



WINSTONE
AGGREGATES

Boffa Miskell



Part
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Appendix B12.4.3

Contaminated Site Investigation

Hunua Quarry Pit Development – Combined Preliminary & Detailed Site Investigation

• Prepared for

Fletcher Concrete and Infrastructure Limited

• March 2026



PATTLE DELAMORE PARTNERS LTD
Level 2, 109 Fanshawe Street,
Auckland Central 1010
PO Box 9528, Auckland 1149, New Zealand

Tel +64 9 523 6900
Web www.pdp.co.nz



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DOCUMENT CONTRIBUTORS

Prepared by

SIGNATURE

Erin Makepeace

Reviewed by

SIGNATURE

Stefan Yap

Approved by

Hamish Wilson

Limitations:

This document has been prepared by Pattle Delamore Partners Limited (PDP) on the basis of information provided by Fletcher Concrete and Infrastructure Limited (trading as Winstone Aggregates) and others (not directly contracted by PDP for the work), including Auckland Council. PDP has not independently verified the provided information and has relied upon it being accurate and sufficient for use by PDP in preparing the report. PDP accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the provided information.

This document has been prepared based on visual observations within the investigation area and analysis of 16 soil samples and four subsurface soil samples. All soil samples were analysed by Hill Laboratories selectively for heavy metals, PAHs and/or TPHs. The site conditions described in this document have been interpreted from, and are subject to, this information and its limitations and accordingly PDP does not represent that its interpretation accurately represents the full condition of the investigation area.

Owing to the limited nature of this assessment (as described in the Objectives and Scope sections), there could be conditions at the investigation area that have not been identified and that have not been considered in this document. Thus, although the assessment has shown knowledge of possible sources of soil contamination, there is a risk that sources of soil contamination could exist that are not identified by the assessment. This risk could be reduced by undertaking further research or soil investigation.

The laboratory test results provide an approximation of the concentration of the tested analytes and are subject to the inherent limitations of the laboratory techniques used for the tests. This document is limited to collection and analysis of soil samples from composite and discrete sampling locations. Interpretations of subsurface conditions, including contaminant concentrations, are not guaranteed at distance away from the specific points of sampling.

The information contained within this document applies to sampling undertaken on the dates stated in this document, or if none are stated, the date of this document. With time, the site conditions and environmental standards may change. Accordingly, the reported assessment and conclusions are not guaranteed to apply at a later date.

This document has been prepared by PDP on the specific instructions of Fletcher Concrete and Infrastructure Limited (trading as Winstone Aggregates) for the limited purposes described in the document. If it is intended to support an application under the Fast-track Approvals Act 2024, it may be relied upon by the Expert Panel and relevant administering agencies for the purposes of assessing the application. PDP accepts no liability if the document is used for a different purpose or if it is used or relied on by any other person. Any such use or reliance will be solely at their own risk.

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Executive Summary

Pattle Delamore Partners Limited (PDP) have been engaged by Fletcher Concrete and Infrastructure Limited (FCIL) (trading as Winstone Aggregates [Winstone]) to undertake a Combined Preliminary and Detailed Site investigation (PSI/DSI) in support of Winstone's Hunua Quarry ('the site') Fast-track Approval Application (FTAA) to expand the Symonds Hill pit by approximately 50 ha ('the investigation area') to a full pit extent of 100 ha in eight indicative stages over an approximate 50-80 year period. The proposed pit development will initially extend the existing Symonds Hill pit to the south and east (Stages 1 to 6; planned to be undertaken in the first 35 years of the proposed pit development), followed by areas to the north and west (Stages 7 and 8, planned to be undertaken approximately 35-50 years after the start of the proposed pit development).

The PSI concluded that the areas of potential concern (AOPC; C+R Rack, Graveyard, extension of Graveyard, Hay Paddock overburden disposal area [OBDA] and 193 Middleton Road) are in the northern section of the pit development area (indicatively planned for Stages 7 and 8). Possible Hazardous and Industrial List (HAIL) land uses including the bulk storage of drums for fuel, chemicals or liquid waste; maintenance of heavy machinery; and disposal of possible uncertified fill material (based on Auckland Council records; however, Winstone indicated that the source of this overburden is virgin clay material extracted directly from the Hunua Quarry pit) were identified as more-likely-than-not to have occurred at these AOPC of the investigation area. Therefore, a DSI was required to determine the nature and extent of impacts to ground as a result of these current/historical activities within the AOPC.

As no HAIL land use has been identified in the remainder of the pit development area (indicatively planned for Stages 1 to 6), the proposed soil disturbance outside of the C+R Rack, Graveyard and extension of Graveyard areas is exempt from NES-CS regulations and the contaminated land provisions of the AUP-OP. Therefore, the soil disturbance across most of the proposed pit development area (indicatively planned for Stages 1 to 6) within the first 35 years of the proposed pit development does not require any consents under the NES-CS or the contaminated land provisions of the AUP-OP.

The DSI concluded that:

- ∴ The disturbance of the shallow soil in the vicinity of PMS08 (collected from the extension of Graveyard area) is considered to pose a low human health risk to commercial/industrial land users and a low risk to the environment as there are no surface waterbodies close to this isolated area.
- ∴ Apart from the shallow soil in the vicinity of PMS08, the soil disturbance associated with the remainder of the proposed pit development is unlikely to pose an unacceptable human health risk to commercial/industrial land users or to the environment.

- ∴ The regulations of the NES-CS do not apply to the Hay Paddock OBDA and 193 Middleton Road areas. Therefore, based on the analytical results of the soil samples collected from the Hay Paddock OBDA, it is concluded that the disposal of overburden at the Hay Paddock OBDA is not considered a HAIL activity.
- ∴ It is considered that the soils within the stockyard areas (located within the northern section of the investigation area [indicatively planned for Stages 7 and 8]) do not meet the requirements of NES-CS Regulation 5 (9) and the regulations of the NES-CS apply to the proposed soil disturbance within these AOPC (i.e. the stockyard areas).
- ∴ A controlled activity consent will be required under Regulation 9 of the NES-CS (unless the soil disturbance associated with the proposed pit development within the stockyard areas meets the requirements of NES-CS Regulation 8(3) for a permitted activity) and a Site Management Plan (SMP) will need to be prepared and submitted to Auckland Council prior to undertaking any earthworks within the stockyard areas (located within the northern section of the proposed pit development area, where quarrying is indicatively planned for Stages 7 and 8 [approximately 35-50 years after the start of the proposed pit development]).
- ∴ No contaminated land consent is required under the AUP-OP for the soil disturbance associated with the proposed pit development.
- ∴ The shallow soil in the vicinity of PMS08 should be excavated (prior to undertaking the bulk earthworks within the extension of Graveyard area) and disposed of (instead of being reused on the site) at an appropriate disposal facility licensed to accept the reported level of contamination to avoid the requirement for an ongoing discharge consent under the AUP-OP.
- ∴ With regard to onsite reuse:
 - Apart from the shallow soil in the vicinity of PMS08 (in the extension of Graveyard area), the soil within the investigation area can be reused onsite. However, any excess fill material in the C+R Rack, Graveyard and extension of Graveyard areas not reused onsite cannot be considered clean fill and, if not reused onsite, will require disposal at an appropriate disposal facility licensed to accept the respective levels of contaminants of potential concern (COPC);
 - The shallow soil in the vicinity of PMS08 cannot be reused onsite and will need to be excavated and disposed of at an appropriate disposal facility licensed to accept the reported level of TPH C₁₀-C₁₄; and

- All other excess soil within the investigation area (i.e. outside of the C+R Rack, Graveyard and extension of Graveyard areas) not reused onsite can be considered clean fill and removed from the investigation area at the discretion of the site operator (without restriction from a contamination perspective).

As quarrying of the northern section of the pit development area is indicatively planned for Stages 7 and 8 (i.e. approximately 35-50 years after the start of the proposed pit development), it is recommended that further DSIs be undertaken on the stockyard and any other identified HAIL areas that may develop in the next 35 years prior to any soil disturbance in these areas and, if necessary, further consents obtained to the extent not already provided for by the controlled activity consent already required.

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1.0 Introduction

Fletcher Concrete and Infrastructure Limited (FCIL) (trading as Winstone Aggregates [Winstone]), owns and operates the Hunua Quarry in Hunua, Auckland ('the site'). Winstone is preparing to further develop Symonds Hill pit at the Hunua Quarry ('the pit development area', herein referred to as 'the investigation area') through a substantive application for approvals under the Fast-track Approvals Act 2024 (FTAA).

Pattle Delamore Partners Limited (PDP) has been engaged by FCIL to undertake a Combined Preliminary and Detailed Site Investigation (PSI/DSI) in support of the substantive application for approvals under the FTAA to expand the Symonds Hill pit by approximately 50 ha to a full pit extent of 100 ha.

This PSI/DSI has been undertaken at the direction of, and supervised by, a Suitably Qualified and Experienced Practitioner (a SQEP) for Contaminated Land and has been undertaken in accordance with the Ministry for the Environment (MfE) Contaminated Land Management Guidelines No.1 (CLMG No.1) - *Reporting on Contaminated Sites in New Zealand* (MfE, 2021a) and CLMG No. 5 – *Site Investigation and Analysis of Soils* (MfE, 2021b). A certifying statement to this effect is provided in Appendix A.

2.0 Objectives and Scope

The objectives of the PSI/DSI are to:

- ∴ Determine whether any Hazardous and Industrial List (HAIL)¹ or other potentially contaminating activities, either from historical or current activities, have been undertaken within the investigation area;
- ∴ Assess, by means of soil sampling and analysis, for the presence of any residual contamination impacts to surface and subsurface soils from these current or historical activities;
- ∴ Identify any consenting requirements under the Resource Management (*National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health*) Regulations 2011 (NES-CS) and the contaminated land rules within the Auckland Unitary Plan Operative in Part (AUP-OP), and any special soils management required during the proposed pit development; and
- ∴ Provide recommendations of further investigations, if required.

¹ The Hazardous Activities and Industries List (HAIL) is a compilation of activities and industries that are considered likely to cause land contamination resulting from hazardous substance use, storage or disposal. The HAIL is intended to identify most situations in New Zealand where hazardous substances could cause, and in many cases have caused, land contamination.

The scope of work included:

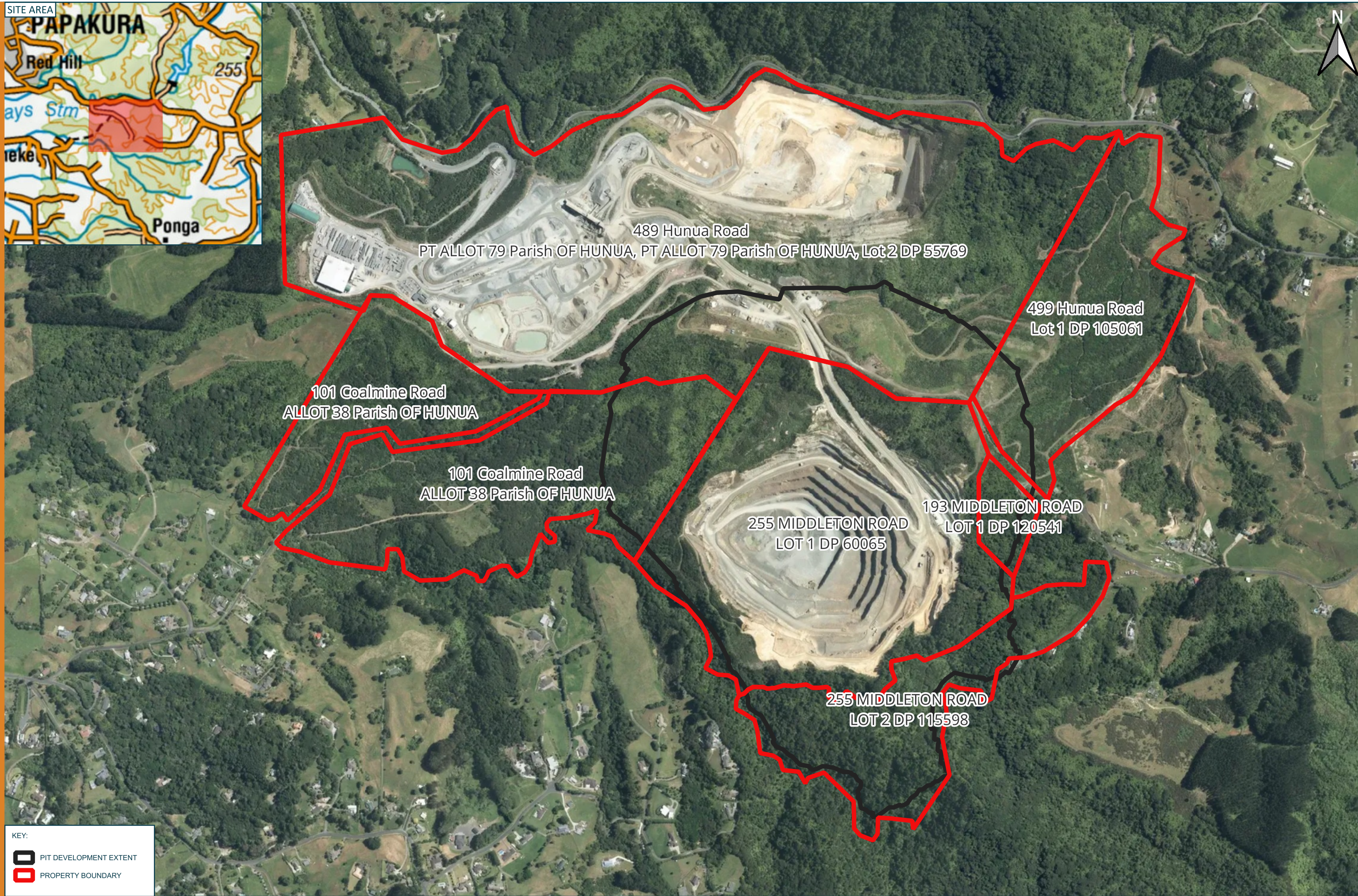
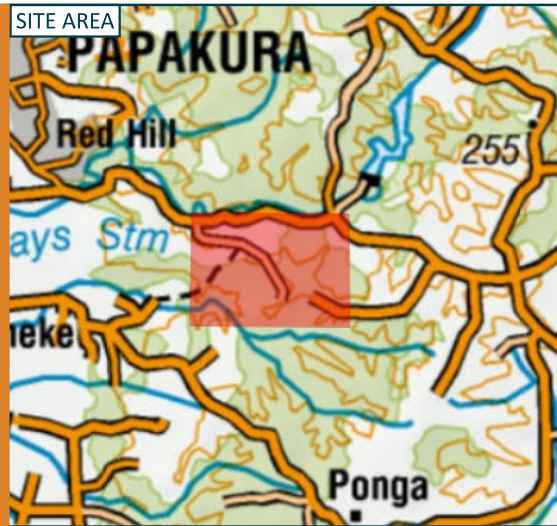
- ✦ Undertaking a detailed review of information provided by the client and publicly available historical information to identify any actual or potential HAIL land use from current or historical land use on the investigation area;
- ✦ Undertaking a site walkover;
- ✦ Soil sampling at ground surface level and down to a maximum depth of 0.3 m below ground level (bgl) with surface and subsurface soil samples analysed for heavy metals, total petroleum hydrocarbon (TPHs) and polycyclic aromatic hydrocarbons (PAHs), and selected subsurface soil samples for TPHs;
- ✦ Comparison of the results against the relevant criteria;
- ✦ Assessing the requirements of the NES-CS and the contaminated land rules within the AUP-OP;
- ✦ Assessing whether any further investigation work is necessary to inform site management and/or consenting and/or soil disturbance requirements; and
- ✦ Preparation of this report.

3.0 Site Description and Background

The investigation area is located within the following six parcels of land owned by FCIL (Winstone):

- ✦ 101 Coalmine Road, Drury (*Legal description: ALLOT 38 Parish OF HUNUA*).
- ✦ 489 Hunua Road, Drury (*Legal description: PT ALLOT 79 Parish OF HUNUA, PT ALLOT 79 Parish OF HUNUA, Lot 2 DP 55769*).
- ✦ 499 Hunua Road, Drury (*Legal description: Lot 1 DP 105061*).
- ✦ 193 Middleton Road, Drury (*Legal description: Lot 1 DP 120541*).
- ✦ 255 Middleton Road, Drury (*Legal description: Lot 2 DP 115598*).
- ✦ 255 Middleton Road, Drury (*Legal description: Lot 1 DP 60065*).

The investigation area makes up 50 ha of these land parcels. A plan of these parcels in relation to the proposed pit development is shown in Figure 1. The proposed pit development will occur in eight indicative stages to be undertaken over an approximate 50-80 year period; initially extending the existing Symonds Hill pit to the south and east (Stages 1 to 6, which is indicatively planned to be undertaken within the first 35 years of the proposed pit development), followed by areas to the north (where some historical overburden placement and native replanting has been undertaken) and west (Stages 7 and 8, which is indicatively planned to be undertaken approximately 35-50 years after the start of the proposed pit development).



KEY:

-  PIT DEVELOPMENT EXTENT
-  PROPERTY BOUNDARY



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 3. PROPERTY PARCELS SOURCED FROM AUCKLAND COUNCIL GEOMAPS.

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FIGURE
FIGURE 1: PROPERTY PARCELS IN RELATION TO THE PROPOSED PIT DEVELOPMENT

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 A035680019 COMBINED PRELIMINARY AND DETAILED SITE INVESTIGATION - HUNUA QUARRY PIT DEVELOPMENT

As shown in Figure 2, the present-day operational Symonds Hill pit is located in the centre and makes up a large portion of the investigation area with the stockyards (i.e. the C+R Rack, Graveyard and extension of Graveyard areas) located in the northern section. These areas are used for the storage of heavy vehicles (where they are also maintained), tyres and other auxiliary machine parts at different frequencies. Further description of these areas and relevant activities is included below in Sections 5.4 and 6.0.

The majority of the proposed development occurs on land that is zoned as 'Special Purpose – Quarry Zone' and a smaller portion of the development extends into the 'Rural – Mixed Rural Zone'. Site photographs showing the current layout/conditions of the investigation area are provided in Appendix B.

