a,h]anthracene	mg/kg dry wt	-	< 0.011	-	< 0.011	< 0.011
Fluoranthene	mg/kg dry wt	-	0.071	-	0.058	0.062
Fluorene	mg/kg dry wt	-	< 0.011	-	< 0.011	< 0.011
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	0.045	-	0.041	0.039
Naphthalene	mg/kg dry wt	-	< 0.06	-	< 0.06	< 0.06
Perylene	mg/kg dry wt	-	0.011	-	0.011	0.012
Phenanthrene	mg/kg dry wt	-	0.036	-	0.026	0.030
Pyrene	mg/kg dry wt	-	0.071	-	0.059	0.063
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	-	-	-	< 20	< 20
C10 - C14	mg/kg dry wt	-	-	-	< 20	< 20
C15 - C36	mg/kg dry wt	-	-	-	< 40	< 40
Total hydrocarbons (C7 - C36)	mg/kg dry wt	-	-	-	< 80	< 80

Sample Name:		WSS_TP5_1.0 28-Nov-2024	WSS_TP6_0.1 28-Nov-2024	WSS_TP6_0.5 28-Nov-2024	WSS_TP6_1.0 28-Nov-2024	WSS_TP7_0.1 28-Nov-2024
Lab Number:		3727360.14	3727360.15	3727360.16	3727360.17	3727360.18
Individual Tests						
Dry Matter	g/100g as rcvd	-	-	93	92	96
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	-	6	5	5	6
Total Recoverable Cadmium	mg/kg dry wt	-	0.10	< 0.10	< 0.10	0.11
Total Recoverable Chromium	mg/kg dry wt	-	14	16	16	15
Total Recoverable Copper	mg/kg dry wt	-	11	10	11	13
Total Recoverable Lead	mg/kg dry wt	-	16.2	14.5	17.2	27
Total Recoverable Mercury	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Nickel	mg/kg dry wt	-	10	11	13	10

Sample Type: Soil							
Sample Name:		WSS_TP5_1.0 28-Nov-2024	WSS_TP6_0.1 28-Nov-2024	WSS_TP6_0.5 28-Nov-2024	WSS_TP6_1.0 28-Nov-2024	WSS_TP7_0.1 28-Nov-2024
Lab Number:		3727360.14	3727360.15	3727360.16	3727360.17	3727360.18
Heavy Metals with Mercury, Screen Level						
Total Recoverable Zinc	mg/kg dry wt	-	60	53	55	105
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	-	-	0.3	0.9	-
1-Methylnaphthalene	mg/kg dry wt	-	-	< 0.011	< 0.011	-
2-Methylnaphthalene	mg/kg dry wt	-	-	< 0.014	< 0.014	-
Acenaphthylene	mg/kg dry wt	-	-	< 0.011	< 0.011	-
Acenaphthene	mg/kg dry wt	-	-	< 0.011	< 0.011	-
Anthracene	mg/kg dry wt	-	-	< 0.011	0.014	-
Benzo[a]anthracene	mg/kg dry wt	-	-	0.020	0.073	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	-	0.023	0.072	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	-	-	0.031	0.109	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	-	-	0.031	0.107	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	-	-	0.028	0.080	-
Benzo[e]pyrene	mg/kg dry wt	-	-	0.015	0.041	-
Benzo[g,h,i]perylene	mg/kg dry wt	-	-	0.017	0.049	-
Benzo[k]fluoranthene	mg/kg dry wt	-	-	0.012	0.034	-
Chrysene	mg/kg dry wt	-	-	0.020	0.059	-
Dibenzo[a,h]anthracene	mg/kg dry wt	-	-	< 0.011	0.011	-
Fluoranthene	mg/kg dry wt	-	-	0.049	0.173	-
Fluorene	mg/kg dry wt	-	-	< 0.011	< 0.011	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	-	0.014	0.047	-
Naphthalene	mg/kg dry wt	-	-	< 0.06	< 0.06	-
Perylene	mg/kg dry wt	-	-	< 0.011	0.016	-
Phenanthrene	mg/kg dry wt	-	-	0.026	0.083	-
Pyrene	mg/kg dry wt	-	-	0.045	0.143	-
Haloethers Trace in SVOC Soil Samples by GC-MS						
Bis(2-chloroethoxy) methane	mg/kg dry wt	-	-	-	-	< 0.10
Bis(2-chloroethyl)ether	mg/kg dry wt	-	-	-	-	< 0.12
Bis(2-chloroisopropyl)ether	mg/kg dry wt	-	-	-	-	< 0.12
4-Bromophenyl phenyl ether	mg/kg dry wt	-	-	-	-	< 0.10
4-Chlorophenyl phenyl ether	mg/kg dry wt	-	-	-	-	< 0.10
Nitrogen containing compounds Trace in SVOC Soil Samples, GC-MS						
N-Nitrosodiphenylamine + Diphenylamine	mg/kg dry wt	-	-	-	-	< 0.12
2,4-Dinitrotoluene	mg/kg dry wt	-	-	-	-	< 0.2
2,6-Dinitrotoluene	mg/kg dry wt	-	-	-	-	< 0.2
Nitrobenzene	mg/kg dry wt	-	-	-	-	< 0.10
N-Nitrosodi-n-propylamine	mg/kg dry wt	-	-	-	-	< 0.3
Organochlorine Pesticides Trace in SVOC Soil Samples by GC-MS						
Aldrin	mg/kg dry wt	-	-	-	-	< 0.10
alpha-BHC	mg/kg dry wt	-	-	-	-	< 0.10
beta-BHC	mg/kg dry wt	-	-	-	-	< 0.10
delta-BHC	mg/kg dry wt	-	-	-	-	< 0.10
gamma-BHC (Lindane)	mg/kg dry wt	-	-	-	-	< 0.10
4,4'-DDD	mg/kg dry wt	-	-	-	-	< 0.10
4,4'-DDE	mg/kg dry wt	-	-	-	-	< 0.10
4,4'-DDT	mg/kg dry wt	-	-	-	-	< 0.2
Dieldrin	mg/kg dry wt	-	-	-	-	< 0.10
Endosulfan I	mg/kg dry wt	-	-	-	-	< 0.2
Endosulfan II	mg/kg dry wt	-	-	-	-	< 0.5
Endosulfan sulphate	mg/kg dry wt	-	-	-	-	< 0.2
Endrin	mg/kg dry wt	-	-	-	-	< 0.12
Endrin ketone	mg/kg dry wt	-	-	-	-	< 0.2

Sample Type: Soil							
Sample Name:		WSS_TP5_1.0 28-Nov-2024	WSS_TP6_0.1 28-Nov-2024	WSS_TP6_0.5 28-Nov-2024	WSS_TP6_1.0 28-Nov-2024	WSS_TP7_0.1 28-Nov-2024
Lab Number:		3727360.14	3727360.15	3727360.16	3727360.17	3727360.18
Organochlorine Pesticides Trace in SVOC Soil Samples by GC-MS						
Heptachlor	mg/kg dry wt	-	-	-	-	< 0.10
Heptachlor epoxide	mg/kg dry wt	-	-	-	-	< 0.10
Hexachlorobenzene	mg/kg dry wt	-	-	-	-	< 0.10
Polycyclic Aromatic Hydrocarbons Trace in SVOC Soil Samples*						
Acenaphthene	mg/kg dry wt	-	-	-	-	< 0.10
Acenaphthylene	mg/kg dry wt	-	-	-	-	< 0.10
Anthracene	mg/kg dry wt	-	-	-	-	< 0.10
Benzo[a]anthracene	mg/kg dry wt	-	-	-	-	0.19
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	-	-	-	0.19
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	-	-	-	-	0.21
Benzo[g,h,i]perylene	mg/kg dry wt	-	-	-	-	0.14
Benzo[k]fluoranthene	mg/kg dry wt	-	-	-	-	< 0.10
1&2-Chloronaphthalene	mg/kg dry wt	-	-	-	-	< 0.10
Chrysene	mg/kg dry wt	-	-	-	-	0.21
Dibenzo[a,h]anthracene	mg/kg dry wt	-	-	-	-	< 0.10
Fluoranthene	mg/kg dry wt	-	-	-	-	0.34
Fluorene	mg/kg dry wt	-	-	-	-	< 0.10
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	-	-	-	0.16
2-Methylnaphthalene	mg/kg dry wt	-	-	-	-	< 0.10
Naphthalene	mg/kg dry wt	-	-	-	-	< 0.10
Phenanthrene	mg/kg dry wt	-	-	-	-	< 0.10
Pyrene	mg/kg dry wt	-	-	-	-	0.34
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	-	-	-	-	0.29
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	-	-	-	-	0.28
Phenols Trace in SVOC Soil Samples by GC-MS						
4-Chloro-3-methylphenol	mg/kg dry wt	-	-	-	-	< 0.5
2-Chlorophenol	mg/kg dry wt	-	-	-	-	< 0.2
2,4-Dichlorophenol	mg/kg dry wt	-	-	-	-	< 0.2
2,4-Dimethylphenol	mg/kg dry wt	-	-	-	-	< 0.4
3 & 4-Methylphenol (m- + p-cresol)	mg/kg dry wt	-	-	-	-	< 0.4
2-Methylphenol (o-cresol)	mg/kg dry wt	-	-	-	-	< 0.2
2-Nitrophenol	mg/kg dry wt	-	-	-	-	< 0.4
Pentachlorophenol (PCP)	mg/kg dry wt	-	-	-	-	< 6
Phenol	mg/kg dry wt	-	-	-	-	< 0.3
2,4,5-Trichlorophenol	mg/kg dry wt	-	-	-	-	< 0.2
2,4,6-Trichlorophenol	mg/kg dry wt	-	-	-	-	< 0.2
Plasticisers Trace in SVOC Soil Samples by GC-MS						
Bis(2-ethylhexyl)phthalate	mg/kg dry wt	-	-	-	-	< 0.5
Butylbenzylphthalate	mg/kg dry wt	-	-	-	-	< 0.2
Di(2-ethylhexyl)adipate	mg/kg dry wt	-	-	-	-	< 0.2
Diethylphthalate	mg/kg dry wt	-	-	-	-	< 0.2
Dimethylphthalate	mg/kg dry wt	-	-	-	-	< 0.2
Di-n-butylphthalate	mg/kg dry wt	-	-	-	-	< 0.2
Di-n-octylphthalate	mg/kg dry wt	-	-	-	-	< 0.2
Other Halogenated compounds Trace in SVOC Soil Samples by GC-MS						
1,2-Dichlorobenzene	mg/kg dry wt	-	-	-	-	< 0.12
1,3-Dichlorobenzene	mg/kg dry wt	-	-	-	-	< 0.3
1,4-Dichlorobenzene	mg/kg dry wt	-	-	-	-	< 0.12
Hexachlorobutadiene	mg/kg dry wt	-	-	-	-	< 0.12
Hexachloroethane	mg/kg dry wt	-	-	-	-	< 0.12
1,2,4-Trichlorobenzene	mg/kg dry wt	-	-	-	-	< 0.10

Sample Type: Soil						
Sample Name:		WSS_TP5_1.0 28-Nov-2024	WSS_TP6_0.1 28-Nov-2024	WSS_TP6_0.5 28-Nov-2024	WSS_TP6_1.0 28-Nov-2024	WSS_TP7_0.1 28-Nov-2024
Lab Number:		3727360.14	3727360.15	3727360.16	3727360.17	3727360.18
Other SVOC Trace in SVOC Soil Samples by GC-MS						
Benzyl alcohol	mg/kg dry wt	-	-	-	-	< 1.0
Carbazole	mg/kg dry wt	-	-	-	-	< 0.10
Dibenzofuran	mg/kg dry wt	-	-	-	-	< 0.10
Isophorone	mg/kg dry wt	-	-	-	-	< 0.10
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	-	-	-	-	< 20
C10 - C14	mg/kg dry wt	-	-	-	-	< 20
C15 - C36	mg/kg dry wt	-	-	-	-	< 40
Total hydrocarbons (C7 - C36)	mg/kg dry wt	-	-	-	-	< 80

Sample Name:		WSS_TP7_0.3 28-Nov-2024	WSS_TP7_0.5 28-Nov-2024	WSS_TP7_1.0 28-Nov-2024	WSS_TP7_1.3 28-Nov-2024	WSS_QA1 28-Nov-2024
Lab Number:		3727360.19	3727360.20	3727360.21	3727360.22	3727360.26
Individual Tests						
Dry Matter	g/100g as rcvd	92	92	90	89	-
SPLP Sample Weight	g	-	-	50	-	-
SPLP Extractant Type*		-	-	De-ionised Water, pH 5.8 +/- 0.4	-	-
SPLP Final pH	pH Units	-	-	8.8	-	-
TCLP Weight of Sample Taken	g	-	-	50	-	-
TCLP Initial Sample pH	pH Units	-	-	8.7	-	-
TCLP Acid Adjusted Sample pH	pH Units	-	-	1.6	-	-
TCLP Extractant Type*		-	-	NaOH/Acetic acid at pH 4.93 +/- 0.05	-	-
TCLP Extraction Fluid pH	pH Units	-	-	5.0	-	-
TCLP Post Extraction Sample pH	pH Units	-	-	5.1	-	-
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	6	8	6	4	6
Total Recoverable Cadmium	mg/kg dry wt	0.11	0.11	0.63	0.27	< 0.10
Total Recoverable Chromium	mg/kg dry wt	15	15	20	15	17
Total Recoverable Copper	mg/kg dry wt	14	16	23	15	20
Total Recoverable Lead	mg/kg dry wt	26	35	540	99	27
Total Recoverable Mercury	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Nickel	mg/kg dry wt	12	13	12	10	15
Total Recoverable Zinc	mg/kg dry wt	196	250	460	193	89
Haloethers Trace in SVOC Soil Samples by GC-MS						
Bis(2-chloroethoxy) methane	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Bis(2-chloroethyl)ether	mg/kg dry wt	< 0.12	< 0.12	< 0.12	< 0.12	-
Bis(2-chloroisopropyl)ether	mg/kg dry wt	< 0.12	< 0.12	< 0.12	< 0.12	-
4-Bromophenyl phenyl ether	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
4-Chlorophenyl phenyl ether	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Nitrogen containing compounds Trace in SVOC Soil Samples, GC-MS						
N-Nitrosodiphenylamine + Diphenylamine	mg/kg dry wt	< 0.12	< 0.12	< 0.12	< 0.13	-
2,4-Dinitrotoluene	mg/kg dry wt	< 0.2	< 0.2	< 0.2	< 0.2	-
2,6-Dinitrotoluene	mg/kg dry wt	< 0.2	< 0.2	< 0.2	< 0.2	-
Nitrobenzene	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
N-Nitrosodi-n-propylamine	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
Organochlorine Pesticides Trace in SVOC Soil Samples by GC-MS						
Aldrin	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
alpha-BHC	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
beta-BHC	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
delta-BHC	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
4,4'-DDD	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
4,4'-DDE	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-

Sample Type: Soil						
Sample Name:		WSS_TP7_0.3 28-Nov-2024	WSS_TP7_0.5 28-Nov-2024	WSS_TP7_1.0 28-Nov-2024	WSS_TP7_1.3 28-Nov-2024	WSS_QA1 28-Nov-2024
Lab Number:		3727360.19	3727360.20	3727360.21	3727360.22	3727360.26
Organochlorine Pesticides Trace in SVOC Soil Samples by GC-MS						
4,4'-DDT	mg/kg dry wt	< 0.2	< 0.2	< 0.2	< 0.2	-
Dieldrin	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Endosulfan I	mg/kg dry wt	< 0.2	< 0.2	< 0.2	< 0.2	-
Endosulfan II	mg/kg dry wt	< 0.5	< 0.5	< 0.5	< 0.5	-
Endosulfan sulphate	mg/kg dry wt	< 0.2	< 0.2	< 0.2	< 0.2	-
Endrin	mg/kg dry wt	< 0.12	< 0.12	< 0.12	< 0.13	-
Endrin ketone	mg/kg dry wt	< 0.2	< 0.2	< 0.2	< 0.2	-
Heptachlor	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Heptachlor epoxide	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Hexachlorobenzene	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Polycyclic Aromatic Hydrocarbons Trace in SVOC Soil Samples*						
Acenaphthene	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Acenaphthylene	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Anthracene	mg/kg dry wt	< 0.10	< 0.10	0.29	0.28	-
Benzo[a]anthracene	mg/kg dry wt	< 0.10	< 0.10	1.06	1.50	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.10	< 0.10	0.90	1.29	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 0.10	< 0.10	0.99	1.41	-
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.10	< 0.10	0.40	0.63	-
Benzo[k]fluoranthene	mg/kg dry wt	< 0.10	< 0.10	0.38	0.55	-
1&2-Chloronaphthalene	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Chrysene	mg/kg dry wt	< 0.10	< 0.10	1.07	1.53	-
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.10	< 0.10	0.11	0.17	-
Fluoranthene	mg/kg dry wt	< 0.10	< 0.10	2.1	2.7	-
Fluorene	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.10	< 0.10	0.54	0.81	-
2-Methylnaphthalene	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Naphthalene	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Phenanthrene	mg/kg dry wt	< 0.10	< 0.10	0.54	0.55	-
Pyrene	mg/kg dry wt	< 0.10	< 0.10	2.1	2.7	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.25	< 0.25	1.33	1.92	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.25	< 0.25	1.31	1.90	-
Phenols Trace in SVOC Soil Samples by GC-MS						
4-Chloro-3-methylphenol	mg/kg dry wt	< 0.5	< 0.5	< 0.5	< 0.5	-
2-Chlorophenol	mg/kg dry wt	< 0.2	< 0.2	< 0.2	< 0.2	-
2,4-Dichlorophenol	mg/kg dry wt	< 0.2	< 0.2	< 0.2	< 0.2	-
2,4-Dimethylphenol	mg/kg dry wt	< 0.4	< 0.4	< 0.4	< 0.4	-
3 & 4-Methylphenol (m- + p-cresol)	mg/kg dry wt	< 0.4	< 0.4	< 0.4	< 0.4	-
2-Methylphenol (o-cresol)	mg/kg dry wt	< 0.2	< 0.2	< 0.2	< 0.2	-
2-Nitrophenol	mg/kg dry wt	< 0.4	< 0.4	< 0.4	< 0.4	-
Pentachlorophenol (PCP)	mg/kg dry wt	< 6	< 6	< 6	< 6	-
Phenol	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
2,4,5-Trichlorophenol	mg/kg dry wt	< 0.2	< 0.2	< 0.2	< 0.2	-
2,4,6-Trichlorophenol	mg/kg dry wt	< 0.2	< 0.2	< 0.2	< 0.2	-
Plasticisers Trace in SVOC Soil Samples by GC-MS						
Bis(2-ethylhexyl)phthalate	mg/kg dry wt	< 0.5	< 0.5	1.7	0.8	-
Butylbenzylphthalate	mg/kg dry wt	< 0.2	< 0.2	1.0	0.3	-
Di(2-ethylhexyl)adipate	mg/kg dry wt	< 0.2	< 0.2	< 0.2	< 0.2	-
Diethylphthalate	mg/kg dry wt	< 0.2	< 0.2	< 0.2	< 0.2	-
Dimethylphthalate	mg/kg dry wt	< 0.2	< 0.2	< 0.2	< 0.2	-
Di-n-butylphthalate	mg/kg dry wt	< 0.2	< 0.2	0.4	< 0.2	-
Di-n-octylphthalate	mg/kg dry wt	< 0.2	< 0.2	< 0.2	< 0.2	-

Sample Type: Soil						
Sample Name:		WSS_TP7_0.3 28-Nov-2024	WSS_TP7_0.5 28-Nov-2024	WSS_TP7_1.0 28-Nov-2024	WSS_TP7_1.3 28-Nov-2024	WSS_QA1 28-Nov-2024
Lab Number:		3727360.19	3727360.20	3727360.21	3727360.22	3727360.26
Other Halogenated compounds Trace in SVOC Soil Samples by GC-MS						
1,2-Dichlorobenzene	mg/kg dry wt	< 0.12	< 0.12	< 0.12	< 0.13	-
1,3-Dichlorobenzene	mg/kg dry wt	< 0.3	< 0.3	< 0.3	< 0.3	-
1,4-Dichlorobenzene	mg/kg dry wt	< 0.12	< 0.12	< 0.12	< 0.13	-
Hexachlorobutadiene	mg/kg dry wt	< 0.12	< 0.12	< 0.12	< 0.13	-
Hexachloroethane	mg/kg dry wt	< 0.12	< 0.12	< 0.12	< 0.13	-
1,2,4-Trichlorobenzene	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Other SVOC Trace in SVOC Soil Samples by GC-MS						
Benzyl alcohol	mg/kg dry wt	< 1.0	< 1.0	< 1.0	< 1.0	-
Carbazole	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Dibenzofuran	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Isophorone	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 20	< 20	35	< 20	-
C10 - C14	mg/kg dry wt	< 20	< 20	< 20	< 20	-
C15 - C36	mg/kg dry wt	84	107	177	108	-
Total hydrocarbons (C7 - C36)	mg/kg dry wt	86	114	220	117	-

Sample Name:		WSS_QA2 28-Nov-2024	WSS_TP8_0.1 28-Nov-2024	WSS_TP8_0.5 28-Nov-2024	WSS_TP8_1.0 28-Nov-2024	Composite of WSS_TP7_0.1, WSS_TP7_0.3 and WSS_TP7_0.5
Lab Number:		3727360.27	3727360.28	3727360.29	3727360.30	3727360.39
Individual Tests						
Poly- and Perfluorinated Alkyl Substances in TCLP Reagent Water*‡		-	-	-	-	See attached report
Dry Matter	g/100g as rcvd	96	-	90	92	-
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	6	4	5	6	-
Total Recoverable Cadmium	mg/kg dry wt	0.12	0.13	0.17	< 0.10	-
Total Recoverable Chromium	mg/kg dry wt	15	15	16	9	-
Total Recoverable Copper	mg/kg dry wt	14	16	19	4	-
Total Recoverable Lead	mg/kg dry wt	33	35	40	9.8	-
Total Recoverable Mercury	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Total Recoverable Nickel	mg/kg dry wt	11	14	17	8	-
Total Recoverable Zinc	mg/kg dry wt	106	96	123	37	-
Haloethers Trace in SVOC Soil Samples by GC-MS						
Bis(2-chloroethoxy) methane	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Bis(2-chloroethyl)ether	mg/kg dry wt	< 0.12	-	< 0.12	< 0.10	-
Bis(2-chloroisopropyl)ether	mg/kg dry wt	< 0.12	-	< 0.12	< 0.10	-
4-Bromophenyl phenyl ether	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
4-Chlorophenyl phenyl ether	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Nitrogen containing compounds Trace in SVOC Soil Samples, GC-MS						
N-Nitrosodiphenylamine + Diphenylamine	mg/kg dry wt	< 0.12	-	< 0.12	< 0.14	-
2,4-Dinitrotoluene	mg/kg dry wt	< 0.2	-	< 0.2	< 0.2	-
2,6-Dinitrotoluene	mg/kg dry wt	< 0.2	-	< 0.2	< 0.2	-
Nitrobenzene	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
N-Nitrosodi-n-propylamine	mg/kg dry wt	< 0.3	-	< 0.3	< 0.14	-
Organochlorine Pesticides Trace in SVOC Soil Samples by GC-MS						
Aldrin	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
alpha-BHC	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
beta-BHC	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
delta-BHC	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
4,4'-DDD	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-

Sample Type: Soil						
Sample Name:		WSS_QA2 28-Nov-2024	WSS_TP8_0.1 28-Nov-2024	WSS_TP8_0.5 28-Nov-2024	WSS_TP8_1.0 28-Nov-2024	Composite of WSS_TP7_0.1, WSS_TP7_0.3 and WSS_TP7_0.5
Lab Number:		3727360.27	3727360.28	3727360.29	3727360.30	3727360.39
Organochlorine Pesticides Trace in SVOC Soil Samples by GC-MS						
4,4'-DDE	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
4,4'-DDT	mg/kg dry wt	< 0.2	-	< 0.2	< 0.2	-
Dieldrin	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Endosulfan I	mg/kg dry wt	< 0.2	-	< 0.2	< 0.2	-
Endosulfan II	mg/kg dry wt	< 0.5	-	< 0.5	< 0.5	-
Endosulfan sulphate	mg/kg dry wt	< 0.2	-	< 0.2	< 0.2	-
Endrin	mg/kg dry wt	< 0.12	-	< 0.12	< 0.14	-
Endrin ketone	mg/kg dry wt	< 0.2	-	< 0.2	< 0.2	-
Heptachlor	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Heptachlor epoxide	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Hexachlorobenzene	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Polycyclic Aromatic Hydrocarbons Trace in SVOC Soil Samples*						
Acenaphthene	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Acenaphthylene	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Anthracene	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Benzo[a]anthracene	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Benzo[k]fluoranthene	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
1&2-Chloronaphthalene	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Chrysene	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Fluoranthene	mg/kg dry wt	< 0.10	-	0.13	< 0.10	-
Fluorene	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
2-Methylnaphthalene	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Naphthalene	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Phenanthrene	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Pyrene	mg/kg dry wt	< 0.10	-	0.14	< 0.10	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.25	-	< 0.25	< 0.25	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.25	-	< 0.25	< 0.25	-
Phenols Trace in SVOC Soil Samples by GC-MS						
4-Chloro-3-methylphenol	mg/kg dry wt	< 0.5	-	< 0.5	< 0.5	-
2-Chlorophenol	mg/kg dry wt	< 0.2	-	< 0.2	< 0.2	-
2,4-Dichlorophenol	mg/kg dry wt	< 0.2	-	< 0.2	< 0.2	-
2,4-Dimethylphenol	mg/kg dry wt	< 0.4	-	< 0.4	< 0.4	-
3 & 4-Methylphenol (m- + p-cresol)	mg/kg dry wt	< 0.4	-	< 0.4	< 0.4	-
2-Methylphenol (o-cresol)	mg/kg dry wt	< 0.2	-	< 0.2	< 0.2	-
2-Nitrophenol	mg/kg dry wt	< 0.4	-	< 0.4	< 0.4	-
Pentachlorophenol (PCP)	mg/kg dry wt	< 6	-	< 6	< 6	-
Phenol	mg/kg dry wt	< 0.3	-	< 0.3	< 0.2	-
2,4,5-Trichlorophenol	mg/kg dry wt	< 0.2	-	< 0.2	< 0.2	-
2,4,6-Trichlorophenol	mg/kg dry wt	< 0.2	-	< 0.2	< 0.2	-
Plasticisers Trace in SVOC Soil Samples by GC-MS						
Bis(2-ethylhexyl)phthalate	mg/kg dry wt	0.6	-	< 0.5	< 0.5	-
Butylbenzylphthalate	mg/kg dry wt	< 0.2	-	< 0.2	< 0.2	-
Di(2-ethylhexyl)adipate	mg/kg dry wt	< 0.2	-	< 0.2	< 0.2	-
Diethylphthalate	mg/kg dry wt	< 0.2	-	< 0.2	< 0.2	-

Sample Type: Soil						
Sample Name:		WSS_QA2 28-Nov-2024	WSS_TP8_0.1 28-Nov-2024	WSS_TP8_0.5 28-Nov-2024	WSS_TP8_1.0 28-Nov-2024	Composite of WSS_TP7_0.1, WSS_TP7_0.3 and WSS_TP7_0.5
Lab Number:		3727360.27	3727360.28	3727360.29	3727360.30	3727360.39
Plasticisers Trace in SVOC Soil Samples by GC-MS						
Dimethylphthalate	mg/kg dry wt	< 0.2	-	< 0.2	< 0.2	-
Di-n-butylphthalate	mg/kg dry wt	< 0.2	-	< 0.2	< 0.2	-
Di-n-octylphthalate	mg/kg dry wt	< 0.2	-	< 0.2	< 0.2	-
Other Halogenated compounds Trace in SVOC Soil Samples by GC-MS						
1,2-Dichlorobenzene	mg/kg dry wt	< 0.12	-	< 0.12	< 0.14	-
1,3-Dichlorobenzene	mg/kg dry wt	< 0.3	-	< 0.3	< 0.14	-
1,4-Dichlorobenzene	mg/kg dry wt	< 0.12	-	< 0.12	< 0.14	-
Hexachlorobutadiene	mg/kg dry wt	< 0.12	-	< 0.12	< 0.14	-
Hexachloroethane	mg/kg dry wt	< 0.12	-	< 0.12	< 0.14	-
1,2,4-Trichlorobenzene	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Other SVOC Trace in SVOC Soil Samples by GC-MS						
Benzyl alcohol	mg/kg dry wt	< 1.0	-	< 1.0	< 1.0	-
Carbazole	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Dibenzofuran	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Isophorone	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 20	-	< 20	< 20	-
C10 - C14	mg/kg dry wt	< 20	-	< 20	< 20	-
C15 - C36	mg/kg dry wt	48	-	< 40	< 40	-
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 80	-	< 80	< 80	-

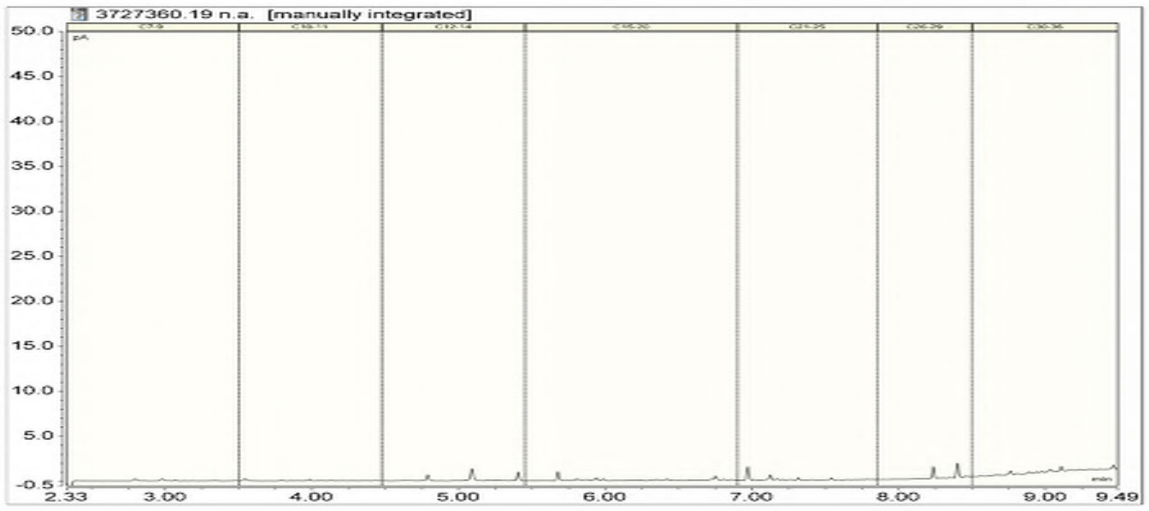
Sample Name:		Composite of WSS_TP7_1.0 and WSS_TP7_1.3
Lab Number:		3727360.40
Individual Tests		
Poly- and Perfluorinated Alkyl Substances in TCLP Reagent Water*‡		See attached report

Sample Type: Aqueous			
Sample Name:		WSS_TP7_1.0 [TCLP Extract]	WSS_TP7_1.0 [SPLP Extract]
Lab Number:		3727360.37	3727360.38
Individual Tests			
Total Lead	g/m³	0.132	0.057
Total Zinc	g/m³	1.88	0.083

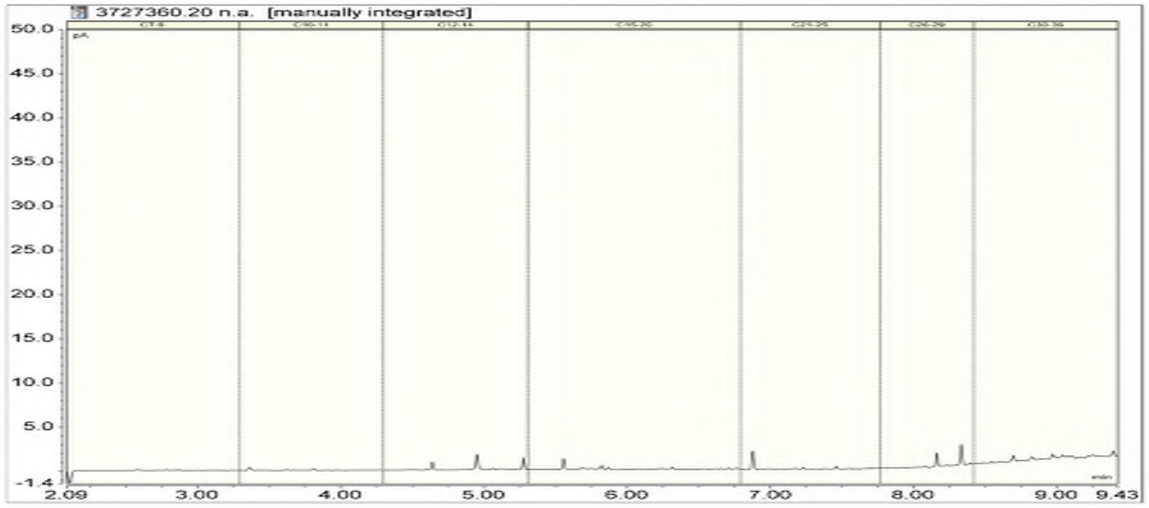
Sample Type: Roading Material			
Sample Name:		WSS_TP8_0.5CT 28-Nov-2024	WSS_TP6_CT 28-Nov-2024
Lab Number:		3727360.23	3727360.25
Individual Tests			
Total Recoverable Mercury*	mg/kg dry wt	< 0.10	< 0.10
Heavy metals, MacroDig, screen, As,Cd,Cr,Cu,Ni,Pb,Zn*			
Total Recoverable Arsenic	mg/kg as rcvd	< 2	3
Total Recoverable Cadmium*	mg/kg as rcvd	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg as rcvd	8	10
Total Recoverable Copper	mg/kg as rcvd	6	8
Total Recoverable Lead	mg/kg as rcvd	16.5 #1	9.8
Total Recoverable Nickel	mg/kg as rcvd	6	8
Total Recoverable Zinc	mg/kg as rcvd	35 #2	34
Polycyclic Aromatic Hydrocarbons Screening in Solids*			
1-Methylnaphthalene*	mg/kg as rcvd	< 0.10	< 0.10
2-Methylnaphthalene*	mg/kg as rcvd	< 0.13	< 0.13
Acenaphthylene*	mg/kg as rcvd	< 0.10	< 0.10
Acenaphthene*	mg/kg as rcvd	< 0.10	< 0.10
Anthracene*	mg/kg as rcvd	< 0.10	< 0.10
Benzo[a]anthracene*	mg/kg as rcvd	< 0.10	< 0.10

Sample Type: Roading Material			
	Sample Name:	WSS_TP8_0.5CT 28-Nov-2024	WSS_TP6_CT 28-Nov-2024
	Lab Number:	3727360.23	3727360.25
Polycyclic Aromatic Hydrocarbons Screening in Solids*			
Benzo[a]pyrene (BAP)*	mg/kg as rcvd	< 0.10	< 0.10
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg as rcvd	< 0.24	< 0.24
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg as rcvd	< 0.3	< 0.3
Benzo[b]fluoranthene + Benzo[j]fluoranthene*	mg/kg as rcvd	< 0.10	< 0.10
Benzo[e]pyrene*	mg/kg as rcvd	< 0.10	< 0.10
Benzo[g,h,i]perylene*	mg/kg as rcvd	0.13	0.15
Benzo[k]fluoranthene*	mg/kg as rcvd	< 0.10	< 0.10
Chrysene*	mg/kg as rcvd	< 0.10	< 0.10
Dibenzo[a,h]anthracene*	mg/kg as rcvd	< 0.10	< 0.10
Fluoranthene*	mg/kg as rcvd	< 0.10	< 0.10
Fluorene*	mg/kg as rcvd	< 0.10	< 0.10
Indeno(1,2,3-c,d)pyrene*	mg/kg as rcvd	< 0.10	< 0.10
Naphthalene*	mg/kg as rcvd	< 0.5	< 0.5
Perylene*	mg/kg as rcvd	< 0.10	< 0.10
Phenanthrene*	mg/kg as rcvd	< 0.10	< 0.10
Pyrene*	mg/kg as rcvd	< 0.10	< 0.10
Total of Reported PAHs*	mg/kg as rcvd	< 3	< 3

