

ENVIRONMENTAL REPORT

Preliminary Site Investigation, 1220
Devon Road, Bell Block, New
Plymouth

For New Plymouth Pistol Club
(NPPC)



Rev A - 16/08/2024

BTWCOMPANY
SURVEYING | ENGINEERING | PLANNING & ENVIRONMENT



Preliminary Site Investigation, 1220 Devon Road, Bell Block, New Plymouth

for New Plymouth Pistol Club
(NPPC)



Certifying Statement:

This Preliminary Site Investigation (PSI) meets the requirements of the Resource Management (National Environmental Standard for assessing and managing contaminants in soil to protect human health) Regulations 2011 because it has been undertaken by a suitably qualified and experienced practitioner, reported on in accordance with the current edition of Contaminated land management guidelines No 1 – Reporting on contaminated sites in New Zealand, and the report has been certified by a suitably qualified and experienced practitioner. At the time of reporting, BTW Company Limited (BTW) believes the information contained within this report to be true and correct.

Evidence of the qualifications and experience of the suitably qualified and experienced practitioner(s) who have undertaken this investigation and have certified this report can be found on page iii of this report.

Reviewed

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16/08/2024

Date

Reviewed by

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16/08/2024

Date

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DOCUMENT REVISION HISTORY

Table 1: Document revision history.

Document Status and Revision Number	Date Issued	Author(s)	Reviewer(s)	Revision Change Information
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SUMMARY

BTW Company (BTW) was engaged by the New Plymouth Pistol Club (NPPC) (the client) to undertake a Preliminary Site Investigation (PSI) for their site at 1220 Devon Road, Bell Block, New Plymouth (the investigation area for this PSI), located within a parcel of land legally described as Lot 1 DP 19854. NPPC have requested this PSI be prepared to accompany the resource consent application for the planned acoustic mitigation works that will involve associated soil disturbance as part of the project.

The broad objective of this PSI was to establish whether it is more likely than not an activity described in the Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL)¹ is being, or has been, undertaken on the site based on current and/or historical land use and assess the likely risk of any identified HAIL on human health from the proposed acoustic mitigation project. If a HAIL activity is identified, the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health 2011 (NESCS)² regulations would apply as trigger activities are proposed in the form of soil disturbance. This objective was achieved by completing a desktop assessment, site visits and preliminary soil sampling.

A summary of the findings and conclusions from the PSI is as follows:

- The investigation area is currently, and was historically, used for commercial / industrial activities which can be seen in historic aerial imagery and is well documented in information provided by NPPC. The investigation area currently operates as a shooting range / gun club (NPPC).
- The desktop investigation identified two categories of HAIL (gun club and machine gun range) within the investigation area.
- The primary contaminants of concern associated with the identified HAIL activities are considered to be heavy metals and PAHs.
- From the above findings, we have identified the investigation area to be a 'Piece of Land' where any soil disturbance within this area would be subject to the NESCS regulations.
- Preliminary soil sampling produced results that were above the applicable Soil Contaminant Standard (SCS) for a commercial / industrial land use for lead, with results exceeding the SCS by 9-1112%. One result for arsenic also exceeded the applicable SCS and results for antimony exceeded the applied NNIPHE³ Environmental Risk Limit for antimony in soil.
- All remaining heavy metal results, and also PAH results, were below the applicable SCS.
- All results for arsenic, copper, lead and zinc, plus one result for cadmium and one result for chromium, were elevated above either the Landcare Research predicted background concentrations or the Taranaki region background levels. Lead, in particular, was significantly elevated above expected background concentrations.
- Results for antimony, arsenic, copper, lead and zinc consistently exceeded the MfE Class A Landfill Screening Criteria.

¹ The Hazardous Activities and Industries List (HAIL) is a compilation of activities and industries considered likely to cause land contamination from the use, storage or disposal of hazardous substances.

² The NESCS is nationwide legislation that was created to ensure that land development does not create an exposure pathway (e.g., inhaling contaminated soils during earthworks, or eating vegetables grown in them) which may affect human health.

³ Netherlands National Institute for Public Health and the Environment provide guideline values to protect human health from antimony contamination.

- The Conceptual Site Model (CSM) for the investigation area identified a complete exposure pathway linkage from the available information and soil sampling data. Therefore, the site soil presents an unacceptable risk to human health for the proposed acoustic mitigation project.
- Whilst no soil disposal is currently planned for the acoustic mitigation works, it should be noted that the soil cannot be classified as 'cleanfill', due to the heavy metal concentrations exceeding background concentrations, therefore any soil that may be disposed of offsite must go to an approved facility licensed to accept this type of material.
- From the current information and soil sampling data this PSI cannot conclude it would be highly unlikely there would be a risk to human health if the planned acoustic mitigation works are to be undertaken within the 'Piece of Land' identified.
- The activity status under the NESCS regulations is yet to be determined as this will depend on soil disturbance volumes and other factors.

Primary Report Author Statement

Emma Brown holds a Bachelor of Science (Marine Biology) and a Master of Marine Conservation from Victoria University of Wellington (2014 and 2016). Emma has also completed the BOHS IP404 Air Monitoring, Clearance and Reoccupation following the Removal of Asbestos, BOHS IP402 Surveying and Sampling Strategies for Asbestos in Buildings, and NZOHS W501 Measurement of Hazardous Substances. Emma has four years of experience in occupational exposure monitoring, asbestos monitoring and clearances, and more recently in contaminated land investigation, sampling and reporting. Emma is an Environmental Advisor at BTW Company and has worked across a wide range of contaminated land projects.

Report Reviewer Statement

Dave Bolger holds a Bachelor of Science (Physical Geography and Environmental Science) from Massey University (1996). Dave is a Certified Environmental Practitioner (CEnvP) EIANZ Certification No.870. Dave has also completed the BOHS IP404 Air Monitoring, Clearance and Reoccupation following the Removal of Asbestos. Dave has over 20 years of environmental experience throughout New Zealand and manages the Environment Team for BTW Company. Dave's area of expertise is in contaminated land investigations and site remediation. Dave has presented evidence in the Environment Court for hydrocarbon remediation. Dave has been involved with over 100 contaminated land projects throughout New Zealand and has an extensive knowledge of the regulatory framework for Resource Management.

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1 INTRODUCTION

1.1 Background

BTW Company (BTW) has been commissioned by the New Plymouth Pistol Club (NPPC) (the client) to undertake a Preliminary Site Investigation (PSI) for their site located at 1220 Devon Road, Bell Block, New Plymouth (here on referred to as the investigation area) located within a parcel of land legally described as Lot 1 DP 19854 (the site). NPPC have requested this report due to planned acoustic mitigation works that will involve associated soil disturbance. The planned works will include modification of the current soil filled tyre bunds, construction of new acoustic fencing, the construction of a new building, and modification of bund formation (see concept plan in Appendix A).



Figure 1.1: Location of investigation area within the overall site. Aerial image from ArcGIS Pro. Plotted by BTW.

1.2 Purpose, Objectives and Scope

The broad objective of this PSI was to establish whether it is more likely than not an activity described in the Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL)⁴ is being, or more likely than not has been, undertaken on the investigation area based on current and / or historical land use. If a HAIL activity is identified, the National Environmental Standard for Assessing

⁴ The Hazardous Activities and Industries List (HAIL) is a compilation of activities and industries considered likely to cause land contamination from the use, storage or disposal of hazardous substances.

and Managing Contaminants in Soil to Protect Human Health 2011 (NESCS)⁵ regulations would apply as trigger activities are proposed in the form of soil disturbance.

This objective was achieved by completing a desktop assessment of available information, site visits and preliminary soil sampling as detailed in the scope below. Following, the location and significance of potential contaminant sources, potential exposure pathways have been evaluated to determine the likelihood that any HAIL activities may present a risk to human health should the acoustic mitigation works occur.

This investigation was undertaken in general accordance with the current edition of the MfE Contaminated Land Management Guidelines (CLMG): No.1⁶, No.2⁷ and No.5⁸

1.2.1 *Scope of Work*

The scope of work undertaken by this PSI included;

- Review of New Plymouth District Council (NPDC) records.
- Review of Taranaki Regional Council (TRC) records.
- Review of aerial imagery from Retrolens (1949-1982), NPDC (1942-2022) and Google Earth Pro (2001-2023)
- Review of online GIS web-viewer applications to gather contour (BTW, 2023), geology (GNS, 2023) and lithology (LRIS, 2023), and hydrology (TRC, 2024) information for the site.
- Site visit and inspection by suitably qualified contaminated land specialist with specific regards to current site condition and activities where they relate to potential for soil contamination.
- Undertake preliminary soil sampling to assist with the risk assessment.
- Develop a conceptual site model (CSM) and complete a risk assessment.
- Provide a conclusion regarding the likely risk to human health from soil contamination.
- Provide recommendations as to whether any further soil contamination investigation or reporting is required for the site (e.g., A Detailed Site Investigation (DSI) and/or a Site Management Plan), including the applicability of the NESCS regulations.

⁵ The NESCS is nationwide legislation that was created to ensure that land development does not create an exposure pathway (e.g. inhaling contaminated soils during earthworks, or eating vegetables grown in them) which may affect human health

⁶ Ministry for the Environment. 2021 (MfE, 2021). Contaminated land management guidelines No 1: Reporting on contaminated sites in New Zealand (Revised 2021). Wellington: Ministry for the Environment.

⁷ Ministry for the Environment. 2011 (MfE, 2011). Contaminated land management guidelines No 2: Hierarchy and Application in New Zealand of Environmental Guideline Values (Revised 2011). Wellington: Ministry for the Environment.

⁸ Ministry for the Environment. 2021 (MfE, 2021). Contaminated land management guidelines No 5: Site Investigation and analysis of soils (Revised 2021). Wellington: Ministry for the Environment.

2 SITE IDENTIFICATION

The investigation area is located at 1220 Devon Road, Bell Block, New Plymouth, located within a parcel of land legally described as Lot 1 DP 19854 that has a total legal parcel area of 4,663,344 m². From aerial imagery, the total area of the investigation area is estimated to be 16,420 m². A lease agreement (license to occupy) for NPPC, stipulates an area of 'more or less 1.6288 ha of land' (equivalent to 16,288 m²).

The investigation area is accessed via the main highway, Devon Road State Highway 3, and has a gravelled drive and parked area in front of the main club building. The investigation area has been cut down significantly from the original contours, forming the present-day shooting ranges. The site is bordered by trees, shrubbery and other vegetation, and steep bunding/hillside on the eastern and southern boundaries. The site consists of eight different ranges of varying sizes, used for different shooting activities, plus several different structures or shelters used for the gun club activities. Large bunds, constructed of soil filled tyres, of varying heights separate the ranges. A storage shed, housing timber and other site maintenance items, is located directly south of the main club room building.

See Table 2.1 for further details and Figure 1.1 for aerial imagery of the site.

Table 2.1: Site identification

Item	Site Description
Location	Legal Parcel: 228 De Havilland Drive, Bell Block, New Plymouth Investigation Area (NPPC): 1220 Devon Road, Bell Block, New Plymouth
Legal Description	LOT 1 DP 19854
Certificate of Title	916091, 945222
Current Owners	New Plymouth District Council, Te Atiawa Iwi Holdings Limited Partnership
Size of Site	4,663,344 m ²
Approximate Area of the Investigation Area (NPPC)	16,420 m ²
Territorial Authority	New Plymouth District Council (NPDC)
Regional Authority	Taranaki Regional Council (TRC)
Iwi	Te Atiawa

3 SITE ENVIRONMENTAL CONTEXT

3.1 Site Geology and Soils

The site is described as follows:

- The Landcare Research Limited (LRIS) Portal⁹ describes the underlying geology of the site as clastic sediment. The predicted background concentrations of heavy metals in soils are detailed in Figure 3.1.
- The GNS Geological Map of New Zealand classifies the underlying geology of the site as Late Pleistocene lahar deposits, described as: *“Multiple beds of indurated to poorly consolidated andesitic conglomerate and sand”*.
- From information from NPPC (4.4), the site is reported to be prone to flooding with ponding often occurring in areas of the site. Soil is often used to soak up ponding on ranges.
- Descriptions and photos of the observed site soils can be found in either Section 6.3, or Appendix F and Appendix G.