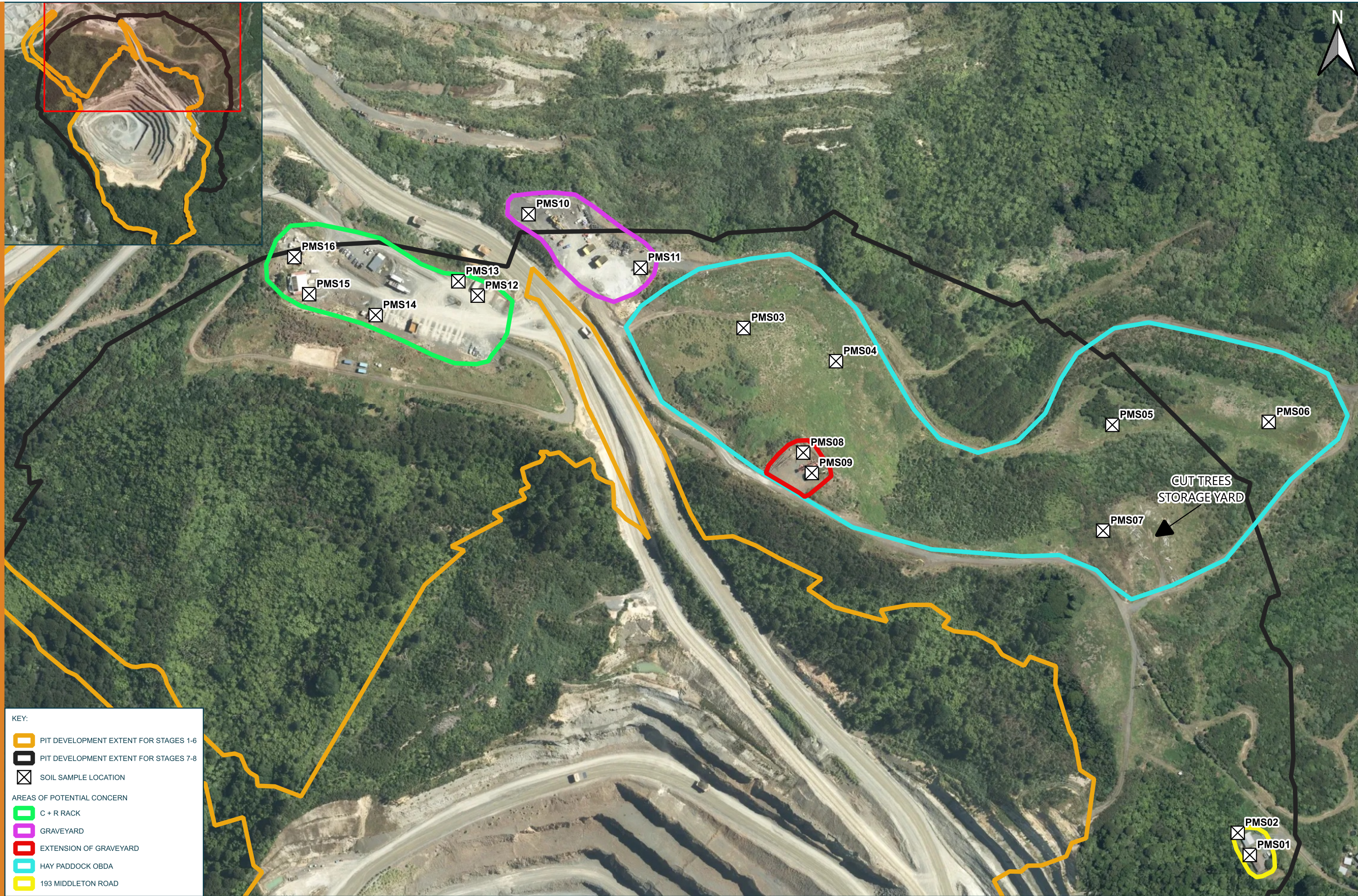
4.0 Geology and Hydrology

4.1 Geology

The geological map of the region indicates that the investigation area is underlain by three main geological formations/groups:

- ∴ The majority of the investigation area is underlain by alternating sandstone and mudstone with variable volcanic content and interbedded volcanoclastic grits from the East Coast Bays Formation.
- ∴ A section of the northwest is underlain by carbonaceous mudstone and claystone with coal seams, minor sandstone and rare conglomerate of the Te Kuiti Group.
- ∴ A section of the south consists of massive to thin-bedded, lithic volcanoclastic metasandstone and argillite, with tectonically enclosed spilite, chert and red and green argillite of the Waipapa Group.

A review of the New Zealand Geotechnical Database (NZGD) on 18 December 2025 indicated that the nearest borehole (NZGD_68220), is located approximately 450 m to the northwest of the investigation area. The associated borehole installation logs identified that fill material comprising aggregate and rock is present to an approximate depth of 1.6 m bgl. This is underlain by sand and silt to a depth of 17 m bgl and Greywacke Siltstone to 150.6 m bgl.



KEY:

- PIT DEVELOPMENT EXTENT FOR STAGES 1-6
- PIT DEVELOPMENT EXTENT FOR STAGES 7-8
- SOIL SAMPLE LOCATION

AREAS OF POTENTIAL CONCERN

- C + R RACK
- GRAVEYARD
- EXTENSION OF GRAVEYARD
- HAY Paddock OBDA
- 193 MIDDLETON ROAD



SCALE 1:3,471,331 (A3)

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 2. PROPOSED PIT EXPANSION AREAS BASED ON 'STAGE 6 PIT DESIGN' AND 'STAGE 8 PIT DESIGN' SUPPLIED BY WINSTONES.
 3. INVESTIGATION AREAS ARE APPROXIMATE AND BASED ON THE TIME OF VISIT.
 4. SITE INVESTIGATION LOCATIONS ARE NOT SURVEYED AND ARE APPROXIMATE ONLY.

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FIGURE 2: AREAS OF POTENTIAL CONCERN AND SOIL SAMPLE LOCATIONS

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4.2 Hydrogeology

The nearest surface waterbody to the investigation area is the Mangapū (Symonds) Stream (which also has a tributary that runs through the investigation area along the western half of the boundary between Lot 1 DP 60065 and Lot 2 DP 115598) that runs in a westerly direction along the southwestern boundary of the investigation area, joining two other streams along the way before discharging into the Manukau Harbour approximately 5 km to the west of the investigation area.

Based on this, shallow groundwater beneath the investigation area is inferred to flow in a westerly direction discharging into the Mangapū Stream.

Review of the groundwater effects assessment report² for this substantive application for approvals under the FTAA indicates that:

- ∴ There is a current groundwater take consent for the existing Symonds Hill pit; and
- ∴ There are 19 private farm bores (operating under permitted activity status) that have been identified as drawing groundwater from the greywacke within the predicted zone of influence for the Symonds Hill pit dewatering.

5.0 Information Review

The purpose of the information review is to establish past land uses at the investigation area and therefore the potential for soil contamination to have arisen from those uses.

5.1 Historical Aerial Photographs

11 of the 12 historical aerial photographs available on Auckland Council's GeoMaps are provided in Appendix C (there were no significant changes to the investigation area between the 1960 and 1970 historical aerial photographs) and a review of these photographs is provided in Table 1.

² PDP, 2026. *Hunua Quarry Development: Groundwater Effects Assessment*. Pattle Delamore Partners.

Table 1: Historical Aerial Photograph Review		
Date	Reference	Description
1940	Photograph 1	The investigation area is undeveloped with the southern half mostly covered by dense bush/forest except for a small area of cleared vegetation near the centre, at the end of an access track.
1950	Photograph 2	The investigation area remains mostly unchanged since 1940 with the exception of: <ul style="list-style-type: none"> ∴ A section in the northeast corner where vegetation has been completely cleared, extending further northeast into 499 Hunua Road property; and ∴ The small area of cleared vegetation near the centre appears to have been partially revegetated.
1960	Photograph 3	The investigation area remains mostly unchanged since 1950 with the exception of: <ul style="list-style-type: none"> ∴ Some earthworks/access tracks appear in the majority of the section adjacent to the northern boundary; ∴ The entire area in the northeast corner is virtually completely clear of vegetation, extending across the entire 499 Hunua Road property; and ∴ The small area with partial revegetation near the centre is completely revegetated with only a couple of access tracks bisecting it.
1980	Photograph 4	The investigation area remains mostly unchanged since 1960 with the exception of: <ul style="list-style-type: none"> ∴ The areas of earthworks/access tracks in the majority of the section adjacent to the northern boundary appears to have been consolidated into two main access tracks and some larger areas of exposed soil (including at the present-day location of the C+R Rack area); and ∴ The trees across the majority of <i>Lot 1 DP 60065</i> have been cleared.

Table 1: Historical Aerial Photograph Review		
1990	Photograph 5	<p>The investigation area remains mostly unchanged since 1980 with the exception of:</p> <ul style="list-style-type: none"> ∴ The areas for earthworks/access tracks in the majority of the section adjacent to the northern boundary appears to have partially revegetated (including the present-day location of the C+R Rack area); and ∴ The present-day residential dwelling and water tank appears on 193 Middleton Road.
2000	Photograph 6	<p>The investigation area remains mostly unchanged since 1990 with the exception of:</p> <ul style="list-style-type: none"> ∴ A portion of the present-day area has been cleared; ∴ Shrubs and trees appear to have Graveyard partially revegetated parts of <i>Lot 1 DP 60065</i> that had been cleared in 1970; and ∴ The present-day garage and ancillary shed appear on 193 Middleton Road.
2006	Photograph 7	<p>The investigation area remains mostly unchanged since 2000 with the exception of earthworks (which appear to be from the disposal of overburden) in the northeastern corner, extending slightly to the northeast with two rectangle clearings (likely sediment retention ponds) just further to the north.</p>
2010 and 2011	Photograph 8	<p>The investigation area remains mostly unchanged since 2006 with the exception of:</p> <ul style="list-style-type: none"> ∴ The area of earthworks in the northeastern corner has been revegetated and planted with young trees; ∴ The portion of the present-day Graveyard area has expanded slightly and appears to have been used for storage of tyres and other miscellaneous items. There also appears to be two shipping containers; ∴ Earthworks appear in a small area between the revegetated areas of earthworks in the

Table 1: Historical Aerial Photograph Review		
		<p>northeastern corner and the present-day Graveyard area; and</p> <ul style="list-style-type: none"> ∴ The partially revegetated parts of <i>Lot 1 DP 60065</i> now appear denser than in 2000.
2015 and 2016	Photograph 9	<p>The investigation area remains mostly unchanged since 2010 with the exception of:</p> <ul style="list-style-type: none"> ∴ Parts of the area of earthworks in the northeast corner that had been planted with young trees have now matured and stacks of tree logs are visible to the southeast of this area; ∴ The Graveyard area has contracted slightly to accommodate an established haulage track that runs from the established area of Hunua Quarry to the middle of <i>Lot 1 DP 60065</i>; ∴ The small earthworks area between the revegetated areas of earthworks in the northeastern corner and the Graveyard area has also been revegetated; ∴ The present-day C+R Rack area has been established with the bunded ASTs, site office and half-dome with shipping containers on both sides. Several large dump trucks are also parked along the southeastern boundary of this area. Three shipping containers (two of which are smaller) are visible to the west of the parked row of large dump trucks; and ∴ The quarrying of Symonds Hill pit has started in the middle of <i>Lot 1 DP 60065</i>.
2017	Photograph 10	<p>The investigation area remains mostly unchanged since 2015 with the exception of:</p> <ul style="list-style-type: none"> ∴ Several more stacks of tree logs are visible in the southeastern portion of the area of earthworks in the northeast corner; ∴ The Graveyard area has expanded again with stockpiles of material (assumed to be overburden) along the northwestern boundary of this area. All stored material that was previously observed in this area has been removed;

Table 1: Historical Aerial Photograph Review		
		<ul style="list-style-type: none"> ∴ The C+R Rack area expanded slightly and another two shipping containers (one of which is smaller) are visible to the northeast of the half-dome; ∴ Stockpiles of material (assumed to be overburden) are observed on the present-day location of the extension of Graveyard area; and ∴ Quarrying activities around the Symonds Hill pit have expanded.
2024 and 2025	Photograph 11	<p>The investigation area remains mostly unchanged since 2017 with the exception of:</p> <ul style="list-style-type: none"> ∴ The number of stacks of tree logs have reduced in the southeastern portion of the area of earthworks in the northeast corner with the tree logs being more scattered around this area; ∴ The Graveyard area appears to be again used for the storage of tyres, large heavy machinery and dump trucks and other miscellaneous items; ∴ One of the ASTs has been moved a little to the southeast and the half-dome at the C+R Rack area has been extended; ∴ The extension of Graveyard area has been established and is used for the storage of large heavy machinery and other miscellaneous items; and ∴ The Symonds Hill pit has been further excavated and extends almost across the entire of <i>Lot 1 DP 60065</i> with the haulage track to the established area of Hunua Quarry now split into two just to the north of the Symonds Hill pit.

5.2 Auckland Council Site Contamination Enquiry Review

A Site Contamination Enquiry (SCE) for the six parcels of land owned by Winstone was submitted to Auckland Council on 9 December 2025 with a response received on 11 December 2025. The SCE response is provided in Appendix D. In summary, the SCE response indicated that the site has possibly been subject to the following list of activities that fall within the HAIL:

- ∴ HAIL Activity A17 – Storage tanks or drums for fuel, chemicals or liquid waste. This is tagged to *PT ALLOT 79 Parish OF HUNUA, PT ALLOT 79 Parish OF HUNUA, Lot 2 DP 55769* as parts of the southern section of the property has been used for the storage, maintenance and refuelling of vehicles/machinery. The pit development area extends into these parts of the property.
- ∴ HAIL Activity E1 – Commercial concrete manufacture or commercial cement storage. This is tagged to *PT ALLOT 79 Parish OF HUNUA, PT ALLOT 79 Parish OF HUNUA, Lot 2 DP 55769* as there is a concrete product manufacturing plant located in the western section of the property and not within the investigation area.
- ∴ HAIL Activity G3 – Landfill sites. This is tagged to *PT ALLOT 79 Parish OF HUNUA, PT ALLOT 79 Parish OF HUNUA, Lot 2 DP 55769* as there is a managed fill consented in 2020 to reinstate the Hunua Quarry pit located in the northern section of the property and not within the investigation area.
- ∴ Potential HAIL Category 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. This is tagged to *LOT 1 DP 105061* as it has been utilised as an overburden disposal area (OBDA) and the pit development area extends into this property. Auckland Council has indicated that it may require investigation to determine if it falls within HAIL Category I.

The SCE response also indicated that records show quarrying commenced on the land in 1934 and that the land had also been used historically for coal mining operations. Auckland Council's records for *ALLOT 38 Parish OF HUNUA, Lot 1 DP 120541, Lot 2 DP 115598* and *Lot 1 DP 60065* do not hold any contamination information.

The Hunua Quarry Management Plan (QMP) (Winstone, 2022) for the site, provided as part of Auckland Council's SCE response, was reviewed. Figure 3 of the QMP (as provided in the SCE response [see Appendix D]) shows the key features and working areas of the site including the stockyard areas within the northern portion of the investigation area. These areas are often referred to as the C+R Rack and Graveyard where diesel, oil and compressed gas are stored (HAIL Activity A17).

5.3 Hunua Quarry Property Files

Property files for the site were obtained from Auckland Council. A summary of the property files review is provided below, and the full documents can be provided upon request.

The information included in the property files largely consisted of land use and discharge consent documentation, building inspections and general property documents. None of the property files include information that identifies potential sources of contamination (e.g. HAIL activities) or information about contaminants of potential concern (COPC).

5.4 Information Provided by Winstone

Cam Russell (Senior Projects & Environmental Advisor, Winstone) explained in email correspondence that:

- ∴ The C+R Rack area is mainly used for heavy vehicle storage and maintenance as well as refuelling;
- ∴ The Graveyard area is mostly used for the storage of tyres and other auxiliary machine parts, as well as the maintenance and storage of heavy vehicles (although less frequently than the C+R Rack area);
- ∴ The extension of Graveyard area, located in the Hay Paddock OBDA to the southeast of the Graveyard area, has also been used for the maintenance and storage of heavy machinery;
- ∴ The clearing in the southeastern portion of the Hay Paddock OBDA has been used as a storage yard for trees that have been cut down as part of the vegetation clearance associated with the development of the Symonds Hill pit. Treated timber has never been stored in this area; and
- ∴ Virgin clay material extracted directly from the Hunua Quarry pit was disposed as overburden in the Hay Paddock OBDA.

6.0 Site Reconnaissance

A site walkover was undertaken on 8 January 2026, with photographs from this visit provided in Appendix B. The site walkover was completed in areas of potential concern (AOPC) that were identified during the information review. These areas were limited to the stockyards (C+R Rack, Graveyard and extension of Graveyard areas), Hay Paddock OBDA and residential buildings/structures at 193 Middleton Road, which are in the northern section of the pit development area (as shown in Figure 2).

193 Middleton Road:

A single dwelling, separate garage and ancillary shed were present at the time of the visit. The dwelling and garage appeared in good condition, and the immediate surrounding area was tidy. The ancillary shed was a wooden structure, which appeared slightly deteriorated and used for storage of general/miscellaneous household items/rubbish with no signs of any stains on the degraded timber flooring. No asbestos containing materials (ACM) were visually identified on the exterior of the structures³.

Hay Paddock OBDA:

The Hay Paddock OBDA was the largest of the AOPC:

- ∴ The majority of the Hay Paddock OBDA consisted of steep, vegetated slopes.
- ∴ The extension of Graveyard area, located in the southwestern section of the Hay Paddock OBDA, is a flat clearing with compacted hardfill gravel and used as a storage yard. One heavy machine, several empty metal drums and discarded vehicle batteries were observed in this area, which was generally clean and tidy with the exception of small patches of hydrocarbon staining.
- ∴ Another clearing, located in the southeastern portion of the Hay Paddock OBDA, is used to stockpile tree logs and woodchips.

Graveyard:

The Graveyard area consists of compacted hardfill gravel and is generally tidy with the exception of miscellaneous rusted metal items scattered across its eastern portion. A small pile of hydrocarbon material was also observed in this area.

During the site walkover, maintenance/servicing was being undertaken on a piece of heavy machinery. The mechanic indicated that vehicle maintenance was temporarily being undertaken in the Graveyard area as the workshop in the C+R Rack area was unusable.

During the site walkover, PDP staff observed dump trucks stockpiling material, assumed to be overburden from the quarry pit, within the western portion of the Graveyard area. Fresh hydrocarbon staining was also observed on the ground near the stockpiled material, presumably from the temporary servicing/repairs of heavy machinery that were being undertaken during the site walkover at the Graveyard as there was a broken-down vehicle at the half-dome structure at the C+R Rack that is used for heavy vehicle maintenance.

³ Note that this does not represent an asbestos management survey under the Health and Safety at Work (Asbestos) Regulations 2016 (the Asbestos Regulations).