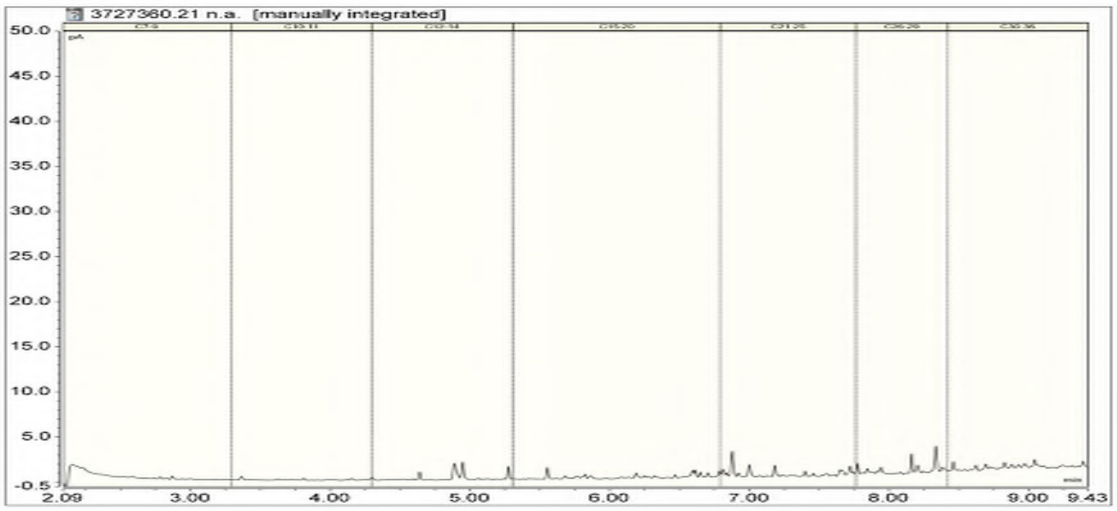
3727360.19
WSS_TP7_0.3 28-Nov-2024
Client Chromatogram for TPH by FID



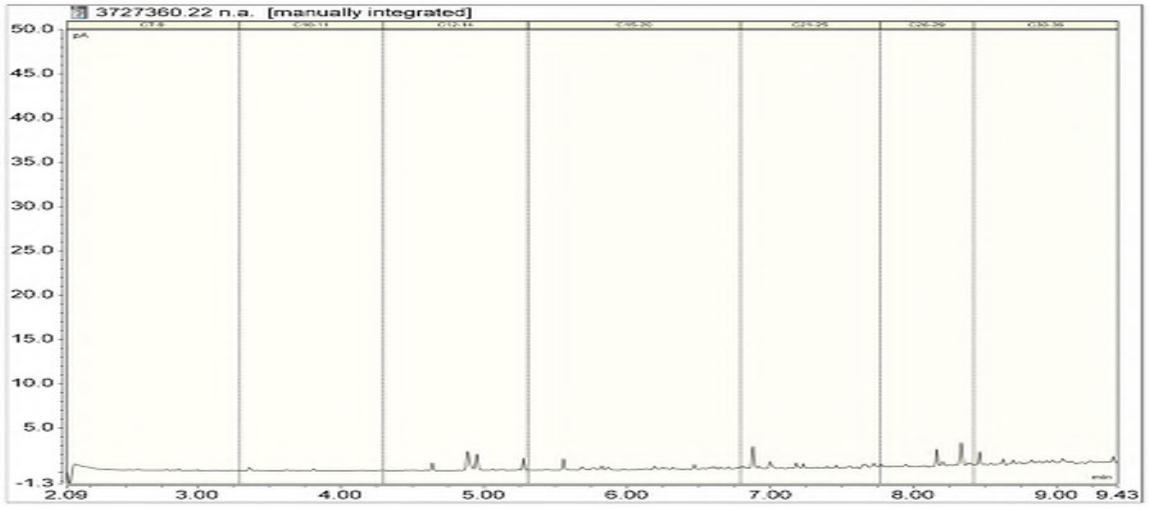
3727360.20
WSS_TP7_0.5 28-Nov-2024
Client Chromatogram for TPH by FID



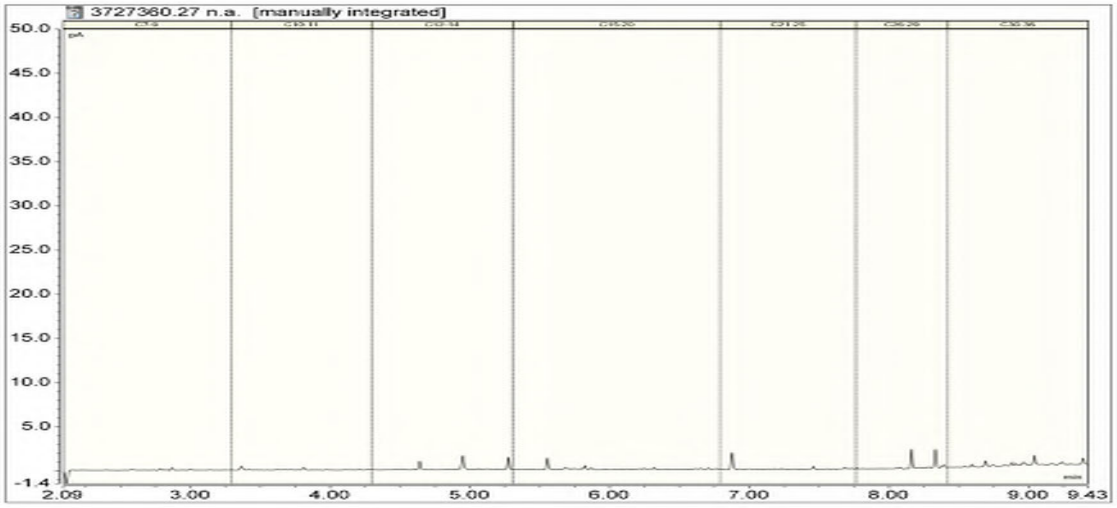
3727360.21
WSS_TP7_1.0 28-Nov-2024
Client Chromatogram for TPH by FID



3727360.22
WSS_TP7_1.3 28-Nov-2024
Client Chromatogram for TPH by FID



3727360.27
WSS_QA2 28-Nov-2024
Client Chromatogram for TPH by FID



Sample Type: Soil				
		Sample Name:	WSS_TP2_0.1 28-Nov-2024	WSS_TP3_0.1 28-Nov-2024
		Lab Number:	3727360.3	3727360.6
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	-	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	-	< 0.0010
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	-	0.0034
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	-	< 0.046
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	-	< 0.0010
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	-	< 0.0010
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	-	< 0.0010
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	-	< 0.0010
PFOA	Perfluorooctanoic acid	mg/kg dry wt	-	< 0.0010
PFNA	Perfluorononanoic acid	mg/kg dry wt	-	< 0.0010
PFDA	Perfluorodecanoic acid	mg/kg dry wt	-	< 0.0010
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	-	< 0.0010
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	-	< 0.0010
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	-	< 0.0010
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	-	< 0.0010
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	-	< 0.0010
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	-	< 0.0010
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	-	< 0.0010
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	-	0.0020
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	-	< 0.0010
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	-	0.0025
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	-	< 0.0010
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	-	< 0.0010
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	-	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	-	< 0.0010
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	-	< 0.0010
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	-	< 0.0010
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	-	< 0.0010
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	-	< 0.0010
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	-	< 0.0010
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	-	< 0.0010
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	-	< 0.0010

Sample Type: Soil				
		Sample Name:	WSS_TP2_0.1 28-Nov-2024	WSS_TP3_0.1 28-Nov-2024
		Lab Number:	3727360.3	3727360.6
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	-	< 0.0010
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	-	< 0.0010
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	-	< 0.0010
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	-	< 0.0010
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	-	< 0.0010
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	-	< 0.0010
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	-	< 0.0010
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	-	< 0.0010
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	-	< 0.0010
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	-	< 0.0010
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	-	< 0.0010
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	-	< 0.0010
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	-	< 0.0010
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	-	< 0.0010
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	-	< 0.0010
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	-	< 0.0010
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	-	< 0.0010
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	-	< 0.0010
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	-	< 0.0010
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	-	< 0.0010

		Sample Name:	WSS_TP3_0.5 28-Nov-2024	WSS_TP4_0.1 28-Nov-2024
		Lab Number:	3727360.7	3727360.9
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010	0.0034
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	< 0.0010	0.0041
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	< 0.046	< 0.046
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	< 0.0010	0.0027
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010	0.0034
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010

Sample Type: Soil				
		Sample Name:	WSS_TP3_0.5 28-Nov-2024	WSS_TP4_0.1 28-Nov-2024
		Lab Number:	3727360.7	3727360.9
PFAS in Soil - Perfluorosulfonic Acids				
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	< 0.0010
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

		Sample Name:	WSS_TP4_0.5 28-Nov-2024	WSS_TP4_1.0 28-Nov-2024
		Lab Number:	3727360.10	3727360.11
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.0144	0.021
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	0.0157	0.023
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	< 0.046	< 0.046
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	0.0012	0.0024
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010

Sample Type: Soil				
		Sample Name:	WSS_TP4_0.5 28-Nov-2024	WSS_TP4_1.0 28-Nov-2024
		Lab Number:	3727360.10	3727360.11
PFAS in Soil - Perfluorosulfonic Acids				
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	0.0014	0.0028
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	0.0114	0.0145
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	0.0029	0.0061
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.0144	0.021
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	< 0.0010
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

		Sample Name:	WSS_TP5_0.1 28-Nov-2024	WSS_TP5_0.5 28-Nov-2024
		Lab Number:	3727360.12	3727360.13
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	0.0022
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.0082	0.049
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	0.0087	0.058
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	< 0.046	0.066
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010	0.0014
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	0.0022
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

Sample Type: Soil				
		Sample Name:	WSS_TP5_0.1 28-Nov-2024	WSS_TP5_0.5 28-Nov-2024
		Lab Number:	3727360.12	3727360.13
PFAS in Soil - Perfluorocarboxylic Acids				
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	< 0.0010	0.0082
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	0.0013
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	< 0.0010	0.0095
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	0.0067	0.034
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	0.0015	0.0145
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.0082	0.049
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	< 0.0010
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

		Sample Name:	WSS_TP5_1.0 28-Nov-2024	WSS_TP6_0.1 28-Nov-2024
		Lab Number:	3727360.14	3727360.15
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	0.0018	-
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.0147	-
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	0.021	-
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	< 0.046	-
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	-
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010	-
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010	-

Sample Type: Soil				
		Sample Name:	WSS_TP5_1.0 28-Nov-2024	WSS_TP6_0.1 28-Nov-2024
		Lab Number:	3727360.14	3727360.15
PFAS in Soil - Perfluorocarboxylic Acids				
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	-
PFOA	Perfluorooctanoic acid	mg/kg dry wt	0.0018	-
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	-
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	-
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010	-
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	-
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	-
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	-
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	0.0049	-
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	-
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	0.0058	-
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	0.0109	-
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	0.0039	-
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.0147	-
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	< 0.0010	-
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	-
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	-
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	-
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	-
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	-
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	-
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	-
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	-
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	-
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	-
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	-
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	-
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	-
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	-
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	-
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	-
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	-
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010	-
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	-
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	-
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	-
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	-
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	-
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	-

	Sample Name:	WSS_TP6_0.5 28-Nov-2024	WSS_TP6_1.0 28-Nov-2024
	Lab Number:	3727360.16	3727360.17

Sample Type: Soil				
		Sample Name:	WSS_TP6_0.5 28-Nov-2024	WSS_TP6_1.0 28-Nov-2024
		Lab Number:	3727360.16	3727360.17
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010	0.0025
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	< 0.0010	0.0032
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	< 0.046	< 0.046
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	0.0012	0.0013
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	0.0029	0.0046
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	< 0.0010	0.0019
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010	0.0025
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	< 0.0010
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010

Sample Type: Soil				
		Sample Name:	WSS_TP6_0.5 28-Nov-2024	WSS_TP6_1.0 28-Nov-2024
		Lab Number:	3727360.16	3727360.17
PFAS in Soil - Miscellaneous				
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

		Sample Name:	WSS_TP7_0.1 28-Nov-2024	WSS_TP7_0.3 28-Nov-2024
		Lab Number:	3727360.18	3727360.19
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.0089	0.0131
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	0.0095	0.0140
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	< 0.046	< 0.046
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	0.0071	0.0108
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	0.0018	0.0022
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.0089	0.0131
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	< 0.0010
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

Sample Type: Soil				
		Sample Name:	WSS_TP7_0.1 28-Nov-2024	WSS_TP7_0.3 28-Nov-2024
		Lab Number:	3727360.18	3727360.19
PFAS in Soil - Miscellaneous				
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

		Sample Name:	WSS_TP7_0.5 28-Nov-2024	WSS_TP7_1.0 28-Nov-2024
		Lab Number:	3727360.20	3727360.21
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.045	0.36
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	0.048	0.36
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	0.050	0.41
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010	0.0034
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	0.0013
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	0.0022	0.0037
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	0.0024	0.0041
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	0.034	0.29
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	0.0114	0.062
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.045	0.36
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010	0.0014
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	< 0.0010	0.0025
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	< 0.0010	0.0033
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	0.026
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010

Sample Type: Soil				
		Sample Name:	WSS_TP7_0.5 28-Nov-2024	WSS_TP7_1.0 28-Nov-2024
		Lab Number:	3727360.20	3727360.21
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	< 0.0010
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010	0.0026
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

		Sample Name:	WSS_TP7_1.3 28-Nov-2024	WSS_QA1 28-Nov-2024
		Lab Number:	3727360.22	3727360.26
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	-
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.46	-
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	0.47	-
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	0.53	-
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	-
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010	-
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010	-
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	-
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	-
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	-
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	-
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	0.0029	-
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	-
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	0.0014	-
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	-
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	0.0085	-
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	0.0011	-
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	0.0096	-
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	0.0019	-
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	0.37	-
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	0.093	-
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.46	-
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	0.0013	-
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	0.0022	-
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	-
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	0.0018	-

Sample Type: Soil				
		Sample Name:	WSS_TP7_1.3 28-Nov-2024	WSS_QA1 28-Nov-2024
		Lab Number:	3727360.22	3727360.26
PFAS in Soil - Fluorotelomer Sulfonic Acids				
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	0.035	-
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	-
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	-
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	-
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	-
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	-
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	-
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	-
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	-
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	-
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	-
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	-
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	-
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	-
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	-
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	0.0054	-
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	-
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	-
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	-
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	-
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	-
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	-

		Sample Name:	WSS_QA2 28-Nov-2024	WSS_TP8_0.1 28-Nov-2024
		Lab Number:	3727360.27	3727360.28
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	-
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.0106	-
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	0.0111	-
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	< 0.046	-
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	-
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010	-
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010	-
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	-
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	-
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	-
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	-
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010	-
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	-
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	-
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	-
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	< 0.0010	-
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	-
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	< 0.0010	-
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	0.0083	-
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	0.0023	-

Sample Type: Soil				
		Sample Name:	WSS_QA2 28-Nov-2024	WSS_TP8_0.1 28-Nov-2024
		Lab Number:	3727360.27	3727360.28
PFAS in Soil - Perfluorosulfonic Acids				
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.0106	-
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	< 0.0010	-
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	-
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	-
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	-
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	-
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	-
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	-
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	-
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	-
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	-
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	-
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	-
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	-
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	-
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	-
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	-
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	-
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	-
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010	-
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	-
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	-
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	-
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	-
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	-
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	-

		Sample Name:	WSS_TP8_0.5 28-Nov-2024	WSS_TP8_1.0 28-Nov-2024
		Lab Number:	3727360.29	3727360.30
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010	0.21
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	< 0.0010	0.21
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	< 0.046	0.24
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	0.0014
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	0.0010
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010	0.0074
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010

Sample Type: Soil				
		Sample Name:	WSS_TP8_0.5 28-Nov-2024	WSS_TP8_1.0 28-Nov-2024
		Lab Number:	3727360.29	3727360.30
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	< 0.0010	0.0022
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	< 0.0010	0.0025
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	< 0.0010	0.168
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	0.041
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010	0.21
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	< 0.0010	0.0019
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	< 0.0010	0.0016
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	0.0099
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	0.0012
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	< 0.0010
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010	0.0018
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

Analyst's Comments

Carbon particulates were observed in the matrix of sample 3727360.25 and this has absorbed most of the System Monitoring Compounds in the PAH analysis, whereby the recovery for Fluoranthene-d10 and Benzo[a]pyrene-d12 was 63% and 60% respectively. Therefore the results presented for these analytes may not represent the actual concentration in the sample.

The matrix of samples 3727360.18, 19, 20, 21, 22, 27 and 29 has affected the System Monitoring Compounds 2-fluorophenol and phenol-d5 in the SVOC analysis, whereby the recoveries were:
3727360.18 = 35% and 36%
3727360.19 = 30% and 41%
3727360.20 = 32% and 30%
3727360.21 = 22% and 28%
3727360.22 = 32% and 28%
3727360.27 = 40% and 33%
3727360.29 = 24% and 28%
Therefore the phenolic compound results may be underestimated. The detection limits have been increased to reflect this.

‡ Analysis subcontracted to an external provider. Refer to the Summary of Methods section for more details.

#1 It should be noted that the replicate analyses performed on this sample as part of our in-house Quality Assurance procedures showed greater variation than would normally be expected. This may reflect the heterogeneity of the sample. Replicate 1 = 16.5mg/kg, replicate 2 = 28mg/kg.

#2 It should be noted that the replicate analyses performed on this sample as part of our in-house Quality Assurance procedures showed greater variation than would normally be expected. This may reflect the heterogeneity of the sample. Replicate 1 = 35mg/kg, replicate 2 = 52mg/kg.

Amended Report: This certificate of analysis replaces report '3727360-SPv6' issued on 08-Jan-2025 at 3:26 pm. Reason for amendment: Additional testing added as per clients request.

Appendix No.1 - AsureQuality Report

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request.
Unless otherwise indicated, analyses were performed at Hill Labs, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Individual Tests			
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	1-3, 6, 9-10, 12-13, 15-22, 26-30
Total of Reported PAHs in Soil	Sonication extraction, GC-MS/MS analysis. In-house based on US EPA 8270.	0.03 mg/kg dry wt	1-2, 10, 12-13, 16-17
Poly- and Perfluorinated Alkyl Substances in TCLP Reagent Water*	Analysis by LC-MS/MS. Subcontracted to AsureQuality, Lower Hutt.	-	39-40
Dry Matter	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	1-2, 10, 12-13, 16-22, 27, 29-30
Dry Matter	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	0.10 g/100g as rcvd	6-7, 9-14, 16-22, 27, 29-30
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	BaP Potency Equivalence calculated from; Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(j)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a)pyrene x 1.0 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Fluoranthene x 0.01 + Indeno(1,2,3-c,d)pyrene x 0.1. Ministry for the Environment. 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.	0.024 mg/kg dry wt	1-2, 10, 12-13, 16-17
Benzo[a]pyrene Toxic Equivalence (TEF)*	Benzo[a]pyrene Toxic Equivalence (TEF) calculated from; Benzo[a]pyrene x 1.0 + Benzo(a)anthracene x 0.1 + Benzo(b) fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Indeno(1,2,3-c,d)pyrene x 0.1. Guidelines for assessing and managing contaminated gasworks sites in New Zealand (GMG) (MfE, 1997).	0.024 mg/kg dry wt	1-2, 10, 12-13, 16-17

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
TPH Oil Industry Profile + PAHscreen	Sonication extraction, GC-FID and GC-MS/MS analysis. Tested on as received sample. In-house based on US EPA 8015 and US EPA 8270.	0.010 - 70 mg/kg dry wt	12-13
Heavy Metals with Mercury, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	1-3, 6, 9-10, 12-13, 15-22, 26-30
Polycyclic Aromatic Hydrocarbons Screening in Soil*	Sonication extraction, GC-MS/MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.010 - 0.05 mg/kg dry wt	1-2, 10, 16-17
Semivolatile Organic Compounds Trace in Soil by GC-MS	Sonication extraction, GC-MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.10 - 6 mg/kg dry wt	18-22, 27, 29-30
SPLP Profile*	Extraction at 30 +/- 2 rpm for 18 +/- 2 hours, (Ratio 1g sample : 20g extraction fluid). US EPA 1312.	-	21
TCLP Profile*	Extraction at 30 +/- 2 rpm for 18 +/- 2 hours, (Ratio 1g sample : 20g extraction fluid). US EPA 1311.	-	21
PFAS in Soil	Solvent extraction. LC-MS/MS analysis. Tested on as received sample. In-house based on ASTM D7968.	0.0010 - 0.046 mg/kg dry wt	6-7, 9-14, 16-22, 27, 29-30
Total Petroleum Hydrocarbons in Soil			
Client Chromatogram for TPH by FID	Small peaks associated with QC compounds may be visible in chromatograms with low TPH concentrations. QC peaks are as follows: one peak in the C12 - 14 band, the C21 - 25 band and the C30 - 36 band. All QC peaks are corrected for in the reported TPH concentrations.	-	19-22, 27
C7 - C9	Solvent extraction, GC-FID analysis. In-house based on US EPA 8015.	20 mg/kg dry wt	12-13, 18-22, 27, 29-30
C10 - C14	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	20 mg/kg dry wt	12-13, 18-22, 27, 29-30
C15 - C36	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	40 mg/kg dry wt	12-13, 18-22, 27, 29-30
Total hydrocarbons (C7 - C36)	Calculation: Sum of carbon bands from C7 to C36. In-house based on US EPA 8015.	70 mg/kg dry wt	12-13, 18-22, 27, 29-30
SPLP Profile			
SPLP Sample Weight	Gravimetric. US EPA 1312.	0.1 g	21
SPLP Extractant Type*	US EPA 1312 (Modified for New Zealand conditions to use De-ionised Water unless otherwise specified).	-	21
SPLP Final pH	pH meter. US EPA 1312.	0.1 pH Units	21
TCLP Profile			
TCLP Weight of Sample Taken	Gravimetric. US EPA 1311.	0.1 g	21
TCLP Initial Sample pH	pH meter. US EPA 1311.	0.1 pH Units	21
TCLP Acid Adjusted Sample pH	pH meter. US EPA 1311.	0.1 pH Units	21
TCLP Extractant Type*	US EPA 1311.	-	21
TCLP Extraction Fluid pH	pH meter. US EPA 1311.	0.1 pH Units	21
TCLP Post Extraction Sample pH	pH meter. US EPA 1311.	0.1 pH Units	21

Sample Type: Aqueous			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Individual Tests			
Total Digestion of Extracted Samples*	Nitric acid digestion. APHA 3030 E (modified) : Online Edition.	-	37-38
Total Lead	Nitric acid digestion, ICP-MS, screen level. APHA 3125 B : Online Edition.	0.0021 g/m^3	37
Total Lead	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition / US EPA 200.8.	0.00011 g/m^3	38
Total Zinc	Nitric acid digestion, ICP-MS, screen level. APHA 3125 B : Online Edition.	0.053 g/m^3	37
Total Zinc	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition / US EPA 200.8.	0.0011 g/m^3	38

Sample Type: Roading Material			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Individual Tests			
SHOC Macro Extraction 10x Dilution*		-	23, 25

Sample Type: Roading Material			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Macro Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	23, 25
Total Recoverable Arsenic	Tested on as received sample. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	2 mg/kg as rcvd	23, 25
Total Recoverable Cadmium*	Tested on as received sample. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	0.10 mg/kg as rcvd	23, 25
Total Recoverable Chromium	Tested on as received sample. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	2 mg/kg as rcvd	23, 25
Total Recoverable Copper	Tested on as received sample. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	2 mg/kg as rcvd	23, 25
Total Recoverable Lead	Tested on as received sample. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	0.4 mg/kg as rcvd	23, 25
Total Recoverable Mercury*	Dried sample, Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	0.10 mg/kg dry wt	23, 25
Total Recoverable Nickel	Tested on as received sample. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	2 mg/kg as rcvd	23, 25
Total Recoverable Zinc	Tested on as received sample. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	4 mg/kg as rcvd	23, 25
Heavy metals, MacroDig, screen, As,Cd,Cr,Cu,Ni,Pb,Zn*	Tested on as received sample. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	0.10 - 4 mg/kg as rcvd	23, 25
Polycyclic Aromatic Hydrocarbons Screening in Solids*	Sonication extraction, GC-MS/MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.002 - 0.3 mg/kg as rcvd	23, 25

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 02-Dec-2024 and 29-Jan-2025. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

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Kim Harrison MSc
Client Services Manager - Environmental

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Certificate of Analysis

Submission Reference: EnvSubAQ_LH 1279

Final Report

Pre-registration ID: AvR-IKv-JPk

[redacted]

Hill Subcontracting
Hill Laboratories - Hamilton
Private Bag 3205
Hamilton 3240
New Zealand

Report Issued: 08-Jan-2025 **AsureQuality Reference: 24-338539** **Sample(s) Received:** 13-Dec-2024 11:45

Testing Period: 13-Dec-2024 to 07-Jan-2025
Date of analysis is available on request.

Sample Summary

Customer Sample Name: WSS_TP7_0.1 **Lab ID:** 24-338539-1
Sample Description: 3727360.18
Sample Condition: Acceptable **Sampled Date**: 28-Nov-2024

Customer Sample Name: WSS_TP7_0.3 **Lab ID:** 24-338539-2
Sample Description: 3727360.19
Sample Condition: Acceptable **Sampled Date**: 28-Nov-2024

Customer Sample Name: WSS_TP7_0.5 **Lab ID:** 24-338539-3
Sample Description: 3727360.20
Sample Condition: Acceptable **Sampled Date**: 28-Nov-2024

Customer Sample Name: WSS_TP7_1.0 **Lab ID:** 24-338539-4
Sample Description: 3727360.21
Sample Condition: Acceptable **Sampled Date**: 28-Nov-2024

Customer Sample Name: WSS_TP7_1.3 **Lab ID:** 24-338539-5
Sample Description: 3727360.22
Sample Condition: Acceptable **Sampled Date**: 28-Nov-2024

Composition

Composite ID	Composition
24-338539-6	24-338539-1, 24-338539-2, 24-338539-3
24-338539-7	24-338539-4, 24-338539-5

Results

The tests were performed on the samples as received.

Customer Sample Name: Composite of WSS_TP7_0.1, WSS_TP7_0.3 and WSS_TP7_0.5 **Lab ID:** 24-338539-6
Sample Description: 3727360.39

Test	Result	Unit	Method Reference
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)

AsureQuality Ltd has used reasonable skill, care, and effort to provide an accurate analysis of the sample(s) which form(s) the subject of this report. However, the accuracy of this analysis is reliant on, and subject to, the sample(s) provided by you and your responsibility as to transportation of the sample(s). AsureQuality Ltd's standard terms of business apply to the analysis set out in this report: https://www.asurequality.com/about/terms-of-business/

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AsureQuality Reference: 24-338539 **Report Issued:** 08-Jan-2025

Test	Result	Unit	Method Reference
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.038	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.038	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.093	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.43	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.52	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.56	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 24-338539 **Report Issued:** 08-Jan-2025

Test	Result	Unit	Method Reference
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	107	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	98	%	AsureQuality Method (LC-MS/MS)
M8PFOS	102	%	AsureQuality Method (LC-MS/MS)
M4PFBA	106	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	108	%	AsureQuality Method (LC-MS/MS)
MPFHpA	107	%	AsureQuality Method (LC-MS/MS)
M8PFOA	102	%	AsureQuality Method (LC-MS/MS)
M9PFNA	98	%	AsureQuality Method (LC-MS/MS)
M6PFDA	103	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	104	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	108	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	105	%	AsureQuality Method (LC-MS/MS)
MPFOSA	105	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	105	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	105	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	112	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	109	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	99	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	90	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	96	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	103	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: Composite of WSS_TP7_1.0 and WSS_TP7_1.3 **Lab ID:** 24-338539-7

Sample Description: 3727360.40

Test	Result	Unit	Method Reference
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.15	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.15	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	0.030	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.056	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	2.1	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	11	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	13	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	13	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 24-338539 **Report Issued:** 08-Jan-2025

Test	Result	Unit	Method Reference
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.080	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.027	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.037	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	0.070	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	0.062	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.14	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	1.8	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	108	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	105	%	AsureQuality Method (LC-MS/MS)
M8PFOS	106	%	AsureQuality Method (LC-MS/MS)
M4PFBA	105	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	103	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	101	%	AsureQuality Method (LC-MS/MS)
M8PFOA	105	%	AsureQuality Method (LC-MS/MS)
M9PFNA	99	%	AsureQuality Method (LC-MS/MS)
M6PFDA	106	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	101	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	105	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	98	%	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 24-338539 **Report Issued:** 08-Jan-2025

Test	Result	Unit	Method Reference
MPFOSA	106	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	105	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	105	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	107	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	97	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	108	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	122	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 24-338539-6, 24-338539-7

Test	Result	Unit	Method Reference
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 24-338539 **Report Issued:** 08-Jan-2025

Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	111	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	112	%	AsureQuality Method (LC-MS/MS)
M8PFOS	113	%	AsureQuality Method (LC-MS/MS)
M4PFBA	106	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	106	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	108	%	AsureQuality Method (LC-MS/MS)
MPFHpA	107	%	AsureQuality Method (LC-MS/MS)
M8PFOA	101	%	AsureQuality Method (LC-MS/MS)
M9PFNA	101	%	AsureQuality Method (LC-MS/MS)
M6PFDA	106	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	103	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	106	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	91	%	AsureQuality Method (LC-MS/MS)
MPFOSA	106	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	102	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	103	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	91	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	96	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	88	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	97	%	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 24-338539 **Report Issued:** 08-Jan-2025

Test	Result	Unit	Method Reference
M8:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	115	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Authorised by
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water		
DX-PFCS02, 06-TCLP_W	AsureQuality Method (LC-MS/MS)	Christopher Sampson

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)

mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)

L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)

Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)

di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)

mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)

L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)

Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)

Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.

Reported results are corrected for internal standard recovery.

In house protocol based on US EPA 1311 test Toxicity Characteristic Leaching Procedure (TCLP).

Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.



Christopher Sampson
Scientist

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Appendix

Analyte LOR Summary

Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Listing applies to samples: 24-338539-6, 24-338539-7	
Perfluoroalkylsulfonic acids	
PFPrS	0.025 µg/L
PFBS	0.025 µg/L
PFPeS	0.025 µg/L
di-PFHxS (1)	0.025 µg/L
mono-PFHxS (1)	0.025 µg/L
L-PFHxS (1)	0.025 µg/L
Total PFHxS (3)	0.025 µg/L
PFHpS	0.025 µg/L
di-PFOS (5)	0.025 µg/L
mono-PFOS (5)	0.025 µg/L
L-PFOS (5)	0.025 µg/L
Total PFOS (7)	0.025 µg/L
Sum PFHxS+PFOS (1)	0.025 µg/L
PFNS	0.050 µg/L
PFDS	0.10 µg/L
PFECHS	0.025 µg/L
Perfluoroalkylcarboxylic acids	
PFBA	0.10 µg/L
PFPeA	0.10 µg/L
PFHxA	0.025 µg/L
PFHpA	0.025 µg/L
PFOA	0.025 µg/L
PFNA	0.025 µg/L
PFDA	0.025 µg/L
PFUnDA	0.025 µg/L
PFDoDA	0.10 µg/L
PFTrDA	0.10 µg/L
PFTeDA	0.10 µg/L
P37DMOA	0.050 µg/L
Perfluorooctanesulfonamides	
PFOSA	0.025 µg/L
NEtFOSA-M	0.10 µg/L
NMeFOSA-M	0.10 µg/L
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	0.025 µg/L
NMeFOSAA	0.025 µg/L
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	0.10 µg/L
NMeFOSE-M	0.10 µg/L
Telomere Sulfonic acids	
4:2 FTS	0.025 µg/L
6:2 FTS	0.050 µg/L
8:2 FTS	0.10 µg/L
10:2 FTS	0.025 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.10 µg/L

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FPePA (5:3FTA)	0.025 µg/L
FHpPA (7:3FTA)	0.025 µg/L
Miscellaneous	
F-53B (major)	0.10 µg/L
F-53B (minor)	0.050 µg/L
Sum F-53B	0.1 µg/L
ADONA	0.025 µg/L
HFPO-DA (GenX)	0.050 µg/L

Analyte Definitions

Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water - AsureQuality Method (LC-MS/MS)

Analyte	Full Name
Listing applies to samples: 24-338539-6, 24-338539-7	
Perfluoroalkylsulfonic acids	
PFPrS	Perfluoro-1-propanesulfonic acid
PFBS	Perfluoro-1-butanesulfonic acid
PFPeS	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)	Linear Perfluorohexanesulfonic acid
PFHpS	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)	Total Perfluoromethylheptane sulfonic acids
L-PFOS (5)	Linear Perfluorooctanesulfonic acid
PFNS	Perfluoro-1-nonanesulfonic acid
PFDS	Perfluoro-1-decanesulfonic acid
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid
Perfluoroalkylcarboxylic acids	
PFBA	Perfluoro-n-butanoic acid
PFPeA	Perfluoro-n-pentanoic acid
PFHxA	Perfluoro-n-hexanoic acid
PFHpA	Perfluoro-n-heptanoic acid
PFOA	Perfluoro-n-octanoic acid
PFNA	Perfluoro-n-nonanoic acid
PFDA	Perfluoro-n-decanoic acid
PFUnDA	Perfluoro-n-undecanoic acid
PFDoDA	Perfluoro-n-dodecanoic acid
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid
Perfluorooctanesulfonamides	
PFOSA	Perfluoro-1-octanesulfonamide
NEtFOSA-M	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M	N-methylperfluoro-1-octanesulfonamide
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
Telomere Sulfonic acids	
4:2 FTS	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid
10:2 FTS	1H,1H,2H,2H-perfluorododecanesulfonic acid

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AsureQuality Reference: 24-338539 **Report Issued:** 08-Jan-2025

Telomere Carboxylic acids	
FPrPA (3:3FTA)	3-Perfluoropropyl propanoic acid
FPePA (5:3FTA)	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B	Sum of F-53B components (major + minor)
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)	Tetrafluoro-2-(heptafluoropropoxy)propanoic acid
Internal Standards	
M3PFBS	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PFPeA	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA	Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid
M8PFOA	Perfluoro-n-[13C8]octanoic acid
M9PFNA	Perfluoro-n-[13C9]nonanoic acid
M6PFDA	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDoDA	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA	Perfluoro-n-[1,2-13C2]tetradecanoic acid
MPFOSA	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid
M3HFPO-DA	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

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Certificate of Analysis

Client:	Beca Limited	**Lab No:**	3728481 SPv7
Contact:	Genevieve Jessica Smith C/- Beca Limited PO Box 3942 Wellington 6140	**Date Received:**	29-Nov-2024
		Date Reported:	08-Jan-2025
		Quote No:	
		Order No:	
		Client Reference:	Southern Seawall
		Add. Client Ref:	3324228/09/09
		Submitted By:	Genevieve Jessica Smith

Sample Type: Soil

Sample Name:		WSS_HA1_0.1 29-Nov-2024	WSS_HA1_0.3 29-Nov-2024	WSS_HA1_0.5 29-Nov-2024	WSS_HA2_0.1 29-Nov-2024	WSS_HA3_0.1 29-Nov-2024
Lab Number:		3728481.1	3728481.2	3728481.3	3728481.4	3728481.5
Individual Tests						
Dry Matter	g/100g as rcvd	90	90	-	-	-
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	5	4	5	5	4
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	14	14	15	23	15
Total Recoverable Copper	mg/kg dry wt	19	17	48	28	16
Total Recoverable Lead	mg/kg dry wt	22	19.2	31	29	22
Total Recoverable Mercury	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Nickel	mg/kg dry wt	11	10	12	17	13
Total Recoverable Zinc	mg/kg dry wt	66	53	68	75	67
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	1.4	1.1	-	-	-
1-Methylnaphthalene	mg/kg dry wt	< 0.011	< 0.011	-	-	-
2-Methylnaphthalene	mg/kg dry wt	< 0.014	< 0.014	-	-	-
Acenaphthylene	mg/kg dry wt	0.064	0.057	-	-	-
Acenaphthene	mg/kg dry wt	< 0.011	< 0.011	-	-	-
Anthracene	mg/kg dry wt	0.037	0.033	-	-	-
Benzo[a]anthracene	mg/kg dry wt	0.092	0.070	-	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	0.150	0.119	-	-	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	0.23	0.180	-	-	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	0.22	0.179	-	-	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	0.191	0.151	-	-	-
Benzo[e]pyrene	mg/kg dry wt	0.093	0.071	-	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	0.121	0.085	-	-	-
Benzo[k]fluoranthene	mg/kg dry wt	0.071	0.060	-	-	-
Chrysene	mg/kg dry wt	0.085	0.055	-	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	0.025	0.021	-	-	-
Fluoranthene	mg/kg dry wt	0.136	0.095	-	-	-
Fluorene	mg/kg dry wt	< 0.011	< 0.011	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	0.135	0.107	-	-	-
Naphthalene	mg/kg dry wt	< 0.06	< 0.06	-	-	-
Perylene	mg/kg dry wt	0.036	0.028	-	-	-
Phenanthrene	mg/kg dry wt	0.030	0.019	-	-	-
Pyrene	mg/kg dry wt	0.133	0.107	-	-	-