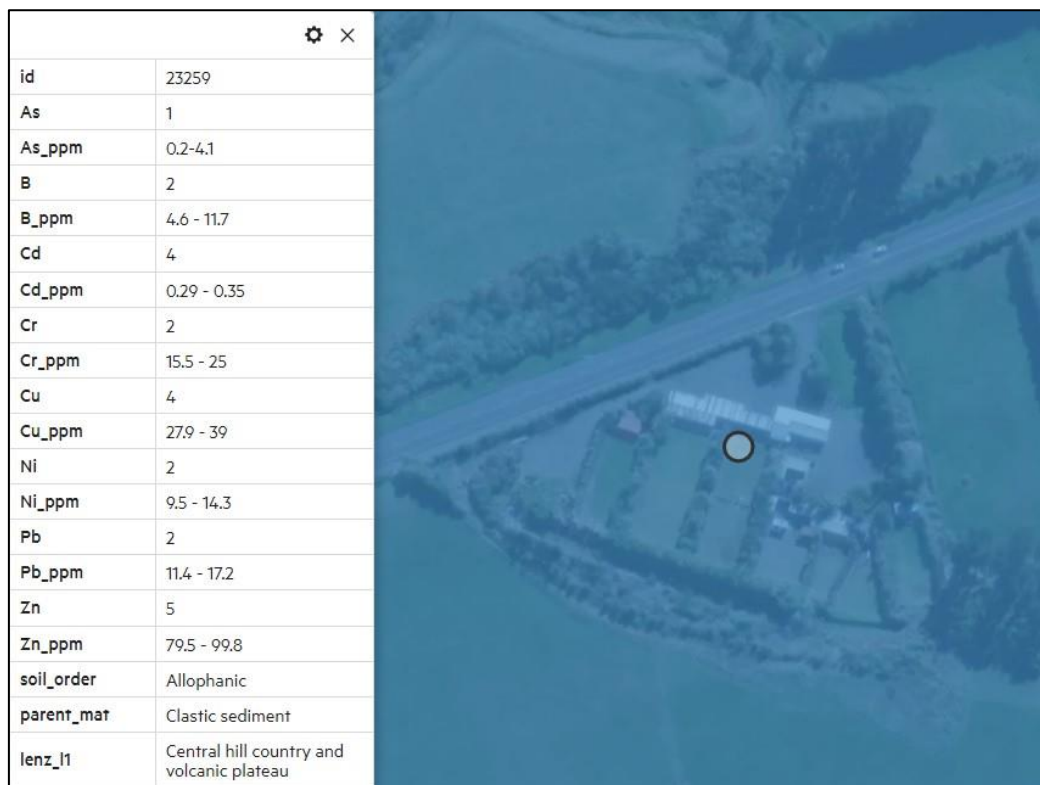


Figure 3.1: Landcare Research Limited (LRIS) Portal predicted background heavy metal soil concentrations and map viewer (2023).

3.2 Topography

NPDC contours show the investigation area itself is predominantly flat, in general sloping toward the eastern boundary of the site where an unnamed tributary of the Mangaoraka Stream flows. Steep bunds separate each of the shooting ranges (heights can be seen in Appendix A). There is a sharp

⁹ <https://iris.scinfo.org.nz/layer/114281-pbc-predicted-background-soil-concentrations-new-zealand-h3-resolution-9/>

gradient increase up into the long range at the southern end of the investigation area, and another sharp gradient increase along the southern boundary of the investigation area up into the surrounding farmland. The surrounding contours to the south and east of the site, grade down into the site and / or into the tributary flowing along the eastern boundary of the investigation area. The site topography and surrounding area is illustrated in Figure 3.2 below.



Figure 3.2: Topographic contours. Source: NPDC.

3.3 Hydrology

The investigation area is located in the Waionga catchment as per the TRC Rivers and Catchments LocalMaps portal¹⁰. Running along the eastern boundary of the investigation area is an unnamed tributary of the Mangaoraka Stream. The tributary flows north, down from the farmland of the overall site, past the investigation area along the eastern boundary, where it joins with the Mangaoraka stream approximately 270m north of the investigation area.

There are no TRC groundwater monitoring bores in the vicinity of the investigation area, with the nearest bore being approximately 760m north-west of the site. However, the current site condition (i.e., cut down significantly from the original ground level), information from NPPC (section 4.4) regarding flooding and ponding of water on the site, and the close proximity of the tributary to the investigation area, all suggests that the groundwater level may be very shallow.

From the information provided by TRC (section 4.2) it is understood that the investigation area has a discharge point (stormwater/runoff) into the tributary.

¹⁰ <https://maps.trc.govt.nz/LocalMapsViewer/?map=1687ecc97acb45ebafee36fa5deace0e>

3.4 Notable Features

From a cultural perspective, the site is within the rohe of Te Atiawa Iwi and Puketapu Hapū (mana whenua). From the NPDC Proposed District Plan – Appeals Version, there are no recorded Waahi Taonga / Sites of Significance to Māori or Archaeological Sites located on the investigation area, however there are two Sites of Significance to Māori in close proximity to the site, one to the east, adjacent to the tributary, and one to the west of the investigation area.

From the NPDC District Plan, it can also be seen that a Firstgas gas transmission pipeline runs through the wider site, to the south of the investigation area.

The TRC LocalMaps portal was reviewed and found no HAIL sites within the proximity of the investigation area. The nearest HAIL sites are a historical quarry approximately 400 m north-east of the site and varied industrial activity HAIL activities along De Havilland Drive, approximately 700m south-west of the site.

No other notable features were identified within the vicinity of the site.

4 HISTORICAL SITE INFORMATION

4.1 Aerial Imagery Analysis

Historical aerial imagery sourced from Retrolens (1949-1982), NPDC (1942-2022) and Google Earth Pro (2001-2023) was reviewed (Appendix B). Aerial imagery commentary is provided in Table 4.1 below. The Key points from the review of historical aerial imagery is as follows:

- The site currently, and has historically, operated as a gun club.
- A machine gun range can be seen present on the site from 1949 aerial imagery until further development seen in 1993 aerial imagery.
- Earthwork activity associated with range formation can be seen occurring on the site in 1983 aerial imagery.
- The first shooting ranges and buildings/structures can be seen present on the site in 1993 aerial imagery. Stream modification to the unnamed tributary, east of the investigation area, can be seen also.
- Further development to the site, including the formation of further shooting ranges and additional structures can be seen in 2005, 2007 and 2010 aerial imagery.

Table 4.1: Historical aerial imagery timeline

Year	Source	Description
1949	Retrolens	Imagery too zoomed out / not detailed enough to accurately conclude the investigation area activities. Assumed military use. Surround land use appears pastoral farmland.
1953	Retrolens	Evidence of machine gun shooting range, discussed in section 4.4, seen. Site is well vegetated. The present-day tributary can be seen meandering north toward the site, and looks to also be wetland. Surrounding land use remains pastoral farmland
1958	Retrolens	No discernible changes
1963	Retrolens	Machine gun range can clearly be seen. No discernible changes
1969	Retrolens	No discernible changes.
1970	Retrolens	No discernible changes other some possible clearing of vegetation.
1982	Retrolens	No discernible changes to the investigation area. A dwelling is now present east of the investigation area. The surrounding land use continues to be predominantly pastoral farmland with some commercial / industrial looking activities to the southwest and east.
1983	NPDC	Major earthworks can be seen occurring at the investigation area, along with a new access track. The machine gun range is still present. The surrounding land use remains the same.
1993	NPDC	The investigation area has undergone significant development, with several buildings now present in the central area of the site and 6-7 ranges clearly visible. The southern and eastern boundaries appear well vegetated. The unnamed tributary to the east of the investigation area appears to have been modified.
2001	NPDC	Imagery blurry, possible earthworks along southern boundary, removing old machine gun buttress.
2005	NPDC	The investigation area has undergone further development. The present-day club room has been added/is in the process of being added, and multiple other small structures have been added around ranges 1-4. A likely gravelled carpark is present in front of the club room buildings. The investigation area is well vegetated along eastern, western and southern boundaries.
2007	NPDC	Club room building complete, some vegetation clearance on western border. Further development to parking / turnaround areas.

Year	Source	Description
2010	NPDC	Addition of the present-day storage shed and several other smaller structures. Significant vegetation clearance on the western border of the investigation area.
2011	Google Earth	Further development on western side of the investigation area (vegetation clearance etc).
2012	NPDC	Further development on western side of the investigation area (vegetation clearance etc).
2013	NPDC	No discernible changes
2015	Google Earth	Western side of investigation area has been cleared, tidied and by the looks, had gravel laid. Eight ranges are visible.
2017	Google Earth	No discernible changes
2018	Google Earth	No discernible changes
2019	Google Earth	No discernible changes
2020	Google Earth	No discernible changes
2021	Google Earth	No discernible changes
2022	NPDC	No discernible changes
2023	Google Earth	No discernible changes



Figure 4.1: 1963 ariel imagery of the investigation area showing the presence of the historical machine gun range. Source: Retrolens, georeferenced by BTW in ArcGIS Pro.

4.2 Taranaki Regional Council Records

An information request was made to the TRC on 25th July 2024, to obtain relevant information available for the investigation area. TRC confirmed¹¹ that minimal information was held on the investigation area and overall site, but that the site would be added to the TRC Register of Selected Land Uses (RSLU) when the new database was up and running.

The only documentation provided was an incident report related to a complaint received by NPDC, questioning the quality of groundwater beneath NPPC. Sampling results of water from a discharge pipe associated with the investigation area found normal background levels of metals and water quality (Appendix C). Further information was provided by TRC on 6th August 2024, regarding sediment and surface water samples taken from upstream and downstream of the discharge point, concluding that there does not appear to be significant amounts of lead or other heavy metals discharging from the site to the tributary of the Mangaoraka Stream.

4.3 New Plymouth District Council Records

An information request was made to NPDC on 24th July 2024, to obtain relevant information available for the site. Limited relevant information was available for the site, primarily related to building consents. The information is summarised below:

- The plans for the construction of a toilet block were approved in 1990.
- Plans for a haybarn were approved in 1990
- Plans for outdoor range buildings were approved in 1984
- Plans for the current club room building were approved in 2005

It can be concluded from the age of the buildings, the materials listed in the documents, and observations from the site visit by BTW that the use of asbestos containing products, and lead based paints, is unlikely.

4.4 Client Information

A summary of relevant information about the site provided by NPPC is as follows:

- The investigation area was originally occupied by the Taranaki Militia in the 1870s.
- The investigation area was utilised by the military prior to use by NPPC, used as a machine gun range (now range 5). The old airport was located south of the investigation area, on the now farmland area of the overall site.
- The first New Plymouth pistol club was formed in 1964 and NPPC was incorporated in 1983, with earthworks beginning in 1983/84 to begin development of the investigation area, forming the present-day ranges 5 and 6.
- The club has had several fire events, one in the 80's and one in the 90's.
- Plans were developed in 1991 to further develop the site into a total of 12 ranges. The plans were then downsized to eight outdoor ranges and one indoor range.
- The club is prone to flooding and ponding events. NPPC stated that they use soil to remedy the ponding of water on the ranges. At the time of BTW's site visit, a stockpile of soil, sourced from Whitaker Civil Engineering, was on site and being used for this purpose on range 6.

¹¹ Email received 25/07/2024 from Callum MacKenzie – Scientist – Land and Water TRC

- The club currently uses sandbags, nets and other items to collect lead from shooting activities. A modified concrete mixer is used to extract the visible lead from the soil. The soil is then reused back on areas of the site. Volunteers wear masks when undertaking the lead recycling activities, and the club has a special purpose soap for washing hands etc after.



Figure 4.2: The machine gun range in 1983. Source: NPPC



Figure 4.3: Site earthworks in 1984. Source: NPPC

5 HAIL ACTIVITY JUSTIFICATION AND PIECE OF LAND SUMMARY

The HAIL is referenced in the NESCS and therefore has regulatory significance. Fundamentally, it is a compilation of activities and industries that are considered more likely to cause land contamination resulting from hazardous substance use, storage or disposal based on empirical evidence¹². The HAIL has been utilised during this investigation to identify any “Pieces of Land” within the investigation area that have the potential for soil contamination to be present.

Presented below is a breakdown of the HAIL activities conclusively evidenced by this investigation to have been undertaken within the proposed development area of the site (either currently or historically) or are ‘more likely than not’ to have been undertaken on the site.

5.1 HAIL C2: Gun Clubs or Rifle Ranges

Gun clubs are listed in the HAIL as C2: Gun clubs or rifle ranges, including clay target clubs that use lead munitions outdoors, and described as: *“Outdoor shooting ranges include gun clubs or rifle and clay target ranges. Small arms (rifles, handguns and shotguns) discharge ammunition that contains a variety of metallic components. Most metallic ammunition consists of components made of copper, brass (an alloy of copper and zinc) and lead and lead alloys. Contamination from ammunition is caused by lead shot, lead-containing bullets and projectile fragments (shrapnel) fired by small arms (handguns, shotguns and rifles). As a result, places where small arms are repeatedly used are likely to have greatly elevated concentrations of metals present in soil. Additionally, at clay target shooting ranges, polycyclic aromatic hydrocarbons (PAHs), specifically high-molecular-weight persistent PAHs, occur as a result of clay target fragments containing coal tar or petroleum pitch.”* (MfE, 2023).