C+R Rack:

The C+R Rack consists of compacted hardfill gravel with a site office (which was not investigated during this visit), a half-dome used for heavy vehicle maintenance, a Portacom toilet block, shipping containers used for storage and two bunded aboveground storage tanks (ASTs). The area was generally clean and tidy, with the exception of miscellaneous rusted metal items stored in the western corner and small isolated areas with hydrocarbon staining as described below.

Following a discussion with Mr. Russell, it was confirmed that waste oil from vehicle maintenance is temporarily stored in a bunded intermediate bulk container (IBC) within the shipping container to the northwest of the half-dome. Hydrocarbon staining was observed on the ground in the vicinity of this shipping container.

Various coolants and oil (engine, hydraulic and transmission) in drums and jerry cans were observed in a small shipping container to the east of the half-dome. Hydrocarbon staining was also observed on the ground in the vicinity of this shipping container.

A shipping container to the south of the half-dome appeared to be used for tool storage; however, several empty metal drums along with hydrocarbon staining were also observed on the ground outside of this container. Another shipping container to the north of the half-dome was locked and its interior was not inspected as part of the site walkover; however, no hydrocarbon stains were observed around this container.

The bunded ASTs are located within the northeastern portion of the C+R Rack area. The bottom of both bunds appeared to have a thin layer of liquid with an oily sheen on the surface. Hydrocarbon staining was observed on the ground outside of both bunds, which appears to have originated from the bunds' discharge valves.

7.0 Summary of Information

The information gathered during this PSI regarding the current and historical land use of the site related to possible ground contamination at the investigation area (which are all located in the northern section of the proposed pit development area⁴) can be summarised as follows:

⁴ Note that the quarrying of the northern section of the pit development area is indicatively planned for Stages 7 and 8 (i.e. approximately 35-50 years after the start of the proposed pit development).

Storage of Fuel, Oil and Waste Oil

Auckland Council's SCE response indicated that the site has storage tanks or drums for fuel, chemicals or liquid waste (HAIL Activity A17) and the storage of fuel (diesel in bunded ASTs), oil (various in drums/jerry cans) and waste oil (in a bunded IBC) were observed at the C+R Rack area during the site walkover.

Specific COPC with respect to fuel, oil and waste oil include:

- ∴ Heavy metals (such as arsenic, cadmium, chromium, lead, manganese, nickel, and zinc);
- ∴ PAHs;
- ∴ TPHs; and
- ∴ Benzene, Toluene, Ethylbenzene and Xylene (BTEX).

Maintenance of Heavy Machinery

Evidence of the maintenance of heavy machinery (HAIL Activity F4 – motor vehicle workshops) were noted at the C+R Rack, Graveyard and extension of Graveyard areas during the site walkover. COPC with respect to the maintenance of heavy machinery include:

- ∴ Heavy metals;
- ∴ PAHs; and
- ∴ TPHs.

Disposal of Possible Uncertified Fill Material

Auckland Council's SCE response indicated that the site has been utilised as an OBDA and that it may require investigation to determine if it falls within HAIL Category I (land that has been subject to intentional release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment). The review of historical aerial photographs identified earthworks in the northeastern corner of the investigation area (i.e. the Hay Paddock OBDA) that appear to be from the disposal of overburden⁵. COPC with respect to uncertified fill material are extensive and varied, depending on their source, but could include:

- ∴ Heavy metals;
- ∴ PAH; and
- ∴ ACM⁶ or asbestos fibres.

⁵ Note that Winstone indicated that the source of this overburden is virgin clay material extracted directly from the Hunua Quarry pit.

⁶ Unlikely to be a COPC at the Hay Paddock OBDA given that Winstone have reported that the overburden was natural material extracted from the Hunua Quarry pit.

8.0 Preliminary Conceptual Site Model

A risk to human health can only occur if there is a source (e.g. contaminated soil), a receptor (e.g. people) and an exposure pathway between the source and receptor. The absence of any of these components means no risk can exist.

A preliminary conceptual site model (CSM) is set out in Table 2 below. The table presents the potential contaminant sources at the investigation area (determined by the historical information review and site walkover), the future receptors (such as excavation/maintenance workers during the soil disturbance in the AOPC⁷ as part of the proposed pit development) and potential pathways whereby the receptors could be exposed either directly or indirectly to soil contaminants. The likelihood of soil contamination based on the history, and the likelihood of exposure based on the proposed site use, can then be assessed to determine whether a complete exposure pathway is likely to exist.

The ability for this contaminant pathway to negatively impact the receptor can be assessed by qualitative assessment (when the proposed site use is well understood) and/or comparison of the source with appropriate guideline values and/or standards.

Table 2: Preliminary Conceptual Site Model			
Source	Pathway	Receptor	Pathway Linkage
Heavy metals, TPHs and PAHs if present in fill material	Dermal contact with soil and dust	Site workers	Potentially Complete: Short term exposure may occur during soil disturbance works if contaminants are present at concentrations that could pose a risk to human health.
	Inhalation and ingestion of soil and dust		
	Run off to surface water	Surface water receptors	Potentially Complete: If contaminants are present in shallow soils there is potential for run off via overland flow paths.

⁷ Note that the AOPC are located in the northern section of the proposed pit development area, where quarrying is indicatively planned for Stages 7 and 8 (i.e. approximately 35-50 years after the start of the proposed pit development).

Table 2: Preliminary Conceptual Site Model			
Source	Pathway	Receptor	Pathway Linkage
	Infiltration to groundwater	Down gradient groundwater users	Potentially Complete: Depending on the potential contaminants present and their mobility and the depth to groundwater, it is possible that downward migration of contaminants may occur.
Asbestos if present in fill material (unlikely)	Inhalation of asbestos fibres in the air mobilised during soil disturbance	Site workers	Likely incomplete: Short term exposure may occur during soil disturbance works if contaminants are present at concentrations that could pose a risk to human health.
	Inhalation and ingestion of soil and dust		

It is concluded that storage of fuel, oil and waste oil; maintenance of heavy machinery; and (based on Auckland Council records) disposal of possible uncertified fill material⁸ are more-likely-than-not to have occurred or are occurring at the AOPC, which are all located in the northern section of the investigation area⁹. Therefore, the NES-CS and its regulations:

- ∴ Apply to the piece of land where these sources of potential contaminants have been identified (i.e. the AOPC) and would be triggered by the proposed activities anticipated to be undertaken in the future (i.e. soil disturbance); and
- ∴ Do not apply to the remainder of the proposed pit development area¹⁰ (i.e. outside of the C+R Rack, Graveyard and extension of Graveyard areas).

⁸ Note that Winstone indicated that the source of this overburden is virgin clay material extracted directly from the Hunua Quarry pit.

⁹ Note that the quarrying of the northern section of the pit development area is indicatively planned for Stages 7 and 8 (i.e. approximately 35-50 years after the start of the proposed pit development).

¹⁰ Note that the quarrying in the remainder of the pit development area is indicatively planned for Stages 1 to 6 (i.e. within the first 35 years of the proposed pit development).

Based on the anticipated area and volume of soil disturbance on land containing elevated levels of contaminants, that is expected to be required for the proposed pit development, the contaminated land rules of the AUP-OP may also be applicable to the proposed pit development if concentrations of COPC are found to exceed the Permitted Activity soil acceptance criteria from Section E30 of the AUP-OP.

The actual/possible contaminated land issues identified by the PSI above are expected to be able to be addressed using standard contaminated land management practices, beginning with a DSI of the identified possible contamination sources to determine the nature and extent of impacts to ground as a result of these current/historical activities. The results of the DSI will determine whether it is necessary to seek resource consents under the NES-CS and/or the contaminated land rules within the AUP-OP, and/or the provision of supporting documents such as a Site Management Plan (SMP) and/or Remedial Action Plan (RAP) as part of any conditions of consent, in advance of undertaking works in Stages 7 and 8 (where the AOPC have been identified).

9.0 Soil Sampling Plan

The sampling strategy was designed to assess the risk to commercial/industrial (i.e. excavation/maintenance) workers from potentially contaminated materials.

The sampling plan was undertaken to target the AOPC within the investigation area. Targeted soil sampling was undertaken in the vicinity of the OBDA; heavy machinery storage/maintenance; storage of fuel, oil and waste oil; and residential property within the proposed pit development area to determine the presence of heavy metals, TPHs and PAHs. The sampling locations are outlined in Figure 2.

10.0 Detailed Site Investigation Activities

10.1 Intrusive Investigation

Soil sampling was undertaken on 8 January 2026 by two PDP environmental scientists using hand excavation methods with a shovel or pinch bar when necessary. All locations were backfilled upon completion.

Sampling was undertaken at 16 targeted locations at surface level (0.0 m bgl) and from a maximum depth of 0.3 m bgl to investigate potential contaminants associated with the storage of fuel, oil and waste oil; maintenance of heavy machinery; and disposal of possible uncertified fill material¹¹.

¹¹ Note that Winstone indicated that the source of this overburden is virgin clay material extracted directly from the Hunua Quarry pit.

A fresh pair of nitrile gloves were worn to transfer the material from the test pits to a glass sample jar. The jars were placed into a chilly bin containing ice and sent via courier to an IANZ¹² accredited laboratory (Hill Laboratories) under PDP's Chain of Custody (COC) procedures.

10.2 Field Observations

The lithology at the AOPC consists of the following:

- ∴ The surface soil encountered at 193 Middleton Road (0.0 – 0.2 m bgl) comprised a brown clayey silt, underlain by orange silty clay to the target depth of 0.3 m bgl.
- ∴ Soil within the northern and eastern portions of the Hay Paddock OBDA generally comprised a brown clayey silty matrix from the ground surface to the target depth of 0.3 m bgl.
- ∴ The Graveyard, extension of Graveyard and C+R Rack areas mainly consist of gravel hardfill material. The geology between 0.0 and 0.2 m bgl is described as 'clayey gravel' at sampling locations PMS11 and PMS13, and 'silty gravel' at location PMS15.

During soil sampling, the following were observed:

- ∴ Hydrocarbon stains were noted in soil samples PMS08_0.1, PMS09_0.1, PMS10_0.1¹³, PMS11_0.1, PMS12_0.1, PMS13_0.1, PMS13_0.2, PMS14_0.1, PMS15_0.1, and PMS16_0.1. No hydrocarbon staining was observed in the subsurface sample collected from PMS08, PMS09 and PMS16.
- ∴ No hydrocarbon odour was noted while sampling the soils above except at PMS13 from 0.0 to 0.2 m bgl.
- ∴ No evidence of Asbestos Containing Material (ACM) or fragments of asbestos.
- ∴ No specific evidence of 'landfill type refuse' or general household waste.
- ∴ Groundwater was not encountered within any of the test pits.

10.3 Laboratory Analysis

All surface soil samples were submitted for laboratory analysis and were analysed for a suite of heavy metals (arsenic, cadmium, chromium, copper, lead, nickel and zinc) and PAHs. In addition, the nine surface soils (where hydrocarbon staining was observed) and the subsurface soil samples that were collected from four of these locations¹⁴ were also analysed for TPHs.

¹² International Accreditation New Zealand.

¹³ Heavily stained and appeared to be fresh.

¹⁴ Subsurface soil samples from the other five locations were unable to be collected due to the tightly packed hardfill.

The remaining soil samples were placed on hold at the laboratory pending review of the initial results.

11.0 Soil Evaluation Criteria

Appropriate standards, criteria and guidelines have been selected for comparison to carry out a preliminary health and environmental risk assessment (as outlined in the CSM). These guideline values were selected in accordance with the guidance provided in the MfE (2011a) *CLMG No.2 – Hierarchy and application in New Zealand of environmental guideline values*.

11.1 Human Health Assessment Criteria

Applicable human health assessment criteria for soils within the investigation area are the Soil Contaminant Standards (SCSs) (from the NES-CS) and Soil Guideline Values (SGVs) (from Schedule B(1) *Guideline on Investigation Levels for Soils and Groundwater* National Environmental Protection Measure [NEPM, 2013]). Commercial/Industrial SCSs have been selected as the most appropriate for the current use of the quarry and the proposed pit development. Further, route specific guideline values for PAH and TPH compounds for excavation workers are only available in the oil industry guidelines (MfE, 2011b). Where applicable (i.e. for PAH compounds with more stringent guideline values than the SCSs) these guideline values have been included for assessment.

It should be noted that for HAIL sites for which sampling indicates that concentrations of COPC are within published background concentrations, the regulations of the NES-CS do not apply. As such, it is relevant to include the Auckland Regional Council (ARC) Technical Publication 153 (TP153), *Concentrations of inorganic elements in soils from the Auckland Region* (ARC, 2001); also included in the AUP-OP as Table E30.6.1.4.2 – Background Ranges of Trace Elements in Auckland Soils. In this case, based on the location and size of the investigation area, and underlying geology (as indicated in Section 4.1), the ‘non-volcanic’ ranges of the trace elements have been conservatively adopted.

11.2 Environmental Assessment Criteria

Applicable environmental assessment criteria for soils within the Auckland area are the ‘discharge criteria’ from the AUP-OP Contaminated Land Rules E30.6.1.4 (2), Table E30.6.1.4.1 – Permitted Activity (PA) Soil Acceptance Criteria.

12.0 Results and Assessment

The results of the soil analysis, and comparison to applicable assessment criteria, are provided in Table 3 below and in the appended laboratory reports (Appendix E). Soil sample locations are shown in Figure 2.

12.1 Human Health Risk Assessment

All but one of the surface soil and analysed subsurface soil samples have concentrations of heavy metals, PAHs and/or TPHs that are below the relevant NES-CS SCSs and SGVs for commercial/industrial land use (including Tier 1 soil guideline criteria)¹⁵. The exception is the TPH C₁₀-C₁₄ concentration (1,840 mg/kg) of surface soil sample PMS08_0.1 (collected from the extension of Graveyard area), which exceeds the surface (<1 m) sand Tier 1 soil guideline criteria for commercial/industrial land use (1,500 mg/kg). However, as the chromatogram of PMS08_0.1 indicates that the sample has been contaminated by a diesel product and the TPH C₁₀-C₁₄ Tier 1 soil guideline value is a surrogate for naphthalene (which is the specific PAH compound used as the basis for its derivation in the context of diesel releases), the assessment of the PAHs analytical results for PMS08_0.1 indicates that the concentrations of PAH compounds were low and well beneath the surface (<1 m) sand Tier 1 soil guideline criteria.

Further to the above, subsurface soil sample PMS18_0.3 (collected 0.3 m below PMS08_0.1) reported a TPH C₁₀-C₁₄ concentration of 840 mg/kg, indicating a reduction in hydrocarbon concentrations with depth. In summary, while exceedances of TPH criteria in PMS08_0.1 indicate elevated concentrations of hydrocarbons, the health risk to site users is considered to be low given the isolated area and low concentrations of PAHs. Despite this, any future handling/disturbance of shallow soils that are visually impacted by hydrocarbons should be in accordance with petroleum industry specific protocols to manage/mitigate risks associated with the material (further details on these protocols will be provided in a SMP, which is proposed to be included as part of the conditions of consent for soil disturbance).

All soil samples collected from the C+R Rack, Graveyard and extension of Graveyard areas (PMS08 to PMS16) reported various PAH and/or TPH compounds above the laboratory detection limit and are therefore considered an exceedance of published background concentrations of non-volcanic soils in the Auckland region.

¹⁵ Note that while soil sample PMS10_0.1 has a TPH C₁₅-C₃₆ concentration of 28,000 mg/kg and the estimated Tier 1 soil acceptance criteria for TPH C₁₅-C₃₆ is noted to be in exceedance of 20,000 mg/kg, it is unlikely to pose an unacceptable human health risk to commercial/industrial land users. However, at 20,000 mg/kg residual separate phase is expected to have formed in the soil matrix and some aesthetic impact may be noted.



Table 3: Soil Analytical Results - Heavy Metals ¹, Polycyclic Aromatic Hydrocarbons (PAHs)² and Total Petroleum Hydrocarbons (TPHs)³ - COMMERCIAL/ INDUSTRIAL LAND USE

Sample Name	PMS01_0.1	PMS02_0.1	PMS03_0.1	PMS04_0.1	PMS05_0.1	PMS06_0.1	PMS07_0.1	PMS08_0.1	Background Concentrations for Trace Elements in Auckland Soils ²	AUP-OP Permitted Activity Criteria (Environmental Discharge Criteria) ³	Human Health Protection Criteria (SCSs & SGVs) ⁴	Tier 1 Soil Acceptance Criteria ⁴		
Laboratory Reference	4070484.1	4070484.3	4070484.5	4070484.7	4070484.9	4070484.11	4070484.13	4070484.15				Commercial / industrial		
Date Sampled	8 Jan 2026								Non-volcanic	Commercial / industrial	Commercial / industrial			
Sample Location	193 Middleton Rd				OBDA						Extension of graveyard			
Soil Type - Field	Clayey SILT	Clayey SILT	Clayey SILT	Sandy SILT	Clayey SILT	Silty CLAY	Silty CLAY	GRAVEL	0.4 - 12	100	70	-	-	-
Soil Type - MFE (2011)	Sandy SILT	Sandy SILT	Sandy SILT	Sandy SILT	Sandy SILT	Silty CLAY	Silty CLAY	SAND						
Sample Depth (meters below ground level)	0.1								2 - 55	400	6,300 ^{4a}	-	-	-
Sample Depth (meters below ground level)	0.1													
Sample Depth (meters below ground level)	0.1								<5 - 65	250	3,300 ^{4b}	-	-	-
Sample Depth (meters below ground level)	0.1													
Sample Depth (meters below ground level)	0.1								9 - 180	400	400,000 ⁵	-	-	-
Heavy Metals														
Arsenic	5	8	5	2	6	5	5	4	0.4 - 12	100	70	-	-	-
Cadmium	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1 - 0.65	7.5	1,300	-	-	-
Chromium	11	12	20	17	19	23	19	31	2 - 55	400	6,300 ^{4a}	-	-	-
Copper	8	11	12	5	20	18	23	18	1 - 45	325	>10,000	-	-	-
Lead	12.5	10.3	12.8	7.3	13.2	12.0	18.8	13.9	<5 - 65	250	3,300 ^{4b}	-	-	-
Nickel	3	6	11	8	18	22	10	17	0.9 - 35	105	6,000 ⁵	-	-	-
Zinc	48	102	30	17	68	56	58	118	9 - 180	400	400,000 ⁵	-	-	-
Polycyclic Aromatic Hydrocarbons (PAHs) ⁶														
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES ⁷	ND	ND	ND	ND	ND	ND	ND	ND	-	20	35	(11) ^{9a,10}	(11) ^{9a,10}	(11) ^{9a,10}
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND ¹⁰	-	-	-	(210) ^{9a,10}	(230) ^{9a,10}	(190) ^{9a,10}
Pyrene	ND	ND	ND	ND	ND	ND	ND	3.4	-	-	-	NA ¹¹	NA ¹¹	NA ¹¹
Total Petroleum Hydrocarbons (TPHs)														
C ₇ -C ₉ hydrocarbons	-	-	-	-	-	-	-	< 20	-	-	-	(500) ^{9a,10}	(8,800) ^{9a,10}	120 ^{9a,10}
C ₁₀ -C ₁₄ hydrocarbons	-	-	-	-	-	-	-	1,840	-	-	-	(1,700) ^{9a,10}	(1,900) ^{9a,10}	(1,500) ^{9a,10}
C ₁₅ -C ₂₈ hydrocarbons	-	-	-	-	-	-	-	17,900	-	-	-	NA ¹¹	NA ¹¹	NA ¹¹
Total hydrocarbons (C ₇ - C ₂₈)	-	-	-	-	-	-	-	19,800	-	-	-	-	-	-

100	Result exceeds the Background Concentrations for Trace Elements in Non-volcanic Auckland Soils
100	Result exceeds the AUP-OP Permitted Activity Criteria
100	Result exceeds the SCS & SGV criteria for Commercial/Industrial land use
-	Parameter not tested / Guideline value not available
ND	Result below the laboratory limit of detection

Notes.