This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.
The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

Sample Type: Soil						
Sample Name:		WSS_HA3_0.3 29-Nov-2024	WSS_HA4_0.1 29-Nov-2024	WSS_HA4_0.3 29-Nov-2024	WSS_HA4_0.5 29-Nov-2024	WSS_HA4_0.8 29-Nov-2024
Lab Number:		3728481.6	3728481.7	3728481.8	3728481.9	3728481.10
Individual Tests						
Poly- and Perfluorinated Alkyl Substances in TCLP Reagent Water*‡		-	-	-	-	See attached report
Poly- and Perfluorinated Alkyl Substances in TCLP pH5 Acetate Buffer*‡		-	-	-	-	See attached report
Dry Matter	g/100g as rcvd	93	93	93	84	87
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	7	5	6	5	4
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	0.14	0.19	0.13
Total Recoverable Chromium	mg/kg dry wt	15	12	13	15	12
Total Recoverable Copper	mg/kg dry wt	21	11	15	37	19
Total Recoverable Lead	mg/kg dry wt	24	34	70	190	78
Total Recoverable Mercury	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Nickel	mg/kg dry wt	15	10	10	12	9
Total Recoverable Zinc	mg/kg dry wt	70	88	125	186	91
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	0.4	-	-	-	-
1-Methylnaphthalene	mg/kg dry wt	< 0.011	-	-	-	-
2-Methylnaphthalene	mg/kg dry wt	< 0.013	-	-	-	-
Acenaphthylene	mg/kg dry wt	0.016	-	-	-	-
Acenaphthene	mg/kg dry wt	< 0.011	-	-	-	-
Anthracene	mg/kg dry wt	< 0.011	-	-	-	-
Benzo[a]anthracene	mg/kg dry wt	0.028	-	-	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	0.040	-	-	-	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	0.060	-	-	-	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	0.059	-	-	-	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	0.049	-	-	-	-
Benzo[e]pyrene	mg/kg dry wt	0.027	-	-	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	0.036	-	-	-	-
Benzo[k]fluoranthene	mg/kg dry wt	0.020	-	-	-	-
Chrysene	mg/kg dry wt	0.024	-	-	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.011	-	-	-	-
Fluoranthene	mg/kg dry wt	0.051	-	-	-	-
Fluorene	mg/kg dry wt	< 0.011	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	0.033	-	-	-	-
Naphthalene	mg/kg dry wt	< 0.06	-	-	-	-
Perylene	mg/kg dry wt	< 0.011	-	-	-	-
Phenanthrene	mg/kg dry wt	0.016	-	-	-	-
Pyrene	mg/kg dry wt	0.046	-	-	-	-
Haloethers Trace in SVOC Soil Samples by GC-MS						
Bis(2-chloroethoxy) methane	mg/kg dry wt	-	< 0.10	< 0.10	< 0.15	< 0.10
Bis(2-chloroethyl)ether	mg/kg dry wt	-	< 0.10	< 0.10	< 0.15	< 0.10
Bis(2-chloroisopropyl)ether	mg/kg dry wt	-	< 0.10	< 0.10	< 0.15	< 0.10
4-Bromophenyl phenyl ether	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
4-Chlorophenyl phenyl ether	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
Nitrogen containing compounds Trace in SVOC Soil Samples, GC-MS						
N-Nitrosodiphenylamine + Diphenylamine	mg/kg dry wt	-	< 0.14	< 0.14	< 0.15	< 0.15
2,4-Dinitrotoluene	mg/kg dry wt	-	< 0.2	< 0.2	< 0.2	< 0.2
2,6-Dinitrotoluene	mg/kg dry wt	-	< 0.2	< 0.2	< 0.2	< 0.2
Nitrobenzene	mg/kg dry wt	-	< 0.10	< 0.10	< 0.15	< 0.10
N-Nitrosodi-n-propylamine	mg/kg dry wt	-	< 0.14	< 0.14	< 0.3	< 0.15

Sample Type: Soil						
Sample Name:		WSS_HA3_0.3 29-Nov-2024	WSS_HA4_0.1 29-Nov-2024	WSS_HA4_0.3 29-Nov-2024	WSS_HA4_0.5 29-Nov-2024	WSS_HA4_0.8 29-Nov-2024
Lab Number:		3728481.6	3728481.7	3728481.8	3728481.9	3728481.10
Organochlorine Pesticides Trace in SVOC Soil Samples by GC-MS						
Aldrin	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
alpha-BHC	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
beta-BHC	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
delta-BHC	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
gamma-BHC (Lindane)	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
4,4'-DDD	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
4,4'-DDE	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
4,4'-DDT	mg/kg dry wt	-	< 0.2	< 0.2	< 0.2	< 0.2
Dieldrin	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
Endosulfan I	mg/kg dry wt	-	< 0.2	< 0.2	< 0.2	< 0.2
Endosulfan II	mg/kg dry wt	-	< 0.5	< 0.5	< 0.5	< 0.5
Endosulfan sulphate	mg/kg dry wt	-	< 0.2	< 0.2	< 0.2	< 0.2
Endrin	mg/kg dry wt	-	< 0.14	< 0.14	< 0.15	< 0.15
Endrin ketone	mg/kg dry wt	-	< 0.2	< 0.2	< 0.2	< 0.2
Heptachlor	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
Heptachlor epoxide	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
Hexachlorobenzene	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
Polycyclic Aromatic Hydrocarbons Trace in SVOC Soil Samples*						
Acenaphthene	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	mg/kg dry wt	-	< 0.10	< 0.10	0.10	0.36
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	< 0.10	< 0.10	0.19	0.44
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	-	< 0.10	< 0.10	0.23	0.57
Benzo[g,h,i]perylene	mg/kg dry wt	-	< 0.10	< 0.10	0.21	0.31
Benzo[k]fluoranthene	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	0.22
1&2-Chloronaphthalene	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg dry wt	-	< 0.10	< 0.10	0.15	0.41
Dibenzo[a,h]anthracene	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg dry wt	-	< 0.10	< 0.10	0.16	0.58
Fluorene	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	< 0.10	< 0.10	0.21	0.35
2-Methylnaphthalene	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
Naphthalene	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	0.16
Pyrene	mg/kg dry wt	-	< 0.10	< 0.10	0.19	0.55
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	-	< 0.25	< 0.25	0.29	0.66
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	-	< 0.25	< 0.25	0.29	0.65
Phenols Trace in SVOC Soil Samples by GC-MS						
4-Chloro-3-methylphenol	mg/kg dry wt	-	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorophenol	mg/kg dry wt	-	< 0.2	< 0.2	< 0.2	< 0.2
2,4-Dichlorophenol	mg/kg dry wt	-	< 0.2	< 0.2	< 0.2	< 0.2
2,4-Dimethylphenol	mg/kg dry wt	-	< 0.4	< 0.4	< 0.4	< 0.4
3 & 4-Methylphenol (m- + p-cresol)	mg/kg dry wt	-	< 0.4	< 0.4	< 0.4	< 0.4
2-Methylphenol (o-cresol)	mg/kg dry wt	-	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg dry wt	-	< 0.4	< 0.4	< 0.4	< 0.4
Pentachlorophenol (PCP)	mg/kg dry wt	-	< 6	< 6	< 6	< 6
Phenol	mg/kg dry wt	-	< 0.2	< 0.2	< 0.3	< 0.2
2,4,5-Trichlorophenol	mg/kg dry wt	-	< 0.2	< 0.2	< 0.3	< 0.2
2,4,6-Trichlorophenol	mg/kg dry wt	-	< 0.2	< 0.2	< 0.3	< 0.2

Sample Type: Soil						
Sample Name:		WSS_HA3_0.3 29-Nov-2024	WSS_HA4_0.1 29-Nov-2024	WSS_HA4_0.3 29-Nov-2024	WSS_HA4_0.5 29-Nov-2024	WSS_HA4_0.8 29-Nov-2024
Lab Number:		3728481.6	3728481.7	3728481.8	3728481.9	3728481.10
Plasticisers Trace in SVOC Soil Samples by GC-MS						
Bis(2-ethylhexyl)phthalate	mg/kg dry wt	-	0.9	< 0.5	0.7	< 0.5
Butylbenzylphthalate	mg/kg dry wt	-	< 0.2	< 0.2	0.6	< 0.2
Di(2-ethylhexyl)adipate	mg/kg dry wt	-	< 0.2	< 0.2	< 0.2	< 0.2
Diethylphthalate	mg/kg dry wt	-	< 0.2	< 0.2	< 0.2	< 0.2
Dimethylphthalate	mg/kg dry wt	-	< 0.2	< 0.2	< 0.2	< 0.2
Di-n-butylphthalate	mg/kg dry wt	-	< 0.2	< 0.2	< 0.2	< 0.2
Di-n-octylphthalate	mg/kg dry wt	-	< 0.2	< 0.2	< 0.2	< 0.2
Other Halogenated compounds Trace in SVOC Soil Samples by GC-MS						
1,2-Dichlorobenzene	mg/kg dry wt	-	< 0.14	< 0.14	< 0.3	< 0.15
1,3-Dichlorobenzene	mg/kg dry wt	-	< 0.14	< 0.14	< 0.3	< 0.15
1,4-Dichlorobenzene	mg/kg dry wt	-	< 0.14	< 0.14	< 0.3	< 0.15
Hexachlorobutadiene	mg/kg dry wt	-	< 0.14	< 0.14	< 0.3	< 0.15
Hexachloroethane	mg/kg dry wt	-	< 0.14	< 0.14	< 0.3	< 0.15
1,2,4-Trichlorobenzene	mg/kg dry wt	-	< 0.10	< 0.10	< 0.15	< 0.10
Other SVOC Trace in SVOC Soil Samples by GC-MS						
Benzyl alcohol	mg/kg dry wt	-	< 1.0	< 1.0	< 1.5	< 1.0
Carbazole	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
Dibenzofuran	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	< 0.10
Isophorone	mg/kg dry wt	-	< 0.10	< 0.10	< 0.15	< 0.10
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	-	< 20	< 20	< 20	< 20
C10 - C14	mg/kg dry wt	-	< 20	< 20	< 20	< 20
C15 - C36	mg/kg dry wt	-	< 40	47	124	149
Total hydrocarbons (C7 - C36)	mg/kg dry wt	-	< 80	< 80	125	152

Sample Name:		WSS_HA5_0.1 29-Nov-2024	WSS_HA5_0.3 29-Nov-2024	WSS_HA5_0.5 29-Nov-2024	WSS_HA6_0.1 29-Nov-2024	WSS_HA6_0.3 29-Nov-2024
Lab Number:		3728481.11	3728481.12	3728481.13	3728481.14	3728481.15
Individual Tests						
Library Search on TPH samples*	Report	-	-	Library Search Report Attached	-	-
Dry Matter	g/100g as rcvd	79	-	88	78	89
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	6	7	8	6	8
Total Recoverable Cadmium	mg/kg dry wt	0.14	0.12	0.26	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	17	19	56	17	17
Total Recoverable Copper	mg/kg dry wt	26	27	30	21	18
Total Recoverable Lead	mg/kg dry wt	46	37	310	47	26
Total Recoverable Mercury	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Nickel	mg/kg dry wt	11	13	18	13	14
Total Recoverable Zinc	mg/kg dry wt	163	192	510	105	104
Haloethers Trace in SVOC Soil Samples by GC-MS						
Bis(2-chloroethoxy) methane	mg/kg dry wt	< 0.16	-	< 0.7	< 0.16	< 0.10
Bis(2-chloroethyl)ether	mg/kg dry wt	< 0.16	-	< 0.7	< 0.16	< 0.10
Bis(2-chloroisopropyl)ether	mg/kg dry wt	< 0.16	-	< 0.7	< 0.16	< 0.10
4-Bromophenyl phenyl ether	mg/kg dry wt	< 0.10	-	< 0.7	< 0.10	< 0.10
4-Chlorophenyl phenyl ether	mg/kg dry wt	< 0.10	-	< 0.7	< 0.10	< 0.10
Nitrogen containing compounds Trace in SVOC Soil Samples, GC-MS						
N-Nitrosodiphenylamine + Diphenylamine	mg/kg dry wt	< 0.16	-	< 1.4	< 0.16	< 0.14
2,4-Dinitrotoluene	mg/kg dry wt	< 0.2	-	< 1.4	< 0.2	< 0.2
2,6-Dinitrotoluene	mg/kg dry wt	< 0.2	-	< 1.4	< 0.2	< 0.2
Nitrobenzene	mg/kg dry wt	< 0.16	-	< 0.7	< 0.16	< 0.10
N-Nitrosodi-n-propylamine	mg/kg dry wt	< 0.4	-	< 1.4	< 0.4	< 0.14

Sample Type: Soil						
Sample Name:		WSS_HA5_0.1 29-Nov-2024	WSS_HA5_0.3 29-Nov-2024	WSS_HA5_0.5 29-Nov-2024	WSS_HA6_0.1 29-Nov-2024	WSS_HA6_0.3 29-Nov-2024
Lab Number:		3728481.11	3728481.12	3728481.13	3728481.14	3728481.15
Organochlorine Pesticides Trace in SVOC Soil Samples by GC-MS						
Aldrin	mg/kg dry wt	< 0.10	-	< 0.7	< 0.10	< 0.10
alpha-BHC	mg/kg dry wt	< 0.10	-	< 0.7	< 0.10	< 0.10
beta-BHC	mg/kg dry wt	< 0.10	-	< 0.7	< 0.10	< 0.10
delta-BHC	mg/kg dry wt	< 0.10	-	< 0.7	< 0.10	< 0.10
gamma-BHC (Lindane)	mg/kg dry wt	< 0.10	-	< 0.7	< 0.10	< 0.10
4,4'-DDD	mg/kg dry wt	< 0.10	-	< 0.7	< 0.10	< 0.10
4,4'-DDE	mg/kg dry wt	< 0.10	-	< 0.7	< 0.10	< 0.10
4,4'-DDT	mg/kg dry wt	< 0.2	-	< 1.4	< 0.2	< 0.2
Dieldrin	mg/kg dry wt	< 0.10	-	< 0.7	< 0.10	< 0.10
Endosulfan I	mg/kg dry wt	< 0.2	-	< 1.4	< 0.2	< 0.2
Endosulfan II	mg/kg dry wt	< 0.5	-	< 1.4	< 0.5	< 0.5
Endosulfan sulphate	mg/kg dry wt	< 0.2	-	< 1.4	< 0.2	< 0.2
Endrin	mg/kg dry wt	< 0.16	-	< 1.4	< 0.16	< 0.14
Endrin ketone	mg/kg dry wt	< 0.2	-	< 1.4	< 0.2	< 0.2
Heptachlor	mg/kg dry wt	< 0.10	-	< 0.7	< 0.10	< 0.10
Heptachlor epoxide	mg/kg dry wt	< 0.10	-	< 0.7	< 0.10	< 0.10
Hexachlorobenzene	mg/kg dry wt	< 0.10	-	< 0.7	< 0.10	< 0.10
Polycyclic Aromatic Hydrocarbons Trace in SVOC Soil Samples*						
Acenaphthene	mg/kg dry wt	< 0.10	-	< 0.4	< 0.10	< 0.10
Acenaphthylene	mg/kg dry wt	< 0.10	-	< 0.4	< 0.10	< 0.10
Anthracene	mg/kg dry wt	< 0.10	-	< 0.4	< 0.10	< 0.10
Benzo[a]anthracene	mg/kg dry wt	0.11	-	0.4	< 0.10	0.12
Benzo[a]pyrene (BAP)	mg/kg dry wt	0.14	-	< 0.7	< 0.10	0.12
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	0.18	-	< 0.7	0.13	0.14
Benzo[g,h,i]perylene	mg/kg dry wt	0.13	-	< 0.7	0.11	< 0.10
Benzo[k]fluoranthene	mg/kg dry wt	< 0.10	-	< 0.7	< 0.10	< 0.10
1&2-Chloronaphthalene	mg/kg dry wt	< 0.10	-	< 0.5	< 0.10	< 0.10
Chrysene	mg/kg dry wt	0.12	-	< 0.4	< 0.10	0.12
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.10	-	< 0.7	< 0.10	< 0.10
Fluoranthene	mg/kg dry wt	0.17	-	0.9	0.12	0.23
Fluorene	mg/kg dry wt	< 0.10	-	< 0.4	< 0.10	< 0.10
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	0.13	-	< 0.7	< 0.10	< 0.10
2-Methylnaphthalene	mg/kg dry wt	< 0.10	-	0.6	< 0.10	< 0.10
Naphthalene	mg/kg dry wt	< 0.10	-	2.1	< 0.10	< 0.10
Phenanthrene	mg/kg dry wt	< 0.10	-	0.8	< 0.10	0.14
Pyrene	mg/kg dry wt	0.17	-	1.1	0.12	0.22
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.25	-	< 1.7	< 0.25	< 0.25
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.25	-	< 1.7	< 0.25	< 0.25
Phenols Trace in SVOC Soil Samples by GC-MS						
4-Chloro-3-methylphenol	mg/kg dry wt	< 0.5	-	< 1.4	< 0.5	< 0.5
2-Chlorophenol	mg/kg dry wt	< 0.2	-	< 0.7	< 0.2	< 0.2
2,4-Dichlorophenol	mg/kg dry wt	< 0.2	-	< 0.7	< 0.2	< 0.2
2,4-Dimethylphenol	mg/kg dry wt	< 0.4	-	< 0.7	< 0.4	< 0.4
3 & 4-Methylphenol (m- + p-cresol)	mg/kg dry wt	< 0.4	-	< 1.4	< 0.4	< 0.4
2-Methylphenol (o-cresol)	mg/kg dry wt	< 0.2	-	< 0.7	< 0.2	< 0.2
2-Nitrophenol	mg/kg dry wt	< 0.4	-	< 1.4	< 0.4	< 0.4
Pentachlorophenol (PCP)	mg/kg dry wt	< 6	-	< 14	< 6	< 6
Phenol	mg/kg dry wt	< 0.4	-	< 1.4	< 0.4	< 0.2
2,4,5-Trichlorophenol	mg/kg dry wt	< 0.4	-	< 1.4	< 0.4	< 0.2
2,4,6-Trichlorophenol	mg/kg dry wt	< 0.4	-	< 1.4	< 0.4	< 0.2

Sample Type: Soil						
Sample Name:		WSS_HA5_0.1 29-Nov-2024	WSS_HA5_0.3 29-Nov-2024	WSS_HA5_0.5 29-Nov-2024	WSS_HA6_0.1 29-Nov-2024	WSS_HA6_0.3 29-Nov-2024
Lab Number:		3728481.11	3728481.12	3728481.13	3728481.14	3728481.15
Plasticisers Trace in SVOC Soil Samples by GC-MS						
Bis(2-ethylhexyl)phthalate	mg/kg dry wt	< 0.5	-	29	< 0.5	< 0.5
Butylbenzylphthalate	mg/kg dry wt	< 0.2	-	12.9	< 0.2	< 0.2
Di(2-ethylhexyl)adipate	mg/kg dry wt	< 0.2	-	< 0.7	< 0.2	< 0.2
Diethylphthalate	mg/kg dry wt	< 0.2	-	< 1.4	< 0.2	< 0.2
Dimethylphthalate	mg/kg dry wt	< 0.2	-	< 1.4	< 0.2	< 0.2
Di-n-butylphthalate	mg/kg dry wt	< 0.2	-	9.5	< 0.2	< 0.2
Di-n-octylphthalate	mg/kg dry wt	< 0.2	-	< 1.4	< 0.2	< 0.2
Other Halogenated compounds Trace in SVOC Soil Samples by GC-MS						
1,2-Dichlorobenzene	mg/kg dry wt	< 0.4	-	< 1.4	< 0.4	< 0.14
1,3-Dichlorobenzene	mg/kg dry wt	< 0.4	-	< 1.4	< 0.4	< 0.14
1,4-Dichlorobenzene	mg/kg dry wt	< 0.4	-	< 1.4	< 0.4	< 0.14
Hexachlorobutadiene	mg/kg dry wt	< 0.4	-	< 1.4	< 0.4	< 0.14
Hexachloroethane	mg/kg dry wt	< 0.4	-	< 1.4	< 0.4	< 0.14
1,2,4-Trichlorobenzene	mg/kg dry wt	< 0.16	-	< 0.7	< 0.16	< 0.10
Other SVOC Trace in SVOC Soil Samples by GC-MS						
Benzyl alcohol	mg/kg dry wt	< 1.6	-	< 7	< 1.6	< 1.0
Carbazole	mg/kg dry wt	< 0.10	-	< 0.7	< 0.10	< 0.10
Dibenzofuran	mg/kg dry wt	< 0.10	-	< 0.7	< 0.10	< 0.10
Isophorone	mg/kg dry wt	< 0.16	-	< 0.7	< 0.16	< 0.10
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 20	-	560	< 20	< 20
C10 - C14	mg/kg dry wt	< 20	-	124	< 20	< 20
C15 - C36	mg/kg dry wt	< 40	-	1,640	< 40	100
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 80	-	2,300	< 80	102

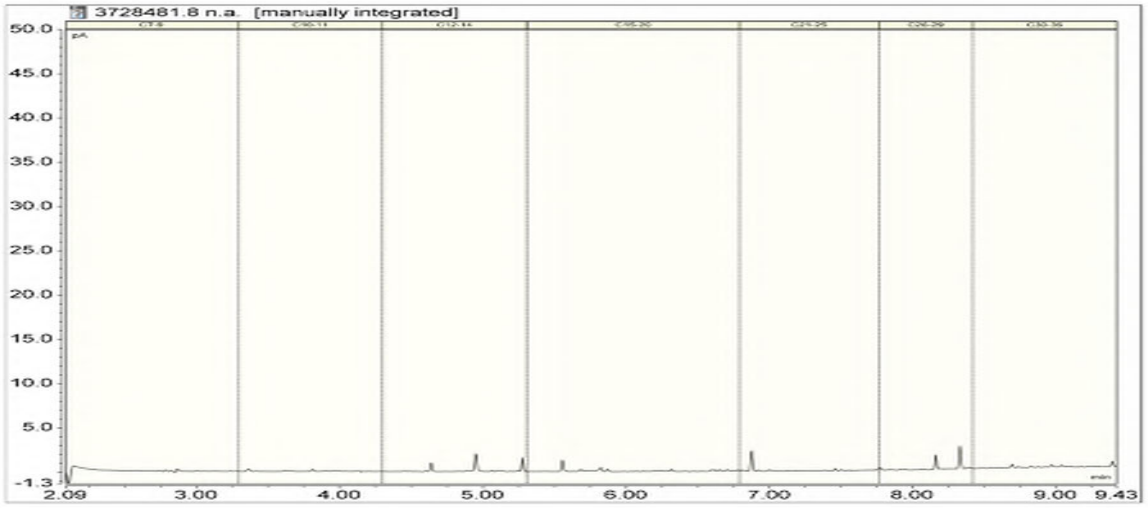
Sample Name:		WSS_HA7_0.1 29-Nov-2024	WSS_HA7_0.3 29-Nov-2024	WSS_QA3 29-Nov-2024	Composite of WSS_HA5_0.1, WSS_HA5_0.3 & WSS_HA5_0.5	Composite of WSS_HA5_0.1, WSS_HA5_0.3 & WSS_HA5_0.5
Lab Number:		3728481.16	3728481.17	3728481.18	3728481.22	3728481.25
Individual Tests						
Poly- and Perfluorinated Alkyl Substances in TCLP Reagent Water*‡		-	-	-	-	See attached report
Poly- and Perfluorinated Alkyl Substances in TCLP pH5 Acetate Buffer*‡		-	-	-	-	See attached report
Dry Matter	g/100g as rcvd	-	90	-	-	-
SPLP Sample Weight	g	-	-	-	50	-
SPLP Extractant Type*		-	-	-	De-ionised Water, pH 5.8 +/- 0.4	-
SPLP Final pH	pH Units	-	-	-	9.3	-
TCLP Weight of Sample Taken	g	-	-	-	50	-
TCLP Initial Sample pH	pH Units	-	-	-	8.4	-
TCLP Acid Adjusted Sample pH	pH Units	-	-	-	1.6	-
TCLP Extractant Type*		-	-	-	NaOH/Acetic acid at pH 4.93 +/- 0.05	-
TCLP Extraction Fluid pH	pH Units	-	-	-	5.0	-
TCLP Post Extraction Sample pH	pH Units	-	-	-	5.0	-
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	11	4	5	-	-
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	-	-
Total Recoverable Chromium	mg/kg dry wt	15	14	15	-	-
Total Recoverable Copper	mg/kg dry wt	27	49	29	-	-
Total Recoverable Lead	mg/kg dry wt	48	39	25	-	-
Total Recoverable Mercury	mg/kg dry wt	< 0.10	< 0.10	< 0.10	-	-
Total Recoverable Nickel	mg/kg dry wt	12	12	12	-	-
Total Recoverable Zinc	mg/kg dry wt	80	71	69	-	-

Sample Type: Soil						
Sample Name:		WSS_HA7_0.1 29-Nov-2024	WSS_HA7_0.3 29-Nov-2024	WSS_QA3 29-Nov-2024	Composite of WSS_HA5_0.1, WSS_HA5_0.3 & WSS_HA5_0.5	Composite of WSS_HA5_0.1, WSS_HA5_0.3 & WSS_HA5_0.5
Lab Number:		3728481.16	3728481.17	3728481.18	3728481.22	3728481.25
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	-	1.3	-	-	-
1-Methylnaphthalene	mg/kg dry wt	-	< 0.011	-	-	-
2-Methylnaphthalene	mg/kg dry wt	-	< 0.014	-	-	-
Acenaphthylene	mg/kg dry wt	-	0.016	-	-	-
Acenaphthene	mg/kg dry wt	-	< 0.011	-	-	-
Anthracene	mg/kg dry wt	-	0.016	-	-	-
Benzo[a]anthracene	mg/kg dry wt	-	0.095	-	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	0.122	-	-	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	-	0.185	-	-	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	-	0.183	-	-	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	-	0.150	-	-	-
Benzo[e]pyrene	mg/kg dry wt	-	0.071	-	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	-	0.085	-	-	-
Benzo[k]fluoranthene	mg/kg dry wt	-	0.059	-	-	-
Chrysene	mg/kg dry wt	-	0.093	-	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	-	0.020	-	-	-
Fluoranthene	mg/kg dry wt	-	0.191	-	-	-
Fluorene	mg/kg dry wt	-	< 0.011	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	0.097	-	-	-
Naphthalene	mg/kg dry wt	-	< 0.06	-	-	-
Perylene	mg/kg dry wt	-	0.024	-	-	-
Phenanthrene	mg/kg dry wt	-	0.041	-	-	-
Pyrene	mg/kg dry wt	-	0.178	-	-	-

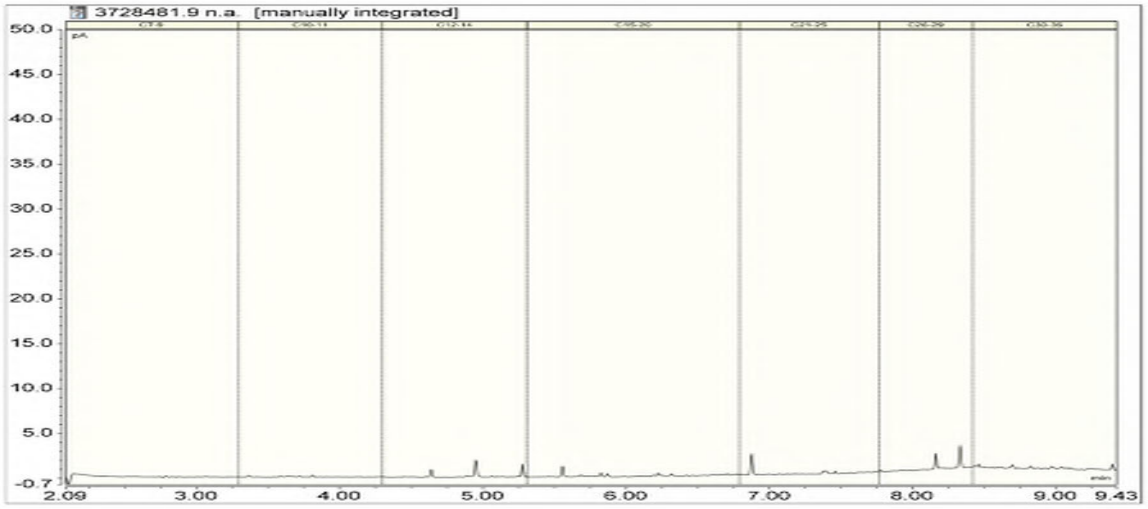
Sample Name:	Composite of WSS_HA04_0.1, WSS_HA04_0.3 & WSS_HA04_0.5
Lab Number:	3728481.26
Individual Tests	
Poly- and Perfluorinated Alkyl Substances in TCLP Reagent Water*‡	See attached report
Poly- and Perfluorinated Alkyl Substances in TCLP pH5 Acetate Buffer*‡	See attached report

Sample Type: Aqueous				
Sample Name:		Rinsate Blank 1	Composite of WSS_HA5_0.1, WSS_HA5_0.3 & WSS_HA5_0.5 [TCLP Extract]	Composite of WSS_HA5_0.1, WSS_HA5_0.3 & WSS_HA5_0.5 [SPLP Extract]
Lab Number:		3728481.20	3728481.23	3728481.24
Individual Tests				
Poly- and Perfluorinated Alkyl Substances in Water*‡		See attached report	-	-
Total Lead	g/m³	-	0.023 #1	0.025
Total Zinc	g/m³	-	0.45	0.059

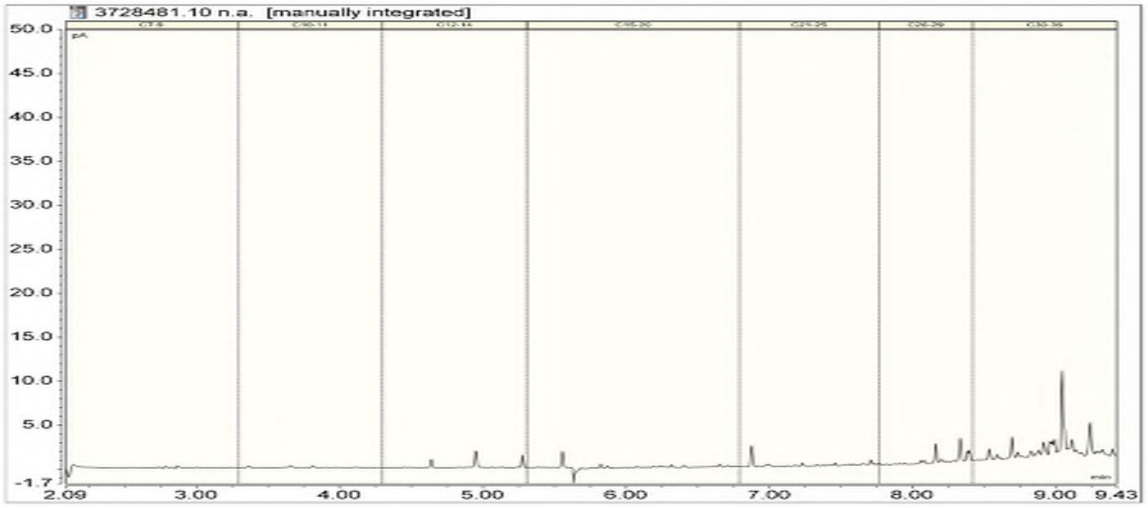
3728481.8
WSS_HA4_0.3 29-Nov-2024
Client Chromatogram for TPH by FID



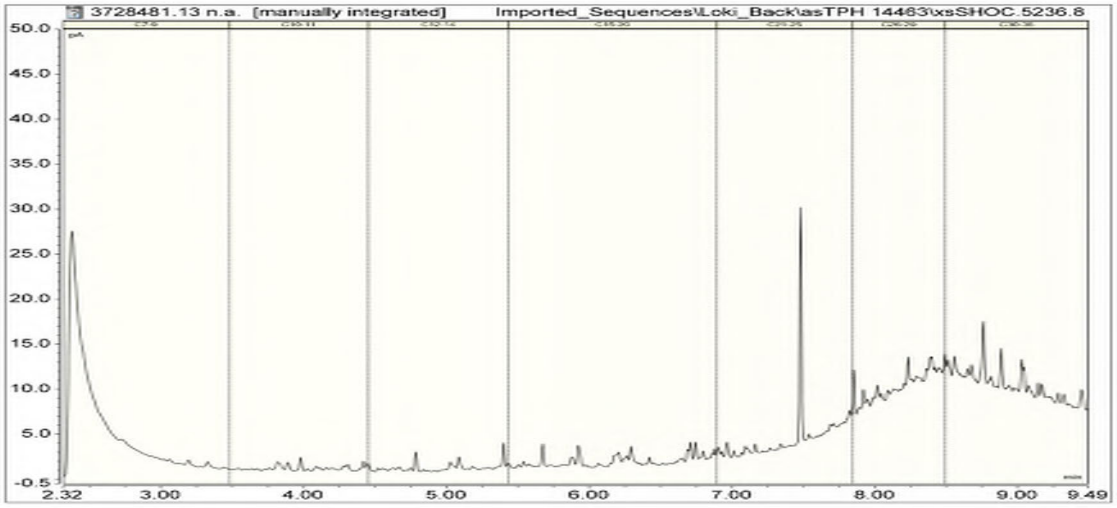
3728481.9
WSS_HA4_0.5 29-Nov-2024
Client Chromatogram for TPH by FID



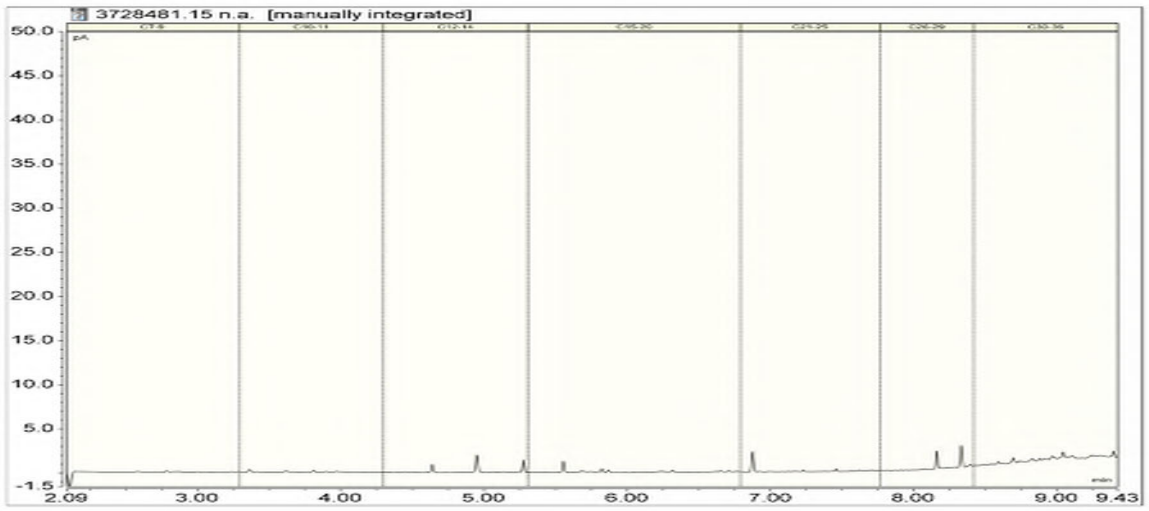
3728481.10
WSS_HA4_0.8 29-Nov-2024
Client Chromatogram for TPH by FID