The investigation area currently operates as a gun club and the presence of a gun club type activity within the investigation area is well documented (as discussed throughout section 4) and can be seen in aerial imagery from 1993 onwards (Section 4.1, Appendix B). The overall investigation area is therefore regarded as a ‘Piece of Land’.

As mentioned above, the primary contaminants of concern from this HAIL activity are heavy metals used within the ammunition, specifically lead, antimony, copper, nickel and zinc. PAHs are also considered a contaminant of concern. Heavy metals accumulate in soils over time and may be taken up by plants, leached to groundwater, or in specific conditions they may be bound in soils. These metals can persist long-term in soils and although trace quantities of certain heavy metals are essential to animal and plant growth, they are of considerable environmental concern due to their ability to bioaccumulate in living organisms. Heavy metal enrichment may pose risks to human health and the ecosystem through direct dermal contact, ingestion / inhalation of contaminated soil / dust and can be bioaccumulated through the food chain (soil-plant-human or soil-animal-human).

5.2 HAIL C3: Training Areas for Detonation of Explosive Ammunition

Training areas for detonation of explosive ammunition are listed in the HAIL as C3: Training areas set aside exclusively or primarily for the detonation of explosive ammunition, and are described as: *“The New Zealand Defence Force requires areas for training in the use of equipment such as aircraft and vehicle mounted cannons, missiles and bombs. Munitions and ordnance include bombs, rockets, missiles and artillery shells, with explosive payloads ranging in weight from less than 1 kilogram to several hundred kilogrammes. Explosives relates to any substance that can be made to explode, especially any substance used in bombs or shells. As such, the category is considered to encompass ammunition, which is the material fired, scattered, dropped or detonated from any weapon, including*

¹² MfE (2022). Hazardous Activities and Industries List (HAIL).

the means of igniting or exploding such material, such as primers, fuses and gunpowder. This activity encompasses the detonation of explosives by operation (ie, activating explosives in the manner they were designed to function) and the destruction of explosives via detonation (ie, the use of explosives to cause the destruction of other explosive ordnance). The detonation of explosives may involve the destruction of targets and, therefore, the contamination potential of the activity is affected by the composition of any targets, for example, vehicles or buildings.” (MfE, 2023).

The presence of a machine gun range within the investigation area is well documented (as discussed throughout section 4) and can be seen in aerial imagery from 1949-1983 (Section 4.1, Appendix B). The area in Figure 5.1 is therefore regarded as a ‘Piece of Land’, included in the overall ‘Piece of Land identified in the previous section.

The primary contaminants of concern from this HAIL activity are heavy metals, as discussed in the previous section.



Figure 5.1: ‘Piece of Land’ (POL) associated with the historic machine gun range. Source: BTW plotted

6 SITE VISIT AND SOIL SAMPLING

6.1 Soil Sampling Rationale and Methodology

A preliminary CSM was developed from the desktop assessment and potential activities that could cause soil contamination from agricultural farming and horticulture. Developing the CSM involved evaluating the source-pathway-linkage probability which in turn was used to inform whether soil sampling was required. The preliminary CSM indicated that heavy metals (primarily antimony, copper, lead, nickel and zinc) and polycyclic aromatic hydrocarbons (PAHs) were the most likely contaminants of concern at the site. Preliminary soil sampling was completed to provide supplementary evidence to assist in the assessment of human health risk from potential soil contamination and inform the activity status under the NESCS regulations. The CSM is presented (in a revised format following analysis of quantitative soil data) in Section 8.1.

Soil sample locations were judgementally selected and were chosen to provide coverage across areas of the investigation area that are included in the acoustic mitigation works concept plan (i.e., areas of possible soil disturbance) and to provide a spread of information across the investigation area. While not a detailed site investigation (DSI), the sample collection was undertaken in general accordance with MfE Contaminated Land Management Guidelines No 5: Site investigation and analysis of soils (Revised 2021).

A total of eight sampling locations were selected across the investigation area. A total of ten samples were collected across the sampling locations with a surface (0 -100 mm below ground level [bgl]) sample taken from all sampling locations, and subsurface (ranging between 300mm and 400mm bgl) samples taken from 20% of the sampling locations. The 0 -100 mm depth was to provide data for the dermal, soil ingestion and dust inhalation pathway, while the 300mm/400mm depth was to provide further understanding of the potential depth of any contamination and likely further risk to receptors and any soil management required. Surface samples were either taken from the soils directly adjacent to the bunds (true soil horizon) or from the soils within the tyres (mixed fill) to provide further of information on possible soil contamination as it is understood that some of the bunds may be cleared to ground level as part of the acoustic mitigation works.

Table 6.1 below outlines the analytes sampling allocation. Refer to Appendix D for a soil sampling location map.

Table 6.1: Analyte sampling allocation

Sample ID	Heavy Metals	PAH	pH
SS01_0-0.1	X		X
SS02_0-0.1	X		X
SS03_0-0.1	X		X
SS04_0-0.1	X	X	X
SS05_0-0.1	X		X
SS06_0-0.1	X		X
SS06_0.3	X		X
SS07_0-0.1	X	X	X
SS07_0.4	X		X
SS08_0-0.1	X		X

6.2 Field and Laboratory Quality Assurance and Quality Control

Soil samples were collected on 22nd July 2024 in clean laboratory supplied (Eurofins Laboratories; IANZ accredited laboratory) containers. Soil sampling equipment was decontaminated prior to work and between each sample as per BTW internal procedures. Samples were individually labelled, stored, and transported in a chilled bins and sent to Eurofins Laboratories as soon as practicable. Chain of Custody forms are available in Appendix E.

One lab duplicate¹³ sample was collected during the site sampling and analysed for lead. The relative percentage difference (RPD) is provided in Table 6.2.

Table 6.2: Relative percentage difference

Analyte	Primary Result (SS03_0-0.1) mg/kg	Duplicate Result (SS03A) mg/kg	Relative Percentage Difference (RPD)%
Lead	4,200	4,200	0

The Australian Standard for soil (AS4482.1-2005), gives an acceptance criteria RPD of 30-50 %. In reference to this standard, the results of the RPD analysis indicate the duplicate was acceptable and the sample collection was accurate.

6.3 Field Observations

Photos from the site visit and detailed field notes are available in Appendix F and Appendix G. The key observations from the site visits are as follows:

- Surface soils varied in composition throughout the site. Samples generally consisted of a mixture of mid-dark topsoil with some silty clay. Subsurface samples were also varied, consisting of mildly plastic dark brown silty clay at SS06, and very plastic orange/brown clay with some dark staining at SS07. No bugs or odour were recorded from any of the samples.
- The varied soil composition was consistent with the information provided by NPPC that included historical soil disturbances to cut down the site and construct the bunds, and regular soil disturbance activities as part of their site maintenance and lead recycling programme.
- Significant amounts of ammunition debris and possible lead were recorded around the area of SS04. Pale colour small flakes were also recorded in samples from SS02, SS03 and SS07.

6.4 Applicable Soil Acceptance Criteria

The land use scenario determined for this assessment was '*commercial / Industrial outdoor worker (unpaved)*'. The description of this land use scenario¹⁴ is as follows:

- Commercial / industrial site with varying degrees of exposed soil. Exposure of outdoor workers to near-surface soil during routine maintenance and gardening activities with occasional excavation as part of maintaining subsurface utilities (ie, a caretaker or site maintenance personnel). Also conservatively applicable to outdoor workers on a largely unpaved site.

¹³ Duplicate samples (also known as blind replicate) collection of two separate samples from a single sample location. The blind replicate provides information on the overall variability (or precision) of both the sampling technique and the analytical laboratory. In general, one blind replicate should be collected up to the first 10 samples, and an additional replicate taken for every 10 samples thereafter, although this will be dependent on the specific Data Quality Objectives (DQOs).

¹⁴ Extract from Table B1 Land use scenarios Appendix B Ministry for the Environment. 2012. Users' Guide: National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment

In accordance with the MfE's Contaminated Land Management Guidelines No.2 – Hierarchy and Application in New Zealand of Environmental Guideline Values (revised 2011), New Zealand risk-based standards or guidelines should be used where the exposure assumptions and scenarios were relevant to the site. Where New Zealand guidelines do not exist, overseas risk-based guidelines may be used. The following soil contaminant standards (SCS) and guidelines have therefore been utilised for this investigation:

- MfE NESCS Users Guide – Soil Contaminant Standards (SCS) for the commercial / industrial land use scenario¹⁵.
 - Contaminants assessed: Arsenic, Cadmium, Chromium¹⁶, Copper, Lead¹⁷, Mercury, and Polycyclic Aromatic Hydrocarbons (PAHs)¹⁸.
- NEPM – Guideline on Investigation Levels for Soil and Groundwater – Commercial / Industrial D¹⁹.
 - Contaminants assessed: Nickel and Zinc.
- Netherlands National Institute for Public Health and the Environment (NNIPHE) Environmental Risk Limits (ERLs)²⁰
 - Contaminants assessed: Antimony.

Whilst it is understood that there is no current plan for offsite disposal of soil, the MfE Landfill Waste Acceptance Criteria has been referenced to inform soil disposal options should any soil disposal be required for the acoustic mitigation works.

In addition, the Predicted Background Soil Concentrations²¹ (PBC), New Zealand, and Maps of total soil concentrations²² (background levels) of chromium, copper, lead, nickel, and zinc in the Taranaki Region²³, both provided by Landcare Research Limited, were referenced to provide information on likely background soil concentrations for heavy metals.

The concentration of an element that exists in the absence of human input reflects the natural background concentration. Some elements exist naturally over a wide range of concentrations, and it is important to distinguish whether the amount present at a site is a result of anthropogenic contamination, rather than natural geogenic processes. Natural background concentrations are important in providing baseline information to avoid incorrectly describing a natural state as 'contaminated' or imposing unrealistic clean-up standards.

¹⁵ Ministry for the Environment. 2012. (MfE, 2012). Users' Guide: National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.

¹⁶ The SCS for Chromium VI has been applied as it is the more conservative SCS.

¹⁷ It should be noted that the results for lead were for 'total recoverable lead', which includes both inorganic and organic compounds, while the NESCS guidelines apply to inorganic lead only. There is no available test for inorganic lead in NZ.

¹⁸ Assessed against the SCS for Benzo(a)pyrene (BaP).

¹⁹ National Environmental Protection (Assessment of Site Contamination) Measure. April 2011. (NEPM 2011) National Environment Protection (Assessment of Site Contamination) Measure April Schedule B1 GUIDELINE ON Investigation Levels for Soil and Groundwater.

²⁰ Netherlands National Institute for Public Health and the Environment, 2012 (NNIPHE), Environmental risk limits for antimony. RIVM Letter report 601357001/2012.

²¹ <https://iris.scinfo.org.nz/layer/48470-pbc-predicted-background-soil-concentrations-new-zealand/>

²² Landcare Research New Zealand Limited, Maps of total soil concentrations (background levels) of chromium, copper, lead, nickel, vanadium, and zinc in the Taranaki Region. Harry Percival, Anne Sutherland, Landcare Research, prepared for Taranaki Regional Council. LC0102/152

²³ Background Levels of Agrichemical Residues in Bay Of Plenty Soils. A preliminary technical investigation. Prepared by SEM NZ limited. 2005. Based on control site concentrations (n=25).

It should be noted that Landcare Research have acknowledged that the PBC values for arsenic and zinc are currently noted to be under-predicting concentrations at higher concentrations, therefore producing more conservative background concentrations for the upper percentile estimates. Further model development is to be undertaken. Therefore, background concentrations for arsenic and zinc cannot be relied upon to accurately conclude whether soil sampling results are exceeding background concentrations.

7 RESULTS

The results from the soil sampling have been presented in Table 7.1. Results exceeding an applicable standard or guideline have been highlighted in the corresponding colour. The raw laboratory data is available in Appendix H. See Appendix D for sampling locations.

A summary of the results is as follows:

- A total of ten samples were collected across eight different sampling locations and sent to Eurofins Laboratories. All samples were analysed for heavy metals and pH, two were also analysed for PAHs.
- Three results for lead (surface samples from SS03, SS04 and SS08) exceeded the applicable SCS, to protect human health, for lead. The result from SS04 exceeded the SCS by 1112%, whilst the results from SS03 and SS08 exceeded the SCS by 27% and 9% respectively. It should be noted that significant ammunition debris were noted in the area of sample location SS04, which has likely affected the sample result, resulting in an overly significantly elevated result.
- One result for arsenic exceeded the applicable SCS, for the protection of human health. It is acknowledged that this result is also from the sample at SS04, therefore it is unlikely to be representative of the entire investigation area and is likely isolated to the significant ammunition debris areas.
- Four results for antimony exceeded the applied NNIPHE Environmental Risk Limit (guideline value to protect human health).
- All remaining heavy metal results, and also PAH results, were below the applicable SCS. It is noted that the result from SS07, whilst below the SCS, would be considered elevated.
- All results for arsenic, copper, lead and zinc, plus one result for cadmium and one result for chromium, were elevated above either the Landcare Research PBC or the Taranaki region background levels. Lead, in particular, was significantly elevated above expected background concentrations.
- Results for antimony, arsenic, copper, lead and zinc consistently exceeded the MfE Class A Landfill Screening Criteria.
- The soil pH ranged from 6.1-7.2. Normal pH range is 5.8-6.2.