- Results in mg/kg.
- Criteria from Table E30.6.1.4.1 - Permitted activity soil acceptance criteria - Chapter E30 of the Auckland Unitary Plan Operative in Part (AUP-OP; AC, 2016).
- Criteria from TP153: Background Concentrations of Inorganic Elements in Soils from the Auckland Region (ARC, 2001) - Chapter E30, Table E30.6.1.4.2 of the Auckland Unitary Plan Operative in Part (AUP-OP; AC, 2016) - Non-volcanic values adopted.
- Soil Contaminant Standards (SCSs) from 'Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health' (MFE, 2011) - Commercial/ Industrial values adopted based on current and proposed land use.
- SCS value is for chromium VI.
- SCS value is for inorganic lead.
- Guideline values from 'Schedule B(1) Guideline on Investigation Levels for Soils and Groundwater National Environment Protection Measure' (NEPM), updated May, 2013 - Commercial/ Industrial values adopted.
- Select PAH results have been included to compare against the relevant guideline criteria. Refer to the laboratory report for a full list of the results.
- Due to inference found in the chromatography, the sample was diluted and reanalysed by the laboratory, which resulted in a higher detection limit of 0.6 mg/kg.
- BaP Potency Equivalence calculated from: Benzo(a)anthracene x 0.1 + Benzo(b)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.
- Values from 'Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand' (MFE, 2011) for sandy silt, silty clay and sand at < 1m, for all pathways. Values for commercial/industrial land use.
- Following notes indicate the limiting pathway for each criterion: m - Maintenance/excavation, d - Dermal, v - Volatilisation and x - PAH surrogate.
- Brackets denote value exceeds threshold likely to correspond to formation of residual separate phase.
- NA indicates estimated criterion exceeds 20,000 mg/kg. At 20,000 mg/kg residual separate phase is expected to have formed in soil matrix. Some aesthetic impact may be noted.



Table 3 Continued: Soil Analytical Results - Heavy Metals ¹, Polycyclic Aromatic Hydrocarbons (PAHs)¹ and Total Petroleum Hydrocarbons (TPHs)¹ - COMMERCIAL/ INDUSTRIAL LAND USE

Sample Name	PMS09_0.1	PMS10_0.1 ¹²	PMS11_0.1	PMS12_0.1	PMS13_0.1	PMS14_0.1	PMS15_0.1	PMS16_0.1	Background Concentrations for Trace Elements in Auckland Soils ²	AUP-OP Permitted Activity Criteria (Environmental Discharge Criteria) ³	Human Health Protection Criteria (SCSs & SGVs) ⁴	Tier 1 Soil Acceptance Criteria ⁵		
Laboratory Reference	4070484.17	4070484.19	4070484.20	4070484.21	4070484.22	4070484.24	4070484.25	4070484.26				Commercial / industrial		
Date Sampled	8 Jan 2026									Non-volcanic	Commercial / industrial	Commercial / industrial		
Sample Location	Extension of graveyard	Graveyard			C+R Rack							CLAY	SAND	SAND
Soil Type - Field	GRAVEL	GRAVEL	Clayey GRAVEL	Clayey GRAVEL	Clayey GRAVEL	GRAVEL	GRAVEL	Silty GRAVEL				< 1 m	< 1 m	< 1 m
Soil Type - MfE (2011)	SAND	SAND	SAND	SAND	SAND	SAND	SAND	SAND						
Sample Depth (meters below ground level)	0.1													
Heavy Metals														
Arsenic	5	-	5	4	4	6	6	6	0.4 - 12	100	70	-	-	-
Cadmium	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.1 - 0.65	7.5	1,300	-	-	-
Chromium	29	-	35	34	35	29	33	29	2 - 55	400	6,300 ^{4a}	-	-	-
Copper	24	-	22	33	21	19	24	19	1 - 45	325	>10,000	-	-	-
Lead	14.0	-	12.0	11.9	10.5	14.5	16.3	12.6	<5 - 65	250	3,300 ^{4b}	-	-	-
Nickel	15	-	22	21	18	15	22	19	0.9 - 35	105	6,000 ³	-	-	-
Zinc	107	-	101	370	190	111	140	172	9 - 180	400	400,000 ³	-	-	-
Polycyclic Aromatic Hydrocarbons (PAHs)⁶														
Benzo(a)pyrene Potency Equivalency Factor (PEF) NES ⁷	ND	1.25	ND	ND	ND	ND	ND	ND	-	20	35	(11) ^{9a,10}	(11) ^{9a,10}	(11) ^{9a,10}
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	(210) ^{9a,10}	(230) ^{9a,10}	(190) ^{9a,10}
Pyrene	0.095	0.81	ND	0.40	0.35	ND	0.011	0.046	-	-	-	NA ¹¹	NA ¹¹	NA ¹¹
Total Petroleum Hydrocarbons (TPHs)														
C ₇ -C ₉ hydrocarbons	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	-	-	-	(500) ^{9a,10}	(8,800) ^{9a,10}	120 ^{9a}
C ₁₀ -C ₁₄ hydrocarbons	< 20	101	< 20	98	490	49	< 20	54	-	-	-	(1,700) ^{9a,10}	(1,900) ^{9a,10}	(1,500) ^{9a,10}
C ₁₅ -C ₃₀ hydrocarbons	8,100	28,000	1,310	7,200	10,300	8,000	13,200	16,100	-	-	-	NA ¹¹	NA ¹¹	NA ¹¹
Total hydrocarbons (C ₇ - C ₃₀)	8,200	28,000	1,320	7,300	10,800	8,100	13,200	16,200	-	-	-	-	-	-

100	Result exceeds the Background Concentrations for Trace Elements in Non-volcanic Auckland Soils
100	Result exceeds the AUP-OP Permitted Activity Criteria
100	Result exceeds the SCS & SGV criteria for Commercial/Industrial land use
-	Parameter not tested / Guideline value not available
ND	Result below the laboratory limit of detection

Notes.

- Results in mg/kg.
- Criteria from Table E30.6.1.4.1 - Permitted activity soil acceptance criteria - Chapter E30 of the Auckland Unitary Plan Operative in Part (AUP-OP; AC, 2016).
- Criteria from TP153: Background Concentrations of Inorganic Elements in Soils from the Auckland Region (ARC, 2001) - Chapter E30, Table E30.6.1.4.2 of the Auckland Unitary Plan Operative in Part (AUP-OP; AC, 2016) - Non-volcanic values adopted.
- Soil Contaminant Standards (SCSs) from 'Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health' (MfE, 2011) - Commercial/ Industrial values adopted based on current and proposed land use.
- a. SCS value is for chromium VI.
- b. SCS value is for inorganic lead.
- Guideline values from 'Schedule B(1) Guideline on Investigation Levels for Soils and Groundwater National Environment Protection Measure' (NEPM), updated May, 2013 - Commercial/ Industrial values adopted.
- Select PAH results have been included to compare against the relevant guideline criteria. Refer to the laboratory report for a full list of the results.
- BaP Potency Equivalence calculated from: Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a)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.
- Values from 'Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand' (MfE, 2011) for sandy silt, silty clay and sand at < 1m, for all pathways. Values for commercial/industrial land use.
- Following notes indicate the limiting pathway for each criterion : m - Maintenance/excavation, d - Dermal, v - Volatilisation and x - PAH surrogate.
- Brackets denote value exceeds threshold likely to correspond to formation of residual separate phase.
- NA indicates estimated criterion exceeds 20,000 mg/kg. At 20,000 mg/kg residual separate phase is expected to have formed in soil matrix. Some aesthetic impact may be noted.
- Due to the sample being too oily, the laboratory was not able to carry out the heavy metal analysis in-house.

Table 3 Continued: Soil Analytical Results - Heavy Metals ¹, Polycyclic Aromatic Hydrocarbons (PAHs)¹ and Total Petroleum Hydrocarbons (TPHs)¹ - COMMERCIAL/ INDUSTRIAL LAND USE

Sample Name	PMS08_0.3	PMS09_0.3	PMS13_0.2	PMS16_0.2	Blank for formatting purposes	Background Concentrations for Trace Elements in Auckland Soils ²	AUP-OP Permitted Activity Criteria (Environmental Discharge Criteria) ³	Human Health Protection Criteria (SCSs & SGVs) ⁴	Tier 1 Soil Acceptance Criteria ⁵			
Laboratory Reference	4070484.16	4070484.18	4070484.23	4070484.27				Non-volcanic	Commercial / industrial	Commercial / industrial		
Date Sampled	8 Jan 2026								Sandy SILT	Silty CLAY	SAND	
Sample Location	Extension of graveyard		C+R Rack						< 1 m	< 1 m	< 1 m	
Soil Type - Field	GRAVEL	GRAVEL	Clayey GRAVEL	GRAVEL								
Soil Type - MfE (2011)	SAND	SAND	SAND	SAND								
Sample Depth (meters below ground level)	0.3		0.2									
Heavy Metals												
Arsenic	-	-	-	-			0.4 - 12	100	70	-	-	-
Cadmium	-	-	-	-			<0.1 - 0.65	7.5	1,300	-	-	-
Chromium	-	-	-	-		2 - 55	400	6,300 ^{4a}	-	-	-	
Copper	-	-	-	-		1 - 45	325	>10,000	-	-	-	
Lead	-	-	-	-		<5 - 65	250	3,300 ^{4b}	-	-	-	
Nickel	-	-	-	-		0.9 - 35	105	6,000 ³	-	-	-	
Zinc	-	-	-	-		9 - 180	400	400,000 ³	-	-	-	
Polycyclic Aromatic Hydrocarbons (PAHs) ⁶												
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES ⁷	-	-	-	-		-	20	35	(11) ^{9a,10}	(11) ^{9a,10}	(11) ^{9a,10}	
Naphthalene	-	-	-	-		-	-	-	(210) ^{9a,10}	(230) ^{9a,10}	(190) ^{9a,10}	
Pyrene	-	-	-	-		-	-	-	NA ¹¹	NA ¹¹	NA ¹¹	
Total Petroleum Hydrocarbons (TPHs)												
C ₇ -C ₉ hydrocarbons	< 20	< 20	< 20	< 20		-	-	-	(500) ^{9a,10}	(8,800) ^{9a,10}	120 ^{9a}	
C ₁₀ -C ₁₄ hydrocarbons	840	< 20	320	< 20		-	-	-	(1,700) ^{9a,10}	(1,900) ^{9a,10}	(1,500) ^{9a,10}	
C ₁₅ -C ₃₀ hydrocarbons	5,300	580	5,400	3,900		-	-	-	NA ¹¹	NA ¹¹	NA ¹¹	
Total hydrocarbons (C ₇ - C ₃₀)	6,200	580	5,700	3,900		-	-	-	-	-	-	

100	Result exceeds the Background Concentrations for Trace Elements in Non-volcanic Auckland Soils
100	Result exceeds the AUP-OP Permitted Activity Criteria
100	Result exceeds the SCS & SGV criteria for Commercial/Industrial land use
-	Parameter not tested / Guideline value not available
ND	Result below the laboratory limit of detection

Notes.

- Results in mg/kg.
- Criteria from Table E30.6.1.4.1 - Permitted activity soil acceptance criteria - Chapter E30 of the Auckland Unitary Plan Operative in Part (AUP-OP; AC, 2016).
- Criteria from TP153: Background Concentrations of Inorganic Elements in Soils from the Auckland Region (ARC, 2001) - Chapter E30, Table E30.6.1.4.2 of the Auckland Unitary Plan Operative in Part (AUP-OP; AC, 2016) - Non-volcanic values adopted.
- Soil Contaminant Standards (SCSs) from 'Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health' (MfE, 2011) - Commercial/ Industrial values adopted based on current and proposed land use.
- a. SCS value is for chromium VI.
- b. SCS value is for inorganic lead.
- Guideline values from 'Schedule B(1) Guideline on Investigation Levels for Soils and Groundwater National Environment Protection Measure' (NEPM), updated May, 2013 - Commercial/ Industrial values adopted.
- Select PAH results have been included to compare against the relevant guideline criteria. Refer to the laboratory report for a full list of the results.
- BaP Potency Equivalence calculated from: Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a)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.
- Values from 'Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand' (MfE, 2011) for sandy silt, silty clay and sand at < 1m, for all pathways. Values for commercial/industrial land use.
- Following notes indicate the limiting pathway for each criterion : m - Maintenance/excavation, d - Dermal, v - Volatilisation and x - PAH surrogate.
- Brackets denote value exceeds threshold likely to correspond to formation of residual separate phase.
- NA indicates estimated criterion exceeds 20,000 mg/kg. At 20,000 mg/kg residual separate phase is expected to have formed in soil matrix. Some aesthetic impact may be noted.

All other analysed soil samples from the Hay Paddock OBDA¹⁶ and 193 Middleton Road reported concentrations of various PAH compounds below the laboratory detection limit (and therefore, it can be considered that the soils in these areas comply with the published background concentrations of non-volcanic soils in the Auckland region).

In terms of heavy metals, with the exception of two of the analysed surface soil samples (PMS12_0.1 and PMS13_0.1) collected from the C+R Rack area, which have concentrations of zinc (370 and 190 mg/kg, respectively) above the published background concentrations of non-volcanic soils in the Auckland region (180 mg/kg), all of the other analysed soil samples¹⁷ have heavy metal concentrations below the published background concentrations of non-volcanic soils in the Auckland region.

Therefore, apart from the shallow soil in the vicinity of PMS08, the soil disturbance associated with the remainder of the proposed pit development is unlikely to pose an unacceptable human health risk to commercial/industrial land users.

12.2 Environmental Risk Assessment

All of the analysed soil samples reported concentrations of heavy metals and PAHs below the permitted activity 'discharge criteria' of the AUP-OP, set in Table E30.6.1.4.1. While there is no permitted activity 'discharge criteria' of the AUP-OP for TPH, the disturbance of the shallow soil (0 – 0.3 m bgl) in the vicinity of PMS08 with the elevated TPH C₁₀-C₁₄ concentration is considered to pose a low risk to the environment as there are no surface waterbodies close to this isolated area. However, as described in Section 12.1 above, localised areas of soils that are visually impacted with hydrocarbons should be handled/disturbed in accordance with petroleum industry specific protocols to manage/mitigate risks associated with the material.

13.0 Resource Consent Assessment

13.1 Consideration of the NES-CS

As indicated in Section 8.0, the NES-CS and its regulations do not apply to the majority of the proposed pit development area (i.e. outside of the C+R Rack, Graveyard and extension of Graveyard areas) that is indicatively planned for Stages 1 to 6 (i.e. within the first 35 years of the proposed pit development). Therefore, the soil disturbance across most of the proposed pit development area (indicatively planned for Stages 1 to 6) within the first 35 years of the proposed pit development does not require any consents under the NES-CS.

¹⁶ Note that as the perylene concentration of sample PMS03_0.1 (0.013 mg/kg) is at the laboratory's detection limit of 0.013 mg/kg, it can be considered to comply with the published background concentrations of non-volcanic soils in the Auckland region.

¹⁷ Note that soil sample PMS10_0.1 was too oily for the laboratory to carry out the heavy metal analysis in-house.

However, as the concentration of zinc in two soil samples and detection of various PAH and/or TPH compounds in 13 soil samples exceed the published background concentrations of non-volcanic soils in the Auckland region, it is considered that the soils within the stockyard areas (located within the northern section of the investigation area¹⁸) do not meet the requirements of NES-CS Regulation 5 (9) (i.e. within background ranges) and the regulations of the NES-CS apply to the proposed soil disturbance within these AOPC (i.e. the stockyard areas). While the concentration of TPH C₁₀-C₁₄ in one soil sample exceeds the surface sand Tier 1 soil guideline criteria for commercial/industrial land use, that soil sample also had concentrations of PAH compounds that are below the surface sand Tier 1 soil guideline criteria for commercial/industrial land use and therefore, the health risk to site users is considered to be low.

Consequently, a controlled activity consent will be required under Regulation 9 of the NES-CS unless the soil disturbance associated with the proposed pit development within the stockyard areas (located within the northern section of the investigation area¹⁸) meets the requirements of NES-CS Regulation 8(3) for a permitted activity (i.e. the volume of soil disturbance of the piece of land must be less than 25 m³ per 500 m², the volume of soil disposal from the piece of land must be less than 5 m³ per 500 m², the soil is reinstated to erosion-resistant state within 1 month, and the soil disturbance duration is less than 2 months). A controlled activity consent will require a SMP to be prepared (to manage the disturbance of soils that are considered an exceedance of background concentrations and to excavate the shallow soil [0 – 0.3 m bgl] in the vicinity of PMS08 for disposal at an appropriate disposal facility licensed to accept the reported level of TPH C₁₀-C₁₄, which is considered a low human health risk to commercial/industrial land users) and submitted to Auckland Council prior to undertaking any earthworks within the stockyard areas (located within the northern section of the investigation area¹⁸).

Therefore, a controlled activity consent under Regulation 9 of the NES-CS will be required prior to the soil disturbance within the stockyard areas (located within the northern section of the proposed pit development area, where quarrying is indicatively planned for Stages 7 and 8 [approximately 35-50 years after the start of the proposed pit development]) unless it meets the requirements of NES-CS Regulation 8(3) for a permitted activity.

¹⁸ Note that the quarrying of the northern section of the pit development area is indicatively planned for Stages 7 and 8 (i.e. approximately 35-50 years after the start of the proposed pit development).