3728481.13
WSS_HA5_0.5 29-Nov-2024
Client Chromatogram for TPH by FID



3728481.15
WSS_HA6_0.3 29-Nov-2024
Client Chromatogram for TPH by FID



Sample Type: Soil				
		Sample Name:	WSS_HA4_0.1 29-Nov-2024	WSS_HA4_0.3 29-Nov-2024
		Lab Number:	3728481.7	3728481.8
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.0052	0.059
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	0.0061	0.063
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	< 0.046	0.078
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

Sample Type: Soil				
		Sample Name:	WSS_HA4_0.1 29-Nov-2024	WSS_HA4_0.3 29-Nov-2024
		Lab Number:	3728481.7	3728481.8
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	< 0.0010	0.0037
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	< 0.0010	0.0042
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	0.0040	0.042
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	0.0012	0.0168
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.0052	0.059
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	< 0.0010	0.0092
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	< 0.0010
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

		Sample Name:	WSS_HA4_0.5 29-Nov-2024	WSS_HA4_0.8 29-Nov-2024
		Lab Number:	3728481.9	3728481.10
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	0.0023
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.60	2.7
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	0.61	2.7
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	0.66	2.7
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	0.0010	0.0012
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	0.0023

Sample Type: Soil				
		Sample Name:	WSS_HA4_0.5 29-Nov-2024	WSS_HA4_0.8 29-Nov-2024
		Lab Number:	3728481.9	3728481.10
PFAS in Soil - Perfluorocarboxylic Acids				
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	0.0024
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	0.0011	< 0.0010
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	0.0143	0.0196
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	0.0018	0.0019
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	0.0162	0.022
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	0.0019	0.026
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	0.49	1.27
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	0.111	1.39
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.60	2.7
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	0.0025	< 0.0010
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	0.0061	< 0.0010
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	0.022	0.0034
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	0.0012	< 0.0010
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	< 0.0010
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	0.0035	< 0.0010
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

		Sample Name:	WSS_HA5_0.1 29-Nov-2024	WSS_HA5_0.3 29-Nov-2024
		Lab Number:	3728481.11	3728481.12
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	-
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.176	-
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	0.186	-

Sample Type: Soil				
		Sample Name:	WSS_HA5_0.1 29-Nov-2024	WSS_HA5_0.3 29-Nov-2024
		Lab Number:	3728481.11	3728481.12
PFAS in Soil - Summary				
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	0.21	-
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	-
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010	-
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010	-
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	-
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	-
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	-
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	-
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	0.0013	-
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	-
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	-
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	-
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	0.0084	-
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	0.0012	-
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	0.0096	-
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	0.0015	-
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	0.095	-
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	0.082	-
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.176	-
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	0.0021	-
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	0.0067	-
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	0.0073	-
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	-
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	-
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	-
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	-
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	-
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	-
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	-
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	-
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	-
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	-
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	-
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	-
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	-
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	-
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	-
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	-
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	-
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010	-
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	-
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	-
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	-
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	-
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	-
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	-

Sample Type: Soil				
		Sample Name:	WSS_HA5_0.5 29-Nov-2024	WSS_HA6_0.1 29-Nov-2024
		Lab Number:	3728481.13	3728481.14
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	0.0055	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	6.7	0.0182
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	6.8	0.021
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	7.1	< 0.046
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	0.0012	< 0.0010
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	0.0018	< 0.0010
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	0.0093	< 0.0010
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	0.0017	< 0.0010
PFOA	Perfluorooctanoic acid	mg/kg dry wt	0.0055	< 0.0010
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	0.0012	< 0.0010
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	0.0043	< 0.0010
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	0.0080	< 0.0010
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	0.120	0.0023
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	0.0190	< 0.0010
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	0.139	0.0024
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	0.039	< 0.0010
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	4.9	0.0139
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	1.75	0.0043
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	6.7	0.0182
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	0.029	< 0.0010
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	0.038	< 0.0010
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	0.056	< 0.0010
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	0.0093	< 0.0010
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	0.0190	< 0.0010
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	0.0043	< 0.0010
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	< 0.0010
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0014	< 0.0010
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	0.010	< 0.0010
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010

Sample Type: Soil				
		Sample Name:	WSS_HA5_0.5 29-Nov-2024	WSS_HA6_0.1 29-Nov-2024
		Lab Number:	3728481.13	3728481.14
PFAS in Soil - Miscellaneous				
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

		Sample Name:	WSS_HA6_0.3 29-Nov-2024	WSS_HA7_0.1 29-Nov-2024
		Lab Number:	3728481.15	3728481.16
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	-
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.023	-
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	0.024	-
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	< 0.046	-
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	-
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010	-
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010	-
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	-
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	-
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	-
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	-
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010	-
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	-
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	-
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	-
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	0.0015	-
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	-
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	0.0016	-
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	0.0159	-
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	0.0069	-
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.023	-
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	< 0.0010	-
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	< 0.0010	-
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	-
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	-
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	-
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	-
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	-
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	-
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	-
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	-
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	-
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	-
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	-
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	-
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	-
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	-

Sample Type: Soil				
		Sample Name:	WSS_HA6_0.3 29-Nov-2024	WSS_HA7_0.1 29-Nov-2024
		Lab Number:	3728481.15	3728481.16
PFAS in Soil - Miscellaneous				
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	-
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	-
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	-
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010	-
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	-
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	-
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	-
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	-
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	-
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	-

Analyst's Comments

The Extracted Internal Standard (EIS) recovery for M8FOSA (133%) on sample 3728481.13 was above the acceptable range (40 - 130%). The sample matrix and high levels of FOSA and other analytes has caused recovery enhancement. Further dilutions could not be undertaken. Therefore the result for FOSA may be underestimated.

The matrix of samples 3728481.9, 11 and 14 has affected the System Monitoring Compounds 2-fluorophenol and phenol-d5 in the SVOC analysis, whereby the recoveries were:
3728481.9 = 35% and 34%
3728481.11 = 25% and 31%
3728481.14 = 22% and 29%
Therefore the phenolic compound results may be underestimated. The detection limits have been increased to reflect this.

‡ Analysis subcontracted to an external provider. Refer to the Summary of Methods section for more details.

#1 It should be noted that the blank TCLP extract contained an elevated level of lead (0.0037g/m3 c.f. detection limit of 0.0021g/m3).This has not been corrected for on the sample TCLP extract concentration. This should be kept in mind when interpreting these results.

Appendix No.1 - Library Search Report Chromatograms - GCMS Scan

Appendix No.2 - Library Search Report - GCMS Scan

Appendix No.3 - AsureQuality Report

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request.
Unless otherwise indicated, analyses were performed at Hill Labs, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Individual Tests			
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	1-18
Library Search on TPH samples*	A Library Search is conducted of the Mass Spectra for unidentified peaks against the NIST 2014 Mass Spectral Library. Only peaks with a greater than 70% quality match are reported, to a maximum of 50 peaks matched. In-house based on US EPA 8270.	-	13
Total of Reported PAHs in Soil	Sonication extraction, GC-MS/MS analysis. In-house based on US EPA 8270.	0.03 mg/kg dry wt	1-2, 6, 17
Poly- and Perfluorinated Alkyl Substances in TCLP Reagent Water*	Analysis by LC-MS/MS. Subcontracted to AsureQuality, Lower Hutt.	-	10, 25-26
Poly- and Perfluorinated Alkyl Substances in TCLP pH5 Acetate Buffer*	Analysis by LC-MS/MS. Subcontracted to AsureQuality, Lower Hutt.	-	10, 25-26
Dry Matter	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	1-2, 6-11, 13-15, 17

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Dry Matter	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	0.10 g/100g as rcvd	7-11, 13-15
Composite Environmental Solid Samples*	Individual sample fractions mixed together to form a composite fraction.	-	11-13
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	BaP Potency Equivalence calculated from; Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(j)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a)pyrene x 1.0 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Fluoranthene x 0.01 + Indeno(1,2,3-c,d)pyrene x 0.1. Ministry for the Environment. 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.	0.024 mg/kg dry wt	1-2, 6, 17
Benzo[a]pyrene Toxic Equivalence (TEF)*	Benzo[a]pyrene Toxic Equivalence (TEF) calculated from; Benzo[a]pyrene x 1.0 + Benzo(a)anthracene x 0.1 + Benzo(b) fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Indeno(1,2,3-c,d)pyrene x 0.1. Guidelines for assessing and managing contaminated gasworks sites in New Zealand (GMG) (MfE, 1997).	0.024 mg/kg dry wt	1-2, 6, 17
Heavy Metals with Mercury, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	1-18
Polycyclic Aromatic Hydrocarbons Screening in Soil*	Sonication extraction, GC-MS/MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.010 - 0.05 mg/kg dry wt	1-2, 6, 17
Semivolatile Organic Compounds Trace in Soil by GC-MS	Sonication extraction, GC-MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.10 - 6 mg/kg dry wt	7-11, 13-15
SPLP Profile*	Extraction at 30 +/- 2 rpm for 18 +/- 2 hours, (Ratio 1g sample : 20g extraction fluid). US EPA 1312.	-	22
TCLP Profile*	Extraction at 30 +/- 2 rpm for 18 +/- 2 hours, (Ratio 1g sample : 20g extraction fluid). US EPA 1311.	-	22
PFAS in Soil	Solvent extraction. LC-MS/MS analysis. Tested on as received sample. In-house based on ASTM D7968.	0.0010 - 0.046 mg/kg dry wt	7-11, 13-15
Total Petroleum Hydrocarbons in Soil			
Client Chromatogram for TPH by FID	Small peaks associated with QC compounds may be visible in chromatograms with low TPH concentrations. QC peaks are as follows: one peak in the C12 - 14 band, the C21 - 25 band and the C30 - 36 band. All QC peaks are corrected for in the reported TPH concentrations.	-	8-10, 13, 15
C7 - C9	Solvent extraction, GC-FID analysis. In-house based on US EPA 8015.	20 mg/kg dry wt	7-11, 13-15
C10 - C14	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	20 mg/kg dry wt	7-11, 13-15
C15 - C36	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	40 mg/kg dry wt	7-11, 13-15
Total hydrocarbons (C7 - C36)	Calculation: Sum of carbon bands from C7 to C36. In-house based on US EPA 8015.	70 mg/kg dry wt	7-11, 13-15
SPLP Profile			
SPLP Sample Weight	Gravimetric. US EPA 1312.	0.1 g	22
SPLP Extractant Type*	US EPA 1312 (Modified for New Zealand conditions to use De-ionised Water unless otherwise specified).	-	22
SPLP Final pH	pH meter. US EPA 1312.	0.1 pH Units	22
TCLP Profile			
TCLP Weight of Sample Taken	Gravimetric. US EPA 1311.	0.1 g	22
TCLP Initial Sample pH	pH meter. US EPA 1311.	0.1 pH Units	22
TCLP Acid Adjusted Sample pH	pH meter. US EPA 1311.	0.1 pH Units	22
TCLP Extractant Type*	US EPA 1311.	-	22
TCLP Extraction Fluid pH	pH meter. US EPA 1311.	0.1 pH Units	22
TCLP Post Extraction Sample pH	pH meter. US EPA 1311.	0.1 pH Units	22

Sample Type: Aqueous			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Individual Tests			
Poly- and Perfluorinated Alkyl Substances in Water*	Analysis by LC-MS/MS. Subcontracted to AsureQuality, Lower Hutt.	-	20
Total Digestion of Extracted Samples*	Nitric acid digestion. APHA 3030 E (modified) : Online Edition.	-	23-24

Sample Type: Aqueous			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Total Lead	Nitric acid digestion, ICP-MS, screen level. APHA 3125 B : Online Edition.	0.0021 g/m^3	23
Total Lead	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition / US EPA 200.8.	0.00011 g/m^3	24
Total Zinc	Nitric acid digestion, ICP-MS, screen level. APHA 3125 B : Online Edition.	0.053 g/m^3	23
Total Zinc	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition / US EPA 200.8.	0.0011 g/m^3	24

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 03-Dec-2024 and 08-Jan-2025. For completion dates of individual analyses please contact the laboratory.

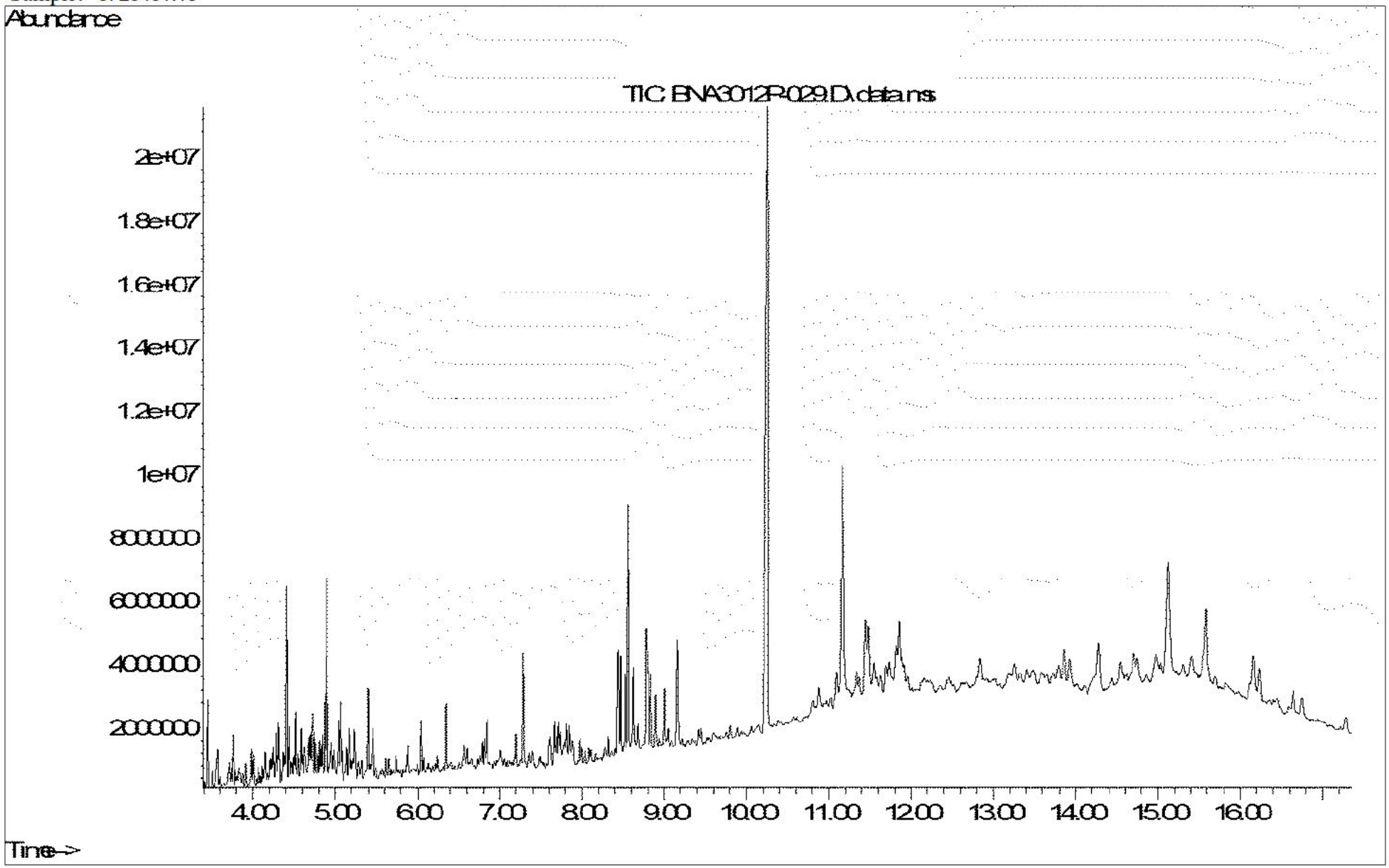
Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.



Kim Harrison MSc
Client Services Manager - Environmental

Sample: 3728481.13



Note: Lone peaks are often internal standards.

LSR Sample: 3728481/13

TIC Integration Parameters: RTEINT.e

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Peak Number 1 Decane Concentration Rank 72

R.T.	EstConc	Area	Relative to ISTD	R.T.
4.413		53276000	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Decane	142	C10H22	000124-18-5	95
2	Decane	142	C10H22	000124-18-5	94

****

Peak Number 2 Undecane Concentration Rank 74

R.T.	EstConc	Area	Relative to ISTD	R.T.
4.902		50126200	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Undecane	156	C11H24	001120-21-4	95
2	Undecane	156	C11H24	001120-21-4	94

****

Peak Number 3 Phenol, 4-(1,1,3,3-tetramet... Concentration Rank 78

R.T.	EstConc	Area	Relative to ISTD	R.T.
7.287		49832200	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Phenol, 4-(1,1,3,3-tetramethylbu...	206	C14H22O	000140-66-9	91
2	Phenol, 4-(1,1,3,3-tetramethylbu...	206	C14H22O	000140-66-9	87

****

Peak Number 5 1,2-Benzenedicarboxylic aci... Concentration Rank 42

R.T.	EstConc	Area	Relative to ISTD	R.T.
8.564		86553000	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	1,2-Benzenedicarboxylic acid, bu...	278	C16H22O4	017851-53-5	94
2	Dibutyl phthalate	278	C16H22O4	000084-74-2	94

****

Peak Number 7 Benzene, (1-methyltridecyl)- Concentration Rank 28

R.T.	EstConc	Area	Relative to ISTD	R.T.
8.778		103913000	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Benzene, (1-methyltridecyl)-	274	C20H34	004534-59-2	70
2	Benzene, (1-methyldodecyl)-	260	C19H32	004534-53-6	43

****

Peak Number 10 Benzyl butyl phthalate Concentration Rank 1

R.T.	EstConc	Area	Relative to ISTD	R.T.
10.255		481006000	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Benzyl butyl phthalate	312	C19H20O4	000085-68-7	99
2	Benzyl butyl phthalate	312	C19H20O4	000085-68-7	93

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Peak Number 11 Nonadecane, 9-methyl- Concentration Rank 41

R.T.	EstConc	Area	Relative to ISTD	R.T.
10.576		86613200	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Nonadecane, 9-methyl-	282	C20H42	013287-24-6	86
2	Heptacosane	380	C27H56	000593-49-7	62

****

Peak Number 15 Bis(2-ethylhexyl) phthalate Concentration Rank 35

R.T.	EstConc	Area	Relative to ISTD	R.T.
11.099		96771600	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Bis(2-ethylhexyl) phthalate	390	C24H38O4	000117-81-7	89
2	Diisooctyl phthalate	390	C24H38O4	000131-20-4	86

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Peak Number 16 Phthalic acid, di(2-propylp... Concentration Rank 5

R.T.	EstConc	Area	Relative to ISTD	R.T.
11.173		249641000	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Phthalic acid, di(2-propylpentyl...	390	C24H38O4	1000377-93-5	91
2	Bis(2-ethylhexyl) phthalate	390	C24H38O4	000117-81-7	90

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Peak Number 18 Bis(2-ethylhexyl) phthalate Concentration Rank 21

R.T.	EstConc	Area	Relative to ISTD	R.T.
11.338		114752000	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Bis(2-ethylhexyl) phthalate	390	C24H38O4	000117-81-7	87
2	Bis(2-ethylhexyl) phthalate	390	C24H38O4	000117-81-7	86

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Peak Number 21 Bis(2-ethylhexyl) phthalate Concentration Rank 33

R.T.	EstConc	Area	Relative to ISTD	R.T.
11.483		99257200	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Bis(2-ethylhexyl) phthalate	390	C24H38O4	000117-81-7	90
2	Diisooctyl phthalate	390	C24H38O4	000131-20-4	83

****

Peak Number 22 Diisooctyl phthalate Concentration Rank 40

R.T.	EstConc	Area	Relative to ISTD	R.T.
11.552		89186300	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Diisooctyl phthalate	390	C24H38O4	000131-20-4	86
2	Phthalic acid, 2-cyclohexylethyl...	388	C24H36O4	1000309-87-8	47

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Peak Number 24 Diisooctyl phthalate Concentration Rank 49

R.T.	EstConc	Area	Relative to ISTD	R.T.
11.697		79907400	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Diisooctyl phthalate	390	C24H38O4	000131-20-4	91
2	Phthalic acid, heptyl isoporpyl ...	306	C18H26O4	1000315-00-1	49

****

Peak Number 25 Diisooctyl phthalate Concentration Rank 22

R.T.	EstConc	Area	Relative to ISTD	R.T.
11.737		109658000	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Diisooctyl phthalate	390	C24H38O4	000131-20-4	78
2	Di-n-octyl phthalate	390	C24H38O4	000117-84-0	64

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Peak Number 26 Diisooctyl phthalate Concentration Rank 43

R.T.	EstConc	Area	Relative to ISTD	R.T.
11.819		84744200	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Diisooctyl phthalate	390	C24H38O4	000131-20-4	94
2	Bis(2-ethylhexyl) phthalate	390	C24H38O4	000117-81-7	74

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Peak Number 35 Heptacosane, 1-chloro- Concentration Rank 6

R.T.	EstConc	Area	Relative to ISTD	R.T.
12.465		190936000	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Heptacosane, 1-chloro-	414	C27H55Cl	062016-79-9	98
2	Pentacosane	352	C25H52	000629-99-2	96

****

Peak Number 39 Octabenzone Concentration Rank 27

R.T.	EstConc	Area	Relative to ISTD	R.T.
12.841		104164000	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Octabenzone	326	C21H26O3	001843-05-6	93
2	Octabenzone	326	C21H26O3	001843-05-6	60

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Peak Number 44 Tetracosane, 1-bromo- Concentration Rank 23

R.T.	EstConc	Area	Relative to ISTD	R.T.
13.184		108946000	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Tetracosane, 1-bromo-	416	C24H49Br	006946-24-3	89
2	Nonadecane	268	C19H40	000629-92-5	83

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Peak Number 46 5a,8b,9a,14b,17a,20R-Choles... Concentration Rank 25

R.T.	EstConc	Area	Relative to ISTD	R.T.
13.326		105615000	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	5a,8b,9a,14b,17a,20R-Cholestane	372	C27H48	1000147-83-1	83
2	Isoquinoline, 1-(2-methylphenyl)-	219	C16H13N	022826-52-4	30

****

Peak Number 49 Cholestane Concentration Rank 29

R.T.	EstConc	Area	Relative to ISTD	R.T.
13.587		103270000	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Cholestane	372	C27H48	000481-21-0	92
2	Cholestane	372	C27H48	000481-21-0	89

****

Peak Number 56 5a,8b,9a,14b,17a,20R-Choles... Concentration Rank 39

R.T.	EstConc	Area	Relative to ISTD	R.T.
14.105		89960400	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	5a,8b,9a,14b,17a,20R-Cholestane	372	C27H48	1000147-83-1	86
2	Naphthalene, 2-(phenylmethyl)-	218	C17H14	000613-59-2	53

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Peak Number 57 Benzenamine, 4-octyl-N-(4-o... Concentration Rank 4

R.T.	EstConc	Area	Relative to ISTD	R.T.
14.280		255553000	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Benzenamine, 4-octyl-N-(4-octylp...	393	C28H43N	000101-67-7	91
2	Benzenamine, 4-(1,1,3,3-tetramet...	393	C28H43N	015721-78-5	55

****

Peak Number 66 28-Nor-17.beta.(H)-hopane Concentration Rank 2

R.T.	EstConc	Area	Relative to ISTD	R.T.
15.127		303596000	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	28-Nor-17.beta.(H)-hopane	398	C29H50	036728-72-0	90
2	Baccharane	414	C30H54	036441-74-4	62

****

Peak Number 69 Baccharane Concentration Rank 7

R.T.	EstConc	Area	Relative to ISTD	R.T.
15.409		190586000	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Baccharane	414	C30H54	036441-74-4	70
2	28-Nor-17.alpha.(H)-hopane	398	C29H50	053584-60-4	62

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Peak Number 70 Urs-20-en-16-ol, (16.beta.,... Concentration Rank 3

R.T.	EstConc	Area	Relative to ISTD	R.T.
15.592		275722000	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Urs-20-en-16-ol, (16.beta.,18.al...	426	C30H50O	066394-74-9	72
2	.beta.-iso-Methyl ionone	206	C14H22O	1000285-40-2	64

****

Peak Number 76 Urs-20-en-16-ol, (16.beta.,... Concentration Rank 48

R.T.	EstConc	Area	Relative to ISTD	R.T.
16.233		80158700	External Standard	0.000

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Urs-20-en-16-ol, (16.beta.,18.al...	426	C30H50O	066394-74-9	72
2	.beta.-iso-Methyl ionone	206	C14H22O	1000285-40-2	70

****

AsureQuality Limited | 1C Quadrant Drive | Waiwhetu | Lower Hutt 5010 | Wellington | New Zealand
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t. +64 4 570 8800 | e. testing@asurequality.com | w. www.asurequality.com

Certificate of Analysis

Submission Reference: EnvSubAQ_LH 1278

Final Report

Pre-registration ID: ipP-PmD-xfx
PO Number: [redacted]

Hill Subcontracting
Hill Laboratories - Hamilton
Private Bag 3205
Hamilton 3240
New Zealand

Report Issued: 08-Jan-2025 **AsureQuality Reference: 24-338405** **Sample(s) Received:** 12-Dec-2024 08:35

Testing Period: 12-Dec-2024 to 08-Jan-2025
Date of analysis is available on request.

Sample Summary

Customer Sample Name: WSS_HA5_0.1 **Lab ID:** 24-338405-3
Sample Description: 3728481.11
Sample Condition: Acceptable **Sampled Date**: 29-Nov-2024

Customer Sample Name: WSS_HA5_0.3 **Lab ID:** 24-338405-4
Sample Description: 3728481.12
Sample Condition: Acceptable **Sampled Date**: 29-Nov-2024

Customer Sample Name: WSS_HA5_0.5 **Lab ID:** 24-338405-5
Sample Description: 3728481.13
Sample Condition: Acceptable **Sampled Date**: 29-Nov-2024

Customer Sample Name: WSS_HA4_0.1 **Lab ID:** 24-338405-6
Sample Description: 3728481.7
Sample Condition: Acceptable **Sampled Date**: 29-Nov-2024

Customer Sample Name: WSS_HA4_0.3 **Lab ID:** 24-338405-7
Sample Description: 3728481.8
Sample Condition: Acceptable **Sampled Date**: 29-Nov-2024

Customer Sample Name: WSS_HA4_0.5 **Lab ID:** 24-338405-8
Sample Description: 3728481.9
Sample Condition: Acceptable **Sampled Date**: 29-Nov-2024

Composition

Composite ID	Composition
24-338405-9	24-338405-3, 24-338405-4, 24-338405-5
24-338405-10	24-338405-6, 24-338405-7, 24-338405-8

Results

The tests were performed on the samples as received.

Customer Sample Name: WSS_HA4_0.8 **Lab ID:** 24-338405-1
Sample Description: 3728481.10
Sample Condition: Acceptable **Sampled Date**: 29-Nov-2024

Test	Result	Unit	Method Reference
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water			

AsureQuality Ltd has used reasonable skill, care, and effort to provide an accurate analysis of the sample(s) which form(s) the subject of this report. However, the accuracy of this analysis is reliant on, and subject to, the sample(s) provided by you and your responsibility as to transportation of the sample(s). AsureQuality Ltd's standard terms of business apply to the analysis set out in this report: https://www.asurequality.com/about/terms-of-business/

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Perfluoroalkylsulfonic acids			
PFPrS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS *	0.038	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1) *	0.088	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1) *	0.98	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3) *	1.1	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS *	1.0	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5) *	2.5	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5) *	60	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5) *	81	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7) *	140	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1) *	140	µg/L	AsureQuality Method (LC-MS/MS)
PFNS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA *	0.095	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA *	0.030	µg/L	AsureQuality Method (LC-MS/MS)
PFOA *	0.13	µg/L	AsureQuality Method (LC-MS/MS)
PFNA *	0.14	µg/L	AsureQuality Method (LC-MS/MS)
PFDA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA) *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major) *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 24-338405 **Report Issued:** 08-Jan-2025

Test	Result	Unit	Method Reference
F-53B (minor) *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX) *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS *	110	%	AsureQuality Method (LC-MS/MS)
M3PFHxS *	103	%	AsureQuality Method (LC-MS/MS)
M8PFOS *	98	%	AsureQuality Method (LC-MS/MS)
M4PFBA *	103	%	AsureQuality Method (LC-MS/MS)
M5PFPeA *	103	%	AsureQuality Method (LC-MS/MS)
M5PFHxA *	103	%	AsureQuality Method (LC-MS/MS)
MPFHpA *	99	%	AsureQuality Method (LC-MS/MS)
M8PFOA *	102	%	AsureQuality Method (LC-MS/MS)
M9PFNA *	76	%	AsureQuality Method (LC-MS/MS)
M6PFDA *	113	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA *	111	%	AsureQuality Method (LC-MS/MS)
MPFDoDA *	109	%	AsureQuality Method (LC-MS/MS)
MPFTeDA *	114	%	AsureQuality Method (LC-MS/MS)
MPFOSA *	105	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA *	105	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA *	101	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA *	115	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA *	98	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE *	112	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE *	98	%	AsureQuality Method (LC-MS/MS)
M4:2FTS *	81	%	AsureQuality Method (LC-MS/MS)
M6:2FTS *	99	%	AsureQuality Method (LC-MS/MS)
M8:2FTS *	102	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA *	108	%	AsureQuality Method (LC-MS/MS)
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - pH5 Acetate Buffer			
Perfluoroalkylsulfonic acids			
PFPrS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS *	0.036	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1) *	0.093	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1) *	0.96	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3) *	1.1	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS *	0.76	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5) *	1.9	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5) *	36	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5) *	39	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7) *	77	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1) *	78	µg/L	AsureQuality Method (LC-MS/MS)
PFNS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

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Test	Result	Unit	Method Reference
PFPeA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA *	0.099	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA *	0.030	µg/L	AsureQuality Method (LC-MS/MS)
PFOA *	0.11	µg/L	AsureQuality Method (LC-MS/MS)
PFNA *	0.098	µg/L	AsureQuality Method (LC-MS/MS)
PFDA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA) *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major) *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor) *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX) *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS *	109	%	AsureQuality Method (LC-MS/MS)
M3PFHxS *	102	%	AsureQuality Method (LC-MS/MS)
M8PFOS *	98	%	AsureQuality Method (LC-MS/MS)
M4PFBA *	105	%	AsureQuality Method (LC-MS/MS)
M5PFPeA *	109	%	AsureQuality Method (LC-MS/MS)
M5PFHxA *	102	%	AsureQuality Method (LC-MS/MS)
MPFHpA *	101	%	AsureQuality Method (LC-MS/MS)
M8PFOA *	105	%	AsureQuality Method (LC-MS/MS)
M9PFNA *	98	%	AsureQuality Method (LC-MS/MS)
M6PFDA *	101	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA *	91	%	AsureQuality Method (LC-MS/MS)
MPFDoDA *	94	%	AsureQuality Method (LC-MS/MS)
MPFTeDA *	98	%	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 24-338405 **Report Issued:** 08-Jan-2025

Test	Result	Unit	Method Reference
MPFOSA *	101	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA *	98	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA *	101	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA *	99	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA *	95	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE *	102	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE *	97	%	AsureQuality Method (LC-MS/MS)
M4:2FTS *	96	%	AsureQuality Method (LC-MS/MS)
M6:2FTS *	104	%	AsureQuality Method (LC-MS/MS)
M8:2FTS *	96	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA *	119	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: Rinsate Blank 1 **Lab ID:** 24-338405-2

Sample Description: 3728481.20

Sample Condition: Acceptable **Sampled Date**: 29-Nov-2024

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 24-338405 **Report Issued:** 08-Jan-2025

Test	Result	Unit	Method Reference
NMeFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	103	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	111	%	AsureQuality Method (LC-MS/MS)
M8PFOS	127	%	AsureQuality Method (LC-MS/MS)
M4PFBA	100	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	101	%	AsureQuality Method (LC-MS/MS)
MPFHpA	107	%	AsureQuality Method (LC-MS/MS)
M8PFOA	106	%	AsureQuality Method (LC-MS/MS)
M9PFNA	112	%	AsureQuality Method (LC-MS/MS)
M6PFDA	124	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	130	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	191 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	154 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	99	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	93	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	102	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	138	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	135	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	101	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	100	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	124	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	128	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	111	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: Composite of WSS_HA5_0.1, WSS_HA5_0.3 & WSS_HA5_0.5 **Lab ID:** 24-338405-9

Sample Description: 3728481.25

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AsureQuality Reference: 24-338405 **Report Issued:** 08-Jan-2025

Test	Result	Unit	Method Reference
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water			
Perfluoroalkylsulfonic acids			
PFPrS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS *	0.093	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS *	0.17	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1) *	0.32	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1) *	2.3	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3) *	2.6	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS *	0.34	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5) *	0.65	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5) *	17	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5) *	73	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7) *	91	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1) *	94	µg/L	AsureQuality Method (LC-MS/MS)
PFNS *	0.15	µg/L	AsureQuality Method (LC-MS/MS)
PFDS *	0.12	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA *	0.46	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA *	0.063	µg/L	AsureQuality Method (LC-MS/MS)
PFOA *	0.17	µg/L	AsureQuality Method (LC-MS/MS)
PFNA *	0.029	µg/L	AsureQuality Method (LC-MS/MS)
PFDA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA *	0.026	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA *	0.12	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS *	0.39	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS *	0.53	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA) *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA) *	0.038	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)

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Test	Result	Unit	Method Reference
Miscellaneous			
F-53B (major) *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor) *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX) *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS *	112	%	AsureQuality Method (LC-MS/MS)
M3PFHxS *	104	%	AsureQuality Method (LC-MS/MS)
M8PFOS *	101	%	AsureQuality Method (LC-MS/MS)
M4PFBA *	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA *	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA *	103	%	AsureQuality Method (LC-MS/MS)
MPFHpA *	104	%	AsureQuality Method (LC-MS/MS)
M8PFOA *	99	%	AsureQuality Method (LC-MS/MS)
M9PFNA *	84	%	AsureQuality Method (LC-MS/MS)
M6PFDA *	116	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA *	101	%	AsureQuality Method (LC-MS/MS)
MPFDoDA *	106	%	AsureQuality Method (LC-MS/MS)
MPFTeDA *	127	%	AsureQuality Method (LC-MS/MS)
MPFOSA *	105	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA *	104	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA *	101	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA *	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA *	99	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE *	107	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE *	100	%	AsureQuality Method (LC-MS/MS)
M4:2FTS *	103	%	AsureQuality Method (LC-MS/MS)
M6:2FTS *	88	%	AsureQuality Method (LC-MS/MS)
M8:2FTS *	104	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA *	120	%	AsureQuality Method (LC-MS/MS)
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - pH5 Acetate Buffer			
Perfluoroalkylsulfonic acids			
PFPrS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS *	0.089	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS *	0.15	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1) *	0.32	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1) *	2.3	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3) *	2.6	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS *	0.30	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5) *	0.43	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5) *	11	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5) *	39	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7) *	50	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1) *	53	µg/L	AsureQuality Method (LC-MS/MS)
PFNS *	0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 24-338405 **Report Issued:** 08-Jan-2025

Test	Result	Unit	Method Reference
Perfluoroalkylcarboxylic acids			
PFBA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA *	0.44	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA *	0.059	µg/L	AsureQuality Method (LC-MS/MS)
PFOA *	0.14	µg/L	AsureQuality Method (LC-MS/MS)
PFNA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS *	0.27	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS *	0.27	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA) *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major) *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor) *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX) *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS *	111	%	AsureQuality Method (LC-MS/MS)
M3PFHxS *	99	%	AsureQuality Method (LC-MS/MS)
M8PFOS *	99	%	AsureQuality Method (LC-MS/MS)
M4PFBA *	105	%	AsureQuality Method (LC-MS/MS)
M5PFPeA *	106	%	AsureQuality Method (LC-MS/MS)
M5PFHxA *	103	%	AsureQuality Method (LC-MS/MS)
MPFHpA *	101	%	AsureQuality Method (LC-MS/MS)
M8PFOA *	103	%	AsureQuality Method (LC-MS/MS)
M9PFNA *	94	%	AsureQuality Method (LC-MS/MS)
M6PFDA *	96	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA *	94	%	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 24-338405 **Report Issued:** 08-Jan-2025