Table 7.1: Soil sampling results

ANALYTE	SAMPLE IDENTIFICATION AND RESULT (mg/kg)										APPLICABLE STANDARDS AND GUIDELINES					
	SS01_0-0.1	SS02_0-0.1	SS03_0-0.1	SS04_0-0.1	SS05_0-0.1	SS06_0-0.1	SS06_0.3	SS07_0-0.1	SS07_0.4	SS08_0-0.1	NESCS Commercial / industrial outdoor worker (unpaved) (mg/kg)	NEPM Commercial / industrial D	NNIPHE Environmental Risk Limits (mg/kg)	Landcare Research Predicted background soil concentrations (mg/kg)	Heavy metal background levels in Taranaki Landcare Research (mg/kg)	MfE Class A Landfill Screening Criteria
Metals																
Antimony	34	100	130	3,200	33	45	5.4	18	3.8	120	-	-	100	-	-	12
Arsenic	6.7	7.8	9.7	170	13	8.3	4.9	6.2	4.4	41	70	-	-	0.2-4.1	-	100
Cadmium	0.14	0.21	0.23	0.75	0.18	0.18	0.15	0.16	0.12	0.25	1,300	-	-	0.29-0.35	-	20
Chromium	17	17	22	20	17	16	14	23	13	36	6,300	-	-	15.5-25	10-45	100
Copper	160	150	170	4,200	160	200	120	230	100	450	>10,000	-	-	27.9-39	50-120	100
Lead	1,300	1,700	4,200	40,000	820	1,600	120	460	250	3,600	3,300	-	-	11.4-17.2	2-25	100
Mercury	0.14	0.11	0.10	0.28	0.04	0.09	0.21	0.09	0.25	0.08	4,200	-	-	-	-	4
Nickel	8.6	9.7	11	8.6	8.3	9.1	8.1	16	6.5	8.8	-	4,000	-	9.5-14.3	2-15	200
Zinc	130	200	210	150	650	290	110	630	120	200	-	400,000	-	79.5-99.8	70-140	200
PAH																
PAH	-	-	-	0.07	-	-	-	7.6	-	-	35	-	-	-	-	-

8 SITE CHARACTERISATION AND EVALUATION

To evaluate the magnitude of the risk pursuant to the NESCS (i.e., determine that it is highly unlikely that there will be a risk to human health if the activity is done to the POL) the contaminated land investigation must complete a site risk assessment. Central to the requirements of the risk assessment is the development of a conceptual site model (CSM). A CSM is an evaluation of the probability of contaminant sources in an environmental system and identification and characterisation of the pathways (e.g., biological, physical, chemical vectors) to human health and environmental receptors (see Figure 7.1: and MfE 2012 for further details). Ultimately the goal is to evaluate the source-pathway-receptor linkage. Instances where the linkage is complete presents a risk to human health that requires further assessment.

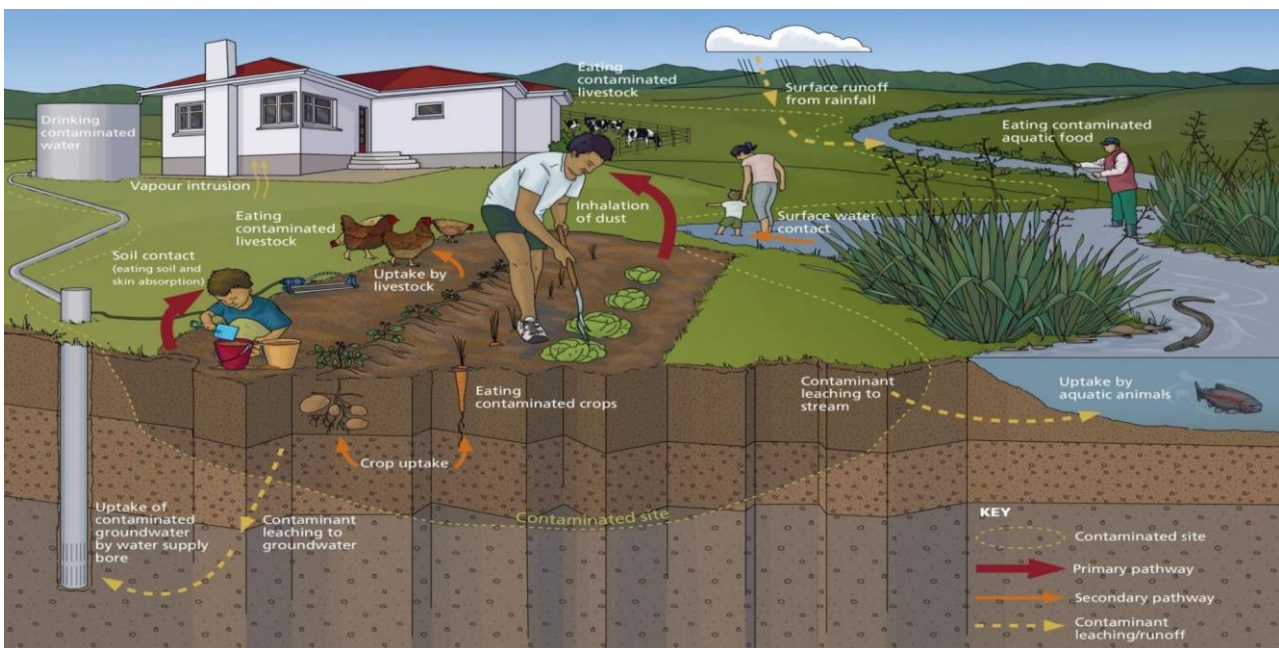


Figure 8.1: Conceptual model of contaminate sources and pathway vectors for human health risk. Source: MfE (2012).

8.1 Conceptual Site Model (CSM)

This PSI has identified that HAIL activities with the potential to result soil contamination have been, or have more likely than not, been conducted on the site and that heavy metals and PAHs are likely the main contaminants of concern. Soil disturbance of soils contaminated with heavy metals and / or PAHs is considered to be the primary pathway for human exposure (inhalation, ingestion and dermal).

MfE (2021) states that a CSM can be presented in written, pictorial or graphical format, or as a table or flow diagram, or a combination of these. This investigation presents a simplified table (Table 8.1) of potential source-pathway-linkages.

Table 8.1: Conceptual Site Model (CSM) for the site

Source HAIL Trigger	Contaminants of Concern	Source Risk	Potential pathway	Potential Receptors	Pathway Linkage
Present day Gun Club and Historical Training Areas for Detonation of Explosive Ammunition	Heavy metals (antimony, arsenic, copper, lead, nickel and zinc), PAHs	Lead detected at concentrations exceeding the SCS at multiple locations, including both the banded soil and ground level soils. Lead consistently significantly elevated above background concentrations and significant amounts of ammunition debris noted on several ranges. Antimony, arsenic, copper and zinc also elevated.	Inhalation of dust, ingestion of soil and dermal exposure.	Construction and maintenance workers during the planned acoustic mitigation works. Future site users / maintenance workers, particularly those involved in the soil	Complete

9 CONCLUSIONS AND RECCOMENDATIONS

9.1 Conclusions

- The investigation area is currently, and was historically, used for commercial / industrial activities which can be seen in historic aerial imagery and is well documented in information provided by NPPC. The investigation area currently operates as a shooting range / gun club (NPPC).
- The desktop investigation identified two categories of HAIL (gun club and machine gun range) within the investigation area.
- The primary contaminants of concern associated with the identified HAIL activities are considered to be heavy metals and PAHs.
- From the above findings, we have identified the investigation area to be a 'Piece of Land' where any soil disturbance within this area would be subject to the NESCS regulations.
- Preliminary soil sampling produced results that were above the applicable SCS for a commercial / industrial land use for lead, with results exceeding the SCS by 9-1112%. One result for arsenic also exceeded the applicable SCS and results for antimony exceeded the applied NNIPHE Environmental Risk Limit for antimony in soil.
- All remaining heavy metal results, and also PAH results, were below the applicable SCS.
- All results for arsenic, copper, lead and zinc, plus one result for cadmium and one result for chromium, were elevated above either the Landcare Research PBC or the Taranaki region background levels. Lead, in particular, was significantly elevated above expected background concentrations.
- Results for antimony, arsenic, copper, lead and zinc consistently exceeded the MfE Class A Landfill Screening Criteria.
- The CSM for the investigation area identified a complete pathway linkage from the available information and soil sampling data. Therefore, the site soil presents a current risk to human health for the proposed acoustic mitigation project.
- Whilst no soil disposal is currently planned for the acoustic mitigation works, it should be noted that the soil cannot be classified as 'cleanfill', due to the heavy metal concentrations exceeding background concentrations, therefore any soil that may be disposed of offsite must go to an approved facility licensed to accept this type of material.
- From the current information and soil sampling data this PSI cannot conclude it would be highly unlikely there would be a risk to human health if the planned acoustic mitigation works are to be undertaken within the 'Piece of Land' identified.
- The activity status under the NESCS regulations is yet to be determined as this will depend on soil disturbance volumes and other factors.

9.2 Recommendations

- The findings of this PSI should be submitted as a supporting document with any resource consent application with NPDC.
- Should the acoustic mitigation works proceed, a contaminated site management plan (CSMP) is likely the best management tool to manage contaminated soil. Following the works project, an ongoing site management plan (OSMP) is recommended to manage future worker soil interaction.

- Should any soil disposal be required for the acoustic mitigation works, it is recommended that further soil sampling be undertaken to facilitate disposal to an appropriate facility.
- Consideration should be given to potential environmental effects on groundwater and/or the adjacent tributary as a result of the planned acoustic mitigation works, particularly concerning the planned modification to the bund immediately adjacent to the tributary. Any monitoring of effects to surface or groundwater can be managed via a CSMP, or any OSMP, as well as any further monitoring by TRC.

10 REPORT LIMITATIONS

BTW Company accepts no responsibility for any errors or omission in the information provided by the client or any third party. It is assumed the information is correct, unless otherwise stated.

This report has been prepared by BTW Company as commissioned by the New Plymouth Pistol Club (NPPC) for the limited objectives, as requested by the client. BTW Company accepts no liability if the report is used for a different purpose, such as future soil disturbances, or it is used or relied on by any other person. Any such use or reliance will be solely at their own risk.

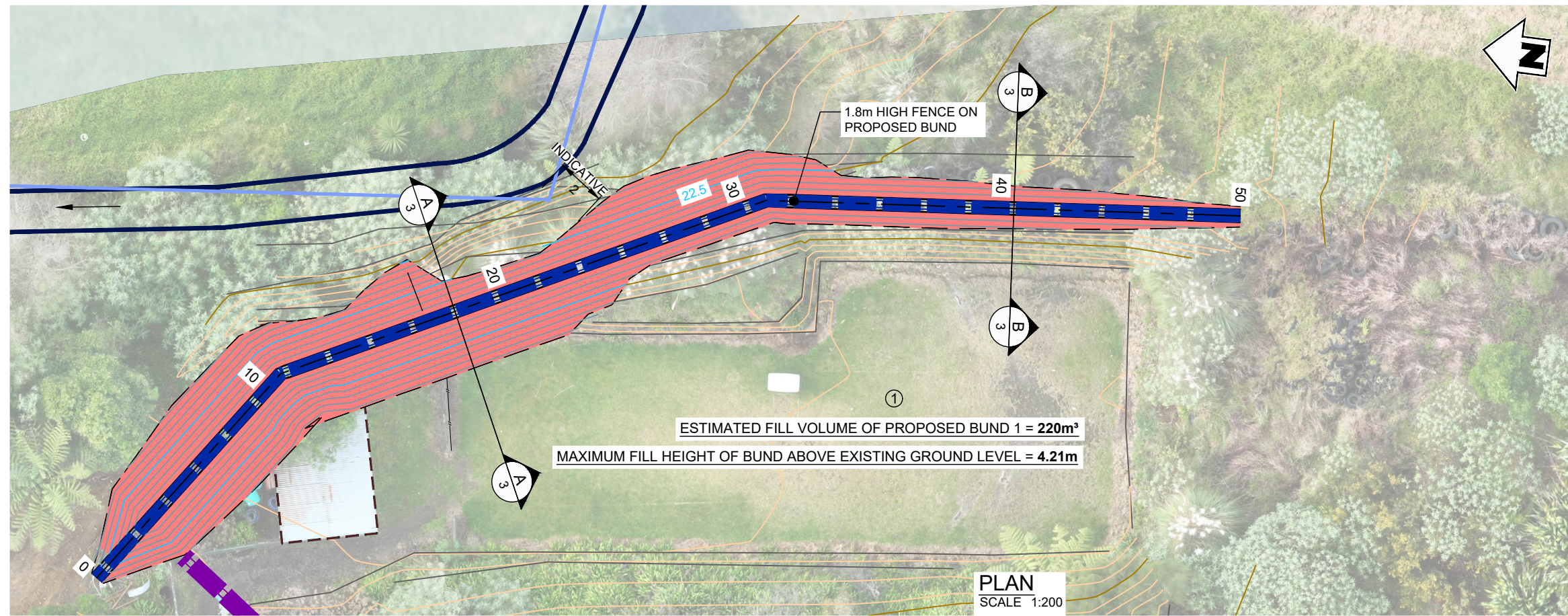
Preliminary soil sampling cannot confirm the absence of contamination. This requires statistically reliable data, derived from a sufficiently large number of samples which exceeds the scope of a PSI. This report is representative of all the information available to the author, and the conclusions and recommendations made in this report are derived from that information which was available at the time the report was written.