13.2 Consideration of the AUP-OP

As all analysed soil samples have concentrations of COPC below the AUP-OP permitted activity 'discharge criteria'¹⁹ and the disturbance of the soil with the elevated TPH C₁₀-C₁₄ concentration being considered to pose a low risk to the environment, it is:

- ∴ Expected that no contaminated land consents regarding soil management are required under the AUP-OP for the soil disturbance associated with the proposed pit development; and
- ∴ Considered that as the investigation area does not contain elevated levels of contaminants (as defined by the AUP-OP) a consent under the contaminated land rules of the AUP-OP is **not required** and the soil disturbance associated with the proposed pit development can be undertaken outside of the Contaminated Land Rules (Chapter E30).

13.3 Long-Term Consenting

As the soil associated with surface soil sample PMS08_0.1 reported concentrations of TPH C₁₀-C₁₄ above the surface sand Tier 1 soil guideline criteria for commercial/industrial land use, this soil should be excavated from the investigation area (prior to undertaking the bulk earthworks within the extension of Graveyard area) and disposed of (instead of being reused on the site) at an appropriate disposal facility licensed to accept the reported level of TPH C₁₀-C₁₄ to avoid the requirement for an ongoing discharge consent under the AUP-OP.

14.0 Onsite Reuse and Soil Disposal Assessment

Based upon the soil sample results and the sampling resolution within the AOPC, with the exception of the shallow soil (0 – 0.3 m bgl) in the vicinity of PMS08, the soil within the investigation area can be reused onsite. However, as various PAH and/or TPH compounds were detected (and therefore considered an exceedance of background concentrations) in all analysed soil samples that were collected from the C+R Rack, Graveyard and extension of Graveyard areas (with two surface soil samples also reporting zinc concentrations above the background concentrations), any excess fill material (i.e. from ground surface to the depth of natural soil) from these areas not reused onsite cannot be considered clean fill. If this material is not reused onsite it will require disposal at an appropriate disposal facility licensed to accept the respective levels of heavy metals, PAH and TPH compounds detected (which exceed the published background concentrations of non-volcanic soils in the Auckland region but were below the NES-CS SCS/SGV and the permitted activity discharge criteria of the AUP-OP).

¹⁹ Where contaminant groups such as PAHs have been selectively analysed, results are interpreted to extend across the investigation area with respect to the consenting assessment.

The shallow soil in the vicinity of PMS08 cannot be reused onsite and will need to be excavated and disposed of at an appropriate disposal facility licensed to accept the reported level of TPH C₁₀-C₁₄ (which exceeds the surface sand Tier 1 soil guideline criteria for commercial/industrial land use).

All other excess soil within the investigation area (i.e. outside of the C+R Rack, Graveyard and extension of Graveyard areas) not reused onsite can be considered clean fill and removed from the investigation area at the discretion of the site operator (without restriction from a contamination perspective).

15.0 Conclusions & Recommendations

Pattle Delamore Partners Limited (PDP) have been engaged by Fletcher Concrete and Infrastructure Limited (FCIL) (trading as Winstone Aggregates [Winstone]) to undertake a Combined Preliminary and Detailed Site investigation (PSI/DSI) in support of Winstone's Hunua Quarry ('the site') Fast-track Approval Application (FTAA) to expand the Symonds Hill pit by approximately 50 ha ('the investigation area') to a full pit extent of 100 ha in eight indicative stages over an approximate 50-80 year period. The proposed pit development will initially extend the existing Symonds Hill pit to the south and east (Stages 1 to 6; planned to be undertaken in the first 35 years of the proposed pit development), followed by areas to the north and west (Stages 7 and 8, planned to be undertaken approximately 35-50 years after the start of the proposed pit development).

The key objectives of this PSI/DSI were to determine whether any Hazardous and Industrial List (HAIL) or other potentially contaminating activities have been undertaken within the investigation area; assess the presence of any residual contamination impacts to surface and subsurface soils from current or historical activities within the investigation area; and to identify any consenting requirements under the Resource Management (*National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health*) Regulations 2011 (NES-CS) and the Auckland Unitary Plan Operative in Part (AUP-OP) (in the context of contaminated land), and any special soil management required during the proposed pit development; and provide recommendations of further investigations, if required.

The PSI concluded that the areas of potential concern (AOPC; C+R Rack, Graveyard, extension of Graveyard, Hay Paddock overburden disposal area [OBDA] and 193 Middleton Road) are in the northern section of the pit development area²⁰. Possible HAIL land uses including the bulk storage of drums for fuel, chemicals or liquid waste; maintenance of heavy machinery; and (based on Auckland Council records) disposal of possible uncertified fill

²⁰ Note that the quarrying of the northern section of the pit development area is indicatively planned for Stages 7 and 8 (i.e. approximately 35-50 years after the start of the proposed pit development).

material²¹ were identified as more-likely-than-not to have occurred at these AOPC of the investigation area. Therefore, a DSI was required to determine the nature and extent of impacts to ground as a result of these current/historical activities within the AOPC.

As no HAIL land use has been identified in the remainder of the pit development area²², the proposed soil disturbance outside of the C+R Rack, Graveyard and extension of Graveyard areas is exempt from NES-CS regulations and the contaminated land provisions of the AUP-OP. Therefore, the soil disturbance across most of the proposed pit development area (indicatively planned for Stages 1 to 6) within the first 35 years of the proposed pit development does not require any consents under the NES-CS or the contaminated land provisions of the AUP-OP.

The three identified HAIL activities were investigated by means of targeted analytical soil sampling (total of 16 surface and four subsurface soil samples). Analysis for COPC associated with the identified HAIL categories (including heavy metals, polycyclic aromatic hydrocarbons [PAHs] and/or total petroleum hydrocarbon [TPHs]) were undertaken.

The key findings of the DSI are as follows:

- ∴ Variable lithologies were encountered at the stockyard (C+R Rack, Graveyard, extension of Graveyard), Hay Paddock OBDA and residential areas.
- ∴ Hydrocarbon stains were noted in all the surface soil samples collected from the stockyard areas and the subsurface sample collected from adjacent to one of the bunded ASTs (PMS13). No hydrocarbon staining was observed in the other subsurface samples, which were collected from the extension of Graveyard area (PMS08 and PMS09) and adjacent to the shipping container that temporarily stores waste oil in a bunded IBC (PMS16). Hydrocarbon odour was only noted while sampling the soils at PMS13.
- ∴ No evidence of ACM or general household waste was encountered within any of the test pits.
- ∴ Groundwater was not encountered within any of the test pits.
- ∴ All but one analysed soil samples reported concentrations of heavy metals, PAHs and/or TPHs that comply with NES-CS SCS and SGV for commercial/ industrial land use (including Tier 1 soil guideline criteria).

²¹ Note that Winstone indicated that the source of this overburden is virgin clay material extracted directly from the Hunua Quarry pit.

²² Note that the quarrying in the remainder of the pit development area is indicatively planned for Stages 1 to 6 (i.e. within the first 35 years of the proposed pit development).

- ∴ The exception is surface soil sample PMS08_0.1 (collected from the extension of Graveyard area), which reported a TPH C₁₀-C₁₄ concentration above the surface (<1 m) sand Tier 1 soil guideline criteria for commercial/industrial land use. However, as the PAH analytical results for PMS08_0.1 are below the surface (<1 m) sand Tier 1 soil guideline criteria and subsurface soil sample PMS08_0.3 indicated a reduction in hydrocarbon concentrations with depth, the health risk to site users is low given the isolated area and low concentrations of PAHs. Despite this, any future handling/disturbance of shallow soils that are visually impacted by hydrocarbons should be in accordance with petroleum industry specific protocols to manage/mitigate risks associated with the material.
- ∴ Apart from the shallow soil in the vicinity of PMS08, the soil disturbance associated with the remainder of the proposed pit development is unlikely to pose an unacceptable human health risk to commercial/industrial land users.
- ∴ All soil samples collected from the stockyard areas reported various heavy metal, PAH and/or TPH compounds that are considered an exceedance of published background concentrations of non-volcanic soils in the Auckland region.
- ∴ As all soil samples collected from the Hay Paddock OBDA and 193 Middleton Road reported concentrations of heavy metals and PAH compounds that are considered to comply with the published background concentrations of non-volcanic soils in the Auckland region, the regulations of the NES-CS do not apply to these areas.
- ∴ Therefore, based on the analytical results of the soil samples collected from the Hay Paddock OBDA, it is concluded that the disposal of overburden at the Hay Paddock OBDA does not fall within HAIL Category I (the potential of which was indicated by Auckland Council's SCE response [see Sections 5.2 and 7.0]) and is consistent with the activities in this area as described by Winstone in Section 5.4 (i.e. the overburden disposed in this area was virgin clay material extracted directly from the Hunua Quarry pit).
- ∴ All of the analysed soil samples reported concentrations of heavy metals and PAHs below the permitted activity 'discharge criteria' of the AUP-OP, set in Table E30.6.1.4.1. While there is no permitted activity 'discharge criteria' of the AUP-OP for TPH, the disturbance of the shallow soil in the vicinity of PMS08 with the elevated TPH C₁₀-C₁₄ concentration is considered to pose a low risk to the environment as there are no surface waterbodies close to this isolated area. However, localised areas of soils that are visually impacted with hydrocarbons should be handled/disturbed in accordance with petroleum industry specific protocols to manage/mitigate risks associated with the material.

As all soil samples collected from the stockyard areas reported various heavy metal, PAH and/or TPH compounds that exceed the published background concentrations of non-volcanic soils in the Auckland region, it is considered that the soils within the stockyard areas (located within the northern section of the investigation area²³) do not meet the requirements of NES-CS Regulation 5 (9) and the regulations of the NES-CS apply to the proposed soil disturbance within these AOPC (i.e. the stockyard areas). While the concentration of TPH C₁₀-C₁₄ in one soil sample exceeds the surface sand Tier 1 soil guideline criteria for commercial/industrial land use, that soil sample also had concentrations of PAH compounds that are below the surface sand Tier 1 soil guideline criteria for commercial/industrial land use and therefore, the health risk to site users is considered to be low. Consequently, a controlled activity consent will be required under Regulation 9 of the NES-CS (unless the soil disturbance associated with the proposed pit development within the stockyard areas meets the requirements of NES-CS Regulation 8(3) for a permitted activity) and a Site Management Plan (SMP) will need to be prepared and submitted to Auckland Council prior to undertaking any earthworks within the stockyard areas (located within the northern section of the proposed pit development area, where quarrying is indicatively planned for Stages 7 and 8 [approximately 35-50 years after the start of the proposed pit development]).

As all analysed soil samples have concentrations of COPC below the AUP-OP Contaminated Land Rules (Rule E30), no contaminated land consent is required under the AUP-OP for the soil disturbance associated with the proposed pit development.

As the soil associated with surface soil sample PMS08_0.1 reported concentrations of TPH C₁₀-C₁₄ above the surface sand Tier 1 soil guideline criteria for commercial/industrial land use, this soil should be excavated from the investigation area (prior to undertaking the bulk earthworks within the extension of Graveyard area) and disposed of (instead of being reused on the site) at an appropriate disposal facility licensed to accept the reported level of TPH C₁₀-C₁₄ to avoid the requirement for an ongoing discharge consent under the AUP-OP.

Where offsite soil disposal is required from the investigation area, the analytical results summary (Table 3 of this report) should be provided to an appropriate disposal facility licensed to accept the respective levels of heavy metals, PAH and TPH compounds detected. With regard to onsite reuse:

- ∴ Apart from the shallow soil in the vicinity of PMS08 (in the extension of Graveyard area), the soil within the investigation area can be reused onsite. However, as various PAH and/or TPH compounds were detected in all analysed soil samples that were collected from the C+R Rack, Graveyard and extension of Graveyard areas, any excess fill material

²³ Note that the quarrying of the northern section of the pit development area is indicatively planned for Stages 7 and 8 (i.e. approximately 35-50 years after the start of the proposed pit development).

- (i.e. from ground surface to the depth of natural soil) in these areas not reused onsite cannot be considered clean fill and, if not reused onsite, will require disposal at an appropriate disposal facility licensed to accept the respective levels of heavy metals, PAH and TPH compounds detected;
- ∴ The shallow soil in the vicinity of PMS08 cannot be reused onsite and will need to be excavated and disposed of at an appropriate disposal facility licensed to accept the reported level of TPH C₁₀-C₁₄; and
 - ∴ All other excess soil within the investigation area (i.e. outside of the C+R Rack, Graveyard and extension of Graveyard areas) not reused onsite can be considered clean fill and removed from the investigation area at the discretion of the site operator (without restriction from a contamination perspective).

As quarrying of the northern section of the pit development area is indicatively planned for Stages 7 and 8 (i.e. approximately 35-50 years after the start of the proposed pit development), it is recommended that further DSIs be undertaken on the stockyard and any other identified HAIL areas that may develop in the next 35 years prior to any soil disturbance in these areas and, if necessary, further consents obtained to the extent not already provided for by the controlled activity consent already required²⁴.

16.0 Recommended Conditions

- XX. The Consent Holder shall engage a SQEP to undertake a detailed site investigation (DSI) for Stages 7 and 8 of quarrying at least six months prior to the commencement of quarry activities.
- XX. The Detailed Site Investigation required under Condition **XX** shall:
 - a) Be undertaken in accordance with the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011;
 - b) Delineate the lateral and vertical extents of the identified HAIL sites; and
 - c) Determine if remediation is required.
- XX. If, contaminated materials are discovered, the handling and reuse of contaminated material must be undertaken in accordance with a Remediation Action Plan (RAP). The RAP and Site Management Plan (SMP) as applicable must be prepared and submitted to the AC Manager for certification at least 20 working days prior to the remediation works commencing.

²⁴ Unless it meets the requirements for a permitted activity.

- XX. The excavation and re-use of the material identified in Condition XX must be supervised and validated by a SQEP as defined in the NES Contaminated Land Users' Guide (MfE 2012). On completion of the works, the Consent Holder must submit a site validation report confirming compliance with the certified RAP to the AC Manager.
- XX. Any material removed from the Site shall be disposed of at a facility authorised to receive such material, and the Consent Holder shall provide the Council, Attention: Regional Leader – Monitoring and Compliance, with written confirmation of such disposal within 10 working days.

17.0 References

- ARC, 2001. *Technical Publication 153 – Background Concentrations of Inorganic Elements in Soils of the Auckland Region*. Auckland Regional Council.
- AC, 2016. *Auckland Unitary Plan - Operative in Part (Updated 10 November 2023)*. Auckland Council.
- Edbrooke, SW. 2001. *Geology of the Auckland Area*. Institute of Geological and Nuclear Sciences 1:250,000 geological map 3.
- MfE, 2011a. *Contaminated Land Management Guidelines No. 2. Hierarchy and Application in New Zealand of Environmental Guideline Values*. Ministry for the Environment.
- MfE 2011b. *Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand (Revised 2011)*. Ministry for the Environment.
- MfE, 2021a. *Contaminated Land Management Guidelines No.1. Reporting on Contaminated Sites in New Zealand*. Ministry for the Environment.
- MfE, 2021b. *Contaminated Land Management Guidelines No.5. Site Investigation and Analysis of Soils*. Ministry for the Environment.
- NEPM, 2013. *Schedule B(1) Guideline on Investigation Levels for Soils and Groundwater*. National Environmental Protection Measure.
- NES-CS, 2011. Resource Management (*National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health*) Regulations 2011. Ministry for the Environment.
- PDP, 2026. *Hunua Quarry Development: Groundwater Effects Assessment*. Pattle Delamore Partners.

I, Hamish Wilson, of Pattle Delamore Partners certify that:

1. This combined Preliminary/Detailed Site Investigation meets the requirements of the Resource Management (*National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health*) Regulations 2011 (the NES-CS) because it has been:
 - a. Completed by a suitably qualified and experienced practitioner;
 - b. Completed in accordance with the current edition of *Contaminated land management guidelines No. 5 – Site investigation and analysis of soils*;
 - c. Reported on in accordance with the current edition of *Contaminated land management guidelines No. 1 – Reporting on contaminated sites in New Zealand*; and
 - d. Certified by a suitably qualified and experienced practitioner.
2. This combined preliminary and detailed site investigation concludes that the soil disturbance associated with the proposed quarry pit development at the investigation area is unlikely to pose an unacceptable risk to human health as they do not exceed the applicable standard in Regulation 7 of the NES-CS.

Evidence of the qualifications and experience of the suitably qualified and experienced practitioner(s) who have done this investigation and certified this report is provided below.

This certification applies to the date of this report.

Signed,



Hamish Wilson

Technical Director – Contaminated Land

Hamish Wilson – Project Director

Hamish is an environmental engineer with over 26 years of experience in undertaking environmental and contaminated land assessments. Hamish has a BE in Civil and Resource Engineering from the University of Auckland. Hamish has experience with undertaking and managing site investigations, environmental assessments, and monitoring programmes for a range of environmental issues, across a broad range of media including soil, sediment, surface water, groundwater, and ground gas; and for a wide range of contaminants including heavy metals, petroleum hydrocarbons, and asbestos. Hamish has experience in the assessment of data (including statistical analysis) to undertake risk assessments, including Tier 2 risk assessments. He has familiarity with and understanding of the current contaminated land regulation and practice in New Zealand including assessments against the NES-CS; and in the consenting of contaminated sites.

Stefan Yap – Project Manager and PSI/DSI Report Reviewer

Stefan is an environmental scientist with over 20 years of diverse experience within the environmental field throughout New Zealand and Asia Pacific with practical expertise in contaminated land management, environmental regulatory compliance and hazardous waste management. He has a BEnvSc (Hons) from Murdoch University. Stefan has reviewed and prepared detailed assessments of contaminated sites, conceptual site models, remedial action plans, long-term management & monitoring plans and risk assessments. He has worked as a contaminated land specialist with small and large clients across a wide variety of industries including large-scale infrastructure, transport, oil & gas, energy, telecommunication, construction, education, manufacturing, recreation, agriculture & horticulture and solid waste.

Erin Makepeace – Report Author

Erin is an environmental scientist with over two years of professional experience in contaminated land, environmental science and geotechnical testing. She has a BSc in Oceanography from the University of Otago. Erin has practical experience in soil investigations, gas monitoring and groundwater sampling; is familiar with the regulations of the NES-CS and the AUP-OP contaminated land rules; and regularly prepares Health and Safety documentation, Preliminary and Detailed Site Investigation reports, soil disposal management options and Site Management Plans.



Photograph 1: Looking southeast at the dwelling located at 193 Middleton Road.