Test	Result	Unit	Method Reference
MPFDoDA *	102	%	AsureQuality Method (LC-MS/MS)
MPFTeDA *	116	%	AsureQuality Method (LC-MS/MS)
MPFOSA *	110	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA *	98	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA *	101	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA *	105	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA *	103	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE *	102	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE *	103	%	AsureQuality Method (LC-MS/MS)
M4:2FTS *	79	%	AsureQuality Method (LC-MS/MS)
M6:2FTS *	109	%	AsureQuality Method (LC-MS/MS)
M8:2FTS *	101	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA *	97	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: Composite of WSS_HA4_0.1, WSS_HA4_0.3 & WSS_HA4_0.5 **Lab ID:** 24-338405-10

Sample Description: 3728481.26

Test	Result	Unit	Method Reference
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water			
Perfluoroalkylsulfonic acids			
PFPrS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1) *	0.11	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3) *	0.11	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5) *	0.87	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5) *	4.5	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7) *	5.4	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1) *	5.5	µg/L	AsureQuality Method (LC-MS/MS)
PFNS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA *	0.041	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA *	0.045	µg/L	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 24-338405 **Report Issued:** 08-Jan-2025

Test	Result	Unit	Method Reference
NEtFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA) *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major) *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor) *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX) *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS *	104	%	AsureQuality Method (LC-MS/MS)
M3PFHxS *	105	%	AsureQuality Method (LC-MS/MS)
M8PFOS *	102	%	AsureQuality Method (LC-MS/MS)
M4PFBA *	105	%	AsureQuality Method (LC-MS/MS)
M5PFPeA *	100	%	AsureQuality Method (LC-MS/MS)
M5PFHxA *	104	%	AsureQuality Method (LC-MS/MS)
MPFHpA *	104	%	AsureQuality Method (LC-MS/MS)
M8PFOA *	101	%	AsureQuality Method (LC-MS/MS)
M9PFNA *	98	%	AsureQuality Method (LC-MS/MS)
M6PFDA *	106	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA *	108	%	AsureQuality Method (LC-MS/MS)
MPFDoDA *	116	%	AsureQuality Method (LC-MS/MS)
MPFTeDA *	109	%	AsureQuality Method (LC-MS/MS)
MPFOSA *	106	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA *	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA *	103	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA *	112	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA *	95	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE *	109	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE *	100	%	AsureQuality Method (LC-MS/MS)
M4:2FTS *	95	%	AsureQuality Method (LC-MS/MS)
M6:2FTS *	99	%	AsureQuality Method (LC-MS/MS)
M8:2FTS *	93	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA *	98	%	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 24-338405 **Report Issued:** 08-Jan-2025

Test	Result	Unit	Method Reference
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - pH5 Acetate Buffer			
Perfluoroalkylsulfonic acids			
PFPrS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1) *	0.12	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3) *	0.12	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5) *	0.63	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5) *	2.8	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7) *	3.4	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1) *	3.5	µg/L	AsureQuality Method (LC-MS/MS)
PFNS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA *	0.048	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA) *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)

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Test	Result	Unit	Method Reference
Miscellaneous			
F-53B (major) *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor) *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX) *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS *	108	%	AsureQuality Method (LC-MS/MS)
M3PFHxS *	101	%	AsureQuality Method (LC-MS/MS)
M8PFOS *	98	%	AsureQuality Method (LC-MS/MS)
M4PFBA *	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA *	110	%	AsureQuality Method (LC-MS/MS)
M5PFHxA *	101	%	AsureQuality Method (LC-MS/MS)
MPFHpA *	95	%	AsureQuality Method (LC-MS/MS)
M8PFOA *	104	%	AsureQuality Method (LC-MS/MS)
M9PFNA *	115	%	AsureQuality Method (LC-MS/MS)
M6PFDA *	88	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA *	89	%	AsureQuality Method (LC-MS/MS)
MPFDoDA *	95	%	AsureQuality Method (LC-MS/MS)
MPFTeDA *	89	%	AsureQuality Method (LC-MS/MS)
MPFOSA *	102	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA *	96	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA *	97	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA *	95	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA *	90	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE *	97	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE *	97	%	AsureQuality Method (LC-MS/MS)
M4:2FTS *	84	%	AsureQuality Method (LC-MS/MS)
M6:2FTS *	104	%	AsureQuality Method (LC-MS/MS)
M8:2FTS *	104	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA *	102	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: Duplicate of 24-338405-1 **Lab ID:** 24-338405-11

Sample Description: WSS_HA4_0.8 Duplicate

Sample Condition: Acceptable **Sampled Date**: 29-Nov-2024

Test	Result	Unit	Method Reference
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water			
Perfluoroalkylsulfonic acids			
PFPrS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS *	0.036	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1) *	0.088	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1) *	0.98	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3) *	1.1	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS *	0.90	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5) *	2.5	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5) *	60	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5) *	77	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7) *	140	µg/L	AsureQuality Method (LC-MS/MS)

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Test	Result	Unit	Method Reference
Sum PFHxS+PFOS (1) *	140	µg/L	AsureQuality Method (LC-MS/MS)
PFNS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA *	0.099	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA *	0.027	µg/L	AsureQuality Method (LC-MS/MS)
PFOA *	0.13	µg/L	AsureQuality Method (LC-MS/MS)
PFNA *	0.12	µg/L	AsureQuality Method (LC-MS/MS)
PFDA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA) *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major) *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor) *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX) *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS *	112	%	AsureQuality Method (LC-MS/MS)
M3PFHxS *	104	%	AsureQuality Method (LC-MS/MS)
M8PFOS *	92	%	AsureQuality Method (LC-MS/MS)
M4PFBA *	104	%	AsureQuality Method (LC-MS/MS)
M5PFPeA *	107	%	AsureQuality Method (LC-MS/MS)
M5PFHxA *	108	%	AsureQuality Method (LC-MS/MS)
MPFHpA *	102	%	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 24-338405 **Report Issued:** 08-Jan-2025

Test	Result	Unit	Method Reference
M8PFOA *	104	%	AsureQuality Method (LC-MS/MS)
M9PFNA *	80	%	AsureQuality Method (LC-MS/MS)
M6PFDA *	108	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA *	105	%	AsureQuality Method (LC-MS/MS)
MPFDoDA *	101	%	AsureQuality Method (LC-MS/MS)
MPFTeDA *	112	%	AsureQuality Method (LC-MS/MS)
MPFOSA *	106	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA *	105	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA *	102	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA *	95	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA *	102	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE *	109	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE *	104	%	AsureQuality Method (LC-MS/MS)
M4:2FTS *	98	%	AsureQuality Method (LC-MS/MS)
M6:2FTS *	98	%	AsureQuality Method (LC-MS/MS)
M8:2FTS *	106	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA *	117	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: Duplicate of 24-338405-10 **Lab ID:** 24-338405-12

Sample Description: 3728481.26 Duplicate

Sample Condition: Acceptable **Sampled Date**: 29-Nov-2024

Test	Result	Unit	Method Reference
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - pH5 Acetate Buffer			
Perfluoroalkylsulfonic acids			
PFPrS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1) *	0.12	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3) *	0.12	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5) *	0.58	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5) *	2.6	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7) *	3.2	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1) *	3.3	µg/L	AsureQuality Method (LC-MS/MS)
PFNS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA *	0.051	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 24-338405 **Report Issued:** 08-Jan-2025

Test	Result	Unit	Method Reference
PFTrDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA) *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA) *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major) *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor) *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA *	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX) *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS *	102	%	AsureQuality Method (LC-MS/MS)
M3PFHxS *	101	%	AsureQuality Method (LC-MS/MS)
M8PFOS *	108	%	AsureQuality Method (LC-MS/MS)
M4PFBA *	105	%	AsureQuality Method (LC-MS/MS)
M5PFPeA *	109	%	AsureQuality Method (LC-MS/MS)
M5PFHxA *	97	%	AsureQuality Method (LC-MS/MS)
MPFHpA *	98	%	AsureQuality Method (LC-MS/MS)
M8PFOA *	104	%	AsureQuality Method (LC-MS/MS)
M9PFNA *	102	%	AsureQuality Method (LC-MS/MS)
M6PFDA *	100	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA *	91	%	AsureQuality Method (LC-MS/MS)
MPFDoDA *	96	%	AsureQuality Method (LC-MS/MS)
MPFTeDA *	106	%	AsureQuality Method (LC-MS/MS)
MPFOSA *	103	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA *	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA *	98	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA *	101	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA *	89	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE *	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE *	99	%	AsureQuality Method (LC-MS/MS)
M4:2FTS *	84	%	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 24-338405 **Report Issued:** 08-Jan-2025

Test	Result	Unit	Method Reference
M6:2FTS *	101	%	AsureQuality Method (LC-MS/MS)
M8:2FTS *	96	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA *	93	%	AsureQuality Method (LC-MS/MS)

QC Results

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Relates to sample(s) 24-338405-1, 24-338405-9, 24-338405-10, 24-338405-11

Test	Result	Unit	Method Reference
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)

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Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	111	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	112	%	AsureQuality Method (LC-MS/MS)
M8PFOS	113	%	AsureQuality Method (LC-MS/MS)
M4PFBA	106	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	106	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	108	%	AsureQuality Method (LC-MS/MS)
MPFHpA	107	%	AsureQuality Method (LC-MS/MS)
M8PFOA	101	%	AsureQuality Method (LC-MS/MS)
M9PFNA	101	%	AsureQuality Method (LC-MS/MS)
M6PFDA	106	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	103	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	106	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	91	%	AsureQuality Method (LC-MS/MS)
MPFOSA	106	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	102	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	103	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	91	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	96	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	88	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	97	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	115	%	AsureQuality Method (LC-MS/MS)

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Relates to sample(s) 24-338405-1, 24-338405-9, 24-338405-10, 24-338405-12

Test	Result	Unit	Method Reference
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - pH5 Acetate Buffer			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 24-338405 **Report Issued:** 08-Jan-2025

Test	Result	Unit	Method Reference
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	99	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	96	%	AsureQuality Method (LC-MS/MS)
M8PFOS	92	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	110	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	101	%	AsureQuality Method (LC-MS/MS)
MPFHpA	103	%	AsureQuality Method (LC-MS/MS)
M8PFOA	99	%	AsureQuality Method (LC-MS/MS)
M9PFNA	103	%	AsureQuality Method (LC-MS/MS)
M6PFDA	94	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	90	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	96	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	79	%	AsureQuality Method (LC-MS/MS)
MPFOSA	103	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	101	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	96	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	102	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	102	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	89	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	115	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	94	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	117	%	AsureQuality Method (LC-MS/MS)

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Relates to sample(s) 24-338405-2

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 24-338405 **Report Issued:** 08-Jan-2025

Test	Result	Unit	Method Reference
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 24-338405 **Report Issued:** 08-Jan-2025

Test	Result	Unit	Method Reference
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	96	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	104	%	AsureQuality Method (LC-MS/MS)
M8PFOS	112	%	AsureQuality Method (LC-MS/MS)
M4PFBA	95	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	102	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	98	%	AsureQuality Method (LC-MS/MS)
MPFHpA	103	%	AsureQuality Method (LC-MS/MS)
M8PFOA	100	%	AsureQuality Method (LC-MS/MS)
M9PFNA	101	%	AsureQuality Method (LC-MS/MS)
M6PFDA	109	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	101	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	117	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	138	%	AsureQuality Method (LC-MS/MS)
MPFOSA	92	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	104	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	106	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	111	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	108	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	102	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	106	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	108	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	95	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	100	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
DX-PFCS01, 03-SUITE_B	AsureQuality Method (LC-MS/MS)	IANZ	Christopher Sampson

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)

mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)

L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)

Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)

di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)

mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)

L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)

Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)

Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.

Reported results are corrected for internal standard recovery

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AsureQuality Reference: 24-338405 **Report Issued:** 08-Jan-2025

Analysis	Method	Accreditation	Authorised by
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water			
DX-PFCS02, 06-TCLP_W	AsureQuality Method (LC-MS/MS)	Not Accredited	Christopher Sampson

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)
mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)
L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)
Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)
di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)
mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)
L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)
Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)
Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)
Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)
For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.
Reported results are corrected for internal standard recovery.
In house protocol based on US EPA 1311 test Toxicity Characteristic Leaching Procedure (TCLP).

Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - pH5 Acetate Buffer			
DX-PFCS02, 07-TCLP_B	AsureQuality Method (LC-MS/MS)	Not Accredited	Christopher Sampson

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)
mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)
L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)
Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)
di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)
mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)
L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)
Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)
Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)
Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)
For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.
Reported results are corrected for internal standard recovery.
In house protocol based on US EPA 1311 test Toxicity Characteristic Leaching Procedure (TCLP).

Any tests marked with * are not accredited for specific matrices or analytes.
Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.

[redacted]

Christopher Sampson
Scientist

Accreditation

Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Listing applies to samples: 24-338405-2	
Perfluoroalkylsulfonic acids	
PFPrS	0.0010 µg/L
PFBS	0.0010 µg/L
PFPeS	0.0010 µg/L
di-PFHxS (1)	0.0010 µg/L
mono-PFHxS (1)	0.0010 µg/L
L-PFHxS (1)	0.0010 µg/L
Total PFHxS (3)	0.0010 µg/L
PFHpS	0.0010 µg/L
di-PFOS (5)	0.0010 µg/L
mono-PFOS (5)	0.0010 µg/L
L-PFOS (5)	0.0010 µg/L
Total PFOS (7)	0.0010 µg/L
Sum PFHxS+PFOS (1)	0.0010 µg/L
PFNS	0.0010 µg/L
PFDS	0.0010 µg/L
PFECHS	0.0010 µg/L
Perfluoroalkylcarboxylic acids	
PFBA	0.0010 µg/L
PFPeA	0.0010 µg/L
PFHxA	0.0010 µg/L
PFHpA	0.0010 µg/L
PFOA	0.0010 µg/L
PFNA	0.0010 µg/L
PFDA	0.0010 µg/L
PFUnDA	0.0010 µg/L
PFDoDA	0.0010 µg/L
PFTrDA	0.0010 µg/L
PFTeDA	0.0010 µg/L
P37DMOA	0.0010 µg/L
Perfluorooctanesulfonamides	
PFOSA	0.0010 µg/L
NEtFOSA-M	0.0010 µg/L
NMeFOSA-M	0.0010 µg/L
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	0.0010 µg/L
NMeFOSAA	0.0010 µg/L
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	0.0010 µg/L
NMeFOSE-M	0.0010 µg/L
Telomere Sulfonic acids	
4:2 FTS	0.0010 µg/L
6:2 FTS	0.0010 µg/L
8:2 FTS	0.0010 µg/L
10:2 FTS	0.0010 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.0010 µg/L

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FPePA (5:3FTA)	0.0010 µg/L
FHpPA (7:3FTA)	0.0010 µg/L
Miscellaneous	
F-53B (major)	0.0010 µg/L
F-53B (minor)	0.0010 µg/L
Sum F-53B	0.0010 µg/L
ADONA	0.0010 µg/L
HFPO-DA (GenX)	0.0010 µg/L

Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water - AsureQuality Method (LC-MS/MS)

Analyte	**LOR**
Listing applies to samples: 24-338405-1, 24-338405-10, 24-338405-11, 24-338405-9	
Perfluoroalkylsulfonic acids	
PFPrS*	0.025 µg/L
PFBS*	0.025 µg/L
PFPeS*	0.025 µg/L
di-PFHxS (1)*	0.025 µg/L
mono-PFHxS (1)*	0.025 µg/L
L-PFHxS (1)*	0.025 µg/L
Total PFHxS (3)*	0.025 µg/L
PFHpS*	0.025 µg/L
di-PFOS (5)*	0.025 µg/L
mono-PFOS (5)*	0.025 µg/L
L-PFOS (5)*	0.025 µg/L
Total PFOS (7)*	0.025 µg/L
Sum PFHxS+PFOS (1)*	0.025 µg/L
PFNS*	0.050 µg/L
PFDS*	0.10 µg/L
PFECHS*	0.025 µg/L
Perfluoroalkylcarboxylic acids	
PFBA*	0.10 µg/L
PFPeA*	0.10 µg/L
PFHxA*	0.025 µg/L
PFHpA*	0.025 µg/L
PFOA*	0.025 µg/L
PFNA*	0.025 µg/L
PFDA*	0.025 µg/L
PFUnDA*	0.025 µg/L
PFDoDA*	0.10 µg/L
PFTrDA*	0.10 µg/L
PFTeDA*	0.10 µg/L
P37DMOA*	0.050 µg/L
Perfluorooctanesulfonamides	
PFOSA*	0.025 µg/L
NEtFOSA-M*	0.10 µg/L
NMeFOSA-M*	0.10 µg/L
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA*	0.025 µg/L
NMeFOSAA*	0.025 µg/L
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M*	0.10 µg/L
NMeFOSE-M*	0.10 µg/L
Telomere Sulfonic acids	

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4:2 FTS*	0.025 µg/L
6:2 FTS*	0.050 µg/L
8:2 FTS*	0.10 µg/L
10:2 FTS*	0.025 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)*	0.10 µg/L
FPePA (5:3FTA)*	0.025 µg/L
FHpPA (7:3FTA)*	0.025 µg/L
Miscellaneous	
F-53B (major)*	0.10 µg/L
F-53B (minor)*	0.050 µg/L
Sum F-53B*	0.1 µg/L
ADONA*	0.025 µg/L
HFPO-DA (GenX)*	0.050 µg/L

Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - pH5 Acetate Buffer - AsureQuality Method (LC-MS/MS)

Analyte	**LOR**
Listing applies to samples: 24-338405-1, 24-338405-10, 24-338405-12, 24-338405-9	
Perfluoroalkylsulfonic acids	
PFPrS*	0.025 µg/L
PFBS*	0.025 µg/L
PFPeS*	0.025 µg/L
di-PFHxS (1)*	0.025 µg/L
mono-PFHxS (1)*	0.025 µg/L
L-PFHxS (1)*	0.025 µg/L
Total PFHxS (3)*	0.025 µg/L
PFHpS*	0.025 µg/L
di-PFOS (5)*	0.025 µg/L
mono-PFOS (5)*	0.025 µg/L
L-PFOS (5)*	0.025 µg/L
Total PFOS (7)*	0.025 µg/L
Sum PFHxS+PFOS (1)*	0.025 µg/L
PFNS*	0.050 µg/L
PFDS*	0.10 µg/L
PFECHS*	0.025 µg/L
Perfluoroalkylcarboxylic acids	
PFBA*	0.10 µg/L
PFPeA*	0.10 µg/L
PFHxA*	0.025 µg/L
PFHpA*	0.025 µg/L
PFOA*	0.025 µg/L
PFNA*	0.025 µg/L
PFDA*	0.025 µg/L
PFUnDA*	0.025 µg/L
PFDoDA*	0.10 µg/L
PFTrDA*	0.10 µg/L
PFTeDA*	0.10 µg/L
P37DMOA*	0.050 µg/L
Perfluorooctanesulfonamides	
PFOSA*	0.025 µg/L
NEtFOSA-M*	0.10 µg/L
NMeFOSA-M*	0.10 µg/L
Perfluorooctanesulfonamidoacetic acids	

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NEtFOSAA*	0.025 µg/L
NMeFOSAA*	0.025 µg/L
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M*	0.10 µg/L
NMeFOSE-M*	0.10 µg/L
Telomere Sulfonic acids	
4:2 FTS*	0.025 µg/L
6:2 FTS*	0.050 µg/L
8:2 FTS*	0.10 µg/L
10:2 FTS*	0.025 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)*	0.10 µg/L
FPePA (5:3FTA)*	0.025 µg/L
FHpPA (7:3FTA)*	0.025 µg/L
Miscellaneous	
F-53B (major)*	0.10 µg/L
F-53B (minor)*	0.050 µg/L
Sum F-53B*	0.1 µg/L
ADONA*	0.025 µg/L
HFPO-DA (GenX)*	0.050 µg/L

Analyte Definitions

Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water - AsureQuality Method (LC-MS/MS)

Analyte	Full Name
Listing applies to samples: 24-338405-2	
Perfluoroalkylsulfonic acids	
PFPrS	Perfluoro-1-propanesulfonic acid
PFBS	Perfluoro-1-butanesulfonic acid
PFPeS	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)	Linear Perfluorohexanesulfonic acid
PFHpS	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)	Total Perfluoromethylheptane sulfonic acids
L-PFOS (5)	Linear Perfluorooctanesulfonic acid
PFNS	Perfluoro-1-nonanesulfonic acid
PFDS	Perfluoro-1-decanesulfonic acid
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid
Perfluoroalkylcarboxylic acids	
PFBA	Perfluoro-n-butanoic acid
PFPeA	Perfluoro-n-pentanoic acid
PFHxA	Perfluoro-n-hexanoic acid
PFHpA	Perfluoro-n-heptanoic acid
PFOA	Perfluoro-n-octanoic acid
PFNA	Perfluoro-n-nonanoic acid
PFDA	Perfluoro-n-decanoic acid
PFUnDA	Perfluoro-n-undecanoic acid
PFDoDA	Perfluoro-n-dodecanoic acid
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid
Perfluorooctanesulfonamides	
PFOSA	Perfluoro-1-octanesulfonamide

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Analyte	Full Name
NEtFOSA-M	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M	N-methylperfluoro-1-octanesulfonamide
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
Telomere Sulfonic acids	
4:2 FTS	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid
10:2 FTS	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)	3-Perfluoropropyl propanoic acid
FPePA (5:3FTA)	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B	Sum of F-53B components (major + minor)
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)	Tetrafluoro-2-(heptafluoropropoxy)propanoic acid
Internal Standards	
M3PFBS	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PFPeA	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA	Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid
M8PFOA	Perfluoro-n-[13C8]octanoic acid
M9PFNA	Perfluoro-n-[13C9]nonanoic acid
M6PFDA	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDoDA	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA	Perfluoro-n-[1,2-13C2]tetradecanoic acid
MPFOSA	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid
M3HFPO-DA	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water - AsureQuality Method (LC-MS/MS)

Analyte	Full Name
Listing applies to samples: 24-338405-1, 24-338405-10, 24-338405-11, 24-338405-9	
Perfluoroalkylsulfonic acids	
PFPrS*	Perfluoro-1-propanesulfonic acid
PFBS*	Perfluoro-1-butanesulfonic acid

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Analyte	Full Name
PFPeS*	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)*	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)*	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)*	Linear Perfluorohexanesulfonic acid
PFHpS*	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)*	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)*	Total Perfluoromethylheptane sulfonic acids
L-PFOS (5)*	Linear Perfluorooctanesulfonic acid
PFNS*	Perfluoro-1-nonanesulfonic acid
PFDS*	Perfluoro-1-decanesulfonic acid
PFECHS*	Perfluoro-4-ethylcyclohexanesulfonic acid
Perfluoroalkylcarboxylic acids	
PFBA*	Perfluoro-n-butanoic acid
PFPeA*	Perfluoro-n-pentanoic acid
PFHxA*	Perfluoro-n-hexanoic acid
PFHpA*	Perfluoro-n-heptanoic acid
PFOA*	Perfluoro-n-octanoic acid
PFNA*	Perfluoro-n-nonanoic acid
PFDA*	Perfluoro-n-decanoic acid
PFUnDA*	Perfluoro-n-undecanoic acid
PFDoDA*	Perfluoro-n-dodecanoic acid
PFTrDA*	Perfluoro-n-tridecanoic acid
PFTeDA*	Perfluoro-n-tetradecanoic acid
P37DMOA*	Perfluoro-3,7-dimethyloctanoic acid
Perfluorooctanesulfonamides	
PFOSA*	Perfluoro-1-octanesulfonamide
NEtFOSA-M*	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M*	N-methylperfluoro-1-octanesulfonamide
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA*	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA*	N-methylperfluoro-1-octanesulfonamidoacetic acid
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M*	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M*	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
Telomere Sulfonic acids	
4:2 FTS*	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS*	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS*	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid
10:2 FTS*	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)*	3-Perfluoropropyl propanoic acid
FPePA (5:3FTA)*	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)*	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)*	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)*	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B*	Sum of F-53B components (major + minor)
ADONA*	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)*	Tetrafluoro-2-(heptafluoropropoxy)propanoic acid
Internal Standards	
M3PFBS*	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS*	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS*	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA*	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PFPeA*	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid

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Analyte	Full Name
M5PFHxA*	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA*	Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid
M8PFOA*	Perfluoro-n-[13C8]octanoic acid
M9PFNA*	Perfluoro-n-[13C9]nonanoic acid
M6PFDA*	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA*	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDoDA*	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA*	Perfluoro-n-[1,2-13C2]tetradecanoic acid
MPFOSA*	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA*	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA*	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA*	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA*	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE*	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE*	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS*	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS*	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS*	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid
M3HFPO-DA*	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - pH5 Acetate Buffer - AsureQuality Method (LC-MS/MS)

Analyte	Full Name
Listing applies to samples: 24-338405-1, 24-338405-10, 24-338405-12, 24-338405-9	
Perfluoroalkylsulfonic acids	
PFPrS*	Perfluoro-1-propanesulfonic acid
PFBS*	Perfluoro-1-butanesulfonic acid
PFPeS*	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)*	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)*	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)*	Linear Perfluorohexanesulfonic acid
PFHpS*	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)*	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)*	Total Perfluoromethylheptane sulfonic acids
L-PFOS (5)*	Linear Perfluorooctanesulfonic acid
PFNS*	Perfluoro-1-nonanesulfonic acid
PFDS*	Perfluoro-1-decanesulfonic acid
PFECHS*	Perfluoro-4-ethylcyclohexanesulfonic acid
Perfluoroalkylcarboxylic acids	
PFBA*	Perfluoro-n-butanoic acid
PFPeA*	Perfluoro-n-pentanoic acid
PFHxA*	Perfluoro-n-hexanoic acid
PFHpA*	Perfluoro-n-heptanoic acid
PFOA*	Perfluoro-n-octanoic acid
PFNA*	Perfluoro-n-nonanoic acid
PFDA*	Perfluoro-n-decanoic acid
PFUnDA*	Perfluoro-n-undecanoic acid
PFDoDA*	Perfluoro-n-dodecanoic acid
PFTrDA*	Perfluoro-n-tridecanoic acid
PFTeDA*	Perfluoro-n-tetradecanoic acid
P37DMOA*	Perfluoro-3,7-dimethyloctanoic acid
Perfluorooctanesulfonamides	
PFOSA*	Perfluoro-1-octanesulfonamide
NEtFOSA-M*	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M*	N-methylperfluoro-1-octanesulfonamide
Perfluorooctanesulfonamidoacetic acids	

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AsureQuality Reference: 24-338405 **Report Issued:** 08-Jan-2025

Analyte	Full Name
NEtFOSAA*	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA*	N-methylperfluoro-1-octanesulfonamidoacetic acid
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M*	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M*	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
Telomere Sulfonic acids	
4:2 FTS*	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS*	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS*	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid
10:2 FTS*	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)*	3-Perfluoropropyl propanoic acid
FPePA (5:3FTA)*	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)*	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)*	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)*	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B*	Sum of F-53B components (major + minor)
ADONA*	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)*	Tetrafluoro-2-(heptafluoropropoxy)propanoic acid
Internal Standards	
M3PFBS*	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS*	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS*	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA*	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PFPeA*	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA*	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA*	Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid
M8PFOA*	Perfluoro-n-[13C8]octanoic acid
M9PFNA*	Perfluoro-n-[13C9]nonanoic acid
M6PFDA*	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA*	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDoDA*	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA*	Perfluoro-n-[1,2-13C2]tetradecanoic acid
MPFOSA*	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA*	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA*	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA*	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA*	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE*	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE*	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS*	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS*	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS*	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid
M3HFPO-DA*	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

Any tests marked with * are not accredited for specific matrices or analytes.

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

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Certificate of Analysis

Client:	Beca Limited	**Lab No:**	3931181 SPv1
Contact:	Genevieve Jessica Smith	**Date Received:**	04-Jul-2025
	C/- Beca Limited	**Date Reported:**	10-Jul-2025
	PO Box 3942	**Quote No:**	96766
	Wellington 6140	**Order No:**	3324337/09.09B
		Client Reference:	Seawall
		Submitted By:	Genevieve Jessica Smith

Sample Type: Soil

Sample Name:		WSD_CR1_0.0 04-Jul-2025	WSD_SS01 04-Jul-2025	WSD_SS02 04-Jul-2025	WSD_SS03 04-Jul-2025	WSD_SS04 04-Jul-2025
Lab Number:		3931181.1	3931181.3	3931181.4	3931181.5	3931181.6
Individual Tests						
Dry Matter	g/100g as rcvd	90	87	88	90	91
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	5	5	6	4	4
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	17	17	17	14	17
Total Recoverable Copper	mg/kg dry wt	17	16	18	14	16
Total Recoverable Lead	mg/kg dry wt	19.4	25	21	14.9	19.6
Total Recoverable Nickel	mg/kg dry wt	14	15	15	11	14
Total Recoverable Zinc	mg/kg dry wt	153	128	88	88	159
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.3	0.3	0.8	0.5	< 0.3
1-Methylnaphthalene	mg/kg dry wt	< 0.011	< 0.012	< 0.011	< 0.011	< 0.011
2-Methylnaphthalene	mg/kg dry wt	< 0.011	< 0.012	< 0.011	< 0.011	< 0.011
Acenaphthylene	mg/kg dry wt	< 0.011	< 0.012	0.031	< 0.011	< 0.011
Acenaphthene	mg/kg dry wt	< 0.011	< 0.012	< 0.011	< 0.011	< 0.011
Anthracene	mg/kg dry wt	< 0.011	< 0.012	0.022	< 0.011	< 0.011
Benzo[a]anthracene	mg/kg dry wt	0.016	0.018	0.040	0.035	0.013
Benzo[a]pyrene (BAP)	mg/kg dry wt	0.022	0.027	0.093	0.056	0.019
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	0.034	0.036	0.137	0.081	0.030
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	0.034	0.036	0.136	0.081	0.030
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	0.028	0.033	0.102	0.066	0.024
Benzo[e]pyrene	mg/kg dry wt	0.014	0.016	0.063	0.034	0.012
Benzo[g,h,i]perylene	mg/kg dry wt	0.017	0.023	0.085	0.036	0.015
Benzo[k]fluoranthene	mg/kg dry wt	0.012	0.014	0.041	0.027	< 0.011
Chrysene	mg/kg dry wt	0.015	0.017	0.035	0.030	0.013
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.011	< 0.012	0.016	< 0.011	< 0.011
Fluoranthene	mg/kg dry wt	0.030	0.038	0.074	0.045	0.031
Fluorene	mg/kg dry wt	< 0.011	< 0.012	< 0.011	< 0.011	< 0.011
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	0.016	0.022	0.087	0.038	0.015
Naphthalene	mg/kg dry wt	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Perylene	mg/kg dry wt	< 0.011	< 0.012	0.025	0.012	< 0.011
Phenanthrene	mg/kg dry wt	0.017	0.016	0.033	0.015	0.018
Pyrene	mg/kg dry wt	0.029	0.038	0.082	0.061	0.029

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The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

Sample Type: Soil				
	Sample Name:		WSD_SS05 04-Jul-2025	WSD_SS06 04-Jul-2025
	Lab Number:		3931181.7	3931181.8
Individual Tests				
Dry Matter	g/100g as rcvd		88	90
Heavy Metals, Screen Level				
Total Recoverable Arsenic	mg/kg dry wt		4	5
Total Recoverable Cadmium	mg/kg dry wt		< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt		17	18
Total Recoverable Copper	mg/kg dry wt		16	18
Total Recoverable Lead	mg/kg dry wt		21	23
Total Recoverable Nickel	mg/kg dry wt		13	14
Total Recoverable Zinc	mg/kg dry wt		128	129
Polycyclic Aromatic Hydrocarbons Screening in Soil*				
Total of Reported PAHs in Soil	mg/kg dry wt		0.3	0.4
1-Methylnaphthalene	mg/kg dry wt		< 0.012	< 0.011
2-Methylnaphthalene	mg/kg dry wt		< 0.012	< 0.011
Acenaphthylene	mg/kg dry wt		< 0.012	< 0.011
Acenaphthene	mg/kg dry wt		< 0.012	< 0.011
Anthracene	mg/kg dry wt		< 0.012	< 0.011
Benzo[a]anthracene	mg/kg dry wt		0.020	0.026
Benzo[a]pyrene (BAP)	mg/kg dry wt		0.025	0.042
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt		0.039	0.063
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt		0.038	0.062
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt		0.032	0.047
Benzo[e]pyrene	mg/kg dry wt		0.015	0.027
Benzo[g,h,i]perylene	mg/kg dry wt		0.020	0.037
Benzo[k]fluoranthene	mg/kg dry wt		0.014	0.019
Chrysene	mg/kg dry wt		0.019	0.025
Dibenzo[a,h]anthracene	mg/kg dry wt		< 0.012	< 0.011
Fluoranthene	mg/kg dry wt		0.043	0.051
Fluorene	mg/kg dry wt		< 0.012	< 0.011
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt		0.019	0.032
Naphthalene	mg/kg dry wt		< 0.06	< 0.06
Perylene	mg/kg dry wt		< 0.012	0.011
Phenanthrene	mg/kg dry wt		0.023	0.027
Pyrene	mg/kg dry wt		0.043	0.048

Sample Type: Soil				
		Sample Name:	WSD_CR1_0.0 04-Jul-2025	WSD_SS01 04-Jul-2025
		Lab Number:	3931181.1	3931181.3
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	< 0.0010	< 0.0010
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	< 0.046	< 0.046
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

Sample Type: Soil				
		Sample Name:	WSD_CR1_0.0 04-Jul-2025	WSD_SS01 04-Jul-2025
		Lab Number:	3931181.1	3931181.3
PFAS in Soil - Perfluorocarboxylic Acids				
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	< 0.0010
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

		Sample Name:	WSD_SS02 04-Jul-2025	WSD_SS03 04-Jul-2025
		Lab Number:	3931181.4	3931181.5
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	< 0.0010	< 0.0010
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	< 0.046	< 0.046
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

Sample Type: Soil				
		Sample Name:	WSD_SS02 04-Jul-2025	WSD_SS03 04-Jul-2025
		Lab Number:	3931181.4	3931181.5
PFAS in Soil - Perfluorocarboxylic Acids				
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	< 0.0010
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

	Sample Name:	WSD_SS04 04-Jul-2025	WSD_SS05 04-Jul-2025
	Lab Number:	3931181.6	3931181.7

Sample Type: Soil				
		Sample Name:	WSD_SS04 04-Jul-2025	WSD_SS05 04-Jul-2025
		Lab Number:	3931181.6	3931181.7
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	< 0.0010	< 0.0010
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	< 0.046	< 0.046
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	< 0.0010
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010

Sample Type: Soil				
		Sample Name:	WSD_SS04 04-Jul-2025	WSD_SS05 04-Jul-2025
		Lab Number:	3931181.6	3931181.7
PFAS in Soil - Miscellaneous				
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

		Sample Name:	WSD_SS06 04-Jul-2025
		Lab Number:	3931181.8
PFAS in Soil - Summary			
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	< 0.0010
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	< 0.046
PFAS in Soil - Perfluorocarboxylic Acids			
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010
PFAS in Soil - Perfluorosulfonic Acids			
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	< 0.0010
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	< 0.0010
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	< 0.0010
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	< 0.0010
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	< 0.0010
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	< 0.0010
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	< 0.0010
PFAS in Soil - Fluorotelomer Sulfonic Acids			
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010
PFAS in Soil - Fluorotelomer Carboxylic Acid			
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010
PFAS in Soil - Miscellaneous			
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010

Sample Type: Soil			
		Sample Name:	WSD_SS06 04-Jul-2025
		Lab Number:	3931181.8
PFAS in Soil - Miscellaneous			
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Labs, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Individual Tests			
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	1, 3-8
Total of Reported PAHs in Soil	Sonication extraction, GC-MS/MS analysis. In-house based on US EPA 8270.	0.03 mg/kg dry wt	1, 3-8
Dry Matter	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	1, 3-8
Dry Matter	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	0.10 g/100g as rcvd	1, 3-8
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	BaP Potency Equivalence calculated from; Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(j)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a)pyrene x 1.0 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Fluoranthene x 0.01 + Indeno(1,2,3-c,d)pyrene x 0.1. Ministry for the Environment. 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.	0.024 mg/kg dry wt	1, 3-8
Benzo[a]pyrene Toxic Equivalence (TEF)*	Benzo[a]pyrene Toxic Equivalence (TEF) calculated from; Benzo[a]pyrene x 1.0 + Benzo(a)anthracene x 0.1 + Benzo(b) fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Indeno(1,2,3-c,d)pyrene x 0.1. Guidelines for assessing and managing contaminated gasworks sites in New Zealand (GMG) (MfE, 1997).	0.024 mg/kg dry wt	1, 3-8
Heavy Metals, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	1, 3-8
Polycyclic Aromatic Hydrocarbons Screening in Soil*	Sonication extraction, GC-MS/MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.010 - 0.05 mg/kg dry wt	1, 3-8
PFAS in Soil	Solvent extraction. LC-MS/MS analysis. Tested on as received sample. In-house based on ASTM D7968.	0.0010 - 0.046 mg/kg dry wt	1, 3-8

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 05-Jul-2025 and 10-Jul-2025. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.