This report is not a detailed site investigation.

The services of this project are in accordance with current best practise and known professional standards for environmental site assessments at the time of investigation. Should additional information become available at a later date, BTW Company reserves the right to update this report.

If you have any question related to this matter, please do not hesitate to contact BTW Company Contaminated Land Team.

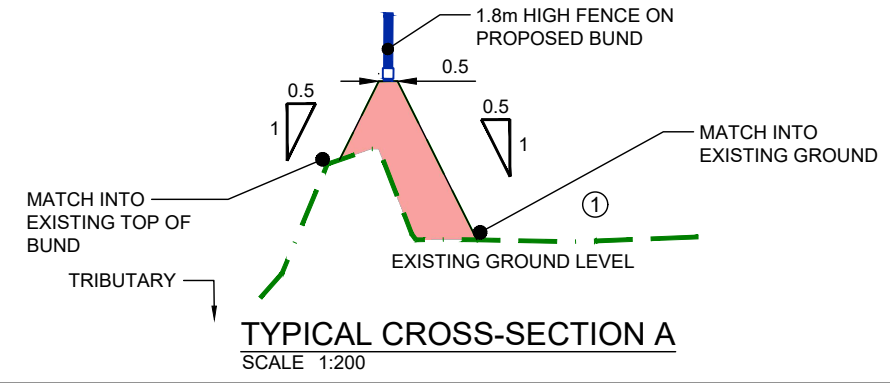
APPENDIX A NPPC CONCEPT PLAN



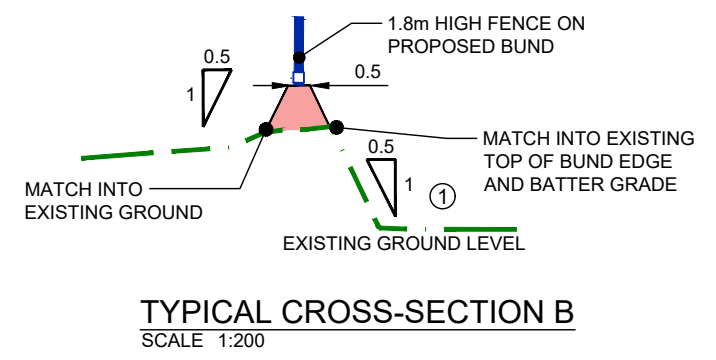
LEGEND	
EXISTING CONTOURS	
DESIGN CONTOURS	
BOUNDARIES - INDICATIVE	
EXISTING BUILDING EXTENT	
EXISTING VEGETATED BUND (RANGES 1-7)	
RANGE NUMBER	
TRIBUTARY	
PROPOSED BUND FILL AREA	
PROPOSED 1.8m FENCE (DETAILS PROVIDED BY OTHERS)	

COORDINATE AND LEVEL DATUM
 COORDINATES: Geodetic Datum (Taranaki 2000)
 REDUCED LEVELS: NZ Vertical Datum 2016
 ORIGIN OF COORDINATES AND LEVELS:
 LP III DP 13958 (F4MR): 811854.62mN, 395361.88mE, RL 39.65m

NOTE: ALL EARTHWORKS AND CONSTRUCTION IS SUBJECT TO DETAILED DESIGN AND CONSENT, INCLUDING EROSION SEDIMENT CONTROLS.



Disclaimer:
 Aerial imagery has been captured by BTW using UAV Photogrammetric methods.
 Areas and dimensions may be subject to scale error.
 Scaling from this drawing is at the users risk.



DATUM: 20.00		TOP OF PROPOSED BUND RL = 24.5m									
CHAINAGE	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	49.8
EXISTING LEVELS	21.36	20.69	20.32	20.35	23.17	23.12	22.98	23.16	23.31	23.58	24.20
CUT/FILL DEPTHS	-0.15	-3.81	-4.18	-4.15	-1.33	-1.38	-1.52	-1.34	-1.19	-0.92	-0.30

CONCEPT ONLY

LONGSECTION
 SCALE 1:200



SURVEYING
 ENGINEERING
 PLANNING
 ENVIRONMENT

NO	DATE	BY	CHKD	APPR	OPER	DESCRIPTION	NUMBER	TITLE

GENERAL NOTES
 1. Coordinates in terms of : Geodetic Datum (Taranaki 2000)
 2. Elevations in terms of : NZ Vertical Datum 2016
 3. Contour interval is : 0.5m



LOCATION	BELL BLOCK	
PROJECT No.	230984	
A3 SCALE	1:200	
SURVEYED	TD	22/7/2024
DRAWN	TD	24/7/2024
CHECKED	KP	25/7/2024

TITLE		NEW PLYMOUTH PISTOL CLUB INC.	
		1220 DEVON ROAD (S.H.3), BELL BLOCK	
		CONCEPT BUND 1 DETAIL	
ORIGINAL SIZE	A3	DRAWING No.	230984-SU-01
SHEET	3	REVISION	WD1

File Name: C:\125\data\BTW12\230984.00 - New Plymouth Pistol Club Inc. 6603107 Drawings\230984.00-SU-01 Topo.dwg - SHT 3 BUND Plot Date: 30/07/2024 Plot Time: 10:51

APPENDIX B HISTORIC AERIAL IMAGERY



A 1: 1949 Aerial Imagery. Source: Retrolens



A 2: 1953 Aerial Imagery. Source: Retrolens



A 3: 1958 Aerial Imagery. Source: Retrolens



A 4: 1963 Aerial Imagery. Source: Retrolens



A 5: 1969 Aerial Imagery. Source: Retrolens



A 6: 1970 Aerial Imagery. Source: Retrolens



A 7: 1982 Aerial Imagery. Source: Retrolens



A 8: 1983 Aerial Imagery. Source: NPDC



A 9: 1993 Aerial Imagery. Source: NPDC



A 10: 2001 Aerial Imagery. Source: NPDC



A 11: 2005 Aerial Imagery. Source: NPDC



A 12: 2007 Aerial Imagery. Source: NPDC



A 13: 2010 Aerial Imagery. Source: NPDC



A 14: 2011 Aerial Imagery. Source: Google Earth



A 15: 2012 Aerial Imagery. Source: NPDC



A 16: 2013 Aerial Imagery. Source: NPDC



A 17: 2015 Aerial Imagery. Source: Google Earth



A 18: 2017 Aerial Imagery. Source: NPDC



A 19: 2018 Aerial Imagery. Source: Google Earth



A 20: 2019 Aerial Imagery. Source: Google Earth



A 21: 2020 Aerial Imagery. Source: Google Earth



A 22: 2021 Aerial Imagery. Source: Google Earth



A 23: 2022 Aerial Imagery. Source: NPDC



A 24: 2023 Aerial Imagery. Source: Google Earth

APPENDIX C TRC INFORMATION

Incident Summary Report

IRIS ID: IN/44714 **Job Number:** 3301-22-396
Request Type: Incident **Request Date/Time:** 10/03/2022 12:00PM
Subject Type: Environmental **Contact Method:** Email
Logged Date/Time: 15/03/2022 11:41 AM

Brief Description: Groundwater discharge - SH3, New Plymouth

Request Details: A complaint was received via NPDC questioning the quality of groundwater flowing from beneath the New Plymouth Pistol Club following many years of bullets fired into a bank.

Incident Source: Complaint
Incident Date/Time: 10/03/2022 12:00 PM

Linked Contacts

	Requestor (Confidential)	15/03/2022
New Plymouth Pistol Club	Alleged Offender	15/03/2022

Linked Locations

Groundwater pipe discharge point from Gun Club Discharge point	LOC-31885	Incident Location
--	-----------	-------------------

Catchment

Tributary 394000 - Waiongana

Incident Classification

Resource Type	Industry Purpose	Breaches	Hazardous Substances
Inland Water	Recreation/Tourism/Cultural	Plan/Rule/Objective	Not Assessed
Inland Water	Recreation/Tourism/Cultural	None	Not Assessed

Causes and Effects

Cause	Effect	Comments
Ground Water Contamination	No Effect	
Ground Water Contamination	No Effect	

Officer Responsible

Name	Date
Clinton Carré	15/03/2022

Regional Plans/Rules/Objectives

Plan	Rule/Objective	Rule/Objective Description
------	----------------	----------------------------

Other Identifiers

Linked Item	IRIS ID	Type	Linked As
-------------	---------	------	-----------

Recommendation to Council No Further Action

Incident Compliance Status RFWP Allowed

Historical Action Comments

Agenda Paragraph

Investigation Outcome Comments

Samples collected from the discharge pipe found normal background levels of metals and water quality. NPDC were advised of the results and they would report back to the complainant as they were working with the complainant on a number of issues.



Certificate of Analysis

Client:	Taranaki Regional Council	Lab No:	2913807	SPV1
Contact:	Jared Glasgow C/- Taranaki Regional Council Private Bag 713 Stratford 4352	Date Received:	12-Mar-2022	
		Date Reported:	21-Mar-2022	
		Quote No:	92798	
		Order No:	4500002828	
		Client Reference:	# - Incident - catch-all	
		Submitted By:	Clinton Carre	

Sample Type: Aqueous

Sample Name:	Pistol Club 11-Mar-2022 8:45 am	Lab Number:	2913807.1				
Turbidity	NTU	1.33	-	-	-	-	-
pH	pH Units	7.4	-	-	-	-	-
Total Alkalinity	g/m ³ as CaCO ₃	26	-	-	-	-	-
Electrical Conductivity (EC)	mS/m	15.0	-	-	-	-	-
Total Copper	g/m ³	0.00109	-	-	-	-	-
Total Lead	g/m ³	0.00022	-	-	-	-	-
Total Nickel	g/m ³	< 0.00053	-	-	-	-	-
Total Zinc	g/m ³	0.0019	-	-	-	-	-
Total Ammoniacal-N	g/m ³	< 0.010	-	-	-	-	-
Escherichia coli	cfu / 100mL	< 10 #1	-	-	-	-	-

Analyst's Comments

#1 Statistically estimated count based on the theoretical countable range for the stated method.
Please interpret this microbiological result with caution as the sample was > 24 hours old at the time of testing in the laboratory. The sample is required to reach the laboratory with sufficient time to allow testing to commence within 24 hours of sampling.

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 Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Test	Method Description	Default Detection Limit	Sample No
Filtration, Unpreserved	Sample filtration through 0.45µm membrane filter.	-	1
Total Digestion	Nitric acid digestion. APHA 3030 E (modified) 23 rd ed. 2017.	-	1
Turbidity	Analysis by Turbidity meter. APHA 2130 B 23 rd ed. 2017 (modified).	0.05 NTU	1
pH	pH meter. APHA 4500-H+ B 23 rd ed. 2017. Note: It is not possible to achieve the APHA Maximum Storage Recommendation for this test (15 min) when samples are analysed upon receipt at the laboratory, and not in the field. Samples and Standards are analysed at an equivalent laboratory temperature (typically 18 to 22 °C). Temperature compensation is used.	0.1 pH Units	1
Total Alkalinity	Titration to pH 4.5 (M-alkalinity), autotitrator. APHA 2320 B (modified for Alkalinity <20) 23 rd ed. 2017.	1.0 g/m ³ as CaCO ₃	1
Electrical Conductivity (EC)	Conductivity meter, 25°C. APHA 2510 B 23 rd ed. 2017.	0.1 mS/m	1
Total Copper	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 rd ed. 2017 / US EPA 200.8.	0.00053 g/m ³	1
Total Lead	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 rd ed. 2017 / US EPA 200.8.	0.00011 g/m ³	1



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

Sample Type: Aqueous			
Test	Method Description	Default Detection Limit	Sample No
Total Nickel	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 rd ed. 2017 / US EPA 200.8.	0.00053 g/m ³	1
Total Zinc	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 rd ed. 2017 / US EPA 200.8.	0.0011 g/m ³	1
Total Ammoniacal-N	Phenol/hypochlorite colourimetry. Flow injection analyser. (NH ₄ -N = NH ₄ ⁺ -N + NH ₃ -N). APHA 4500-NH ₃ H (modified) 23 rd ed. 2017.	0.010 g/m ³	1
Escherichia coli	Membrane filtration, Count on mFC agar, Incubated at 44.5°C for 22 hours, MUG Confirmation. APHA 9222 I 23 rd ed. 2017.	1 cfu / 100mL	1

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

Testing was completed between 14-Mar-2022 and 21-Mar-2022. For completion dates of individual analyses please contact the laboratory.