Photograph 2: Looking northwest at the separate garage and ancillary shed located at 193 Middleton Road.



Photograph 3: Looking west, overview of the OBDA where samples PMS03-PMS07 were collected with the Graveyard area the background.



Photograph 4: Extension of the Graveyard area with weathered hydrocarbon staining next to empty metal drums where PMS08 was sampled.



Photograph 5: Extension of the Graveyard area with weathered hydrocarbon staining under heavy machinery where PMS09 was sampled.



Photograph 6: Overview of the western portion of the Graveyard area where fresh hydrocarbon staining was observed and PMS10 was collected. The stockpile of material (assumed overburden) that was observed to be dumped by a truck during the site walkover is in the background.



Photograph 7: Overview of the eastern portion of the Graveyard area where discarded metal and weathered hydrocarbon staining was observed and PMS11 collected.



Photograph 8: Looking southwest at heavy machinery and the half-dome vehicle maintenance structure at C+R Rack.



Photograph 9: Looking northeast at 2x bunded ASTs located in the C+R Rack.



Photograph 10: Looking northeast at the eastern AST with hydrocarbon staining on the ground where PMS12 was taken.



Photograph 11: Looking northeast at the western AST with hydrocarbon staining on the ground where PMS13 was taken.



Photograph 12: Soil profile at 0.2 m bgl for PMS13.



Photograph 13: Looking southwest at a small shipping container used for coolant and oil storage with hydrocarbon staining on the ground where PMS14 was taken.



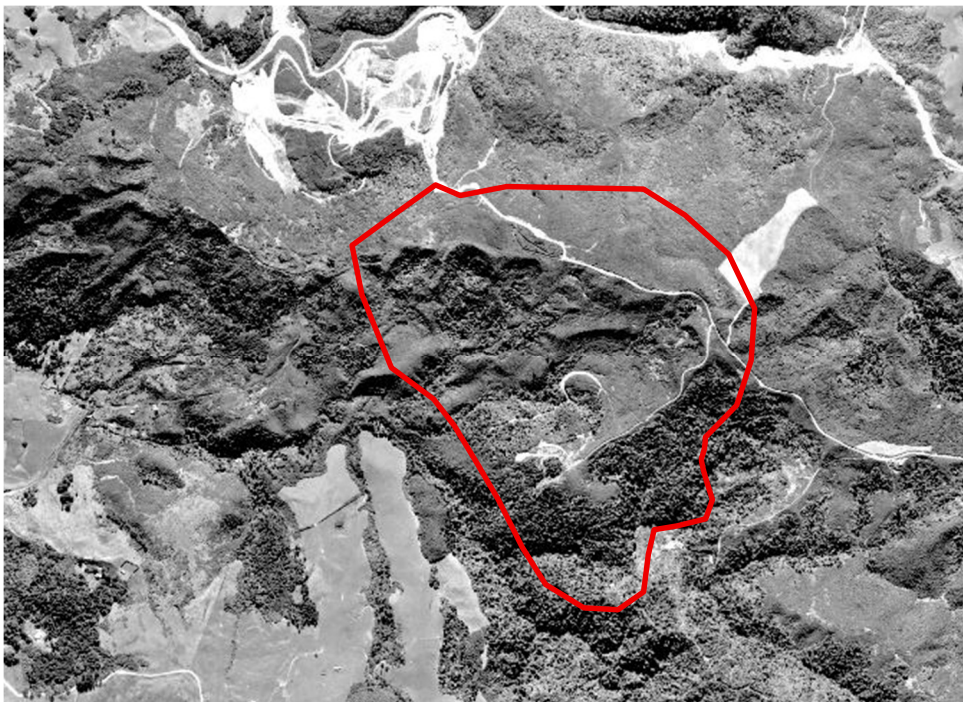
Photograph 14: Looking west at a shipping container adjacent to the vehicle maintenance structure with empty miscellaneous metal drums and hydrocarbon staining on the ground outside where PMS15 was sampled.



Photograph 15: Looking southeast at a shipping container (near the northwestern corner of the vehicle maintenance structure) where waste oil is temporarily stored with hydrocarbon staining on the ground where PMS16 was taken.



Photograph 1: Historical Aerial Photograph from 1940 (source – AC Geomaps).



Photograph 2: Historical Aerial Photograph from 1950 (source – AC Geomaps).



Photograph 3: Historical Aerial Photograph from 1960 (source – AC Geomaps).



Photograph 4: Historical Aerial Photograph from 1980 (source – AC Geomaps).



Photograph 5: Historical Aerial Photograph from 1990 (source – AC Geomaps).



Photograph 6: Historical Aerial Photograph from 2000 (source – AC Geomaps).



Photograph 7: Historical Aerial Photograph from 2006 (source – AC Geomaps).



Photograph 8: Historical Aerial Photograph from 2010 and 2011 (source – AC Geomaps).



Photograph 9: Historical Aerial Photograph from 2015 and 2016 (source – AC Geomaps).



Photograph 10: Historical Aerial Photograph from 2017 (source – AC Geomaps).



Photograph 11: Historical Aerial Photograph from 2024 and 2025 (source – AC Geomaps).

11 December 2025

Pattle Delamore Partners Limited

235 Broadway, Newmarket

AUCKLAND

Attention: Erin Makepeace

Dear Erin,

Site Contamination Enquiry – ALLOT 38 Parish OF HUNUA, Lot 1 DP 60065, PT ALLOT 79 Parish OF HUNUA, PT ALLOT 79 Parish OF HUNUA, Lot 2 DP 55769, Lot 1 DP 105061, Lot 1 DP 120541, Lot 2 DP 115598

This letter is in response to your enquiry requesting available site contamination information within Auckland Council records for the above site. Please note this report does not constitute a site investigation report; such reports are required to be prepared by a (third-party) Suitably Qualified and Experienced Practitioner.

The following details are based on information available to the Contamination, Air & Noise Team in the Planning & Resource Consent Department. The details provided may be from former regional council information, as well as property information held by the former district/city councils. For completeness the relevant property file should also be requested to obtain all historical records and reports via 09 3010101 or online at:

<https://www.aucklandcouncil.govt.nz/buying-property/order-property-report/Pages/order-property-file.aspx>.

1. Hazardous Activities and Industries List (HAIL) Information

This list published by the Ministry for the Environment (MfE) comprises activities and industries that are considered likely to cause land contamination as a result of hazardous substance use, storage, and/or disposal.

Council's records indicate this site has possibly been subject to the following activities that fall within the HAIL:

- HAIL Item (A17) - Storage tanks or drums for fuel, chemicals or liquid waste
- HAIL Item (E1) - Commercial concrete manufacture or commercial cement storage
- HAIL Item (G3) - Landfill sites
- Potential HAIL Item (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

Records indicate that quarrying commenced on the land in 1934. It is indicated that the land had also been used historically for coalmining operations.

A consent was issued for the discharge of contaminants from a managed fill operation at the site PT ALLOT 79 Parish OF HUNUA, PT ALLOT 79 Parish OF HUNUA, Lot 2 DP 55769 to reinstate the Hunua Quarry. The consent is to import 3 million m³ of managed fill and mix it with 2 million m³ of overburden (cleanfill) from the adjacent Symonds Hill Quarry. The managed fill criteria is generally the lowest concentration of the NES:CS SCS for commercial/industrial outdoor work (unpaved) or the AUP(OP) PA soil acceptance criteria.

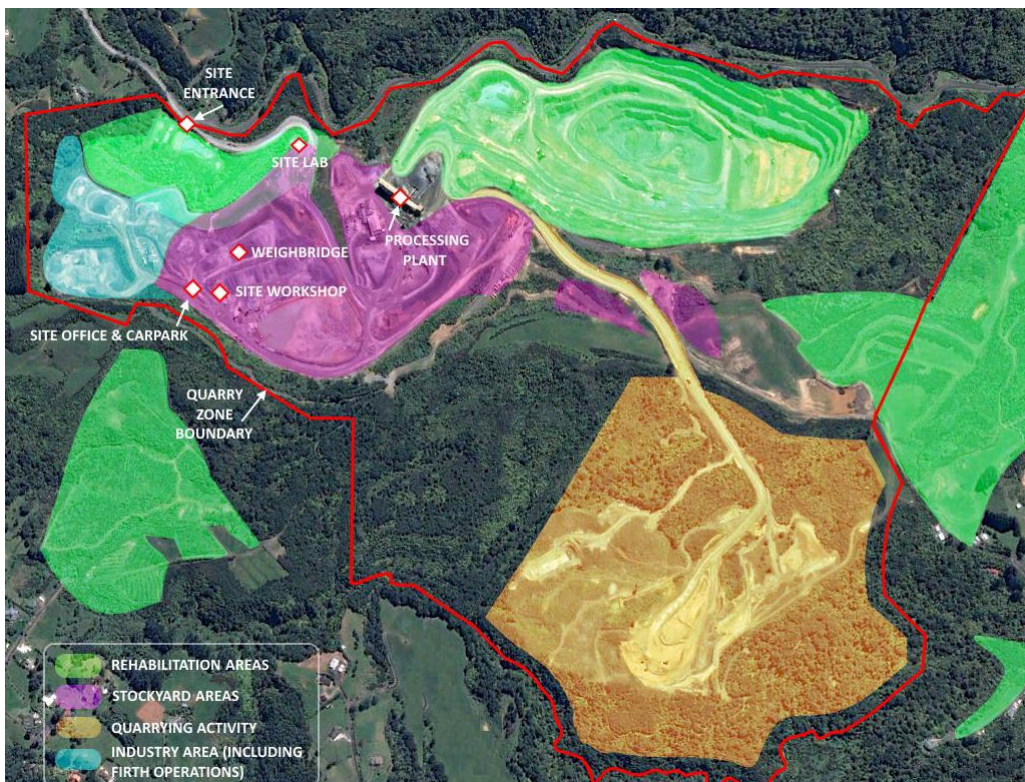
The site PT ALLOT 79 Parish OF HUNUA, PT ALLOT 79 Parish OF HUNUA, Lot 2 DP 55769 contains a concrete product manufacturing plant, for the manufacture of masonry blocks and pavers, and an

associated air discharge consent for the operation. The site also contains a laboratory and a workshop (please see below site plan). A Quarry Management Plan from May 2022 indicates that the site stores diesel, oil and compressed gas.

Council's records indicate the site LOT 1 DP 105061 has been utilised as an overburden disposal site.

There is no contamination information held within Council's records for the sites (ALLOT 38 Parish OF HUNUA, Lot 1 DP 60065, Lot 1 DP 120541, Lot 2 DP 115598).

Due to the age of the structures on site the potential for asbestos and/or lead paint may need to be considered.



Above: Site plan from Quarry Management Plan dated May 2022

Please note:

- *If you are demolishing any building that may have asbestos containing materials (ACM) in it, you have obligations under the Health and Safety at Work (Asbestos) Regulations 2016 for the management and removal of asbestos, including the need to engage a Competent Asbestos Surveyor to confirm the presence or absence of any ACM.*
- *Paints used on external parts of properties up until the mid-1970's routinely contained lead, a poison and a persistent environmental pollutant. You are advised to ensure that soils affected by old, peeling or flaking paint are assessed in relation to the proposed use of the property, including high risk use by young children.*

2. Consents and Incidents Information (200m radius of the selected site)

The Council database was searched for records of the following activities within approximately 200 metres of the site:

- Pollution Incidents (including air discharges, oil or diesel spills)
- Bores
- Contaminated site and air discharges, and industrial trade process consents
- Closed Landfills
- Air quality permitted activities
- Identified HAIL activities

A map of relevant records can be found appended to this letter as Attachment B.

Relevant details of any pollution incidents, consents and HAIL activities are appended to this letter (Attachment A). Please refer to the column titled 'Property Address' on the spreadsheet to aid in identifying corresponding data on the map.

For any identified HAIL sites, please refer to the tab "HAIL activities" for more information (Column C and D include HAIL activity details where these are available).

The following site within the search area has been identified as a closed landfill and may have been subject to historical filling / importation of unverified-origin material. Please note that this information is indicative only and our database of such sites is incomplete.

A. INDICATIVE ONLY	Please contact closedlandfills@aucklandcouncil.govt.nz
OWNERSHIP:	Auckland Council
SITE ID:	220
PROPERTY DESCRIPTION ADDRESS:	Council Managed Closed Landfill
SITE NAME:	Hunua Gorge

Please note:

The HAIL activity hatching in Attachment B only reflects whether a site has been identified as a HAIL site (both verified and non-verified) by the Council and the type of HAIL associated with the site. This does not confirm whether the site has been formally investigated or the contamination status of the property (e.g. contaminated, remediated etc.). Additionally, due to limitations within Council's records, the specific HAIL activity is not included in the data for all properties. For further information on any of these known HAIL sites, a subsequent site contamination enquiry can be lodged for the specific property (up to 5 adjacent properties can be covered in one request).

While the Auckland Council has carried out the above search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

If you wish to clarify anything in this letter that relates to this site, please contact contaminatedsites@aucklandcouncil.govt.nz. Any follow up requests for information on other sites must go through the online order process.

Should you wish to request any of the files referenced above and/or listed in the attached spreadsheet for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure the files will be available).

Please note Auckland Council cost recovers officer's time for all site enquiries. As such an invoice for the time involved in this enquiry will follow shortly.

Yours Sincerely,

**Contamination, Air and Noise Team
Specialist Unit | Planning & Resource Consents
Auckland Council**

Appendix E: Chain of Custody and Laboratory Reports



ANALYSIS REQUEST

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 No: _____ Date Recv: 08-Jan-26 17:42
407 0484
 Received by: Olivia Tod

Quote No 142424
 Primary Contact Stefan Yap 259737
 Submitted By Stefan Yap 259737
 Client Name Pattle Delamore Partners Limited 59

Address PO Box 9528
 Newmarket, Auckland 1149

Phone 09 523 6900 Mobile _____

Email labresults@pdp.co.nz

Charge To Pattle Delamore Partners Limited 59

Client Reference Hunua Quarry

Additional Client Ref _____

Order No A035680019

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 _____

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 Labs Date & Time: 8/1/26
 Name: Erin Maxwell
 Tick if you require COC to be emailed back
 Signature:

Received at Hill Labs Date & Time: _____
 Name: _____
 Signature: _____

Condition Temp: 9.1
 Room Temp Chilled Frozen
 Sample & Analysis details checked
 Signature: _____

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

Requested Reporting Date: _____

ADDITIONAL INFORMATION / KNOWN HAZARDS

Quoted Sample Types

Soil (Soil)

No.	Sample Name	Sample Date/Time	Sample Type	Tests Required
1	PMS01-0.1	8/1/26	S	Hold cold
2	PMS01-0.2	↓	↓	↓
3	PMS02-0.1			
4	PMS02-0.2			
5	PMS03-0.1			
6	PMS03-0.2			
7	PMS04-0.1			
8	PMS04-0.2			
9	PMS05-0.1			

No.	Sample Name	Sample Date/Time	Sample Type	Tests Required			
10	PMS05_0.2	8/1/26	S	MOLD, COLD			
11	PMS06_0.1	↓	↓	↓			
12	PMS06_0.2						
13	PMS07_0.1						
14	PMS07_0.3						
15	PMS08_0.1						
16	PMS08_0.3						
17	PMS09_0.1						
18	PMS09_0.3						
19	PMS10_0.1						
20	PMS10_						
21	PMS11_0.1						
22	PMS11_						
23	PMS12_0.1						
24	PMS13_0.1						
25	PMS13_0.2						
26	PMS14_0.1						
27	PMS15_0.1						
28	PMS16_0.1						
29	PMS16_0.2				↓	↓	↓
30							
31							
32							
33							
34							

Location:	Sample:	Analysis:
Residential area	PMS01_0.1	HMs, PAH
	PMS01_0.2	Hold Cold
	PMS02_0.1	HMs, PAH
	PMS02_0.2	Hold Cold
Overburden	PMS03_0.1	HMs, PAH
	PMS03_0.2	Hold Cold
	PMS04_0.1	HMs, PAH
	PMS04_0.2	Hold Cold
	PMS05_0.1	HMs, PAH
	PMS05_0.2	Hold Cold
	PMS06_0.1	HMs, PAH
	PMS06_0.2	Hold Cold
	PMS07_0.1	HMs, PAH
	PMS07_0.3	Hold Cold
	PMS08_0.1	HMs, PAH+ TPH
	PMS08_0.3	Hold Cold
	PMS09_0.1	HMs, PAH+ TPH
	PMS09_0.3	Hold Cold
Graveyard	PMS10_0.1	HMs, PAH+ TPH
	PMS11_0.1	HMs, PAH+ TPH
C+R Rack	PMS12_0.1	HMs, PAH+ TPH
	PMS13_0.1	HMs, PAH+TPH
	PMS13_0.2	Hold Cold
	PMS14_0.1	HMs, PAH+TPH
	PMS15_0.1	HMs, PAH+TPH
	PMS16_0.1	HMs, PAH+TPH
	PMS16_0.2	Hold Cold

Job Information Summary

Page 1 of 2

Client:	Pattle Delamore Partners Limited	Lab No:	4070484
Contact:	Stefan Yap	Date Registered:	10-Jan-2026 1:27 pm
	C/- Pattle Delamore Partners Limited	Priority:	High
	PO Box 9528	Quote No:	142424
	Newmarket	Order No:	A035680019
	Auckland 1149	Client Reference:	Hunua Quarry
		Add. Client Ref:	
		Submitted By:	Erin Makepeace
		Charge To:	Pattle Delamore Partners Limited
		Target Date:	15-Jan-2026 4:30 pm