[redacted]

Graham Corban MSc Tech (Hons)
Client Services Manager - Environmental

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Certificate of Analysis

Client:	Beca Limited	**Lab No:**	3931182	A2Pv1
Contact:	Genevieve Jessica Smith	**Date Received:**	04-Jul-2025	
	C/- Beca Limited	**Date Reported:**	09-Jul-2025	
	PO Box 3942	**Quote No:**	96766	
	Wellington 6140	**Order No:**	3324337/09.09B	
		Client Reference:	Seawall	
		Submitted By:	Genevieve Jessica Smith	

Sample Type: Soil

Sample Name	Lab Number	As Received Weight Presence / Absence Testing (g)	Dry Weight Presence / Absence Testing (g)	<2mm Subsample Weight Presence / Absence Testing (g dry wt)	Asbestos Presence / Absence from Presence / Absence Testing	Description of Asbestos Form Presence / Absence Testing
WSD_CR1_0.0	3931182.1	916.5	844.3	51.5	Asbestos NOT detected.	-
WSD_SS01	3931182.3	1,318.6	1,164.3	53.5	Asbestos NOT detected.	-
WSD_SS02	3931182.4	1,304.8	1,153.3	54.1	Asbestos NOT detected.	-
WSD_SS03	3931182.5	1,102.0	996.2	50.5	Asbestos NOT detected.	-
WSD_SS04	3931182.6	1,258.3	1,132.4	52.5	Asbestos NOT detected.	-
WSD_SS05	3931182.7	1,194.1	1,068.6	55.2	Asbestos NOT detected.	-
WSD_SS06	3931182.8	1,261.5	1,136.8	51.0	Asbestos NOT detected.	-

Glossary of Terms

- Loose fibres (Minor) - One or two fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- Loose fibres (Major) - Three or more fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- ACM Debris (Minor) - One or two small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- ACM Debris (Major) - Large (>2mm) piece, or more than three small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- Unknown Mineral Fibres - Mineral fibres of unknown type detected by polarised light microscopy including dispersion staining. The fibres detected may or may not be asbestos fibres. To confirm the identities, another independent analytical technique may be required.
- Trace - Trace levels of asbestos, as defined by AS4964-2004.

For further details, please contact the Asbestos Team.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Labs, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Asbestos in Soil			
As Received Weight Presence / Absence Testing	Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g	1, 3-8
Dry Weight Presence / Absence Testing	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	0.1 g	1, 3-8
<2mm Subsample Weight Presence / Absence Testing	Sample dried at 100 to 105°C, weight of <2mm sample fraction taken for asbestos identification if less than entire fraction. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch.	-	1, 3-8
Asbestos Presence / Absence from Presence / Absence Testing	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; Unit 1, 17 Print Place, Middleton, Christchurch. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	1, 3-8

This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.
The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Description of Asbestos Form Presence / Absence Testing	Description of asbestos form and/or shape if present.	-	1, 3-8

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed on 09-Jul-2025. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.



Dexter Paguirigan Dip Chem Engineering Tech
Laboratory Technician - Asbestos

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Certificate of Analysis

Client:	Beca Limited	**Lab No:**	3934578 SPv2
Contact:	Genevieve Jessica Smith	**Date Received:**	09-Jul-2025
	C/- Beca Limited	**Date Reported:**	05-Aug-2025
	PO Box 3942	**Quote No:**	96766
	Wellington 6140	**Order No:**	3324338/09.09B
		Client Reference:	Seawall
		Submitted By:	Genevieve Jessica Smith

Sample Type: Soil

Sample Name:		WSD_HA01_0.1 09-Jul-2025	WSD_HA01_0.3 09-Jul-2025	WSD_HA02_0.1 09-Jul-2025	WSD_HA02_0.3 09-Jul-2025	WSD_HA03_0.1 09-Jul-2025
Lab Number:		3934578.1	3934578.2	3934578.3	3934578.4	3934578.5
Individual Tests						
Poly- and Perfluorinated Alkyl Substances in TCLP Reagent Water*‡		See attached report	See attached report	See attached report	See attached report	See attached report
Dry Matter	g/100g as rcvd	-	92	-	88	-
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	3	4	5	5	5
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	0.11	< 0.10	0.14
Total Recoverable Chromium	mg/kg dry wt	14	17	15	13	15
Total Recoverable Copper	mg/kg dry wt	10	11	19	13	25
Total Recoverable Lead	mg/kg dry wt	16.2	22	35	29	47
Total Recoverable Mercury	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Nickel	mg/kg dry wt	11	14	12	11	13
Total Recoverable Zinc	mg/kg dry wt	54	63	79	61	96
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	-	< 0.3	-	2.8	-
1-Methylnaphthalene	mg/kg dry wt	-	< 0.011	-	< 0.011	-
2-Methylnaphthalene	mg/kg dry wt	-	< 0.016	-	< 0.017	-
Acenaphthylene	mg/kg dry wt	-	< 0.011	-	0.041	-
Acenaphthene	mg/kg dry wt	-	< 0.011	-	< 0.011	-
Anthracene	mg/kg dry wt	-	< 0.011	-	0.031	-
Benzo[a]anthracene	mg/kg dry wt	-	0.011	-	0.20	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	0.015	-	0.33	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	-	< 0.026	-	0.48	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	-	< 0.026	-	0.48	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	-	0.018	-	0.39	-
Benzo[e]pyrene	mg/kg dry wt	-	0.011	-	0.196	-
Benzo[g,h,i]perylene	mg/kg dry wt	-	0.013	-	0.22	-
Benzo[k]fluoranthene	mg/kg dry wt	-	< 0.011	-	0.153	-
Chrysene	mg/kg dry wt	-	< 0.011	-	0.179	-
Dibenzo[a,h]anthracene	mg/kg dry wt	-	< 0.011	-	0.048	-
Fluoranthene	mg/kg dry wt	-	0.023	-	0.31	-
Fluorene	mg/kg dry wt	-	< 0.011	-	< 0.011	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	0.013	-	0.24	-
Naphthalene	mg/kg dry wt	-	< 0.06	-	< 0.06	-
Perylene	mg/kg dry wt	-	< 0.011	-	0.072	-
Phenanthrene	mg/kg dry wt	-	< 0.011	-	0.033	-
Pyrene	mg/kg dry wt	-	0.024	-	0.34	-

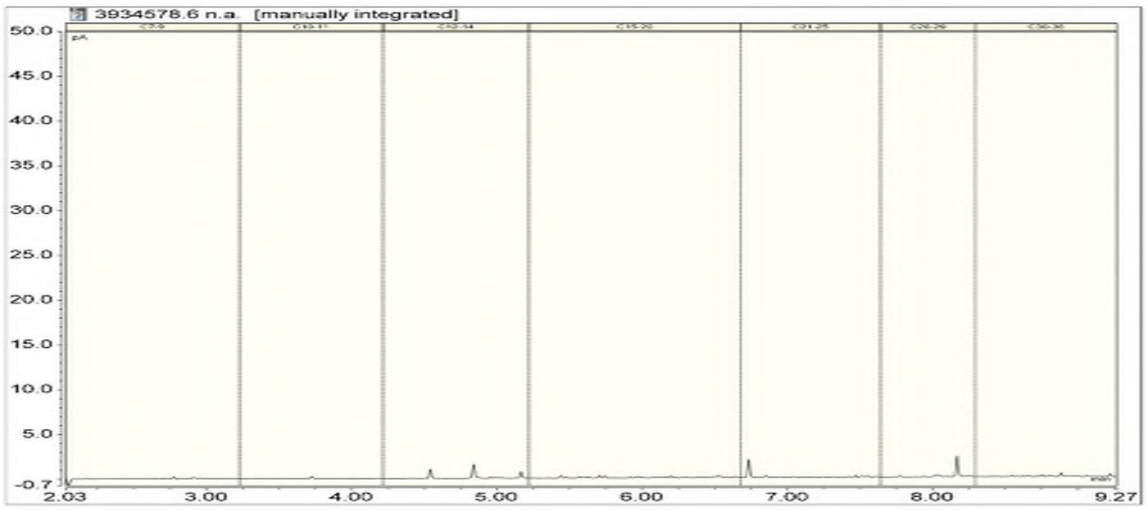
This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.
The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

Sample Type: Soil						
Sample Name:		WSD_HA03_0.3 09-Jul-2025	WSD_HA03_0.5 09-Jul-2025	WSD_HA04_0.1 09-Jul-2025	WSD_HA05_0.1 09-Jul-2025	WSD_HA05_0.5 09-Jul-2025
Lab Number:		3934578.6	3934578.7	3934578.8	3934578.10	3934578.12
Individual Tests						
Poly- and Perfluorinated Alkyl Substances in TCLP Reagent Water*‡		See attached report	-	See attached report	-	-
Dry Matter	g/100g as rcvd	89	89	82	-	91
Total Cyanide‡	mg/kg dry wt	1.8	-	-	-	-
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	5	4	5	5	5
Total Recoverable Cadmium	mg/kg dry wt	0.17	0.11	< 0.10	< 0.10	0.10
Total Recoverable Chromium	mg/kg dry wt	13	13	69	17	17
Total Recoverable Copper	mg/kg dry wt	580	178	25	15	21
Total Recoverable Lead	mg/kg dry wt	105	39	154	23	30
Total Recoverable Mercury	mg/kg dry wt	0.11	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Nickel	mg/kg dry wt	12	10	13	12	15
Total Recoverable Zinc	mg/kg dry wt	710 #1	260	93	73	78
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	1.4	0.3	3.5	-	3.9
1-Methylnaphthalene	mg/kg dry wt	0.013	< 0.011	< 0.012	-	< 0.011
2-Methylnaphthalene	mg/kg dry wt	0.017	< 0.017	< 0.018	-	< 0.014
Acenaphthylene	mg/kg dry wt	0.025	< 0.011	0.035	-	0.029
Acenaphthene	mg/kg dry wt	< 0.012	< 0.011	< 0.012	-	0.011
Anthracene	mg/kg dry wt	0.023	< 0.011	0.048	-	0.040
Benzo[a]anthracene	mg/kg dry wt	0.085	0.020	0.24	-	0.22
Benzo[a]pyrene (BAP)	mg/kg dry wt	0.106	0.023	0.35	-	0.42
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	0.164	0.039	0.53	-	0.64
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	0.162	0.039	0.53	-	0.63
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	0.138	0.036	0.42	-	0.49
Benzo[e]pyrene	mg/kg dry wt	0.072	0.021	0.24	-	0.29
Benzo[g,h,i]perylene	mg/kg dry wt	0.082	0.021	0.29	-	0.48
Benzo[k]fluoranthene	mg/kg dry wt	0.057	0.015	0.169	-	0.167
Chrysene	mg/kg dry wt	0.088	0.021	0.21	-	0.184
Dibenzo[a,h]anthracene	mg/kg dry wt	0.018	< 0.011	0.058	-	0.078
Fluoranthene	mg/kg dry wt	0.21	0.037	0.45	-	0.38
Fluorene	mg/kg dry wt	< 0.012	< 0.011	< 0.012	-	0.011
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	0.085	0.024	0.29	-	0.43
Naphthalene	mg/kg dry wt	< 0.06	< 0.06	< 0.06	-	< 0.06
Perylene	mg/kg dry wt	0.021	< 0.011	0.076	-	0.112
Phenanthrene	mg/kg dry wt	0.118	0.017	0.144	-	0.097
Pyrene	mg/kg dry wt	0.195	0.036	0.43	-	0.40
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 20	-	-	-	-
C10 - C14	mg/kg dry wt	< 20	-	-	-	-
C15 - C36	mg/kg dry wt	47	-	-	-	-
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 80	-	-	-	-

Sample Name:		WSD_HA06_0.1 09-Jul-2025	WSD_HA07_0.1 09-Jul-2025	WSD_CR2_0.2 09-Jul-2025	WSD_QAQC1 09-Jul-2025	WSD_QAQC2 09-Jul-2025
Lab Number:		3934578.13	3934578.14	3934578.15	3934578.18	3934578.19
Individual Tests						
Dry Matter	g/100g as rcvd	96	-	94	94	-
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	4	4	9	11	4
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	15	14	15	16	14
Total Recoverable Copper	mg/kg dry wt	10	10	21	23	10

Sample Type: Soil						
Sample Name:		WSD_HA06_0.1 09-Jul-2025	WSD_HA07_0.1 09-Jul-2025	WSD_CR2_0.2 09-Jul-2025	WSD_QAQC1 09-Jul-2025	WSD_QAQC2 09-Jul-2025
Lab Number:		3934578.13	3934578.14	3934578.15	3934578.18	3934578.19
Heavy Metals with Mercury, Screen Level						
Total Recoverable Lead	mg/kg dry wt	12.0	71	27	29	69
Total Recoverable Mercury	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Nickel	mg/kg dry wt	11	11	16	19	10
Total Recoverable Zinc	mg/kg dry wt	130	73	94	98	78
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.3	-	< 0.3	< 0.3	-
1-Methylnaphthalene	mg/kg dry wt	< 0.010	-	< 0.011	< 0.011	-
2-Methylnaphthalene	mg/kg dry wt	< 0.010	-	< 0.011	< 0.016	-
Acenaphthylene	mg/kg dry wt	< 0.010	-	< 0.011	< 0.011	-
Acenaphthene	mg/kg dry wt	< 0.010	-	< 0.011	< 0.011	-
Anthracene	mg/kg dry wt	< 0.010	-	< 0.011	< 0.011	-
Benzo[a]anthracene	mg/kg dry wt	0.018	-	< 0.011	< 0.011	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	0.019	-	< 0.011	< 0.011	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	0.027	-	< 0.025	< 0.026	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	0.027	-	< 0.025	< 0.026	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	0.028	-	< 0.011	< 0.011	-
Benzo[e]pyrene	mg/kg dry wt	0.014	-	< 0.011	< 0.011	-
Benzo[g,h,i]perylene	mg/kg dry wt	0.015	-	< 0.011	< 0.011	-
Benzo[k]fluoranthene	mg/kg dry wt	0.011	-	< 0.011	< 0.011	-
Chrysene	mg/kg dry wt	0.016	-	< 0.011	< 0.011	-
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.010	-	< 0.011	< 0.011	-
Fluoranthene	mg/kg dry wt	0.032	-	< 0.011	< 0.011	-
Fluorene	mg/kg dry wt	< 0.010	-	< 0.011	< 0.011	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	0.017	-	< 0.011	< 0.011	-
Naphthalene	mg/kg dry wt	< 0.05	-	< 0.06	< 0.06	-
Perylene	mg/kg dry wt	< 0.010	-	< 0.011	< 0.011	-
Phenanthrene	mg/kg dry wt	0.016	-	< 0.011	< 0.011	-
Pyrene	mg/kg dry wt	0.031	-	< 0.011	< 0.011	-

3934578.6
WSD_HA03_0.3 09-Jul-2025
Client Chromatogram for TPH by FID



Sample Type: Soil

Sample Type: Soil				
		Sample Name:	WSD_HA01_0.1 09-Jul-2025	WSD_HA01_0.3 09-Jul-2025
		Lab Number:	3934578.1	3934578.2
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.0010	0.0022
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	0.0012	0.0030
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	< 0.046	< 0.046
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	< 0.0010	0.0015
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.0010	0.0022
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	< 0.0010
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010

Sample Type: Soil				
		Sample Name:	WSD_HA01_0.1 09-Jul-2025	WSD_HA01_0.3 09-Jul-2025
		Lab Number:	3934578.1	3934578.2
PFAS in Soil - Miscellaneous				
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

		Sample Name:	WSD_HA02_0.1 09-Jul-2025	WSD_HA02_0.3 09-Jul-2025
		Lab Number:	3934578.3	3934578.4
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.025	0.027
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	0.025	0.028
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	< 0.048	< 0.048
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	0.023	0.021
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	0.0019	0.0062
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.025	0.027
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	< 0.0010
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

Sample Type: Soil				
		Sample Name:	WSD_HA02_0.1 09-Jul-2025	WSD_HA02_0.3 09-Jul-2025
		Lab Number:	3934578.3	3934578.4
PFAS in Soil - Miscellaneous				
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

		Sample Name:	WSD_HA03_0.1 09-Jul-2025	WSD_HA03_0.3 09-Jul-2025
		Lab Number:	3934578.5	3934578.6
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.0038	0.0019
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	0.0040	0.0023
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	< 0.046	< 0.046
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	0.0034	0.0014
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	0.0038	0.0019
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010

Sample Type: Soil				
		Sample Name:	WSD_HA03_0.1 09-Jul-2025	WSD_HA03_0.3 09-Jul-2025
		Lab Number:	3934578.5	3934578.6
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	< 0.0010
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

		Sample Name:	WSD_HA03_0.5 09-Jul-2025	WSD_HA04_0.1 09-Jul-2025
		Lab Number:	3934578.7	3934578.8
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010	0.0037
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	< 0.0010	0.0040
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	< 0.046	< 0.046
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	< 0.0010	0.0031
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010	0.0037
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010

Sample Type: Soil				
		Sample Name:	WSD_HA03_0.5 09-Jul-2025	WSD_HA04_0.1 09-Jul-2025
		Lab Number:	3934578.7	3934578.8
PFAS in Soil - Fluorotelomer Sulfonic Acids				
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	< 0.0010
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

		Sample Name:	WSD_HA05_0.1 09-Jul-2025	WSD_HA05_0.5 09-Jul-2025
		Lab Number:	3934578.10	3934578.12
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	< 0.0010	< 0.0010
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	< 0.046	< 0.046
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010

Sample Type: Soil				
		Sample Name:	WSD_HA05_0.1 09-Jul-2025	WSD_HA05_0.5 09-Jul-2025
		Lab Number:	3934578.10	3934578.12
PFAS in Soil - Perfluorosulfonic Acids				
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	< 0.0010
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

		Sample Name:	WSD_HA06_0.1 09-Jul-2025	WSD_HA07_0.1 09-Jul-2025
		Lab Number:	3934578.13	3934578.14
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	< 0.0010	< 0.0010
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	< 0.046	< 0.046
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010

Sample Type: Soil				
		Sample Name:	WSD_HA06_0.1 09-Jul-2025	WSD_HA07_0.1 09-Jul-2025
		Lab Number:	3934578.13	3934578.14
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	< 0.0010
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

		Sample Name:	WSD_CR2_0.2 09-Jul-2025	WSD_QAQC1 09-Jul-2025
		Lab Number:	3934578.15	3934578.18
PFAS in Soil - Summary				
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	< 0.0010	< 0.0010
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	< 0.046	< 0.046
PFAS in Soil - Perfluorocarboxylic Acids				
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

Sample Type: Soil				
		Sample Name:	WSD_CR2_0.2 09-Jul-2025	WSD_QAQC1 09-Jul-2025
		Lab Number:	3934578.15	3934578.18
PFAS in Soil - Perfluorocarboxylic Acids				
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Perfluorosulfonic Acids				
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	< 0.0010	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010	< 0.0010
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Sulfonic Acids				
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Fluorotelomer Carboxylic Acid				
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFAS in Soil - Miscellaneous				
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010	< 0.0010
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010	< 0.0010
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010	< 0.0010
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010	< 0.0010
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010	< 0.0010
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010	< 0.0010

		Sample Name:	WSD_QAQC2 09-Jul-2025
		Lab Number:	3934578.19
PFAS in Soil - Summary			
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010
PFHxS+PFOS	The numerical sum of Total PFHxS and Total PFOS	mg/kg dry wt	< 0.0010
Total PFAS	Total of Reported PFAS in Soil	mg/kg dry wt	< 0.046

Sample Type: Soil			
		Sample Name:	WSD_QAQC2 09-Jul-2025
		Lab Number:	3934578.19
PFAS in Soil - Perfluorocarboxylic Acids			
PFBA	Perfluorobutanoic acid	mg/kg dry wt	< 0.0010
PFPeA	Perfluoropentanoic acid	mg/kg dry wt	< 0.0010
PFHxA	Perfluorohexanoic acid	mg/kg dry wt	< 0.0010
PFHpA	Perfluoroheptanoic acid	mg/kg dry wt	< 0.0010
PFOA	Perfluorooctanoic acid	mg/kg dry wt	< 0.0010
PFNA	Perfluorononanoic acid	mg/kg dry wt	< 0.0010
PFDA	Perfluorodecanoic acid	mg/kg dry wt	< 0.0010
PFUnDA	Perfluoroundecanoic acid	mg/kg dry wt	< 0.0010
PFDoDA	Perfluorododecanoic acid	mg/kg dry wt	< 0.0010
PFTrDA	Perfluorotridecanoic acid	mg/kg dry wt	< 0.0010
PFTeDA	Perfluorotetradecanoic acid	mg/kg dry wt	< 0.0010
PFAS in Soil - Perfluorosulfonic Acids			
L-PFPrS	Perfluoropropanesulfonic acid	mg/kg dry wt	< 0.0010
L-PFBS	Perfluorobutanesulfonic acid	mg/kg dry wt	< 0.0010
L-PFPeS	Perfluoropentanesulfonic acid	mg/kg dry wt	< 0.0010
L-PFHxS	Perfluorohexanesulfonic acid	mg/kg dry wt	< 0.0010
B-PFHxS	Perfluorohexanesulfonic acid - Branched	mg/kg dry wt	< 0.0010
PFHxS	Perfluorohexanesulfonic acid - Total	mg/kg dry wt	< 0.0010
L-PFHpS	Perfluoroheptanesulfonic acid	mg/kg dry wt	< 0.0010
L-PFOS	Perfluorooctanesulfonic acid	mg/kg dry wt	< 0.0010
B-PFOS	Perfluorooctanesulfonic acid - Branched	mg/kg dry wt	< 0.0010
PFOS	Perfluorooctanesulfonic acid - Total	mg/kg dry wt	< 0.0010
L-PFNS	Perfluorononanesulfonic acid	mg/kg dry wt	< 0.0010
L-PFDS	Perfluorodecanesulfonic acid	mg/kg dry wt	< 0.0010
L-PFDoS	Perfluorododecanesulfonic acid	mg/kg dry wt	< 0.0010
PFAS in Soil - Fluorotelomer Sulfonic Acids			
4:2 FTS	4:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010
6:2 FTS	6:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010
8:2 FTS	8:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010
10:2 FTS	10:2 Fluorotelomersulfonic acid	mg/kg dry wt	< 0.0010
PFAS in Soil - Fluorotelomer Carboxylic Acid			
3:3 FTCA	3:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010
5:3 FTCA	5:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010
7:3 FTCA	7:3 Fluorotelomercarboxylic acid	mg/kg dry wt	< 0.0010
PFAS in Soil - Miscellaneous			
11Cl-PF3OUdS	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	mg/kg dry wt	< 0.0010
9Cl-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	mg/kg dry wt	< 0.0010
ADONA	4,8-Dioxa-3H-perfluorononanoic acid	mg/kg dry wt	< 0.0010
HFPO-DA	Hexafluoropropylene oxide dimer acid	mg/kg dry wt	< 0.0010
NFDHA	Nonafluoro-3,6-dioxaheptanoic acid	mg/kg dry wt	< 0.0010
PFEESA	Perfluoro(2-ethoxyethane)sulfonic acid	mg/kg dry wt	< 0.0010
PFMPA	Perfluoro-3-methoxypropanoic acid	mg/kg dry wt	< 0.0010
PFMBA	Perfluoro-4-methoxybutanoic acid	mg/kg dry wt	< 0.0010
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	mg/kg dry wt	< 0.0010
FOSA	Perfluorooctanesulfonamide	mg/kg dry wt	< 0.0010
NMeFOSA	N-methylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010
NEtFOSA	N-ethylperfluoro-1-octanesulfonamide	mg/kg dry wt	< 0.0010
NMeFOSE	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010
NEtFOSE	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol	mg/kg dry wt	< 0.0010
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid	mg/kg dry wt	< 0.0010
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	mg/kg dry wt	< 0.0010

Analyst's Comments

‡ Analysis subcontracted to an external provider. Refer to the Summary of Methods section for more details.

#1 It should be noted that the replicate analyses performed on this sample as part of our in-house Quality Assurance procedures showed greater variation than would normally be expected. This may reflect the heterogeneity of the sample. The average of the results of the replicate analyses has been reported. Replicate 1 = 920mg/kg, replicate 2 = 730mg/kg, replicate 3 = 610mg/kg, replicate 4 = 570mg/kg.

Appendix No.1 - ALS Report

Appendix No.2 - AsureQuality Report

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Labs, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Individual Tests			
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	1-8, 10, 12-15, 18-19
Total of Reported PAHs in Soil	Sonication extraction, GC-MS/MS analysis. In-house based on US EPA 8270.	0.03 mg/kg dry wt	2, 4, 6-8, 12-13, 15, 18
Poly- and Perfluorinated Alkyl Substances in TCLP Reagent Water*	Analysis by LC-MS/MS. Subcontracted to AsureQuality, Lower Hutt.	-	1-6, 8
Dry Matter	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	0.10 g/100g as rcvd	1-8, 10, 12-15, 18-19
Dry Matter	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	2, 4, 6-8, 12-13, 15, 18
Total Cyanide	Samples extracted in alkaline conditions prior to on-line distillation and colourmetric determination using Segmented Flow Analysis. Subcontracted test, Analytica Laboratories Limited, Hamilton. EPA Method 9013A Revision 2 (Modified) and ISO 14403:2012(E) (Modified).	0.2 mg/kg dry wt	6
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	BaP Potency Equivalence calculated from; Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(j)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a)pyrene x 1.0 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Fluoranthene x 0.01 + Indeno(1,2,3-c,d)pyrene x 0.1. Ministry for the Environment. 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.	0.024 mg/kg dry wt	2, 4, 6-8, 12-13, 15, 18
Benzo[a]pyrene Toxic Equivalence (TEF)*	Benzo[a]pyrene Toxic Equivalence (TEF) calculated from; Benzo[a]pyrene x 1.0 + Benzo(a)anthracene x 0.1 + Benzo(b) fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Indeno(1,2,3-c,d)pyrene x 0.1. Guidelines for assessing and managing contaminated gasworks sites in New Zealand (GMG) (MfE, 1997).	0.024 mg/kg dry wt	2, 4, 6-8, 12-13, 15, 18
TPH Oil Industry Profile + PAHscreen	Sonication extraction, GC-FID and GC-MS/MS analysis. Tested on as received sample. In-house based on US EPA 8015 and US EPA 8270.	0.010 - 70 mg/kg dry wt	6
Heavy Metals with Mercury, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required. US EPA 200.2 (modified), APHA 3125 B: Online Edition.	0.10 - 4 mg/kg dry wt	1-8, 10, 12-15, 18-19
Polycyclic Aromatic Hydrocarbons Screening in Soil*	Sonication extraction, GC-MS/MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.010 - 0.05 mg/kg dry wt	2, 4, 7-8, 12-13, 15, 18
PFAS in Soil	Solvent extraction. LC-MS/MS analysis. Tested on as received sample. In-house based on ASTM D7968.	0.0010 - 0.046 mg/kg dry wt	1-8, 10, 12-15, 18-19
Total Petroleum Hydrocarbons in Soil			

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Client Chromatogram for TPH by FID	Small peaks associated with QC compounds may be visible in chromatograms with low TPH concentrations. QC peaks are as follows: one peak in the C12 - 14 band, the C21 - 25 band and the C30 - 36 band. All QC peaks are corrected for in the reported TPH concentrations.	-	6
C7 - C9	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	20 mg/kg dry wt	6
C10 - C14	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	20 mg/kg dry wt	6
C15 - C36	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	40 mg/kg dry wt	6
Total hydrocarbons (C7 - C36)	Calculation: Sum of carbon bands from C7 to C36. In-house based on US EPA 8015.	70 mg/kg dry wt	6

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 12-Jul-2025 and 05-Aug-2025. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.



Ara Heron BSc (Tech)
Client Services Manager - Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **NH2500826**		
Client	: **R J Hill Laboratories Limited**	Laboratory	: Environmental Hamilton
Contact	: Environmental Reports Officer	Contact	: Customer Services NH
Address	: Private Bag 3205 Hamilton Waikato New Zealand 3204	Address	: Ruakura Research Centre, 10 Bisley Rd Hamilton WKO New Zealand 3214
Telephone	: 07 858 2000	Telephone	: +64 [redacted]
Project	: fbSubAnalytica 709	Date Samples Received	: 21-Jul-2025 08:30
Order number	: [redacted]	Date Analysis Commenced	: 23-Jul-2025
C-O-C number	: ----	Issue Date	: 28-Jul-2025 11:32
Sampler	: ----		
Site	: ----		
Quote number	: EN/000		
No. of samples received	: 1		
No. of samples analysed	: 1		

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.

Signatories	*Position*	*Accreditation Category*
Astra Southerwood	Section Supervisor - Organics	Soil Prep, Hamilton, Waikato
Louise Coombridge	Chemist - Inorganics	Inorganics, Hamilton, Waikato

Page	:	2 of 4
Work Order	:	NH2500826
Client	:	R J Hill Laboratories Limited
Project	:	fbSubAnalytica 709

General Comments

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 (detection limit).

Unit	*Description*
%	Percent
mg/kg dry weight	mg/kg dry weight

>: greater than.
<: less than.
ø: ALS is not IANZ accredited for these tests.
^: This result is computed from individual analyte detections at or above the level of reporting.
~: Indicates an estimated value.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Workorder Comments

Samples were collected by yourselves (or your agent) and analysed as received at ALS NZ (or at the subcontracted laboratories, when applicable). Samples were in acceptable condition unless otherwise noted on this report.

Page : 3 of 4
Work Order : NH2500826
Client : R J Hill Laboratories Limited
Project : fbSubAnalytica 709

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client Sample ID	3934578.6	----	----	----	----
			Client Sampling date / time	21-Jul-2025 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	NH2500826-001	----	----	----	----
				Result	----	----	----	----
MC_S: Moisture Content								
Moisture Content	----	0.1	%	**12.3**	----	----	----	----
TC_S: Total Cyanide								
Total Cyanide	57-12-5	0.20	mg/kg dry weight	**1.85**	----	----	----	----

Brief Method Summaries

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content in Soil	MC_S	SOIL	Moisture content is determined gravimetrically by drying at 103 °C.
Total Cyanide in Soil	TC_S	SOIL	Samples extracted in alkaline conditions prior to on-line distillation and colourmetric determination using Segmented Flow Analysis. EPA Method 9013A Revision 2 (Modified) and ISO 14403:2012(E) (Modified).

AsureQuality Limited | 1C Quadrant Drive | Waiwhetu | Lower Hutt 5010 | Wellington | New Zealand
PO Box 31242 | Lower Hutt 5040 | Wellington | New Zealand
t. +64 4 570 8800 | e. testing@asurequality.com | w. www.asurequality.com

Certificate of Analysis

Submission Reference: EnvSubAQ_LH 1409

Final Report

Pre-registration ID: uYm-42B-VTb
PO Number: [redacted]

Hill Subcontracting
Hill Laboratories - Hamilton
Private Bag 3205
Hamilton 3240
New Zealand

Report Issued: 01-Aug-2025 **AsureQuality Reference: 25-196275** **Sample(s) Received:** 19-Jul-2025 08:38

Testing Period: 19-Jul-2025 to 01-Aug-2025
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: WSD_HA01_0.1 **Lab ID:** 25-196275-1

Sample Description: 3934578.1

Sample Condition: Acceptable **Sampled Date**: 09-Jul-2025

Test	Result	Unit	Method Reference
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)

AsureQuality Ltd has used reasonable skill, care, and effort to provide an accurate analysis of the sample(s) which form(s) the subject of this report. However, the accuracy of this analysis is reliant on, and subject to, the sample(s) provided by you and your responsibility as to transportation of the sample(s). AsureQuality Ltd's standard terms of business apply to the analysis set out in this report: https://www.asurequality.com/about/terms-of-business/

 This report must not be reproduced except in full, without the prior written approval of the laboratory.