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

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



Ara Heron BSc (Tech)
Client Services Manager - Environmental

Certificate of Analysis

Page 1 of 2

Client:	Taranaki Regional Council	Lab No:	3636776	SPV1
Contact:	Callum MacKenzie C/- Taranaki Regional Council Private Bag 713 Stratford 4352	Date Received:	27-Jul-2024	
		Date Reported:	05-Aug-2024	
		Quote No:	132495	
		Order No:	300852	
		Client Reference:		
		Submitted By:	Callum MacKenzie	

Sample Type: Sediment

Sample Name:	2419182 U/S Sediment 26-Jul-2024 11:55 am	2419183 D/S Sediment 26-Jul-2024 12:25 pm	2419184 Road Sediment 26-Jul-2024 12:40 pm
Lab Number:	3636776.4	3636776.5	3636776.6
Heavy metal, trace level As,Cd,Cr,Cu,Ni,Pb,Zn			
Total Recoverable Arsenic mg/kg dry wt	0.9	0.5	0.9
Total Recoverable Cadmium mg/kg dry wt	0.104	0.089	0.123
Total Recoverable Chromium mg/kg dry wt	5.9	6.2	5.4
Total Recoverable Copper mg/kg dry wt	15.4	9.6	16.5
Total Recoverable Lead mg/kg dry wt	8.0	10.4	15.3
Total Recoverable Nickel mg/kg dry wt	2.8	2.2	2.6
Total Recoverable Zinc mg/kg dry wt	91	67	96

Sample Type: Aqueous

Sample Name:	2419179 U/S Water 26-Jul-2024 12:00 pm	2419180 Discharge 26-Jul-2024 12:05 pm	2419181 D/S Water 26-Jul-2024 12:15 pm
Lab Number:	3636776.1	3636776.2	3636776.3
Heavy metals, totals, trace As,Cd,Cr,Cu,Ni,Pb,Zn			
Total Arsenic g/m ³	< 0.0011	< 0.0011	< 0.0011
Total Cadmium g/m ³	< 0.000053	< 0.000053	< 0.000053
Total Chromium g/m ³	< 0.00053	< 0.00053	< 0.00053
Total Copper g/m ³	< 0.00053	0.00057	< 0.00053
Total Lead g/m ³	< 0.00011	0.00019	< 0.00011
Total Nickel g/m ³	< 0.00053	< 0.00053	< 0.00053
Total Zinc g/m ³	0.0033	< 0.0011	0.0030

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: Sediment

Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	4-6
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. 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).	-	4-6
Heavy metal, trace level As,Cd,Cr,Cu,Ni,Pb,Zn	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, trace level.	0.010 - 0.8 mg/kg dry wt	4-6
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	4-6

Sample Type: Aqueous			
Test	Method Description	Default Detection Limit	Sample No
Heavy metals, totals, trace As,Cd,Cr,Cu,Ni,Pb,Zn	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B (modified) : Online Edition / US EPA 200.8.	0.000053 - 0.0011 g/m ³	1-3
Total Digestion	Nitric acid digestion. APHA 3030 E (modified) : Online Edition.	-	1-3

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

Testing was completed between 27-Jul-2024 and 05-Aug-2024. For completion dates of individual analyses please contact the laboratory.

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

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Martin Cowell - BSc
Client Services Manager - Environmental

Survey #	<input type="text" value="9607"/>	Project
Description	<input type="text" value="New Plymouth Pistol Club environmental sampling"/>	Programme
Job Number	<input type="text" value="730200.344"/>	Task
Sample Type (default)	<input type="text" value="Water"/> ▾	Sub-Type <input type="text" value="Water (fresh)"/> ▾
Collected (default)	<input checked="" type="checkbox"/> 26 July 2024 <input type="text" value="📅"/> ▾	by <input type="text" value="Callum MacKenzie"/> ▾
Comments	<input type="text" value="Upstream, discharge and downstream water samples, plus three stream sediment samples, analysed for heavy metals. Locations included in sample comments."/>	

	Sample Type	Sample #	Collected Date	Collected Time	Site Code
		TRC2419179	26/07/2024	12:00:00	1702336-5679671
	Water	TRC2419180	26/07/2024	12:05:00	1702327-5679674
	Water	TRC2419181	26/07/2024	12:15:00	1702322-5679687
	Water	TRC2419182	26/07/2024	11:55:00	1702336-5679671
	Water	TRC2419183	26/07/2024	12:25:00	1702322-5679687
	Water	TRC2419184	26/07/2024	12:40:00	1702309-5679742

APPENDIX D SAMPLING LOCATION PLAN

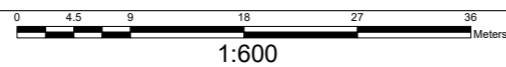


- Legend**
- Soil Sampling Location
 - Approximate Site Area
 - River
 - Property Parcel

BTW
COMPANY

SURVEYING
ENGINEERING
PLANNING
ENVIRONMENT

GENERAL NOTES
1. Coordinates are in terms of New Zealand Transverse Mercator
DISCLAIMER
GIS data and imagery are for indicative purposes only.
Cadastral information sourced from LINZ. Crown copyright reserved.



NO	DATE	BY	CHKD.	REVISIONS

LOCATION **BELL BLOCK**
PROJECT No. **230984**

DRAWN	E. NOLLY	01.08.24
CHECKED	G. JOHNSTON	01.08.24
SCALE	1:600	
ORIGINAL SIZE	A3	



TITLE
**NPPC SOIL SAMPLING LOCATION
PLAN, 1220 DEVON ROAD, BELL
BLOCK, NEW PLYMOUTH**

DRAWING No.	SHEET	REVISION
230984-EV-01	1	0

APPENDIX E CHAIN OF CUSTODY FORMS

CHAIN OF CUSTODY RECORD - NEW ZEALAND
Environ Environmental Testing New Zealand Ltd. 10251 1024 1022 4981

Auckland Laboratory
35 Tapanui Road, Franklin, Auckland 1061, NZ
 0900 854591 (New Zealand) Enviro@envtl.co.nz

Wellington Office
85 Post Road, Lower Hutt 5051, NZ
 0900 854591 (New Zealand) Enviro@envtl.co.nz

Christchurch Laboratory
43 Central Drive, Fendalton 8013, NZ
 0900 854591 (New Zealand) Enviro@envtl.co.nz

Invercargill Laboratory
Millers Street, Invercargill 9101, NZ
 077 834 9942 Enviro@envtl.co.nz

Company: BTW		Project No: 230984		Project Manager:		Sampler(s): Emma Nolly			
Address: Courtney St New Plymouth		Project Name:		EDQ Format:		Handed over by:			
Contact Name: Emma Nolly		Analytes: m8-N2 + S6@H PH PAH		Email for Invoice: nudy.brewer@btw.nz		Email for Results: emma.nolly@btw.nz			
Phone No: 0272251644				Containers: <small>Change container type if necessary</small>		Required Turnaround Time (TAT) <small>Turned in by 10:00 AM</small>		<input type="checkbox"/> Overnight / same day <input type="checkbox"/> 1 day <input type="checkbox"/> 2 days <input type="checkbox"/> 3 days <input type="checkbox"/> 4 days (Standard) <input type="checkbox"/> Other	
Special Directions: All samples taken 22/7/24				500mL Plastic		250mL Plastic		200mL Amber Glass	
Purchase Order: 230984				125mL Plastic		40mL VOA vial		500mL PFAS Bottle Jar (Glass or HDPE) Other (Asbestos AS4984, WA guidelines)	
Quote ID No:		Matrix: S		Other (Asbestos AS4984, WA guidelines):		Sample Comments: Dangerous Goods Hazard Warning			
No	Client Sample ID	Sampled Date/Time	Matrix						
1	SS01-0-0.1	1020	S	X	X		X		
2	SS02-0-0.1	1035	S	X	X		X		
3	SS03-0-0.1	1045	S	X	X		X		
4	SS03A	1050	S	X	X		X		
5	SS04-0-0.1	1110	S	X	X	X	X		
6	SS05-0-0.1	1120	S	X	X		X		
7	SS06-0-0.1	1135	S	X	X		X		
8	SS06-0.3	1140	S	X	X		X		
9	SS07-0-0.1	1150	S	X	X	X	X		
10	SS07-0.4	1205	S	X	X		X		
Total Counts									
Methods of Shipment:		<input checked="" type="checkbox"/> Courier (P)		<input type="checkbox"/> Hand Delivered		<input type="checkbox"/> Postal			
Name:		Signature: <i>[Signature]</i>		Date: 22/7/24		Time: 1600			
Eurofins Laboratory Use Only		Received By:		Signature:		Date:			
		Received By:		Signature:		Date:			

EUNZAU
00704972
 Order



051-11618-705229-93

Date/Time: **23/7/24 1:50PM**

Chilled: Yes / No

Temp: **10.9°C**
~~12.9°C~~

Correction: **13.7°C**



Substrate of samples for the laboratory will be checked by acceptance of Eurofins Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins Standard Terms and Conditions is available at: <https://www.eurofins.com/locations/230984.html>

APPENDIX F SITE IMAGES

Photo 1
Date: 24th July 2024



The site located at 1220 Devon Road, Bell Block, New Plymouth

Photo 2
Date: 22nd July 2024



Storage shed located south of, and adjacent to, the main clubroom building.

Photo 3
Date: 22nd July 2024



Tyre bund seen on range 1, similar bunding was seen separating each of the ranges

Photo 4
Date: 22nd July 2024



Casings and ammunition debris as seen in areas of some of the ranges to the east of the site.

Photo 5
Date: 22nd July 2024



Fresh soil laid on one of ranges to west of site to help with ponding of water, it is understood soil is laid on a type of mesh to facilitate the club lead recycling programme. Similar systems were seen on several of the other ranges but not all.

Photo 6
Date: 22nd July 2024



Location of soil sampling location SS01, taken from the soil inside the tyres on the lower part of the eastern bund on range 1.

Photo 7
Date: 22nd July 2024



Location of soil sampling location SS02, taken from inside grassed area adjacent to small shed on range 1.

Photo 8

Date: 22nd July 2024



Location of soil sampling location SS03, taken from the surface soils directly adjacent to the eastern bund of range 1 as it was understood that the current bunds were being cleared to ground level.

Photo 9
Date: 22nd July 2024



Location of soil sampling location SS04, taken from the soils within the tyres at the top of the eastern tyre bund of range 4, significant ammunition debris was seen scattered over the bund.

Photo 10
Date: 22nd July 2024



Location of soil sampling location SS05, taken from the surface soils directly behind the main clubroom building

Photo 11
Date: 22nd July 2024



Location of soil sampling location SS06, taken from the surface soils directly adjacent to the eastern bund of range 5. Picture shows soil horizon past surface.

Photo 12
Date: 22nd July 2024



Location of soil sampling location SS06, taken from 0.3m from soils directly adjacent to the eastern bund of range 5.

Photo 13
Date: 22nd July 2024



Location of soil sampling location SS07, taken from surface soils directly adjacent to building of range 6.

Photo 14
Date: 22nd July 2024



Location of soil sampling location SS07, taken from 0.4m soils directly adjacent to building of range 6.

Photo 15
Date: 22nd July 2024



Location of soil sampling location SS08, taken from surface soils at the southern end of range 6.