Samples

No	Sample Name	Sample Type	Containers	Tests Requested
1	PMS01_0.1 08-Jan-2026	Soil	GSoil300	Heavy Metals, Screen Level, Polycyclic Aromatic Hydrocarbons Screening in Soil
2	PMS01_0.2 08-Jan-2026	Soil	GSoil300	Hold Cold
3	PMS02_0.1 08-Jan-2026	Soil	GSoil300	Heavy Metals, Screen Level, Polycyclic Aromatic Hydrocarbons Screening in Soil
4	PMS02_0.2 08-Jan-2026	Soil	GSoil300	Hold Cold
5	PMS03_0.1 08-Jan-2026	Soil	GSoil300	Heavy Metals, Screen Level, Polycyclic Aromatic Hydrocarbons Screening in Soil
6	PMS03_0.2 08-Jan-2026	Soil	GSoil300	Hold Cold
7	PMS04_0.1 08-Jan-2026	Soil	GSoil300	Heavy Metals, Screen Level, Polycyclic Aromatic Hydrocarbons Screening in Soil
8	PMS04_0.2 08-Jan-2026	Soil	GSoil300	Hold Cold
9	PMS05_0.1 08-Jan-2026	Soil	GSoil300	Heavy Metals, Screen Level, Polycyclic Aromatic Hydrocarbons Screening in Soil
10	PMS05_0.2 08-Jan-2026	Soil	GSoil300	Hold Cold
11	PMS06_0.1 08-Jan-2026	Soil	GSoil300	Heavy Metals, Screen Level, Polycyclic Aromatic Hydrocarbons Screening in Soil
12	PMS06_0.2 08-Jan-2026	Soil	GSoil300	Hold Cold
13	PMS07_0.1 08-Jan-2026	Soil	GSoil300	Heavy Metals, Screen Level, Polycyclic Aromatic Hydrocarbons Screening in Soil
14	PMS07_0.3 08-Jan-2026	Soil	GSoil300	Hold Cold
15	PMS08_0.1 08-Jan-2026	Soil	GSoil300, GSoil300	Heavy Metals, Screen Level, TPH Oil Industry Profile + PAHscreen
16	PMS08_0.3 08-Jan-2026	Soil	GSoil300, GSoil300	Total Petroleum Hydrocarbons in Soil
17	PMS09_0.1 08-Jan-2026	Soil	GSoil300, GSoil300	Heavy Metals, Screen Level, TPH Oil Industry Profile + PAHscreen
18	PMS09_0.3 08-Jan-2026	Soil	GSoil300, GSoil300	Total Petroleum Hydrocarbons in Soil
19	PMS10_0.1 08-Jan-2026	Soil	GSoil300, GSoil300	TPH Oil Industry Profile + PAHscreen
20	PMS11_0.1 08-Jan-2026	Soil	GSoil300, GSoil300	Heavy Metals, Screen Level, TPH Oil Industry Profile + PAHscreen
21	PMS12_0.1 08-Jan-2026	Soil	GSoil300, GSoil300	Heavy Metals, Screen Level, TPH Oil Industry Profile + PAHscreen
22	PMS13_0.1 08-Jan-2026	Soil	GSoil300, GSoil300	Heavy Metals, Screen Level, TPH Oil Industry Profile + PAHscreen
23	PMS13_0.2 08-Jan-2026	Soil	GSoil300, GSoil300	Total Petroleum Hydrocarbons in Soil
24	PMS14_0.1 08-Jan-2026	Soil	GSoil300, GSoil300	Heavy Metals, Screen Level, TPH Oil Industry Profile + PAHscreen
25	PMS15_0.1 08-Jan-2026	Soil	GSoil300, GSoil300	Heavy Metals, Screen Level, TPH Oil Industry Profile + PAHscreen
26	PMS16_0.1 08-Jan-2026	Soil	GSoil300, GSoil300	Heavy Metals, Screen Level, TPH Oil Industry Profile + PAHscreen
27	PMS16_0.2 08-Jan-2026	Soil	GSoil300, GSoil300	Total Petroleum Hydrocarbons in Soil

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, 5, 7, 9, 11, 13, 15, 17, 19-22, 24-26
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, 5, 7, 9, 11, 13, 15, 17, 19-22, 24-26
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, 3, 5, 7, 9, 11, 13, 15-27
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, 5, 7, 9, 11, 13, 15, 17, 19-22, 24-26
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, 5, 7, 9, 11, 13, 15, 17, 19-22, 24-26
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	15, 17, 19-22, 24-26
Heavy Metals, 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, 3, 5, 7, 9, 11, 13, 15, 17, 20-22, 24-26
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, 5, 7, 9, 11, 13
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.	-	15-27
C7 - C9	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	20 mg/kg dry wt	15-27
C10 - C14	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	20 mg/kg dry wt	15-27
C15 - C36	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	40 mg/kg dry wt	15-27
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	15-27

Certificate of Analysis

Page 1 of 10

Client:	Pattle Delamore Partners Limited	Lab No:	4070484	SPV3
Contact:	Stefan Yap C/- Pattle Delamore Partners Limited PO Box 9528 Newmarket Auckland 1149	Date Received:	08-Jan-2026	
		Date Reported:	15-Jan-2026	
		Quote No:	142424	
		Order No:	A035680019	
		Client Reference:	Hunua Quarry	
		Submitted By:	Erin Makepeace	

Sample Type: Soil

Sample Name:	PMS01_0.1 08-Jan-2026	PMS02_0.1 08-Jan-2026	PMS03_0.1 08-Jan-2026	PMS04_0.1 08-Jan-2026	PMS05_0.1 08-Jan-2026	
Lab Number:	4070484.1	4070484.3	4070484.5	4070484.7	4070484.9	
Individual Tests						
Dry Matter	g/100g as rcvd	63	69	78	80	79
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	5	8	5	2	6
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	11	12	20	17	19
Total Recoverable Copper	mg/kg dry wt	8	11	12	5	20
Total Recoverable Lead	mg/kg dry wt	12.5	10.3	12.8	7.3	13.2
Total Recoverable Nickel	mg/kg dry wt	3	6	11	8	18
Total Recoverable Zinc	mg/kg dry wt	48	102	30	17	68
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.4	< 0.4	< 0.4	< 0.3	< 0.3
1-Methylnaphthalene	mg/kg dry wt	< 0.016	< 0.015	< 0.013	< 0.013	< 0.013
2-Methylnaphthalene	mg/kg dry wt	< 0.016	< 0.015	< 0.013	< 0.013	< 0.013
Acenaphthylene	mg/kg dry wt	< 0.016	< 0.015	< 0.013	< 0.013	< 0.013
Acenaphthene	mg/kg dry wt	< 0.016	< 0.015	< 0.013	< 0.013	< 0.013
Anthracene	mg/kg dry wt	< 0.016	< 0.015	< 0.013	< 0.013	< 0.013
Benzo[a]anthracene	mg/kg dry wt	< 0.016	< 0.015	< 0.013	< 0.013	< 0.013
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.016	< 0.015	< 0.013	< 0.013	< 0.013
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.038	< 0.035	< 0.031	< 0.030	< 0.030
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.038	< 0.035	< 0.031	< 0.030	< 0.030
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 0.016	< 0.015	< 0.013	< 0.013	< 0.013
Benzo[e]pyrene	mg/kg dry wt	< 0.016	< 0.015	< 0.013	< 0.013	< 0.013
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.016	< 0.015	< 0.013	< 0.013	< 0.013
Benzo[k]fluoranthene	mg/kg dry wt	< 0.016	< 0.015	< 0.013	< 0.013	< 0.013
Chrysene	mg/kg dry wt	< 0.016	< 0.015	< 0.013	< 0.013	< 0.013
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.016	< 0.015	< 0.013	< 0.013	< 0.013
Fluoranthene	mg/kg dry wt	< 0.016	< 0.015	< 0.013	< 0.013	< 0.013
Fluorene	mg/kg dry wt	< 0.016	< 0.015	< 0.013	< 0.013	< 0.013
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.016	< 0.015	< 0.013	< 0.013	< 0.013
Naphthalene	mg/kg dry wt	< 0.08	< 0.08	< 0.07	< 0.07	< 0.07
Perylene	mg/kg dry wt	< 0.016	< 0.015	0.013	< 0.013	< 0.013
Phenanthrene	mg/kg dry wt	< 0.016	< 0.015	< 0.013	< 0.013	< 0.013
Pyrene	mg/kg dry wt	< 0.016	< 0.015	< 0.013	< 0.013	< 0.013

Sample Type: Soil						
Sample Name:		PMS06_0.1 08-Jan-2026	PMS07_0.1 08-Jan-2026	PMS08_0.1 08-Jan-2026	PMS08_0.3 08-Jan-2026	PMS09_0.1 08-Jan-2026
Lab Number:		4070484.11	4070484.13	4070484.15	4070484.16	4070484.17
Individual Tests						
Dry Matter	g/100g as rcvd	60	69	91	93	94
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	5	5	4	-	5
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	-	< 0.10
Total Recoverable Chromium	mg/kg dry wt	23	19	31	-	29
Total Recoverable Copper	mg/kg dry wt	18	23	18	-	24
Total Recoverable Lead	mg/kg dry wt	12.0	18.8	13.9	-	14.0
Total Recoverable Nickel	mg/kg dry wt	22	10	17	-	15
Total Recoverable Zinc	mg/kg dry wt	56	58	118	-	107
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.4	< 0.4	4.0	-	< 0.3
1-Methylnaphthalene	mg/kg dry wt	< 0.017	< 0.015	0.21	-	< 0.011
2-Methylnaphthalene	mg/kg dry wt	< 0.017	< 0.015	< 0.2 #1	-	< 0.011
Acenaphthylene	mg/kg dry wt	< 0.017	< 0.015	< 0.11 #1	-	< 0.011
Acenaphthene	mg/kg dry wt	< 0.017	< 0.015	< 0.11 #1	-	< 0.011
Anthracene	mg/kg dry wt	< 0.017	< 0.015	< 0.11 #1	-	< 0.011
Benzo[a]anthracene	mg/kg dry wt	< 0.017	< 0.015	< 0.011	-	< 0.011
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.017	< 0.015	< 0.011	-	< 0.011
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.039	< 0.035	< 0.027	-	< 0.026
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.039	< 0.035	< 0.027	-	< 0.025
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 0.017	< 0.015	< 0.011	-	< 0.011
Benzo[e]pyrene	mg/kg dry wt	< 0.017	< 0.015	< 0.011	-	< 0.011
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.017	< 0.015	< 0.011	-	< 0.011
Benzo[k]fluoranthene	mg/kg dry wt	< 0.017	< 0.015	< 0.011	-	< 0.011
Chrysene	mg/kg dry wt	< 0.017	< 0.015	< 0.011	-	< 0.011
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.017	< 0.015	< 0.011	-	< 0.011
Fluoranthene	mg/kg dry wt	< 0.017	< 0.015	0.016	-	< 0.011
Fluorene	mg/kg dry wt	< 0.017	< 0.015	0.25	-	< 0.011
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.017	< 0.015	< 0.011	-	< 0.011
Naphthalene	mg/kg dry wt	< 0.09	< 0.08	< 0.6 #1	-	< 0.06
Perylene	mg/kg dry wt	< 0.017	< 0.015	< 0.011	-	< 0.011
Phenanthrene	mg/kg dry wt	< 0.017	< 0.015	< 0.15 #1	-	< 0.011
Pyrene	mg/kg dry wt	< 0.017	< 0.015	3.4	-	0.095
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	-	-	< 20	< 20	< 20
C10 - C14	mg/kg dry wt	-	-	1,840	840	< 20
C15 - C36	mg/kg dry wt	-	-	17,900	5,300	8,100
Total hydrocarbons (C7 - C36)	mg/kg dry wt	-	-	19,800	6,200	8,200
Sample Name:		PMS09_0.3 08-Jan-2026	PMS10_0.1 08-Jan-2026	PMS11_0.1 08-Jan-2026	PMS12_0.1 08-Jan-2026	PMS13_0.1 08-Jan-2026
Lab Number:		4070484.18	4070484.19	4070484.20	4070484.21	4070484.22
Individual Tests						
Dry Matter	g/100g as rcvd	94	96	94	88	91
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	-	-	5	4	4
Total Recoverable Cadmium	mg/kg dry wt	-	-	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	-	-	35	34	35
Total Recoverable Copper	mg/kg dry wt	-	-	22	33	21
Total Recoverable Lead	mg/kg dry wt	-	-	12.0	11.9	10.5
Total Recoverable Nickel	mg/kg dry wt	-	-	22	21	18
Total Recoverable Zinc	mg/kg dry wt	-	-	101	370	190

Sample Type: Soil

Sample Name:	PMS09_0.3 08-Jan-2026	PMS10_0.1 08-Jan-2026	PMS11_0.1 08-Jan-2026	PMS12_0.1 08-Jan-2026	PMS13_0.1 08-Jan-2026
Lab Number:	4070484.18	4070484.19	4070484.20	4070484.21	4070484.22

Polycyclic Aromatic Hydrocarbons Screening in Soil*

Total of Reported PAHs in Soil	mg/kg dry wt	-	6.9	< 0.3	0.4	1.5
1-Methylnaphthalene	mg/kg dry wt	-	< 0.011	< 0.011	< 0.011	0.139
2-Methylnaphthalene	mg/kg dry wt	-	< 0.011	< 0.011	< 0.011	0.111
Acenaphthylene	mg/kg dry wt	-	0.053	< 0.011	< 0.011	< 0.011
Acenaphthene	mg/kg dry wt	-	0.014	< 0.011	< 0.011	0.079
Anthracene	mg/kg dry wt	-	0.065	< 0.011	< 0.011	< 0.011
Benzo[a]anthracene	mg/kg dry wt	-	0.35	< 0.011	< 0.011	< 0.011
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	0.87	< 0.011	< 0.011	< 0.011
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	-	1.25	< 0.026	< 0.027	< 0.026
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	-	1.24	< 0.026	< 0.027	< 0.026
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	-	0.92	< 0.011	< 0.011	< 0.011
Benzo[e]pyrene	mg/kg dry wt	-	0.55	< 0.011	0.015	< 0.011
Benzo[g,h,i]perylene	mg/kg dry wt	-	0.76	< 0.011	< 0.011	< 0.011
Benzo[k]fluoranthene	mg/kg dry wt	-	0.30	< 0.011	< 0.011	< 0.011
Chrysene	mg/kg dry wt	-	0.32	< 0.011	< 0.011	< 0.011
Dibenzo[a,h]anthracene	mg/kg dry wt	-	0.138	< 0.011	< 0.011	< 0.011
Fluoranthene	mg/kg dry wt	-	0.60	< 0.011	< 0.011	0.012
Fluorene	mg/kg dry wt	-	< 0.011	< 0.011	< 0.011	0.45
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	0.72	< 0.011	< 0.011	< 0.011
Naphthalene	mg/kg dry wt	-	< 0.06	< 0.06	< 0.06	< 0.06
Perylene	mg/kg dry wt	-	0.26	< 0.011	< 0.011	< 0.011
Phenanthrene	mg/kg dry wt	-	0.119	< 0.011	< 0.011	0.30
Pyrene	mg/kg dry wt	-	0.81	< 0.011	0.40	0.35

Total Petroleum Hydrocarbons in Soil

C7 - C9	mg/kg dry wt	< 20	< 20	< 20	< 20	< 20
C10 - C14	mg/kg dry wt	< 20	101	< 20	98	490
C15 - C36	mg/kg dry wt	580	28,000	1,310	7,200	10,300
Total hydrocarbons (C7 - C36)	mg/kg dry wt	580	28,000	1,320	7,300	10,800

Sample Name:	PMS13_0.2 08-Jan-2026	PMS14_0.1 08-Jan-2026	PMS15_0.1 08-Jan-2026	PMS16_0.1 08-Jan-2026	PMS16_0.2 08-Jan-2026
Lab Number:	4070484.23	4070484.24	4070484.25	4070484.26	4070484.27

Individual Tests

Dry Matter	g/100g as rcvd	91	95	97	93	92
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Heavy Metals, Screen Level

Total Recoverable Arsenic	mg/kg dry wt	-	6	6	6	-
Total Recoverable Cadmium	mg/kg dry wt	-	< 0.10	< 0.10	< 0.10	-
Total Recoverable Chromium	mg/kg dry wt	-	29	33	29	-
Total Recoverable Copper	mg/kg dry wt	-	19	24	19	-
Total Recoverable Lead	mg/kg dry wt	-	14.5	16.3	12.6	-
Total Recoverable Nickel	mg/kg dry wt	-	15	22	19	-
Total Recoverable Zinc	mg/kg dry wt	-	111	140	172	-

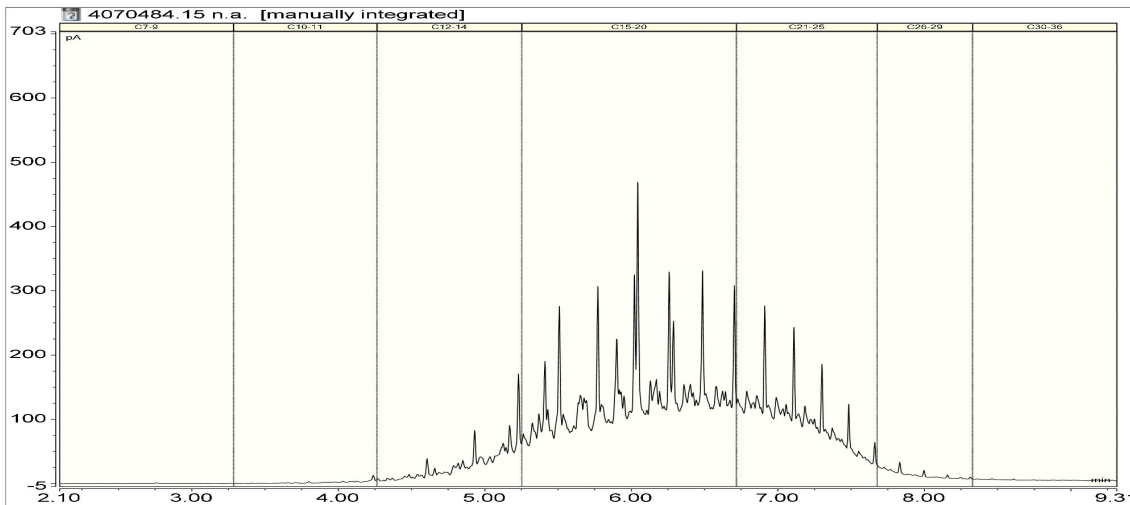
Polycyclic Aromatic Hydrocarbons Screening in Soil*

Total of Reported PAHs in Soil	mg/kg dry wt	-	< 0.3	< 0.3	< 0.3	-
1-Methylnaphthalene	mg/kg dry wt	-	< 0.011	< 0.010	< 0.011	-
2-Methylnaphthalene	mg/kg dry wt	-	< 0.011	< 0.010	< 0.011	-
Acenaphthylene	mg/kg dry wt	-	< 0.011	< 0.010	< 0.011	-
Acenaphthene	mg/kg dry wt	-	< 0.011	< 0.010	< 0.011	-
Anthracene	mg/kg dry wt	-	< 0.011	< 0.010	< 0.011	-
Benzo[a]anthracene	mg/kg dry wt	-	< 0.011	< 0.010	< 0.011	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	< 0.011	< 0.010	< 0.011	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	-	< 0.025	< 0.025	< 0.026	-