AsureQuality Reference: 25-196275 **Report Issued:** 01-Aug-2025

Test	Result	Unit	Method Reference
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	106	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	105	%	AsureQuality Method (LC-MS/MS)
M8PFOS	98	%	AsureQuality Method (LC-MS/MS)
M4PFBA	106	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	103	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	106	%	AsureQuality Method (LC-MS/MS)
MPFHpA	105	%	AsureQuality Method (LC-MS/MS)
M8PFOA	103	%	AsureQuality Method (LC-MS/MS)
M9PFNA	95	%	AsureQuality Method (LC-MS/MS)
M6PFDA	100	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	111	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	101	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	90	%	AsureQuality Method (LC-MS/MS)
MPFOSA	103	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	101	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	101	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	98	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	103	%	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 25-196275 **Report Issued:** 01-Aug-2025

Test	Result	Unit	Method Reference
DNMeFOSE	99	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	113	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	89	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	103	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: WSD_HA01_0.3 **Lab ID:** 25-196275-2

Sample Description: 3934578.2

Sample Condition: Acceptable **Sampled Date**: 09-Jul-2025

Test	Result	Unit	Method Reference
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.040	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.040	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.031	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.095	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.13	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.17	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 25-196275 **Report Issued:** 01-Aug-2025

Test	Result	Unit	Method Reference
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	105	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	107	%	AsureQuality Method (LC-MS/MS)
M8PFOS	98	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	107	%	AsureQuality Method (LC-MS/MS)
MPFHpA	108	%	AsureQuality Method (LC-MS/MS)
M8PFOA	106	%	AsureQuality Method (LC-MS/MS)
M9PFNA	93	%	AsureQuality Method (LC-MS/MS)
M6PFDA	105	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	105	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	103	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	91	%	AsureQuality Method (LC-MS/MS)
MPFOSA	101	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	101	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	102	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	101	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	101	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	113	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	85	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	92	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: WSD_HA02_0.1 **Lab ID:** 25-196275-3

Sample Description: 3934578.3

Sample Condition: Acceptable **Sampled Date**: 09-Jul-2025

Test	Result	Unit	Method Reference
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 25-196275 **Report Issued:** 01-Aug-2025

Test	Result	Unit	Method Reference
PFPeS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.027	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.027	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.067	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.92	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.99	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	1.0	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 25-196275 **Report Issued:** 01-Aug-2025

Test	Result	Unit	Method Reference
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	107	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	105	%	AsureQuality Method (LC-MS/MS)
M8PFOS	101	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	105	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	107	%	AsureQuality Method (LC-MS/MS)
MPFHpA	104	%	AsureQuality Method (LC-MS/MS)
M8PFOA	108	%	AsureQuality Method (LC-MS/MS)
M9PFNA	97	%	AsureQuality Method (LC-MS/MS)
M6PFDA	105	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	100	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	101	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	89	%	AsureQuality Method (LC-MS/MS)
MPFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	101	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	108	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	102	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	99	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	100	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	106	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	110	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	80	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	102	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: WSD_HA02_0.3 **Lab ID:** 25-196275-4

Sample Description: 3934578.4

Sample Condition: Acceptable **Sampled Date**: 09-Jul-2025

Test	Result	Unit	Method Reference
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.031	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.031	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.27	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.94	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	1.2	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	1.2	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 25-196275 **Report Issued:** 01-Aug-2025

Test	Result	Unit	Method Reference
Perfluoroalkylcarboxylic acids			
PFBA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.040	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	108	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	109	%	AsureQuality Method (LC-MS/MS)
M8PFOS	100	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	107	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	109	%	AsureQuality Method (LC-MS/MS)
MPFHpA	106	%	AsureQuality Method (LC-MS/MS)
M8PFOA	106	%	AsureQuality Method (LC-MS/MS)
M9PFNA	95	%	AsureQuality Method (LC-MS/MS)
M6PFDA	107	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	98	%	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 25-196275 **Report Issued:** 01-Aug-2025

Test	Result	Unit	Method Reference
MPFDoDA	103	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	87	%	AsureQuality Method (LC-MS/MS)
MPFOSA	102	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	105	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	105	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	107	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	104	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	98	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	106	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	87	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	93	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: WSD_HA03_0.1 **Lab ID:** 25-196275-5

Sample Description: 3934578.5

Sample Condition: Acceptable **Sampled Date**: 09-Jul-2025

Test	Result	Unit	Method Reference
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.13	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.13	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.13	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 25-196275 **Report Issued:** 01-Aug-2025

Test	Result	Unit	Method Reference
Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	108	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	112	%	AsureQuality Method (LC-MS/MS)
M8PFOS	104	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	105	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	111	%	AsureQuality Method (LC-MS/MS)
MPFHpA	107	%	AsureQuality Method (LC-MS/MS)
M8PFOA	107	%	AsureQuality Method (LC-MS/MS)
M9PFNA	110	%	AsureQuality Method (LC-MS/MS)
M6PFDA	109	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	125	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	110	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	120	%	AsureQuality Method (LC-MS/MS)
MPFOSA	106	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	111	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	107	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	108	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	114	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	112	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	109	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	109	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	113	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	85	%	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 25-196275 **Report Issued:** 01-Aug-2025

Customer Sample Name: WSD_HA03_0.3 **Lab ID:** 25-196275-6

Sample Description: 3934578.6

Sample Condition: Acceptable **Sampled Date**: 09-Jul-2025

Test	Result	Unit	Method Reference
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.026	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.076	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.10	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 25-196275 **Report Issued:** 01-Aug-2025

Test	Result	Unit	Method Reference
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	110	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	110	%	AsureQuality Method (LC-MS/MS)
M8PFOS	109	%	AsureQuality Method (LC-MS/MS)
M4PFBA	108	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	107	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	110	%	AsureQuality Method (LC-MS/MS)
MPFHpA	109	%	AsureQuality Method (LC-MS/MS)
M8PFOA	109	%	AsureQuality Method (LC-MS/MS)
M9PFNA	112	%	AsureQuality Method (LC-MS/MS)
M6PFDA	113	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	125	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	110	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	122	%	AsureQuality Method (LC-MS/MS)
MPFOSA	110	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	112	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	109	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	111	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	108	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	112	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	111	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	114	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	110	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	108	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	105	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: WSD_HA04_0.1 **Lab ID:** 25-196275-7

Sample Description: 3934578.8

Sample Condition: Acceptable **Sampled Date**: 09-Jul-2025

Test	Result	Unit	Method Reference
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 25-196275 **Report Issued:** 01-Aug-2025

Test	Result	Unit	Method Reference
di-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.16	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.16	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.16	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	99	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	103	%	AsureQuality Method (LC-MS/MS)
M8PFOS	99	%	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 25-196275 **Report Issued:** 01-Aug-2025

Test	Result	Unit	Method Reference
M4PFBA	103	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	102	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	109	%	AsureQuality Method (LC-MS/MS)
MPFHpA	105	%	AsureQuality Method (LC-MS/MS)
M8PFOA	100	%	AsureQuality Method (LC-MS/MS)
M9PFNA	97	%	AsureQuality Method (LC-MS/MS)
M6PFDA	98	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	98	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	98	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	97	%	AsureQuality Method (LC-MS/MS)
MPFOSA	101	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	101	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	99	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	101	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	97	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	107	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	102	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	107	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: Duplicate.of 25-196275-6A **Lab ID:** 25-196275-8

Sample Description: 27802126_Duplicate

Sample Condition: Acceptable **Sampled Date**: 09-Jul-2025

Test	Result	Unit	Method Reference
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.028	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.081	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.11	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.11	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 25-196275 **Report Issued:** 01-Aug-2025

Test	Result	Unit	Method Reference
PFNA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	105	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	107	%	AsureQuality Method (LC-MS/MS)
M8PFOS	107	%	AsureQuality Method (LC-MS/MS)
M4PFBA	108	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	107	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	106	%	AsureQuality Method (LC-MS/MS)
MPFHpA	108	%	AsureQuality Method (LC-MS/MS)
M8PFOA	109	%	AsureQuality Method (LC-MS/MS)
M9PFNA	105	%	AsureQuality Method (LC-MS/MS)
M6PFDA	107	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	120	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	113	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	130	%	AsureQuality Method (LC-MS/MS)
MPFOSA	105	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	113	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	112	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	111	%	AsureQuality Method (LC-MS/MS)

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Test	Result	Unit	Method Reference
DNMeFOSAA	106	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	116	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	112	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	98	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	107	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	106	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	100	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 25-196275-1, 25-196275-2, 25-196275-3, 25-196275-4, 25-196275-5, 25-196275-6, 25-196275-8

Test	Result	Unit	Method Reference
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

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Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	108	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	105	%	AsureQuality Method (LC-MS/MS)
M8PFOS	104	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	108	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	106	%	AsureQuality Method (LC-MS/MS)
MPFHpA	101	%	AsureQuality Method (LC-MS/MS)
M8PFOA	106	%	AsureQuality Method (LC-MS/MS)
M9PFNA	103	%	AsureQuality Method (LC-MS/MS)
M6PFDA	108	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	110	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	106	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	93	%	AsureQuality Method (LC-MS/MS)
MPFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	102	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	103	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	108	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	102	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	99	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	101	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	111	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	97	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	97	%	AsureQuality Method (LC-MS/MS)

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Relates to sample(s) 25-196275-7

Test	Result	Unit	Method Reference
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

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AsureQuality Reference: 25-196275 **Report Issued:** 01-Aug-2025

Test	Result	Unit	Method Reference
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	101	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	99	%	AsureQuality Method (LC-MS/MS)
M8PFOS	100	%	AsureQuality Method (LC-MS/MS)
M4PFBA	100	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	99	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	102	%	AsureQuality Method (LC-MS/MS)
MPFHpA	108	%	AsureQuality Method (LC-MS/MS)
M8PFOA	108	%	AsureQuality Method (LC-MS/MS)
M9PFNA	105	%	AsureQuality Method (LC-MS/MS)
M6PFDA	103	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	107	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	103	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	101	%	AsureQuality Method (LC-MS/MS)
MPFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	105	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	102	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	106	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	101	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	96	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	98	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	103	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Authorised by
Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water		
DX-PFCS02, 06-TCLP_W	AsureQuality Method (LC-MS/MS)	Christopher Sampson

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di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)

mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)

L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)

Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)

di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)

mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)

L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)

Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)

Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.

Reported results are corrected for internal standard recovery.

In house protocol based on US EPA 1311 test Toxicity Characteristic Leaching Procedure (TCLP).

Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.



Christopher Sampson

Scientist

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Appendix

Analyte LOR Summary

Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPrS	0.025 µg/L
PFBS	0.025 µg/L
PFPeS	0.025 µg/L
di-PFHxS (1)	0.025 µg/L
mono-PFHxS (1)	0.025 µg/L
L-PFHxS (1)	0.025 µg/L
Total PFHxS (3)	0.025 µg/L
PFHpS	0.025 µg/L
di-PFOS (5)	0.025 µg/L
mono-PFOS (5)	0.025 µg/L
L-PFOS (5)	0.025 µg/L
Total PFOS (7)	0.025 µg/L
Sum PFHxS+PFOS (1)	0.025 µg/L
PFNS	0.050 µg/L
PFDS	0.10 µg/L
PFECHS	0.025 µg/L
Perfluoroalkylcarboxylic acids	
PFBA	0.10 µg/L
PFPeA	0.10 µg/L
PFHxA	0.025 µg/L
PFHpA	0.025 µg/L
PFOA	0.025 µg/L
PFNA	0.025 µg/L
PFDA	0.025 µg/L
PFUnDA	0.025 µg/L
PFDoDA	0.10 µg/L
PFTrDA	0.10 µg/L
PFTeDA	0.10 µg/L
P37DMOA	0.050 µg/L
Perfluorooctanesulfonamides	
PFOSA	0.025 µg/L
NEtFOSA-M	0.10 µg/L
NMeFOSA-M	0.10 µg/L
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	0.025 µg/L
NMeFOSAA	0.025 µg/L
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	0.10 µg/L
NMeFOSE-M	0.10 µg/L
Telomere Sulfonic acids	
4:2 FTS	0.025 µg/L
6:2 FTS	0.050 µg/L
8:2 FTS	0.10 µg/L
10:2 FTS	0.025 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.10 µg/L
FPePA (5:3FTA)	0.025 µg/L

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FHpPA (7:3FTA)	0.025 µg/L
Miscellaneous	
F-53B (major)	0.10 µg/L
F-53B (minor)	0.050 µg/L
Sum F-53B	0.1 µg/L
ADONA	0.025 µg/L
HFPO-DA (GenX)	0.050 µg/L

Analyte Definitions

Poly and Perfluorinated Alkyl Substances (PFAS) in Soil Leachate - Reagent Water - AsureQuality Method (LC-MS/MS)

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPrS	Perfluoro-1-propanesulfonic acid
PFBS	Perfluoro-1-butanesulfonic acid
PFPeS	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)	Linear Perfluorohexanesulfonic acid
PFHpS	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)	Total Perfluoromethylheptane sulfonic acids
L-PFOS (5)	Linear Perfluorooctanesulfonic acid
PFNS	Perfluoro-1-nonanesulfonic acid
PFDS	Perfluoro-1-decanesulfonic acid
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic acid
Perfluoroalkylcarboxylic acids	
PFBA	Perfluoro-n-butanoic acid
PFPeA	Perfluoro-n-pentanoic acid
PFHxA	Perfluoro-n-hexanoic acid
PFHpA	Perfluoro-n-heptanoic acid
PFOA	Perfluoro-n-octanoic acid
PFNA	Perfluoro-n-nonanoic acid
PFDA	Perfluoro-n-decanoic acid
PFUnDA	Perfluoro-n-undecanoic acid
PFDoDA	Perfluoro-n-dodecanoic acid
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid
Perfluorooctanesulfonamides	
PFOSA	Perfluoro-1-octanesulfonamide
NEtFOSA-M	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M	N-methylperfluoro-1-octanesulfonamide
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
Telomere Sulfonic acids	
4:2 FTS	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid
10:2 FTS	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)	3-Perfluoropropyl propanoic acid

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AsureQuality Reference: 25-196275 **Report Issued:** 01-Aug-2025

Analyte	Full Name
FPePA (5:3FTA)	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B	Sum of F-53B components (major + minor)
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)	Tetrafluoro-2-(heptafluoropropoxy)propanoic acid
Internal Standards	
M3PFBS	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PFPeA	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA	Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid
M8PFOA	Perfluoro-n-[13C8]octanoic acid
M9PFNA	Perfluoro-n-[13C9]nonanoic acid
M6PFDA	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDoDA	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA	Perfluoro-n-[1,2-13C2]tetradecanoic acid
MPFOSA	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid
M3HFPO-DA	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

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F

Appendix F – Test Pit Logs and Hand Pit Summaries

Environmental Test Pit Log

Test Pit ID: WSS_TP1

Sheet 1 of 1

Project:	WIAL Sea Defences Renewal	**Project Number:**	3324338
Site Location:	Wellington Internation Airport Seawall, Moa Point Road	**Client:**	Wellington International Airport Limited
Location:	On seawall - adjacent to gabions	**Coordinate System:**	NZTM2000
		Northing:	5422500.5
		Easting:	1751215.9
		Vertical Datum:	NZVD 2016
		Ground Level (mRL):	3.52
		Location Method:	GPS/Phone

Groundwater (m)	PID	Samples	Depth (m)	RL (m)	Graphic Log	Soil/ Rock Description	Geological Unit
		ES		3.5		Very soft, gravelly SILT, minor coarse sand, brown. Dry, non plastic.	Topsoil
	0.0					Very soft, gravelly SILT, minor coarse sand, brown. Dry, non plastic. Angular coarse GREYWACKE.	Fill
		ES					
	0.0		0.5	3.0		Tightly packed GREYWACKE. Refusal @ 0.55 m due to rock layer.	Greywacke
						0.55m - End of test pit, Terminated due to refusal (compacted gravels / greywacke)	
			1.0	2.5			
			1.5	2.0			

Date Started:	28/11/2024	**Logged By:**	GJS	**Comments:**
Method:	TP	**Contractor:**	McConnell Dowell	Terminated due to refusal at 0.55 m (compacted gravels / greywacke)
Face Orientation:		**Equipment:**	1.5T Mini Excavator	

Note: These logs are for environmental purposes only and may not comply with NZGS geotechnical logging guidelines.

Photo Log

Location ID: WSS_TP1

Project:	WIAL Sea Defences Renewal		**Project number:**	3324338	
Site location:	Wellington Internation Airport Seawall, Moa Point Road		**Client Name:**	Wellington International Airport Limited	
Location:	On seawall - adjacent to gabions	**Coordinate system:**	NZTM2000	**Vertical datum:**	NZVD 2016
		Northing:	5422500.5	**Ground level (mRL):**	3.52
		Easting:	1751215.9	**Location method:**	GPS/Phone



Photograph 1. Excavation to approximately 0.5 m below ground level on edge of seawall.



Photograph 2. Location of excavation in relation to the seawall / gabions.

Environmental Test Pit Log

Test Pit ID: WSS_TP2

Project:	WIAL Sea Defences Renewal	**Project Number:**	3324338
Site Location:	Wellington Internation Airport Seawall, Moa Point Road	**Client:**	Wellington International Airport Limited
Location:	On seawall	**Coordinate System:**	NZTM2000
		Northing:	5422517.0
		Easting:	1751261.0
		Vertical Datum:	NZVD 2016
		Ground Level (mRL):	3.09
		Location Method:	GPS/Phone

Groundwater (m)	PID	Samples	Depth (m)	RL (m)	Graphic Log	Soil/ Rock Description	Geological Unit
	0.0	ES		3.0		Very soft, gravelly SILT, brown. Dry, non plastic. Medium angular gravels.	Topsoil
						Very soft SILT, minor coarse sand, brown. Dry, non plastic. Some medium angular gravels.	Fill
	0.2	ES	0.5	2.5		Sandy SILT, minor coarse sand, trace clay, dark brown. Moist, poor plasticity. Medium angular gravels.	
	0.0	ES	1.0	2.0		1.00m - End of test pit, Target depth reached.	
			1.5	1.5			

Date Started:	28/11/2024	**Logged By:**	GJS
Method:	TP	**Contractor:**	McConnell Dowell
Face Orientation:		**Equipment:**	1.5T Mini Excavator

Comments:

Note: These logs are for environmental purposes only and may not comply with NZGS geotechnical logging guidelines.

Photo Log

Location ID: WSS_TP2

Project:	WIAL Sea Defences Renewal			**Project number:**	3324338
Site location:	Wellington Internation Airport Seawall, Moa Point Road			**Client Name:**	Wellington International Airport Limited
Location:	On seawall	**Coordinate system:**	NZTM2000	**Vertical datum:**	NZVD 2016
		Northing:	5422517.0	**Ground level (mRL):**	3.09
		Easting:	1751261.0	**Location method:**	GPS/Phone



Photograph 1. Surface scrape.



Photograph 2. Excavation to approximately 1 m below ground level.

Environmental Test Pit Log

Test Pit ID: WSS_TP3

Project:	WIAL Sea Defences Renewal	**Project Number:**	3324338
Site Location:	Wellington Internation Airport Seawall, Moa Point Road	**Client:**	Wellington International Airport Limited
Location:	On seawall	**Coordinate System:**	NZTM2000
		Northing:	5422522.2
		Easting:	1751293.1
		Vertical Datum:	NZVD 2016
		Ground Level (mRL):	4.53
		Location Method:	GPS/Phone

Groundwater (m)	PID	Samples	Depth (m)	RL (m)	Graphic Log	Soil/ Rock Description	Geological Unit
	0.0	ES		4.5		Very soft, gravelly brown SILT. Dry, non plastic. Some medium angular gravels.	Topsoil
						Very soft SILT, minor coarse sand, brown. dry, non plastic. Some medium angular gravels.	Fill
	0.0	ES	0.5	4.0		Loose dark brown sandy SILT with minor clay. Moist, moderate plasticity.	
	0.0	ES	1.0	3.5		1.00m - End of test pit, Target depth reached.	
			1.5	3.0			

Date Started:	28/11/2024	**Logged By:**	GJS	**Comments:**	
Method:	TP	**Contractor:**	McConnell Dowell		
Face Orientation:		**Equipment:**	1.5T Mini Excavator		

Note: These logs are for environmental purposes only and may not comply with NZGS geotechnical logging guidelines.

Photo Log

Location ID: WSS_TP3

Project:	WIAL Sea Defences Renewal			**Project number:**	3324338
Site location:	Wellington Internation Airport Seawall, Moa Point Road			**Client Name:**	Wellington International Airport Limited
Location:	On seawall	**Coordinate system:**	NZTM2000	**Vertical datum:**	NZVD 2016
		Northing:	5422522.2	**Ground level (mRL):**	4.53
		Easting:	1751293.1	**Location method:**	GPS/Phone



Photograph 1. Excavation of surface in gravelled car park area beside the seawall.



Photograph 2. Excavation to approximately 1 m below ground level.

Environmental Test Pit Log

Test Pit ID: WSS_TP4

Project:	WIAL Sea Defences Renewal	**Project Number:**	3324338
Site Location:	Wellington Internation Airport Seawall, Moa Point Road	**Client:**	Wellington International Airport Limited
Location:	On a walkway area	**Coordinate System:**	NZTM2000
		Northing:	5422538.1
		Easting:	1751368.0
		Vertical Datum:	NZVD 2016
		Ground Level (mRL):	5.68
		Location Method:	GPS/Phone

Groundwater (m)	PID	Samples	Depth (m)	RL (m)	Graphic Log	Soil/ Rock Description	Geological Unit
	0.0	ES				Loosely packed, soft brown gravelly SILT with trace sand. Some medium subangular and angular gravels. Dry, poor plasticity.	Topsoil
				5.5			
	0.0	ES	0.5				
				5.0			
						Brown SILT with minor coarse gravels / greywacke. Moist, non plastic. No defined layers, homogenous.	Fill
	0.0	ES	1.0			Orange-brown SILT with some clay, minor sand and minor fine gravels. Moist, poor plasticity.	Fill
						1.00m - End of test pit, Target depth reached.	
				4.5			
			1.5				
				4.0			

Date Started:	28/11/2024	**Logged By:**	GJS	**Comments:**
Method:	TP	**Contractor:**	McConnell Dowell	
Face Orientation:		**Equipment:**	1.5T Mini Excavator	

Note: These logs are for environmental purposes only and may not comply with NZGS geotechnical logging guidelines.

Photo Log

Location ID: WSS_TP4

Project:	WIAL Sea Defences Renewal		**Project number:**	3324338	
Site location:	Wellington Internation Airport Seawall, Moa Point Road		**Client Name:**	Wellington International Airport Limited	
Location:	On a walkway area	**Coordinate system:**	NZTM2000	**Vertical datum:**	NZVD 2016
		Northing:	5422538.1	**Ground level (mRL):**	5.68
		Easting:	1751368.0	**Location method:**	GPS/Phone



Photograph 1. Excavation to approximately 1 m below ground level.

Environmental Test Pit Log

Test Pit ID: WSS_TP5

Sheet 1 of 1

Project:	WIAL Sea Defences Renewal	**Project Number:**	3324338
Site Location:	Wellington Internation Airport Seawall, Moa Point Road	**Client:**	Wellington International Airport Limited
Location:	On a walkway area, west of the suspected fire training area	**Coordinate System:**	NZTM2000
		Northing:	5422518.1
		Easting:	1751372.4
		Vertical Datum:	NZVD 2016
		Ground Level (mRL):	6.66
		Location Method:	GPS/Phone

Groundwater (m)	PID	Samples	Depth (m)	RL (m)	Graphic Log	Soil/ Rock Description	Geological Unit
	0.0	ES				Brown gravelly SILT. Dry, poor plasticity.	Topsoil
				6.5		Brown SILT with minor coarse angular to subangular gravels. Moist, poor plasticity. Undifferentiated soils - homogenous.	Fill
	0.1	ES	0.5				
				6.0			
		ES					
	0.1		1.0			1.00m - End of test pit, Target depth reached.	
				5.5			
			1.5				
				5.0			

Date Started:	28/11/2024	**Logged By:**	GJS	**Comments:**
Method:	TP	**Contractor:**	McConnell Dowell	
Face Orientation:		**Equipment:**	1.5T Mini Excavator	

Note: These logs are for environmental purposes only and may not comply with NZGS geotechnical logging guidelines.

Photo Log

Location ID: WSS_TP5

Project:	WIAL Sea Defences Renewal		**Project number:**	3324338	
Site location:	Wellington Internation Airport Seawall, Moa Point Road		**Client Name:**	Wellington International Airport Limited	
Location:	On a walkway area, west of the suspected fire training area	**Coordinate system:**	NZTM2000	**Vertical datum:**	NZVD 2016
		Northing:	5422518.1	**Ground level (mRL):**	6.66
		Easting:	1751372.4	**Location method:**	GPS/Phone



Photograph 1. Excavation to approximately 0.5 m below ground level.



Photograph 2. Excavation to approximately 1 m below ground level.



Photograph 3. Test pit soil profile.

Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	29 November 2024	WIAL Sea Defences Renewal

Photo No. 1 & 2

Date: 29 November 2024

Direction: N/A

Description: WSS_HA7.

Grassed surface with dense rootlets. Dry light brown SILT with some fine subangular to angular gravels, minor clay and minor fine sand. Poor plasticity.



Photo No. 3 & 4

Date: 29 November 2024

Direction: N/A

Description: WSS_HA8 hand pit.

Grassed surface with dense rootlets. Moist light brown gravelly SILT, fine subangular to angular gravels, minor clay and minor fine sand. Poor plasticity.



Site Location: Moa Point Road, Rongotai 6022	**Date:** 29 November 2024	**Project:** WIAL Sea Defences Renewal
Photo No. 5 & 6 **Date:** 29 November 2024 **Direction:** N/A **Description:** WSS_HA9. Grassed surface with dense rootlets. Dry brown gravelly SILT, medium subangular to angular gravels, trace fine sand. Poor plasticity.		
Photo No. 7 & 8 **Date:** 29 November 2024 **Direction:** N/A **Description:** WSS_HA10. Same as WSS_HA8.		

Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal – Additional Sampling

Photo No. 1

Date: 4 July 2025

Direction: N/A

Description: Crest location test pit location (WSD_CR1). Crest was removed from area prior to Beca Environmental Scientist's arrival. Location was approximately 1 m below original crest surface.



Photo No. 2

Date: 4 July 2025

Direction: N/A

Description: Material from excavation at WSD_CR1.



Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal – Additional Sampling

Photo No. 3

Date: 4 July 2025

Direction: N/A

Description: WSD_CR1. Soils were orange-brown silty GRAVELS with minor fine sand. Gravels fine to medium angular to subangular. Wet, poor plasticity. Nil refuse observed.



Photo No. 4

Date: 9 July 2025

Direction: N/A

Description: WSD_CR2. Soil in profile was dark brown-grey GRAVELS with some silt and some fine sand. Very dense, moist. Gravels fine to coarse angular to subangular. Became silty fine to coarse SAND at 1.0 m.



Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal – Additional Sampling

Photo No. 5

Date: 4 July 2025

Direction: N/A

Description: WSD_SS01. All stockpile soils were silty GRAVELS with minor clay and minor fine sand. Saturated. Gravels fine to coarse, angular to subangular. Trace cobbles.

Some geotextile cloth and wire netting seen protruding from areas of the stockpile.



Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal – Additional Sampling

Photo No. 6

Date: 4 July 2025

Direction: N/A

Description: WSD_SS02.



Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal – Additional Sampling

Photo No. 7

Date: 4 July 2025

Direction: N/A

Description: WSD_SS03.



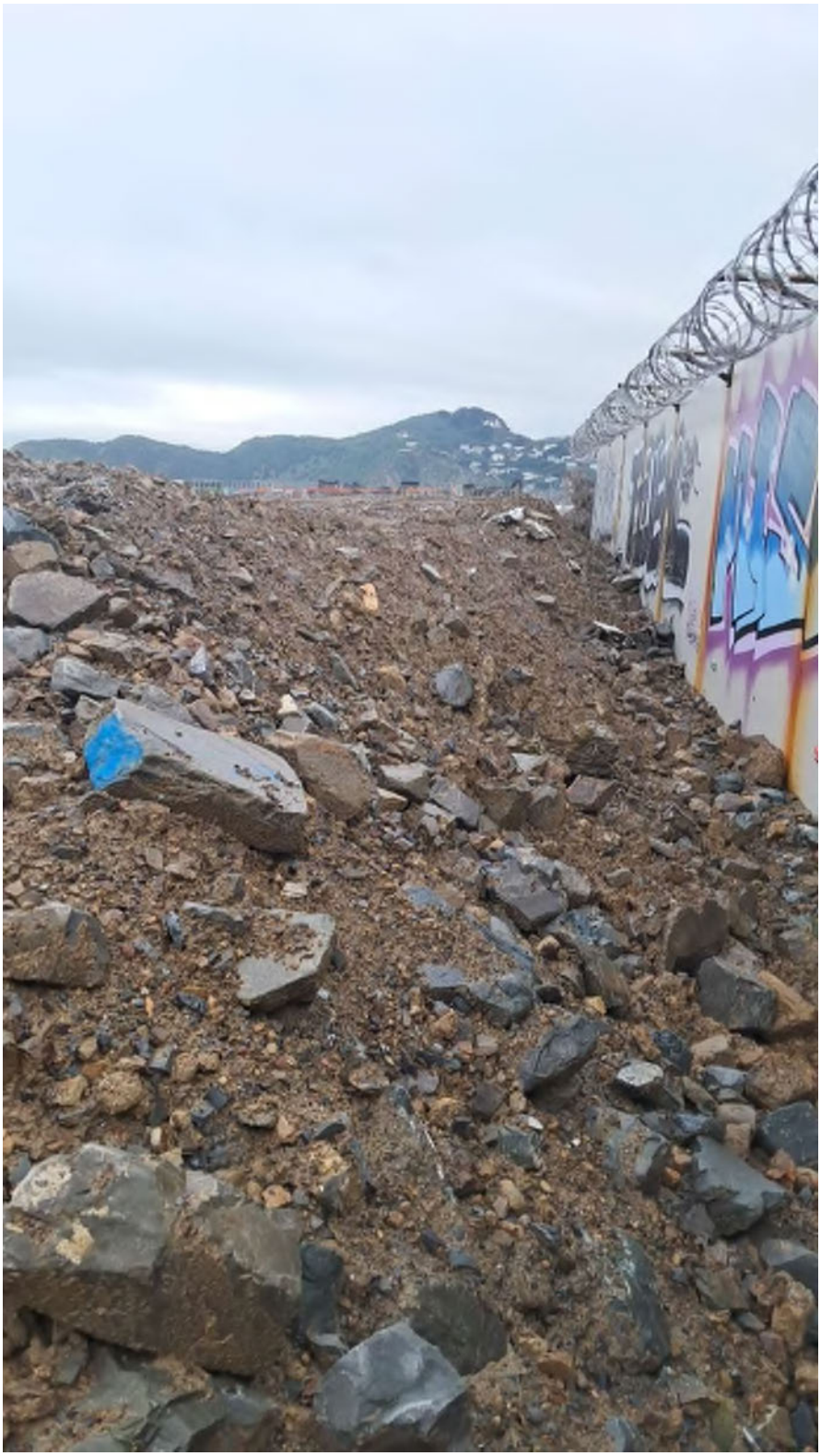
Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal – Additional Sampling

Photo No. 8

Date: 4 July 2025

Direction: West

Description: Area of WSD_SS04.



Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal – Additional Sampling

Photo No. 9

Date: 4 July 2025

Direction: N/A

Description:
WSD_SS05.



Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal – Additional Sampling

Photo No. 10

Date: 4 July 2025

Direction: N/A

Description:
WSD_SS06.



Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal – Additional Sampling

Photo No. 11

Date: 9 July 2025

Direction: N/A

Description:
WSD_HA01.
Orange brown compacted silty sand w medium angular gravels.



Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal – Additional Sampling

Photo No. 12

Date: 9 July 2025

Direction: West

Description: Location of WSD_HA01.



Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal – Additional Sampling

Photo No. 13

Date: 9 July 2025

Direction: North-west

Description:
WSD_HA02.



Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal – Additional Sampling

Photo No. 14

Date: 9 July 2025

Direction: N/A

Description:
WSD_HA02.
Brown silt w minor sand trace clay. Minor fine to medium gravels. Moist. Refusal at 0.3 m - cobble at base.



Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal – Additional Sampling

Photo No. 15

Date: 9 July 2025

Direction: N/A

Description:
WSD_HA03.
Topsoil was silt with minor sand. Wet, dense rootlets. From 0.2 m onward - orange silty SAND with some fine to medium angular gravels. Blue green rocks encountered at 0.3 m with minor black residue in soil.



Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal – Additional Sampling

Photo No. 16

Date: 9 July 2025

Direction: N/A

Description: Soil from WSD_HA03.



Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal – Additional Sampling

Photo No. 17

Date: 9 July 2025

Direction: N/A

Description: Blue-green material in WSD_HA03.



Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal – Additional Sampling

Photo No. 18

Date: 9 July 2025

Direction: South

Description:
WSD_HA04.
Sand surface.
Compacted fine to medium angular gravels from 0.1 m bgl. Refusal at 0.25m



Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal – Additional Sampling

Photo No. 19

Date: 9 July 2025

Direction: N/A

Description:
WSD_HA05.
In yard - original ground undisturbed. Glass shards (brown) seen at 0.3 m. Brown silt w minor sand trace clay. Minor fine to medium gravels. Moist.



Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal – Additional Sampling

Photo No. 20

Date: 9 July 2025

Direction: South-east

Description: Location of WSD_HA05.



Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal – Additional Sampling

Photo No. 21

Date: 9 July 2025

Direction: North

Description: Location of WSD_HA05.



Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal – Additional Sampling

Photo No. 22

Date: 9 July 2025

Direction: N/A

Description:
WSD_HA06.
Sand over orange compacted gravel/silt. Refusal immediately below surface.



G

Appendix G – Site Photography

Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal

Photo No. 1 **Date:** 4 July 2025 **Direction:** North-east **Description:** Seawall area that was previously sampled. The site has had a 0.3 m scrape (approximately), which has been stockpiled under coconut matting on the lefthand side of this image.	
Photo No. 2 **Date:** 4 July 2025 **Direction:** North **Description:** Stockpile of scraped soil from area where PFAS was identified in the 2024 site investigation.	

Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal

Photo No. 3 **Date:** 4 July 2025 **Direction:** North-east **Description:** Stockpiled soil from wave trap scrape. Stockpiled approx. 1.5 m high along the north perimeter fence.	
Photo No. 4 **Date:** 4 July 2025 **Direction:** West **Description:** Continued stockpiled soil from Wave trap.	

Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal

Photo No. 5

Date: 4 July 2025

Direction: South-west

Description: Seawall area that was previously sampled. The site has had a 0.3 m scrape (approximately), which has been stockpiled under coconut matting on the righthand side of this image.



Photo No. 6

Date: 4 July 2025

Direction: West

Description: West side of seawall, with the west end of the tunnel on the righthand side. This area was scraped between 0.2 m to 0.5 m bgl. Elevated area in the background directly beside the tunnel wall is original ground level.



Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal

Photo No. 7 **Date:** 4 July 2025 **Direction:** West **Description:** Far west side of the seawall and crest. Excess scraped surface material from seawall maintenance was placed in foreground.	
Photo No. 8 **Date:** 4 July 2025 **Direction:** South **Description:** First crest location (WSD_CR1).	

Site Location:	Date:	Project:
Moa Point Road, Rongotai 6022	4 July 2025 – 9 July 2025	WIAL Sea Defences Renewal

Photo No. 9 **Date:** 4 July 2025 **Direction:** South **Description:** Exposed soil profile in crest. Thin layer of concrete at surface (approximately 0.2 m), underlain by riprap, geotextile cloth and wire netting, then soil.	
Photo No. 10 **Date:** 4 July 2025 **Direction:** South **Description:** Exposed soil profile in crest. This profile scraped and sampled for WSD_CR2 during the sampling on 9 July 2025.	

H

Appendix H – Results Assessment Tables

	Asbestos
	Presence / Absence
New Zealand Guidelines for Assessing and Managing Asbestos in Soil (BRANZ, 2017) [1]	Detect/Non-Detect

Field ID	Sample Code	Date	Depth (m)	
WSS_TP1_0.1	3727361_1	28 Nov 2024	0.1	Asbestos NOT detected
WSS_TP1_0.5	3727361_2	28 Nov 2024	0.5	Asbestos NOT detected
WSS_TP4_0.1	3727361_9	28 Nov 2024	0.1	Asbestos NOT detected
WSS_TP4_0.5	3727361_10	28 Nov 2024	0.5	Asbestos NOT detected
WSS_TP5_0.1	3727361_12	28 Nov 2024	0.1	Asbestos NOT detected
WSS_TP5_0.5	3727361_13	28 Nov 2024	0.5	Asbestos NOT detected
WSS_HA7_0.3	3728491_17	29 Nov 2024	0.3	Asbestos NOT detected
WSS_HA8_0.1	3729107_1	29 Nov 2024	0.1	Asbestos NOT detected
WSS_HA8_0.5	3729107_3	29 Nov 2024	0.5	Asbestos NOT detected
WSS_HA9_0.1	3729107_4	29 Nov 2024	0.1	Asbestos NOT detected
WSS_HA9_0.5	3729107_6	29 Nov 2024	0.5	Asbestos NOT detected
WSS_HA10_0.1	3729107_7	29 Nov 2024	0.1	Asbestos NOT detected
WSD_CR1_0.0	3931182_1	04 Jul 2025	0.0	Asbestos NOT detected
WSD_SS01	3931182_2	04 Jul 2025	Stockpile sample	Asbestos NOT detected
WSD_SS02	3931182_3	04 Jul 2025	Stockpile sample	Asbestos NOT detected
WSD_SS03	3931182_4	04 Jul 2025	Stockpile sample	Asbestos NOT detected
WSD_SS04	3931182_5	04 Jul 2025	Stockpile sample	Asbestos NOT detected
WSD_SS05	3931182_6	04 Jul 2025	Stockpile sample	Asbestos NOT detected
WSD_SS06	3931182_7	04 Jul 2025	Stockpile sample	Asbestos NOT detected

Annotations:

1 - New Zealand Guidelines for Assessing and Managing Asbestos in Soil (BRANZ, 2017).