APPENDIX G FIELD NOTES

Sample ID	Depth (m)	Time	Comments
SS01_0-0.1	0.1	10:20	Silty topsoil with some clay lenses, occasional stones and bulbs, rootlets(vegetated) no bugs, organic odour.
SS02_0-0.1	0.1	10:35	From inside tyres, very friable medium brown topsoil mixed with clay lens and some bits of grey fill. Some possible lead fragments and darker patches of soil. No odour, no bugs, grassed.
SS03_0-0.1	0.1	10:45	Mid brown topsoil mixed with clay, organic layer on top. Lots of pale flecks, unsure if anaerobic soil/fungus or lead or paint flecks. Some definite pieces of lead. No odour, no bugs.
SS04-0-0.1	0.1	11:10	Taken from inside tyres top of bund, mixed topsoil/clay with large amounts of lead/ammunition debris. Vegetation, no odour, no bugs.
SS05_0-0.1	0.1	11:20	Dark brown topsoil mixed with gravels/fill. Small stones, no odour, no bugs.
SS06_0-0.1	0.1	11:30	Very friable mid brown topsoil with some clay lenses, no odour, no bugs, some pale flecks.
SS06_0-0.3	0.3	11:40	Mildly plastic dark brown silty clay , no bugs no odour.
SS07_0-0.1	0.1	11:50	Mid-dark brown topsoil with some clay lens, friable, no bugs, minimal vegetation, ponding of water and mud around.
SS07_0-0.3	0.3	12:05	Very plastic clay, orange/brown with some dark staining. No bugs, no odour. Varied layering of fill before, some light clay, some gravel. Mesh/net in area directly adjacent at 250-300 but not in this location.
SS08_0-0.1	0.1	12:15	Very damp mixed topsoil and clay, no vegetation, no bugs, no odour. Much tidier than other ranges. Minimal debris.

APPENDIX H BTW SAMPLING LABORATORY RESULTS

Environment Testing NZ

ANALYTICAL REPORT

REPORT CODE **AR-24-NU-063847-01** REPORT DATE **05/08/2024**

Attention BTW Company Limited
 Emma Nolly
 P O Box 551, New Plymouth
 4340 Taranaki
 NEW ZEALAND

Phone
Email emma.nolly@btw.nz

Contact for your orders: Katyana Gausel **Order code:** EUNZAU-00704972
Submission Reference: 230984 **Purchase Order Number:** 230984

SAMPLE CODE **816-2024-00178648**

<p>Sample Name SS01 0-0.1 Reception Date & Time: 23/07/2024 13:50 Analysis Started on: 23/07/2024 Sampled Date & Time 22/07/2024 10:20 Attempt to Chill was evident Yes Appropriate sample containers have been used Yes</p>	<p>Reception temperature: 13.7 °C Analysis Ending Date: 05/08/2024 Sampled By EMMA NOLLY Sample correctly preserved Yes</p>
---	--

METALS	RESULTS	LOQ
--------	---------	-----

NU0Y3 Lead (Pb)		
Lead (Pb)	1300 mg/kg	0.1
NU0M8 Arsenic (As)		
Arsenic (As)	6.7 mg/kg	0.1
NU0N8 Chromium (Cr)		
Chromium (Cr)	17 mg/kg	0.1
NU0P8 Copper (Cu)		
Copper (Cu)	160 mg/kg	0.1
NU0Q8 Nickel (Ni)		
Nickel (Ni)	8.6 mg/kg	0.1
NUKZ4 Antimony (Sb)		
Antimony (Sb)	34 mg/kg	0.5
NU2A2 Mercury (Hg)		
Mercury (Hg)	0.14 mg/kg	0.01
NU0U5 Zinc (Zn)		
Zinc (Zn)	130 mg/kg	5
NU0V3 Cadmium (Cd)		
Cadmium (Cd)	0.14 mg/kg	0.01

RESULTS	LOQ
---------	-----

NU5E9 pH		
pH	6.4	0.1

Environment Testing NZ

HOLDING TIMES

Test	Sampling Date	Holding End	Effective Holding (days)	Requirement (days)	Compliance
NU0M8 Arsenic (As)	22/07/2024	24/07/2024	2	180	True
NU0N8 Chromium (Cr)	22/07/2024	24/07/2024	2	180	True
NU0P8 Copper (Cu)	22/07/2024	24/07/2024	2	180	True
NU0Q8 Nickel (Ni)	22/07/2024	24/07/2024	2	180	True
NU0U5 Zinc (Zn)	22/07/2024	24/07/2024	2	180	True
NU0V3 Cadmium (Cd)	22/07/2024	24/07/2024	2	180	True
NU0Y3 Lead (Pb)	22/07/2024	26/07/2024	4	180	True
NU2A2 Mercury (Hg)	22/07/2024	24/07/2024	2	28	True
NU5E9 pH	22/07/2024	25/07/2024	3	7	True
NUKZ4 Antimony (Sb)	22/07/2024	01/08/2024	10	180	True

SAMPLE CODE 816-2024-00178649

Sample Name	SS02 0-0.1	Reception temperature:	13.7 °C
Reception Date & Time:	23/07/2024 13:50	Analysis Ending Date:	02/08/2024
Analysis Started on:	23/07/2024	Sampled By	EMMA NOLLY
Sampled Date & Time	22/07/2024 10:35	Sample correctly preserved	Yes
Attempt to Chill was evident	Yes		
Appropriate sample containers have been used	Yes		

METALS	RESULTS	LOQ
--------	---------	-----

NU0Y3 Lead (Pb)		
Lead (Pb)	1700	mg/kg 0.1
NU0M8 Arsenic (As)		
Arsenic (As)	7.8	mg/kg 0.1
NU0N8 Chromium (Cr)		
Chromium (Cr)	17	mg/kg 0.1
NU0P8 Copper (Cu)		
Copper (Cu)	150	mg/kg 0.1
NU0Q8 Nickel (Ni)		
Nickel (Ni)	9.7	mg/kg 0.1
NUKZ4 Antimony (Sb)		
Antimony (Sb)	100	mg/kg 0.5
NU2A2 Mercury (Hg)		
Mercury (Hg)	0.11	mg/kg 0.01
NU0U5 Zinc (Zn)		
Zinc (Zn)	200	mg/kg 5
NU0V3 Cadmium (Cd)		
Cadmium (Cd)	0.21	mg/kg 0.01

RESULTS	LOQ
---------	-----

NU5E9 pH	
pH	6.1 0.1

Environment Testing NZ

HOLDING TIMES

Test	Sampling Date	Holding End	Effective Holding (days)	Requirement (days)	Compliance
NU0M8 Arsenic (As)	22/07/2024	24/07/2024	2	180	True
NU0N8 Chromium (Cr)	22/07/2024	24/07/2024	2	180	True
NU0P8 Copper (Cu)	22/07/2024	24/07/2024	2	180	True
NU0Q8 Nickel (Ni)	22/07/2024	24/07/2024	2	180	True
NU0U5 Zinc (Zn)	22/07/2024	24/07/2024	2	180	True
NU0V3 Cadmium (Cd)	22/07/2024	24/07/2024	2	180	True
NU0Y3 Lead (Pb)	22/07/2024	26/07/2024	4	180	True
NU2A2 Mercury (Hg)	22/07/2024	24/07/2024	2	28	True
NU5E9 pH	22/07/2024	25/07/2024	3	7	True
NUKZ4 Antimony (Sb)	22/07/2024	02/08/2024	11	180	True

SAMPLE CODE 816-2024-00178650

Sample Name	SS03 0-0.1	Reception temperature:	13.7 °C
Reception Date & Time:	23/07/2024 13:50	Analysis Ending Date:	02/08/2024
Analysis Started on:	23/07/2024	Sampled By	EMMA NOLLY
Sampled Date & Time	22/07/2024 10:45	Sample correctly preserved	Yes
Attempt to Chill was evident	Yes		
Appropriate sample containers have been used	Yes		

METALS	RESULTS	LOQ
--------	---------	-----

NU0Y3 Lead (Pb) Lead (Pb)	4200 mg/kg	0.1
NU0M8 Arsenic (As) Arsenic (As)	9.7 mg/kg	0.1
NU0N8 Chromium (Cr) Chromium (Cr)	22 mg/kg	0.1
NU0P8 Copper (Cu) Copper (Cu)	170 mg/kg	0.1
NU0Q8 Nickel (Ni) Nickel (Ni)	11 mg/kg	0.1
NUKZ4 Antimony (Sb) Antimony (Sb)	130 mg/kg	0.5
NU2A2 Mercury (Hg) Mercury (Hg)	0.10 mg/kg	0.01
NU0U5 Zinc (Zn) Zinc (Zn)	210 mg/kg	5
NU0V3 Cadmium (Cd) Cadmium (Cd)	0.23 mg/kg	0.01

RESULTS	LOQ
---------	-----

NU5E9 pH pH	6.5	0.1
-----------------------	-----	-----

Environment Testing NZ

HOLDING TIMES

Test	Sampling Date	Holding End	Effective Holding (days)	Requirement (days)	Compliance
NU0M8 Arsenic (As)	22/07/2024	25/07/2024	3	180	True
NU0N8 Chromium (Cr)	22/07/2024	24/07/2024	2	180	True
NU0P8 Copper (Cu)	22/07/2024	24/07/2024	2	180	True
NU0Q8 Nickel (Ni)	22/07/2024	24/07/2024	2	180	True
NU0U5 Zinc (Zn)	22/07/2024	24/07/2024	2	180	True
NU0V3 Cadmium (Cd)	22/07/2024	24/07/2024	2	180	True
NU0Y3 Lead (Pb)	22/07/2024	26/07/2024	4	180	True
NU2A2 Mercury (Hg)	22/07/2024	24/07/2024	2	28	True
NU5E9 pH	22/07/2024	25/07/2024	3	7	True
NUKZ4 Antimony (Sb)	22/07/2024	02/08/2024	11	180	True

SAMPLE CODE 816-2024-00178651

Sample Name	SS03 A	Reception temperature:	13.7 °C
Reception Date & Time:	23/07/2024 13:50	Analysis Ending Date:	02/08/2024
Analysis Started on:	23/07/2024	Sampled By	EMMA NOLLY
Sampled Date & Time	22/07/2024 10:50	Sample correctly preserved	Yes
Attempt to Chill was evident	Yes		
Appropriate sample containers have been used	Yes		

METALS	RESULTS	LOQ
NU0Y3 Lead (Pb)		
Lead (Pb)	4200 mg/kg	0.1
NU0M8 Arsenic (As)		
Arsenic (As)	14 mg/kg	0.1
NU0N8 Chromium (Cr)		
Chromium (Cr)	20 mg/kg	0.1
NU0P8 Copper (Cu)		
Copper (Cu)	160 mg/kg	0.1
NU0Q8 Nickel (Ni)		
Nickel (Ni)	10 mg/kg	0.1
NUKZ4 Antimony (Sb)		
Antimony (Sb)	240 mg/kg	0.5
NU2A2 Mercury (Hg)		
Mercury (Hg)	0.094 mg/kg	0.01
NU0U5 Zinc (Zn)		
Zinc (Zn)	210 mg/kg	5
NU0V3 Cadmium (Cd)		
Cadmium (Cd)	0.27 mg/kg	0.01

	RESULTS	LOQ
NU5E9 pH		
pH	6.5	0.1

Environment Testing NZ

HOLDING TIMES

Test	Sampling Date	Holding End	Effective Holding (days)	Requirement (days)	Compliance
NU0M8 Arsenic (As)	22/07/2024	24/07/2024	2	180	True
NU0N8 Chromium (Cr)	22/07/2024	24/07/2024	2	180	True
NU0P8 Copper (Cu)	22/07/2024	24/07/2024	2	180	True
NU0Q8 Nickel (Ni)	22/07/2024	24/07/2024	2	180	True
NU0U5 Zinc (Zn)	22/07/2024	24/07/2024	2	180	True
NU0V3 Cadmium (Cd)	22/07/2024	24/07/2024	2	180	True
NU0Y3 Lead (Pb)	22/07/2024	26/07/2024	4	180	True
NU2A2 Mercury (Hg)	22/07/2024	24/07/2024	2	28	True
NU5E9 pH	22/07/2024	25/07/2024	3	7	True
NUKZ4 Antimony (Sb)	22/07/2024	02/08/2024	11	180	True

SAMPLE CODE 816-2024-00178652

Sample Name	SS04 0-0.1	Reception temperature:	13.7 °C
Reception Date & Time:	23/07/2024 13:50	Analysis Ending Date:	02/08/2024
Analysis Started on:	23/07/2024	Sampled By	EMMA NOLLY
Sampled Date & Time	22/07/2024 11:10	Sample correctly preserved	Yes
Attempt to Chill was evident	Yes		
Appropriate sample containers have been used	Yes		

METALS	RESULTS	LOQ
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NU0Y3 Lead (Pb)			
Lead (Pb)	40000	mg/kg	0.1
NU0M8 Arsenic (As)			
Arsenic (As)	170	mg/kg	0.1
NU0N8 Chromium (Cr)			
Chromium (Cr)	20	mg/kg	0.1
NU0P8 Copper (Cu)			
Copper (Cu)	4300	mg/kg	0.1
NU0Q8 Nickel (Ni)			
Nickel (Ni)	8.6	mg/kg	0.1
NUKZ4 Antimony (Sb)			
Antimony (Sb)	3200	mg/kg	0.5
NU2A2 Mercury (Hg)			
Mercury (Hg)	0.28	mg/kg	0.01
NU0U5 Zinc (Zn)			
Zinc (Zn)	150	mg/kg	5
NU0V3 Cadmium (Cd)			
Cadmium (Cd)	0.75	mg/kg	0.01