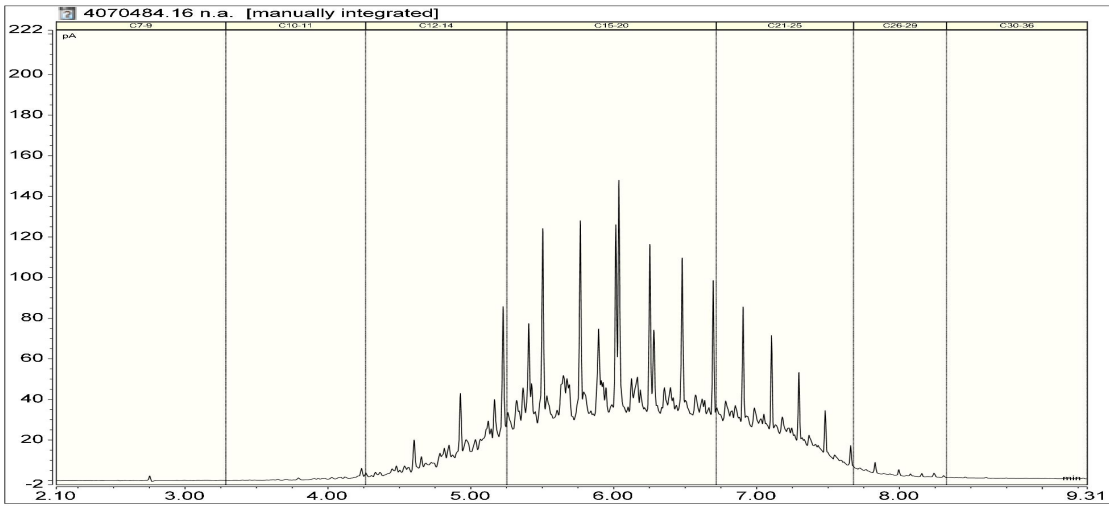
Sample Type: Soil

Sample Name:		PMS13_0.2	PMS14_0.1	PMS15_0.1	PMS16_0.1	PMS16_0.2
		08-Jan-2026	08-Jan-2026	08-Jan-2026	08-Jan-2026	08-Jan-2026
Lab Number:		4070484.23	4070484.24	4070484.25	4070484.26	4070484.27
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	-	< 0.025	< 0.025	< 0.026	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	-	< 0.011	< 0.010	< 0.011	-
Benzo[e]pyrene	mg/kg dry wt	-	< 0.011	< 0.010	< 0.011	-
Benzo[g,h,i]perylene	mg/kg dry wt	-	< 0.011	< 0.010	< 0.011	-
Benzo[k]fluoranthene	mg/kg dry wt	-	< 0.011	< 0.010	< 0.011	-
Chrysene	mg/kg dry wt	-	< 0.011	< 0.010	< 0.011	-
Dibenzo[a,h]anthracene	mg/kg dry wt	-	< 0.011	< 0.010	< 0.011	-
Fluoranthene	mg/kg dry wt	-	< 0.011	< 0.010	< 0.011	-
Fluorene	mg/kg dry wt	-	< 0.011	< 0.010	0.019	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	< 0.011	< 0.010	< 0.011	-
Naphthalene	mg/kg dry wt	-	< 0.06	< 0.05	< 0.06	-
Perylene	mg/kg dry wt	-	< 0.011	< 0.010	< 0.011	-
Phenanthrene	mg/kg dry wt	-	< 0.011	< 0.010	< 0.011	-
Pyrene	mg/kg dry wt	-	< 0.011	0.011	0.046	-
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 20	< 20	< 20	< 20	< 20
C10 - C14	mg/kg dry wt	320	49	< 20	54	< 20
C15 - C36	mg/kg dry wt	5,400	8,000	13,200	16,100	3,900
Total hydrocarbons (C7 - C36)	mg/kg dry wt	5,700	8,100	13,200	16,200	3,900

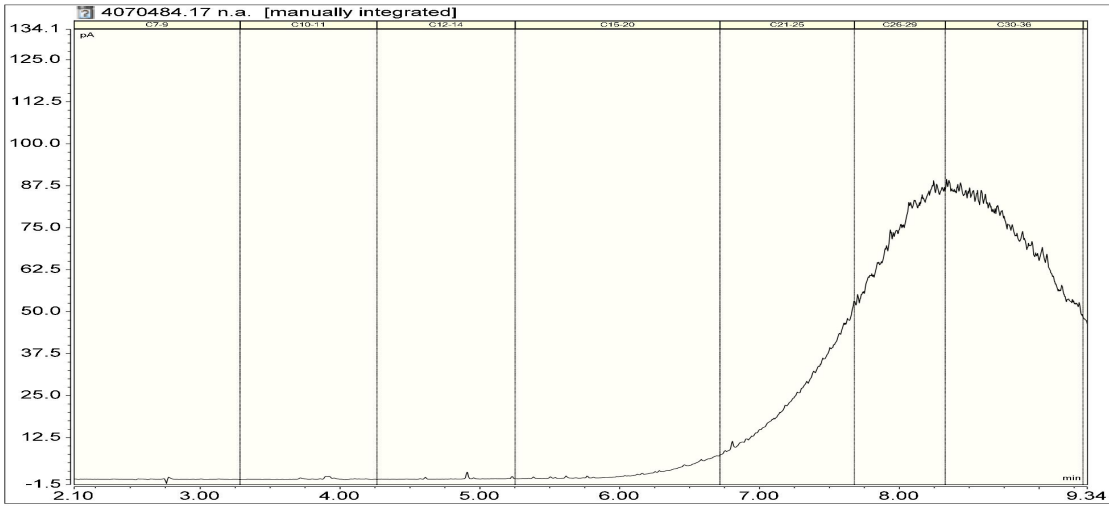
4070484.15
PMS08_0.1 08-Jan-2026
Client Chromatogram for TPH by FID



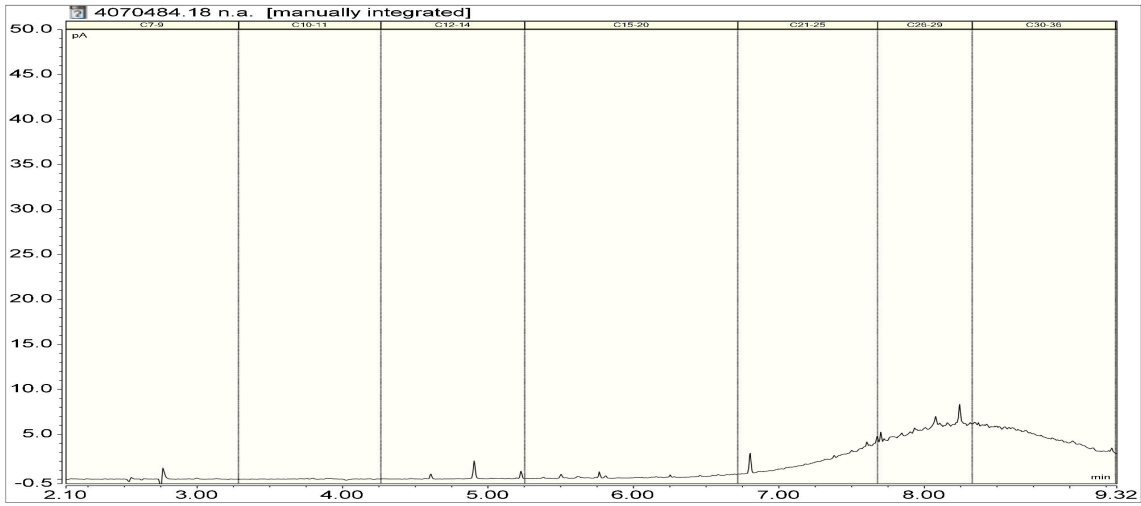
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Client Chromatogram for TPH by FID



4070484.17
PMS09_0.1 08-Jan-2026
Client Chromatogram for TPH by FID



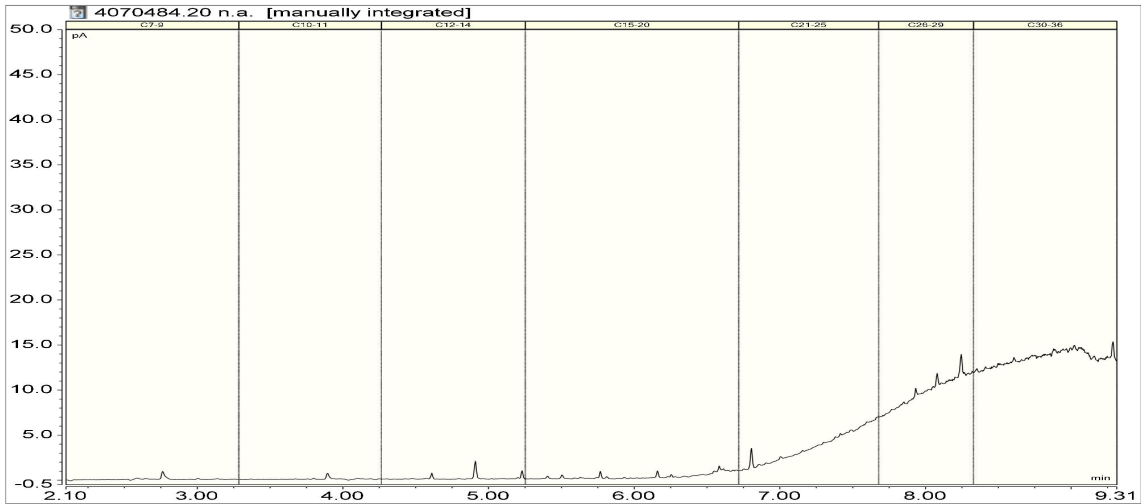
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PMS09_0.3 08-Jan-2026
Client Chromatogram for TPH by FID



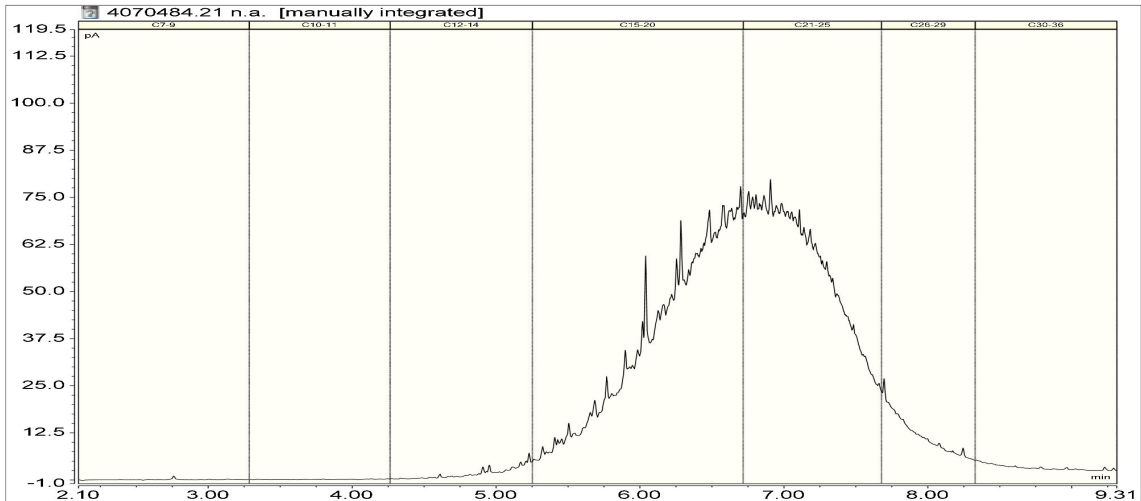
4070484.19
PMS10_0.1 08-Jan-2026
Client Chromatogram for TPH by FID



4070484.20
PMS11_0.1 08-Jan-2026
Client Chromatogram for TPH by FID



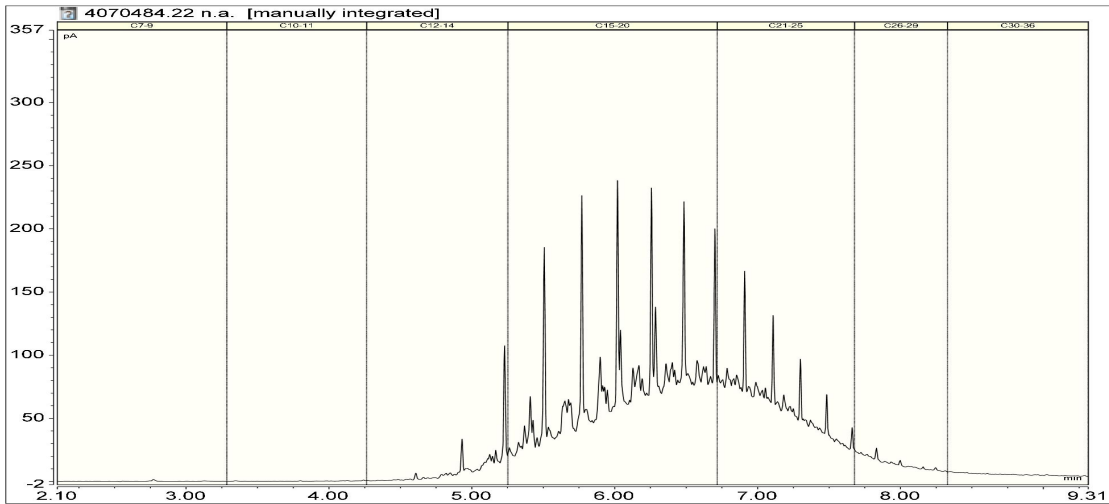
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PMS12_0.1 08-Jan-2026
Client Chromatogram for TPH by FID



4070484.22

PMS13_0.1 08-Jan-2026

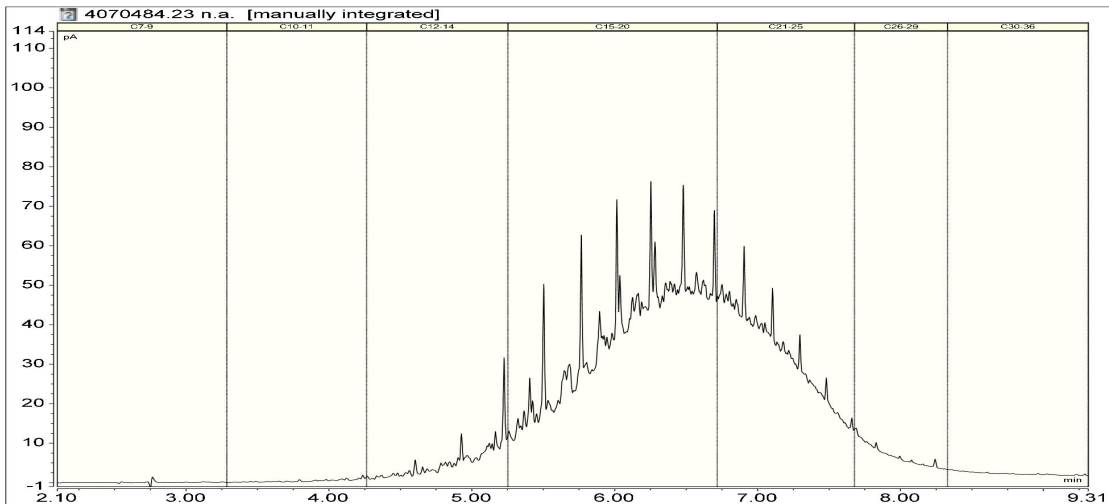
Client Chromatogram for TPH by FID



4070484.23

PMS13_0.2 08-Jan-2026

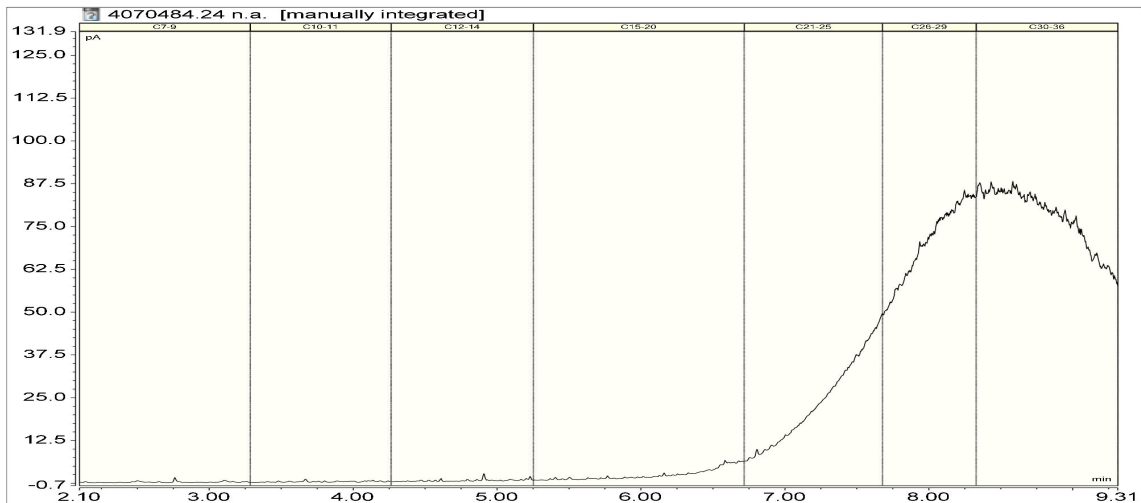
Client Chromatogram for TPH by FID



4070484.24

PMS14_0.1 08-Jan-2026

Client Chromatogram for TPH by FID



4070484.25

PMS15_0.1 08-Jan-2026

Client Chromatogram for TPH by FID



4070484.26

PMS16_0.1 08-Jan-2026

Client Chromatogram for TPH by FID



4070484.27

PMS16_0.2 08-Jan-2026

Client Chromatogram for TPH by FID



Analyst's Comments

#1 Due to some interference found in the chromatography, the sample was diluted and re-analysed. Hence the higher detection limit reported.

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, 5, 7, 9, 11, 13, 15, 17, 19-22, 24-26
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, 5, 7, 9, 11, 13, 15, 17, 19-22, 24-26
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, 3, 5, 7, 9, 11, 13, 15-27
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, 5, 7, 9, 11, 13, 15, 17, 19-22, 24-26
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, 5, 7, 9, 11, 13, 15, 17, 19-22, 24-26
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	15, 17, 19-22, 24-26
Heavy Metals, 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, 3, 5, 7, 9, 11, 13, 15, 17, 20-22, 24-26
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, 5, 7, 9, 11, 13
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.	-	15-27
C7 - C9	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	20 mg/kg dry wt	15-27
C10 - C14	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	20 mg/kg dry wt	15-27
C15 - C36	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	40 mg/kg dry wt	15-27
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	15-27

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

Testing was completed between 12-Jan-2026 and 15-Jan-2026. 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.

A handwritten signature in blue ink, appearing to read 'Graham Corban', is positioned above the printed name.

Graham Corban MSc Tech (Hons)
Client Services Manager - Environmental