				Metals								Cyanide	PFAS			TPH			
				Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Total Cyanide	The sum of Total PFHxS and Total PFOS	Perfluorooctanoic acid (PFOA)	Perfluorooctane sulfonic acid (PFOS)	C7-C9 Fraction	C10-C14 Fraction	C15-C36 Fraction	C7-C36 Fraction
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NESCS Soil Contaminant Standards for Health – Recreation [1]				80	400	2,700	10,000	880	1,800	-	-	-	-	-	-	-	-	-	-
Australian NEPM Measure 1999 (updated 2013) - Recreation [2]				-	-	-	-	-	-	1,200	30,000	-	-	-	-	-	-	-	-
MfE Module 4, Tier 1 Residential (SANDY SILT) [3]				-	-	-	-	-	-	-	-	-	-	-	-	500	510	NA *	-
US EPA Regional Screening Levels - Residential Soils [4]				-	-	-	-	-	-	-	-	2.4	-	-	-	-	-	-	-
HEPA PFAS NEMP Version 3.0 - Human Health investigation levels for 'public spaces' (HIL C) [5]				-	-	-	-	-	-	-	-	-	1	10	-	-	-	-	-
(2022) EcoSGVs - Investigation Trigger (80%) - Typ/Aged Soils [6]				**60**	**12**	**390**	**240**	**900**	-	-	**300**	**0.9**	-	-	-	**130**	**110**	**1,300**	-
Canadian Environmental Quality Guidelines (CCME) [7]				-	-	-	-	-	**6.6**	**45**	-	-	-	-	-	-	-	-	-
HEPA PFAS NEMP Version 3.0 - Ecological guideline values for direct exposure [8]				-	-	-	-	-	-	-	-	-	-	10	1	-	-	-	-
HEPA PFAS NEMP Version 3.0 - Ecological guideline values for direct exposure - Interim screening criteria for reptiles [8]				-	-	-	-	-	-	-	-	-	-	**0.005**	-	-	-	-	-
HEPA PFAS NEMP Version 3.0 - Ecological guideline values for indirect exposure [8]				-	-	-	-	-	-	-	-	-	-	0.003	0.003	-	-	-	-
Wellington Region Background (Greywacke) [9]				*7*	*0.1*	*16*	*25*	*78.6*	*0.2*	*13*	*105*	-	-	-	-	-	-	-	*190*
MfE Hazardous Waste Guidelines Class A Screening [10]				100	20	100	100	100	4	200	200	-	-	-	-	-	-	-	-
Lab Report Number	**Field ID**	**Date**	**Depth (m bgl)**																
3727360	**WSS_TP1_0.1**	**28 Nov 2024**	**0.1**	*8*	<0.10	15	22	25	<0.10	*21*	88	-	-	-	-	-	-	-	-
3727360	**WSS_TP1_0.5**	**28 Nov 2024**	**0.5**	4	<0.10	*17*	12	19.4	<0.10	*15*	67	-	-	-	-	-	-	-	-
3727360	**WSS_TP2_0.1**	**28 Nov 2024**	**0.1**	5	<0.10	16	19	25	<0.10	13	81	-	-	-	-	-	-	-	-
3727360	**WSS_TP3_0.1**	**28 Nov 2024**	**0.1**	*8*	<0.10	16	20	26	0.11	*18*	79	-	0.0034	<0.0010	<0.0010	-	-	-	-
3727360	**WSS_TP3_0.5**	**28 Nov 2024**	**0.5**	-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.0010	-	-	-	-
3727360	**WSS_TP4_0.1**	**28 Nov 2024**	**0.1**	7	<0.10	16	15	28	<0.10	*14*	72	-	0.0041	<0.0010	0.0034	-	-	-	-
3727360	**WSS_TP4_0.5**	**28 Nov 2024**	**0.5**	5	<0.10	15	15	27	<0.10	13	70	-	0.0157	<0.0010	0.0144	-	-	-	-
3727360	**WSS_TP4_1.0**	**28 Nov 2024**	**1**	-	-	-	-	-	-	-	-	-	0.023	<0.0010	0.021	-	-	-	-
3727360	**WSS_TP5_0.1**	**28 Nov 2024**	**0.1**	5	<0.10	14	15	25	<0.10	13	72	-	0.0087	<0.0010	0.0067	<20	<20	<40	<80
3727360	**WSS_TP5_0.5**	**28 Nov 2024**	**0.5**	5	<0.10	15	15	27	<0.10	*14*	69	-	0.058	0.0022	0.034	<20	<20	<40	<80
3727360	**WSS_TP5_1.0**	**28 Nov 2024**	**1.0**	-	-	-	-	-	-	-	-	-	0.021	0.0018	0.0109	-	-	-	-
3728481	**WSS_HA7_0.1**	**29 Nov 2024**	**0.1**	*11*	<0.10	15	*27*	48	< 0.10	12	80	-	-	-	-	-	-	-	-
3728481	**WSS_HA7_0.3**	**29 Nov 2024**	**0.3**	4	<0.10	14	*49*	39	< 0.10	12	71	-	-	-	-	-	-	-	-
3729105	**WSS_HA8_0.1**	**29 Nov 2024**	**0.1**	5	0.1	15	15	41	< 0.10	11	86	-	-	-	-	-	-	-	-
3729105	**WSS_HA8_0.3**	**29 Nov 2024**	**0.3**	5	0.1	15	17	42	< 0.10	12	82	-	-	-	-	-	-	-	-
3729105	**WSS_HA8_0.5**	**29 Nov 2024**	**0.5**	6	*0.11*	16	17	48	< 0.10	13	89	-	-	-	-	-	-	-	-
3729105	**WSS_HA9_0.1**	**29 Nov 2024**	**0.1**	5	<0.10	14	20	27	< 0.10	13	75	-	-	-	-	-	-	-	-
3729105	**WSS_HA9_0.3**	**29 Nov 2024**	**0.3**	5	<0.10	16	*27*	30	< 0.10	*14*	75	-	-	-	-	-	-	-	-
3729105	**WSS_HA9_0.5**	**29 Nov 2024**	**0.5**	5	<0.10	16	22	27	< 0.10	*15*	72	-	-	-	-	-	-	-	-
3729105	**WSS_HA10_0.1**	**29 Nov 2024**	**0.1**	6	*0.12*	16	20	28	< 0.10	*16*	101	-	-	-	-	-	-	-	-
3729105	**WSS_HA10_0.3**	**29 Nov 2024**	**0.3**	7	<0.10	16	20	28	< 0.10	*19*	86	-	-	-	-	-	-	-	-
3931181	**WSD_CR1_0.0**	**04 Jul 2025**	**0.1**	5	< 0.10	*17*	17	19.4	-	*14*	*153*	-	< 0.0010	< 0.0010	< 0.0010	-	-	-	-
3934578.1	**WSD_CR2_0.2**	**09 Jul 2025**	**0.2**	9	< 0.10	15	21	27	< 0.10	*16*	94	-	< 0.0010	< 0.0010	< 0.0010	-	-	-	-
3931181	**WSD_SS01**	**04 Jul 2025**	**Stockpile sample**	5	< 0.10	*17*	16	25	-	*15*	*128*	-	< 0.0010	< 0.0010	< 0.0010	-	-	-	-
3931181	**WSD_SS02**	**04 Jul 2025**	**Stockpile sample**	6	< 0.10	*17*	18	21	-	*15*	88	-	< 0.0010	< 0.0010	< 0.0010	-	-	-	-
3931181	**WSD_SS03**	**04 Jul 2025**	**Stockpile sample**	4	< 0.10	14	14	14.9	-	11	88	-	< 0.0010	< 0.0010	< 0.0010	-	-	-	-
3931181	**WSD_SS04**	**04 Jul 2025**	**Stockpile sample**	4	< 0.10	*17*	16	19.6	-	*14*	*159*	-	< 0.0010	< 0.0010	< 0.0010	-	-	-	-
3931181	**WSD_SS05**	**04 Jul 2025**	**Stockpile sample**	4	< 0.10	*17*	16	21	-	13	*128*	-	< 0.0010	< 0.0010	< 0.0010	-	-	-	-
3931181	**WSD_SS06**	**04 Jul 2025**	**Stockpile sample**	5	< 0.10	18	18	23	-	*14*	*129*	-	< 0.0010	< 0.0010	< 0.0010	-	-	-	-
3934578.1	**WSD_HA01_0.1**	**09 Jul 2025**	**0.1**	3	< 0.10	14	10	16.2	< 0.10	11	54	-	0.0012	< 0.0010	0.001	-	-	-	-
3934578.1	**WSD_HA01_0.3**	**09 Jul 2025**	**0.3**	4	< 0.10	17	11	22	< 0.10	*14*	63	-	0.003	< 0.0010	0.0022	-	-	-	-
3934578.1	**WSD_HA02_0.1**	**09 Jul 2025**	**0.1**	5	*0.11*	15	19	35	< 0.10	12	79	-	0.025	< 0.0010	0.025	-	-	-	-
3934578.1	**WSD_HA02_0.3**	**09 Jul 2025**	**0.3**	5	< 0.10	13	13	29	< 0.10	11	61	-	0.028	< 0.0010	0.027	-	-	-	-
3934578.1	**WSD_HA03_0.1**	**09 Jul 2025**	**0.1**	5	*0.14*	15	25	47	< 0.10	13	96	-	0.004	< 0.0010	0.0038	-	-	-	-
3934578.1	**WSD_HA03_0.3**	**09 Jul 2025**	**0.3**	5	*0.17*	13	***580***	*105*	0.11	12	***710 #***	**1.8**	0.0023	< 0.0010	0.0019	< 20	< 20	47	< 80
3934578.1	**WSD_HA03_0.5**	**09 Jul 2025**	**0.5**	4	*0.11*	13	*178*	39	< 0.10	10	*260*	-	< 0.0010	< 0.0010	< 0.0010	-	-	-	-
3934578.1	**WSD_HA04_0.1**	**09 Jul 2025**	**0.1**	5	< 0.10	*69*	25	*154*	< 0.10	13	93	-	0.004	< 0.0010	0.0037	-	-	-	-
3934578.1	**WSD_HA05_0.1**	**09 Jul 2025**	**0.1**	5	< 0.10	17	15	23	< 0.10	12	73	-	< 0.0010	< 0.0010	< 0.0010	-	-	-	-
3934578.1	**WSD_HA05_0.5**	**09 Jul 2025**	**0.5**	5	0.1	17	21	30	< 0.10	*15*	78	-	< 0.0010	< 0.0010	< 0.0010	-	-	-	-
3934578.1	**WSD_HA06_0.1**	**09 Jul 2025**	**0.1**	4	< 0.10	15	10	12	< 0.10	11	*130*	-	< 0.0010	< 0.0010	< 0.0010	-	-	-	-
3934578.1	**WSD_HA07_0.1**	**09 Jul 2025**	**0.1**	4	< 0.10	14	10	71	< 0.10	11	73	-	< 0.0010	< 0.0010	< 0.0010	-	-	-	-
3727360	**WSS_QA1**	**28 Nov 2024**	**-**	6	<0.10	*17*	20	27	< 0.10	*15*	89	-	-	-	-	-	-	-	-
3728481	**WSS_QA3**	**29 Nov 2024**	**-**	5	<0.10	15	*29*	25	< 0.10	12	69	-	-	-	-	-	-	-	-
3934578.1	**WSD_QAQC1**	**09 Jul 2025**	**-**	*11*	< 0.10	16	23	29	< 0.10	*19*	98	-	< 0.0010	< 0.0010	< 0.0010	-	-	-	-
3934578.1	**WSD_QAQC2**	**09 Jul 2025**	**-**	4	< 0.10	14	10	69	< 0.10	10	78	-	< 0.0010	< 0.0010	< 0.0010	-	-	-	-

Environmental Standards and Annotations

1 - National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS). 2011. Values applicable to a 'Recreation' land use assessment have been adopted for this assessment. Criteria used for assessment of Total Recoverable Chromium is the screening value for Chromium VI.

2 - Australian National Environment Protection Measures (NEPMs) 1999 (Updated 2013) - Values applicable to 'Recreation' site selected.

3 - Ministry for the Environment Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand (revised 2011). Module 4 values applicable to SANDY SILT soils <1m in depth 'residential' (Table 4.11 & 4.14) land use scenario (i.e. conservative approach) have been selected.

4 - US EPA Regional Screening Levels, November 2024. Values for 'residential soil' used. Where indicated, values were multiplied by a factor of 10 for carcinogens in the New Zealand scenario.

5 - Heads of EPA Australia and New Zealand (HEPA), 2025. PFAS National Environmental Management Plan Version 3.0, Table 5 - Human health investigation levels for 'public spaces' (HILC) used.

6 - Manaaki Whenua Landcare Research: Exploring the implementation of ecological soil guideline values for soil contaminants - Investigation trigger 80% value selected - typical/aged soils.

7 - Canadian Environmental Quality Guidelines (CCME) - Residential/parkland land use scenario selected.

8 - HEPA 2025. PFAS National Environmental Management Plan Version 3.0. Table 6 - Ecological guideline values for direct exposure, interim direct exposure values for reptiles, and indirect exposure.

9 - URS New Zealand Ltd, 2003. Determinations of Common Pollutant Background Soil Concentrations for the Wellington Region. Table ES-1: Target analyte background soil concentration ranges for the Wellington region. Values for 'Main Soil Type 3 (Greywacke)' have been selected.

10 - Ministry for the Environment Hazardous Waste Guidelines - Landfill Waste Acceptance Criteria and Landfill Classification (Table 1: Class A).

				PAH																				
				B(a)P PEF (NZ NES)	1-Methylnaphthalene	2-methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a) pyrene	Benzo(b+j)fluoranthene	Benzo(e)pyrene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Perylene	Pyrene	PAHs (Sum of total)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NESCS Soil Contaminant Standards for Health – Recreation[1]				40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Australian NEPM Measure 1999 (updated 2013) - Recreation[2]				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300
Module 4, Tier 1 Residential (SANDY SILT)[3]				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	63	-	-	1,600	-
US EPA Regional Screening Levels - Residential Soils [4]				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Version 3.0 - Human Health investigation levels for 'public spaces' (HIL C) [5]				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(2022) EcoSGVs - Investigation Trigger (80%) - Typ/Aged Soils [6]				-	-	-	-	-	-	-	**22**	-	-	-	-	-	-	**89**	-	-	-	-	-	-	-
Canadian Environmental Quality Guidelines (CCME) [7]				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Version 3.0 - Ecological guideline values for direct exposure - Interim screening criteria for reptiles [8]				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Version 3.0 - Ecological guideline values for indirect exposure [5]				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wellington Region Background (Greywacke) [9]				-	-	-	-	-	*0.05*	-	*0.27*	-	-	-	-	-	-	*0.55*	-	-	*0.01*	*0.26*	-	*0.57*	-
MfE Hazardous Waste Guidelines Class A Screening [10]				300	-	-	-	-	-	-	300	-	-	-	-	-	-	-	-	-	200	-	-	-	-
Lab Report Number	**Field ID**	**Date**	**Depth (m bgl)**																						
3727360	**WSS_TP1_0.1**	**28 Nov 2024**	**0.1**	<0.026	<0.011	<0.014	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.06	<0.011	<0.011	<0.011	<0.3
3727360	**WSS_TP1_0.5**	**28 Nov 2024**	**0.5**	0.041	<0.011	<0.014	<0.011	<0.011	<0.011	0.02	0.028	0.033	0.02	0.021	0.013	0.021	<0.011	0.034	<0.011	0.019	<0.06	0.018	<0.011	0.038	0.3
3727360	**WSS_TP2_0.1**	**28 Nov 2024**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3727360	**WSS_TP3_0.1**	**28 Nov 2024**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3727360	**WSS_TP3_0.5**	**28 Nov 2024**	**0.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3727360	**WSS_TP4_0.1**	**28 Nov 2024**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3727360	**WSS_TP4_0.5**	**28 Nov 2024**	**0.5**	0.077	<0.011	<0.013	<0.011	0.013	<0.011	0.034	0.051	0.062	0.033	0.044	0.026	0.036	<0.011	0.071	<0.011	0.045	<0.06	0.036	0.011	0.071	0.6
3727360	**WSS_TP4_1.0**	**28 Nov 2024**	**1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3727360	**WSS_TP5_0.1**	**28 Nov 2024**	**0.1**	0.073	<0.011	<0.013	<0.011	0.011	<0.011	0.034	0.047	0.06	0.031	0.042	0.025	0.033	<0.011	0.058	<0.011	0.041	<0.06	0.026	0.011	0.059	0.5
3727360	**WSS_TP5_0.5**	**28 Nov 2024**	**0.5**	0.076	<0.011	<0.013	<0.011	<0.011	<0.011	0.034	0.051	0.06	0.032	0.039	0.027	0.039	<0.011	0.062	<0.011	0.039	<0.06	0.03	0.012	0.063	0.5
3727360	**WSS_TP5_1.0**	**28 Nov 2024**	**1.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3728481	**WSS_HA7_0.1**	**29 Nov 2024**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3728481	**WSS_HA7_0.3**	**29 Nov 2024**	**0.3**	0.185	<0.011	<0.014	<0.011	0.016	0.016	0.095	0.122	0.15	0.071	0.085	0.059	0.093	0.02	0.191	<0.011	0.097	<0.06	0.041	0.024	0.178	1.3
3729105	**WSS_HA8_0.1**	**29 Nov 2024**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3729105	**WSS_HA8_0.3**	**29 Nov 2024**	**0.3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3729105	**WSS_HA8_0.5**	**29 Nov 2024**	**0.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3729105	**WSS_HA9_0.1**	**29 Nov 2024**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3729105	**WSS_HA9_0.3**	**29 Nov 2024**	**0.3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3729105	**WSS_HA9_0.5**	**29 Nov 2024**	**0.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3729105	**WSS_HA10_0.1**	**29 Nov 2024**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3729105	**WSS_HA10_0.3**	**29 Nov 2024**	**0.3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3931181.1	**WSD_CR1_0.0**	**04 Jul 2025**	**0.0**	0.034	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	0.016	0.022	0.028	0.014	0.017	0.012	0.015	< 0.011	0.03	< 0.011	0.016	< 0.06	0.017	< 0.011	0.029	< 0.3
3934578.15	**WSD_CR2_0.2**	**09 Jul 2025**	**0.2**	< 0.025	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.06	< 0.011	< 0.011	< 0.011	< 0.3
3931181.3	**WSD_SS01**	**04 Jul 2025**	**Stockpile sample**	0.036	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	0.018	0.027	0.033	0.016	0.023	0.014	0.017	< 0.012	0.038	< 0.012	0.022	< 0.06	0.016	< 0.012	0.038	0.3
3931181.4	**WSD_SS02**	**04 Jul 2025**	**Stockpile sample**	0.137	< 0.011	< 0.011	< 0.011	0.022	0.031	0.04	0.093	0.102	0.063	0.085	0.041	0.035	0.016	0.074	< 0.011	0.087	< 0.06	0.033	0.025	0.082	0.8
3931181.5	**WSD_SS03**	**04 Jul 2025**	**Stockpile sample**	0.081	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	0.035	0.056	0.066	0.034	0.036	0.027	0.03	< 0.011	0.045	< 0.011	0.038	< 0.06	0.015	0.012	0.061	0.5
3931181.6	**WSD_SS04**	**04 Jul 2025**	**Stockpile sample**	0.03	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	0.013	0.019	0.024	0.012	0.015	< 0.011	0.013	< 0.011	0.031	< 0.011	0.015	< 0.06	0.018	< 0.011	0.029	< 0.3
3931181.7	**WSD_SS05**	**04 Jul 2025**	**Stockpile sample**	0.039	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	0.02	0.025	0.032	0.015	0.02	0.014	0.019	< 0.012	0.043	< 0.012	0.019	< 0.06	0.023	< 0.012	0.043	0.3
3931181.8	**WSD_SS06**	**04 Jul 2025**	**Stockpile sample**	0.063	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	0.026	0.042	0.047	0.027	0.037	0.019	0.025	< 0.011	0.051	< 0.011	0.032	< 0.06	0.027	0.011	0.048	0.4
3934578.1	**WSD_HA01_0.1**	**09 Jul 2025**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3934578.2	**WSD_HA01_0.3**	**09 Jul 2025**	**0.3**	< 0.026	< 0.011	< 0.016	< 0.011	< 0.011	< 0.011	0.011	0.015	0.018	0.011	0.013	< 0.011	< 0.011	< 0.011	0.023	< 0.011	0.013	< 0.06	< 0.011	< 0.011	0.024	< 0.3
3934578.3	**WSD_HA02_0.1**	**09 Jul 2025**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3934578.4	**WSD_HA02_0.3**	**09 Jul 2025**	**0.3**	0.48	< 0.011	< 0.017	< 0.011	0.041	0.031	0.2	*0.33*	0.39	0.196	0.22	0.153	0.179	0.048	0.31	**< 0.011**	0.24	**< 0.06**	0.033	0.072	0.34	2.8
3934578.5	**WSD_HA03_0.1**	**09 Jul 2025**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3934578.6	**WSD_HA03_0.3**	**09 Jul 2025**	**0.3**	0.164	0.013	0.017	< 0.012	0.025	0.023	0.085	0.106	0.138	0.072	0.082	0.057	0.088	0.018	0.21	< 0.012	0.085	< 0.06	0.118	0.021	0.195	1.4
3934578.7	**WSD_HA03_0.5**	**09 Jul 2025**	**0.5**	0.039	< 0.011	< 0.017	< 0.011	< 0.011	< 0.011	0.02	0.023	0.036	0.021	0.021	0.015	0.021	< 0.011	0.037	< 0.011	0.024	< 0.06	0.017	< 0.011	0.036	0.3
3934578.8	**WSD_HA04_0.1**	**09 Jul 2025**	**0.1**	0.53	< 0.012	< 0.018	< 0.012	0.035	0.048	0.24	*0.35*	0.42	0.24	0.29	0.169	0.21	0.058	0.45	< 0.012	0.29	< 0.06	0.144	0.076	0.43	3.5
3934578.1	**WSD_HA05_0.1**	**09 Jul 2025**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3934578.12	**WSD_HA05_0.5**	**09 Jul 2025**	**0.5**	0.64	< 0.011	< 0.014	0.011	0.029	0.04	0.22	*0.42*	0.49	0.29	0.48	0.167	0.184	0.078	0.38	0.011	0.43	< 0.06	0.097	0.112	0.4	3.9
3934578.13	**WSD_HA06_0.1**	**09 Jul 2025**	**0.1**	0.027	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.018	0.019	0.028	0.014	0.015	0.011	0.016	< 0.010	0.032	< 0.010	0.017	< 0.05	0.016	< 0.010	0.031	< 0.3
3934578.14	**WSD_HA07_0.1**	**09 Jul 2025**	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3727360	**WSS_QA1**	**28 Nov 2024**	**-**																						
3728481	**WSS_QA3**	**29 Nov 2024**	**-**																						
3934578.18	**WSD_QAQC1**	**09 Jul 2025**	**-**	< 0.026	< 0.011	< 0.016	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.06	< 0.011	< 0.011	< 0.011	< 0.3
3934578.19	**WSD_QAQC2**	**09 Jul 2025**	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Environmental Standards

1 - National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS). 2011. Values applicable to a 'RECREATION' land use assessment have been adopted for this assessment. Criteria used for assessment of Total Recoverable Chromium is the screening value for Chromium VI.

2 - Australian National Environment Protection Measures (NEPMs) 1999 (Updated 2013) - Values applicable to 'Recreation' site selected

3 - Ministry for the Environment Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand (revised 2011). Module 4 values applicable to SANDY SILT soils <1m in depth 'residential' (Table 4.11 & 4.14) land use scenario (i.e. conservative approach) have been selected for.

4 - US EPA Regional Screening Levels, November 2024. Values for 'residential soil' used. Where indicated, values were multiplied by a factor of 10 for carcinogens in the New Zealand scenario.

5 - Heads of EPA Australia and New Zealand (HEPA), 2025. PFAS National Environmental Management Plan Version 3.0, Table 5 - Human health investigation levels for 'public spaces' (HILC) used.

6 - Manaaki Whenua Landcare Research: Exploring the implementation of ecological soil guideline values for soil contaminants - Investigation trigger 80% value selected - typical/aged soils

7 - Canadian Environmental Quality Guidelines (CCME) - Residential/parkland land use scenario selected

8 - HEPA 2025. PFAS National Environmental Management Plan Version 3.0. Table 6 - Ecological guideline values for direct exposure and indirect exposure.

9 - URS New Zealand Ltd, 2003. Determinations of Common Pollutant Background Soil Concentrations for the Wellington Region. Table ES-1: Target analyte background soil concentration ranges for the Wellington region. Values for 'Main Soil Type 3 (Greywacke)' have been selected.

10 - Ministry for the Environment Hazardous Waste Guidelines - Landfill Waste Acceptance Criteria and Landfill Classification (Table 1: Class A)

	PFAS				Heavy metals	
	Perfluorooctanoic acid (PFOA)	Perfluorohexane sulfonic acid (PFHxS)	Perfluorooctane sulfonic acid (PFOS)	Sum of PFHxS and PFOS	Lead	Zinc
	µg/L	µg/L	µg/L	µg/L	g/m³	g/m³
PFAS NEMP 2025 Interim Marine 95% [1]	220	-	0.13	-	-	-
ANZG 2023 Interim Freshwater 95% [2]	-	-	*0.48*	-	-	-
Dilution Attenuation Factor Applied [3]	-	-	13	-	0.44	0.8
PFAS NEMP 2025 Unlined Landfill Acceptance Criteria [4]	**0.56**	**0.07**	**0.07**	**0.07**	-	-
PFAS NEMP 2025 Double Composite Lined Landfill Acceptance Criteria [4]	56	7	7	7	-	-
MfE Hazardous Waste Guidelines Class A Screening [5]	-	-	-	-	5	10
Sample Code	**Field ID**	**Analysis**	**Date**						
25-196275_ 25-196275-1	**WSD_HA01_0.1**	**SPLP**	**09 Jul 2025**	<0.025	<0.025	**<0.025**	**<0.025**	-	-
25-196275_25-196275-2	**WSD_HA01_0.3**	**SPLP**	**09 Jul 2025**	<0.025	0.040	**0.13**	**0.17**	-	-
25-196275_25-196275-3	**WSD_HA02_0.1**	**SPLP**	**09 Jul 2025**	<0.025	0.027	***0.99***	**1.0**	-	-
25-196275_25-196275-4	**WSD_HA02_0.3**	**SPLP**	**09 Jul 2025**	<0.025	0.031	***1.2***	**1.2**	-	-
25-196275_25-196275-5	**WSD_HA03_0.1**	**SPLP**	**09 Jul 2025**	<0.025	<0.025	**0.13**	**0.13**	-	-
25-196275_25-196275-6	**WSD_HA03_0.3**	**SPLP**	**09 Jul 2025**	<0.025	<0.025	**0.1**	**0.1**	-	-
25-196275_25-196275-7	**WSD_HA04_0.1**	**SPLP**	**09 Jul 2025**	<0.025	<0.025	***0.16***	**0.16**	-	-

Environmental Standards

1 - HEPA 2025. PFAS National Environmental Management Plan Version 3.0. Table 5 – Ecological water quality guideline values. Values for ‘interim marine’ and ‘95% species protection value’ used for PFOS and PFOA.

2 - Australian and New Zealand Guidelines for Fresh and Marine Water Quality, May 2023. Toxicant Default Guideline Values for Aquatic Ecosystem Protection, Perfluorooctane Sulfonate (PFOS) in Freshwater, Draft Technical Brief. Values for '95% species protection value' used for PFOS.

3 - Dilution attenuation factor (DAF) calculated using a factor of 100 multiplied by the ANZG 2018 interim marine criteria.

4 - HEPA 2020. PFAS National Environmental Management Plan Version 2.0’. Table 7 – Criteria provided for unlined, and double composite lined. ‘ASLP Leachable Concentration’ values used for sum PFOS+PFHxS and PFOA.

5 - Ministry for the Environment Hazardous Waste Guidelines - Landfill Waste Acceptance Criteria and Landfill Classification (Table 1: Class A). Values for 'concentration in leachate' used.

			Heavy Metals								PAH												
			Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	B(a)P PEF (NZ NES)	1-Methylnaphthalene	2-methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Perylene	Pyrene	PAHs (Sum of total)
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Lab Report Number	Field ID	Date																					
3727360	WSS_TP2_0.1	28 Nov 2024	5	<0.10	16	19	25	<0.10	13	81	-	-	-	-	-	-	-	-	-	-	-	-	-
3727360	WSS_QA1	28 Nov 2024	6	<0.10	17	20	27	<0.10	15	89	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD			18.18	- *	6.06	5.13	7.69	-	14.29	9.41	-	-	-	-	-	-	-	-	-	-	-	-	-
3934578	WSD_CR2_0.2	09 Jul 2025	9	< 0.10	15	21	27	< 0.10	16	94	< 0.025	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.06	< 0.011	< 0.011	< 0.011	< 0.3
3934578	WSD_QAQC1	09 Jul 2025	11	< 0.10	16	23	29	< 0.10	19	98	< 0.026	< 0.011	< 0.016	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.06	< 0.011	< 0.011	< 0.011	< 0.3
RPD			20.00	-	6.45	9.09	7.14	-	17.14	4.17	-	-	-	-	-	-	-	-	-	-	-	-	-
3934578	WSD_HA07_0.1	09 Jul 2025	4	< 0.10	14	10	71	< 0.10	11	73	-	-	-	-	-	-	-	-	-	-	-	-	-
3934578	WSD_QAQC2	09 Jul 2025	4	< 0.10	14	10	69	< 0.10	10	78	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD			0.00	-	0.00	0.00	2.86	-	9.52	6.62	-	-	-	-	-	-	-	-	-	-	-	-	-

			PFAS - Summary				Perfluorocarboxylic Acids										Perfluorosulfonic Acids						
			Perfluorooctanoic acid (PFOA)	Perfluorooctanesulfonic acid - Total (PFOS)	The numerical sum of Total PFHxS and Total PFOS (PFHxS+PFOS)	Total of Reported PFAS in Soil (Total PFAS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluoropropanesulfonic acid (L-PFPrS)	Perfluorobutanesulfonic acid (L-PFBS)	Perfluoropentanesulfonic acid (L-PFPeS)	Perfluorohexanesulfonic acid (L-PFHxS)	Perfluorohexanesulfonic acid - Branched (B-PFHxS)	Perfluorohexanesulfonic acid - Total (PFHxS)	Perfluoroheptanesulfonic acid (L-PFHpS)
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Lab Report Number	Field ID	Date																					
3727360	WSS_TP2_0.1	28 Nov 2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3727360	WSS_QA1	28 Nov 2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3934578	WSD_CR2_0.2	09 Jul 2025	< 0.0010	< 0.0010	< 0.0010	< 0.046	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
3934578	WSD_QAQC1	09 Jul 2025	< 0.0010	< 0.0010	< 0.0010	< 0.046	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
RPD			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3934578	WSD_HA07_0.1	09 Jul 2025	< 0.0010	< 0.0010	< 0.0010	< 0.046	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
3934578	WSD_QAQC2	09 Jul 2025	< 0.0010	< 0.0010	< 0.0010	< 0.046	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
RPD			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Annotations

* Relative percentage difference (RPD) cannot be calculated with values that are below the laboratory limit of reporting (<LOR)

			Perfluorosulfonic Acids						Fluorotelomer Sulfonic Acids				Fluorotelomer Carboxylic Acid			PFAS in Soil - Miscellaneous							
			Perfluorooctanesulfonic acid (L-PFOS)	Perfluorooctanesulfonic acid - Branched (B-PFOS)	Perfluorooctanesulfonic acid - Total (PFOS)	Perfluorononanesulfonic acid (L-PFNS)	Perfluorodecanesulfonic acid (L-PFDS)	Perfluorododecanesulfonic acid (L-PFDoS)	4:2 Fluorotelomersulfonic acid (4:2 FTS)	6:2 Fluorotelomersulfonic acid (6:2 FTS)	8:2 Fluorotelomersulfonic acid (8:2 FTS)	10:2 Fluorotelomersulfonic acid (10:2 FTS)	3:3 Fluorotelomercarboxylic acid (3:3 FTCA)	5:3 Fluorotelomercarboxylic acid (5:3 FTCA)	7:3 Fluorotelomercarboxylic acid (7:3 FTCA)	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	Perfluorooctanesulfonamide (FOSA)	N-methylperfluoro-1-octanesulfonamide (NMeFOSA)	N-ethylperfluoro-1-octanesulfonamide (NEtFOSA)	2-[N-methylperfluoro-1-octanesulfonamido]-ethanol (NMeFOSE)	2-[N-ethylperfluoro-1-octanesulfonamido]-ethanol (NEtFOSE)	Perfluoro-4-ethylcyclohexanesulfonic acid (PFECHS)	Perfluoro-3,7-dimethyloctanoic acid (P37DMOA)
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Lab Report Number	**Field ID**	**Date**																					
3727360	**WSS_TP2_0.1**	**28 Nov 2024**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3727360	**WSS_QA1**	**28 Nov 2024**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3934578	**WSD_CR2_0.2**	**09 Jul 2025**	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
3934578	**WSD_QAQC1**	**09 Jul 2025**	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
RPD			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3934578	**WSD_HA07_0.1**	**09 Jul 2025**	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
3934578	**WSD_QAQC2**	**09 Jul 2025**	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
RPD			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

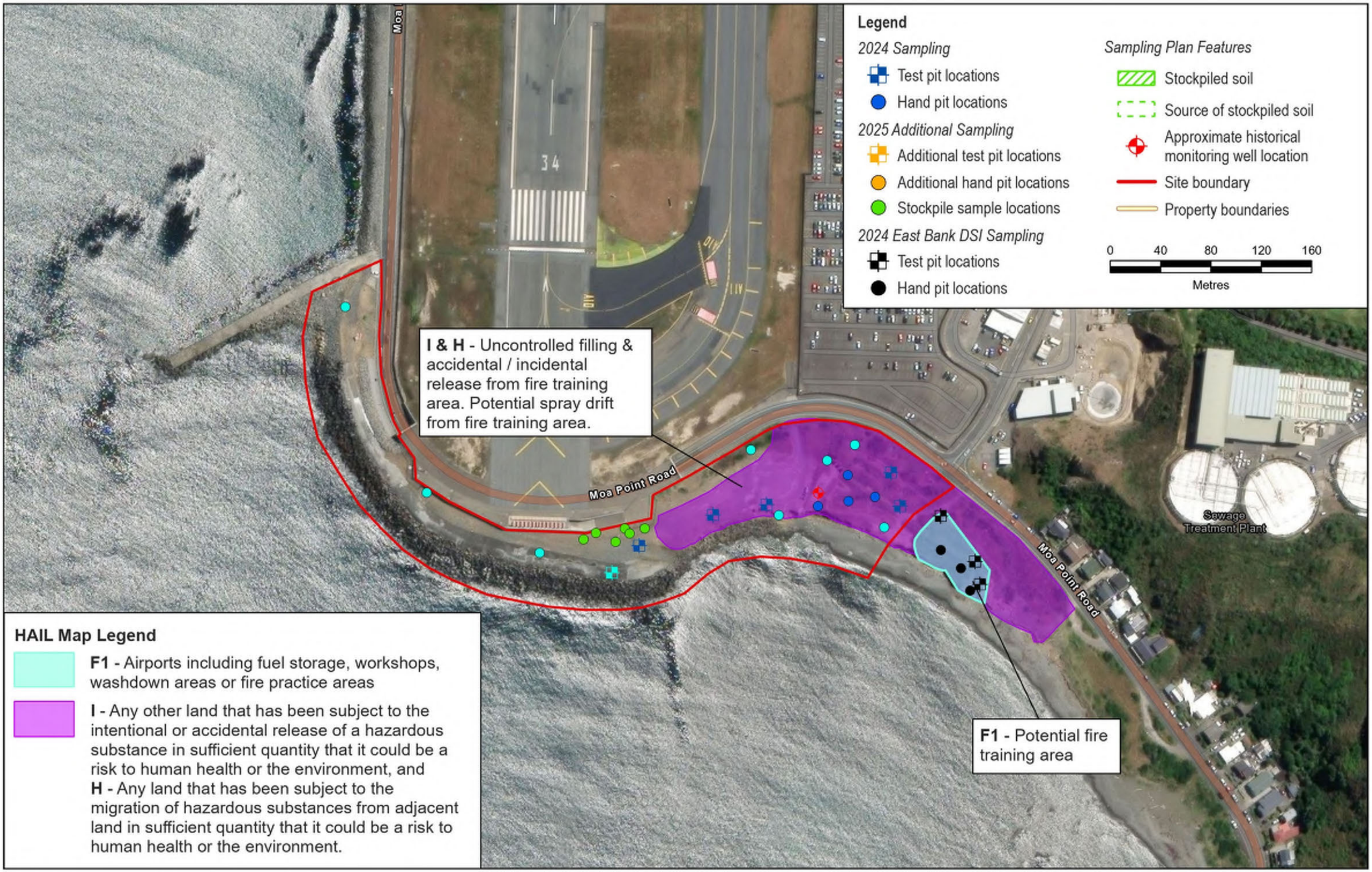
Annotations

* Relative percentage difference (RPD) cannot be calculated with values that are below the laboratory limit of reporting (<LOR)

			Perfluoroalkane Carboxylic Acids	Perfluoroalkane Sulfonic Acids		PFAS
			Perfluorooctanoic acid (PFOA)	Perfluorohexane sulfonic acid (PFHxS)	Perfluorooctane sulfonic acid (PFOS)	Sum of PFHxS and PFOS
			µg/L	µg/L	µg/L	µg/L
Sample Code	**Field ID**	**Date**				
24-338405_24-338405-2A	**Rinsate Blank 1**	**29 Nov 2024**	<0.0010	<0.0010	<0.0010	<0.0010

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Appendix I – Revised HAIL Map



N

Revision	Drawer	Verified	Approved	Date
1	GJS			01.10.24
2	GJS			07.08.25
3	GJS			21.10.25

Title: **HAIL MAP**

Client: WELLINGTON INTERNATIONAL AIRPORT LIMITED

Project: SEA DEFENCES STRUCTURES RENEWAL

Beca

Discipline: ENVIRONMENTAL

Drawing No.: APPENDIX I

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