RESULTS	LOQ
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☉ NWEBH PAH BaP TEQ

Acenaphthene	<0.02	mg/kg	0.0001
Acenaphthylene	0.05	mg/kg	0.001
Anthracene	<0.02	mg/kg	0.001
benz (a) anthracene	<0.02	mg/kg	0.0001
Benzo(a)pyrene	0.02	mg/kg	0.0001
Benzo(a)pyrene TEQ (lower bound)	0.07	mg/kg	0.001

Environment Testing NZ

	RESULTS		LOQ
③ NWEBH PAH BaP TEQ			
Benzo(a)pyrene TEQ (medium bound)	0.12	mg/kg	0.004
Benzo(a)pyrene TEQ (upper bound)	0.17	mg/kg	0.008
Benzo(b+k)fluoranthene	0.03	mg/kg	0.001
Benzo(g,h,i)perylene	0.02	mg/kg	0.001
Chrysene	<0.02	mg/kg	0.0001
Dibenz(a,h)anthracene	<0.02	mg/kg	0.0001
Fluoranthene	<0.02	mg/kg	0.0001
Fluorene	<0.02	mg/kg	0.0001
Indeno(1,2,3-cd)pyrene	0.02	mg/kg	0.0001
Naphthalene	<0.02	mg/kg	0.0001
Phenanthrene	<0.02	mg/kg	0.0001
Pyrene	<0.02	mg/kg	0.0001
NU5E9 pH			
pH	7.1		0.1

HOLDING TIMES						
Test		Sampling Date	Holding End	Effective Holding (days)	Requirement (days)	Compliance
NU0M8	Arsenic (As)	22/07/2024	24/07/2024	2	180	True
NU0N8	Chromium (Cr)	22/07/2024	24/07/2024	2	180	True
NU0P8	Copper (Cu)	22/07/2024	26/07/2024	4	180	True
NU0Q8	Nickel (Ni)	22/07/2024	24/07/2024	2	180	True
NU0U5	Zinc (Zn)	22/07/2024	24/07/2024	2	180	True
NU0V3	Cadmium (Cd)	22/07/2024	24/07/2024	2	180	True
NU0Y3	Lead (Pb)	22/07/2024	26/07/2024	4	180	True
NU2A2	Mercury (Hg)	22/07/2024	24/07/2024	2	28	True
NU5E9	pH	22/07/2024	25/07/2024	3	7	True
NUKZ4	Antimony (Sb)	22/07/2024	02/08/2024	11	180	True
NWEBH	PAH BaP TEQ	22/07/2024	02/08/2024	11	7	False

SAMPLE CODE	816-2024-00178653				
Sample Name	SS05 0-0.1		Reception temperature:	13.7 °C	
Reception Date & Time:	23/07/2024 13:50		Analysis Ending Date:	02/08/2024	
Analysis Started on:	23/07/2024		Sampled By	EMMA NOLLY	
Sampled Date & Time	22/07/2024 11:20		Sample correctly preserved	Yes	
Attempt to Chill was evident	Yes				
Appropriate sample containers have been used	Yes				

	RESULTS		LOQ
NU0Y3 Lead (Pb)			
Lead (Pb)	820	mg/kg	0.1
NU0M8 Arsenic (As)			
Arsenic (As)	13	mg/kg	0.1
NU0N8 Chromium (Cr)			
Chromium (Cr)	17	mg/kg	0.1
NU0P8 Copper (Cu)			
Copper (Cu)	160	mg/kg	0.1

Environment Testing NZ

METALS	RESULTS	LOQ
NU0Q8 Nickel (Ni) Nickel (Ni)	8.3	mg/kg 0.1
NUKZ4 Antimony (Sb) Antimony (Sb)	33	mg/kg 0.5
NU2A2 Mercury (Hg) Mercury (Hg)	0.038	mg/kg 0.01
NU0U5 Zinc (Zn) Zinc (Zn)	650	mg/kg 5
NU0V3 Cadmium (Cd) Cadmium (Cd)	0.18	mg/kg 0.01

RESULTS	LOQ
NU5E9 pH pH	7.0 0.1

HOLDING TIMES						
Test	Sampling Date	Holding End	Effective Holding (days)	Requirement (days)	Compliance	
NU0M8 Arsenic (As)	22/07/2024	24/07/2024	2	180	True	
NU0N8 Chromium (Cr)	22/07/2024	24/07/2024	2	180	True	
NU0P8 Copper (Cu)	22/07/2024	24/07/2024	2	180	True	
NU0Q8 Nickel (Ni)	22/07/2024	24/07/2024	2	180	True	
NU0U5 Zinc (Zn)	22/07/2024	25/07/2024	3	180	True	
NU0V3 Cadmium (Cd)	22/07/2024	24/07/2024	2	180	True	
NU0Y3 Lead (Pb)	22/07/2024	24/07/2024	2	180	True	
NU2A2 Mercury (Hg)	22/07/2024	24/07/2024	2	28	True	
NU5E9 pH	22/07/2024	25/07/2024	3	7	True	
NUKZ4 Antimony (Sb)	22/07/2024	02/08/2024	11	180	True	

SAMPLE CODE	816-2024-00178654		
Sample Name	SS06 0-0.1		
Reception Date & Time:	23/07/2024 13:50	Reception temperature:	13.7 °C
Analysis Started on:	23/07/2024	Analysis Ending Date:	02/08/2024
Sampled Date & Time	22/07/2024 11:35	Sampled By	EMMA NOLLY
Attempt to Chill was evident	Yes	Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes		

METALS	RESULTS	LOQ
NU0Y3 Lead (Pb) Lead (Pb)	1600	mg/kg 0.1
NU0M8 Arsenic (As) Arsenic (As)	8.3	mg/kg 0.1
NU0N8 Chromium (Cr) Chromium (Cr)	16	mg/kg 0.1
NU0P8 Copper (Cu) Copper (Cu)	200	mg/kg 0.1
NU0Q8 Nickel (Ni) Nickel (Ni)	9.1	mg/kg 0.1
NUKZ4 Antimony (Sb) Antimony (Sb)	45	mg/kg 0.5

Environment Testing NZ

METALS	RESULTS	LOQ
NU2A2 Mercury (Hg)		
Mercury (Hg)	0.093	mg/kg 0.01
NU0U5 Zinc (Zn)		
Zinc (Zn)	290	mg/kg 5
NU0V3 Cadmium (Cd)		
Cadmium (Cd)	0.18	mg/kg 0.01

RESULTS	LOQ
NU5E9 pH	
pH	7.2 0.1

HOLDING TIMES						
Test		Sampling Date	Holding End	Effective Holding (days)	Requirement (days)	Compliance
NU0M8	Arsenic (As)	22/07/2024	24/07/2024	2	180	True
NU0N8	Chromium (Cr)	22/07/2024	24/07/2024	2	180	True
NU0P8	Copper (Cu)	22/07/2024	24/07/2024	2	180	True
NU0Q8	Nickel (Ni)	22/07/2024	24/07/2024	2	180	True
NU0U5	Zinc (Zn)	22/07/2024	24/07/2024	2	180	True
NU0V3	Cadmium (Cd)	22/07/2024	24/07/2024	2	180	True
NU0Y3	Lead (Pb)	22/07/2024	26/07/2024	4	180	True
NU2A2	Mercury (Hg)	22/07/2024	24/07/2024	2	28	True
NU5E9	pH	22/07/2024	25/07/2024	3	7	True
NUKZ4	Antimony (Sb)	22/07/2024	02/08/2024	11	180	True

SAMPLE CODE	816-2024-00178655
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Sample Name	SS06 0.3	
Reception Date & Time:	23/07/2024 13:50	Reception temperature: 13.7 °C
Analysis Started on:	23/07/2024	Analysis Ending Date: 02/08/2024
Sampled Date & Time	22/07/2024 11:40	Sampled By EMMA NOLLY
Attempt to Chill was evident	Yes	Sample correctly preserved Yes
Appropriate sample containers have been used	Yes	

METALS	RESULTS	LOQ
NU0Y3 Lead (Pb)		
Lead (Pb)	120	mg/kg 0.1
NU0M8 Arsenic (As)		
Arsenic (As)	4.9	mg/kg 0.1
NU0N8 Chromium (Cr)		
Chromium (Cr)	14	mg/kg 0.1
NU0P8 Copper (Cu)		
Copper (Cu)	120	mg/kg 0.1
NU0Q8 Nickel (Ni)		
Nickel (Ni)	8.1	mg/kg 0.1
NUKZ4 Antimony (Sb)		
Antimony (Sb)	5.4	mg/kg 0.5
NU2A2 Mercury (Hg)		
Mercury (Hg)	0.21	mg/kg 0.01
NU0U5 Zinc (Zn)		
Zinc (Zn)	110	mg/kg 5

Environment Testing NZ

METALS	RESULTS	LOQ
NU0V3 Cadmium (Cd)		
Cadmium (Cd)	0.15	mg/kg 0.01

RESULTS	LOQ
NU5E9 pH	
pH	6.9 0.1

HOLDING TIMES						
Test		Sampling Date	Holding End	Effective Holding (days)	Requirement (days)	Compliance
NU0M8	Arsenic (As)	22/07/2024	24/07/2024	2	180	True
NU0N8	Chromium (Cr)	22/07/2024	24/07/2024	2	180	True
NU0P8	Copper (Cu)	22/07/2024	24/07/2024	2	180	True
NU0Q8	Nickel (Ni)	22/07/2024	24/07/2024	2	180	True
NU0U5	Zinc (Zn)	22/07/2024	24/07/2024	2	180	True
NU0V3	Cadmium (Cd)	22/07/2024	24/07/2024	2	180	True
NU0Y3	Lead (Pb)	22/07/2024	24/07/2024	2	180	True
NU2A2	Mercury (Hg)	22/07/2024	24/07/2024	2	28	True
NU5E9	pH	22/07/2024	25/07/2024	3	7	True
NUKZ4	Antimony (Sb)	22/07/2024	02/08/2024	11	180	True

SAMPLE CODE	816-2024-00178656				
Sample Name	SS07 0-0.1		Reception temperature:	13.7 °C	
Reception Date & Time:	23/07/2024 13:50		Analysis Ending Date:	02/08/2024	
Analysis Started on:	23/07/2024		Sampled By	EMMA NOLLY	
Sampled Date & Time	22/07/2024 11:50		Sample correctly preserved	Yes	
Attempt to Chill was evident	Yes				
Appropriate sample containers have been used	Yes				

METALS	RESULTS	LOQ
NU0Y3 Lead (Pb)		
Lead (Pb)	460	mg/kg 0.1
NU0M8 Arsenic (As)		
Arsenic (As)	6.2	mg/kg 0.1
NU0N8 Chromium (Cr)		
Chromium (Cr)	23	mg/kg 0.1
NU0P8 Copper (Cu)		
Copper (Cu)	230	mg/kg 0.1
NU0Q8 Nickel (Ni)		
Nickel (Ni)	16	mg/kg 0.1
NUKZ4 Antimony (Sb)		
Antimony (Sb)	18	mg/kg 0.5
NU2A2 Mercury (Hg)		
Mercury (Hg)	0.095	mg/kg 0.01
NU0U5 Zinc (Zn)		
Zinc (Zn)	630	mg/kg 5
NU0V3 Cadmium (Cd)		
Cadmium (Cd)	0.16	mg/kg 0.01

RESULTS	LOQ
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© NWEBH PAH BaP TEQ



Environment Testing NZ

	RESULTS		LOQ
③ NWEBH PAH BaP TEQ			
Acenaphthene	0.03	mg/kg	0.0001
Acenaphthylene	0.50	mg/kg	0.001
Anthracene	0.18	mg/kg	0.001
benz (a) anthracene	1.1	mg/kg	0.0001
Benzo(a)pyrene	1.4	mg/kg	0.0001
Benzo(a)pyrene TEQ (lower bound)	7.6	mg/kg	0.001
Benzo(a)pyrene TEQ (medium bound)	7.6	mg/kg	0.004
Benzo(a)pyrene TEQ (upper bound)	7.6	mg/kg	0.008
Benzo(b+k)fluoranthene	1.8	mg/kg	0.001
Benzo(g,h,i)perylene	0.82	mg/kg	0.001
Chrysene	1.1	mg/kg	0.0001
Dibenz(a,h)anthracene	0.30	mg/kg	0.0001
Fluoranthene	1.4	mg/kg	0.0001
Fluorene	0.02	mg/kg	0.0001
Indeno(1,2,3-cd)pyrene	0.99	mg/kg	0.0001
Naphthalene	0.24	mg/kg	0.0001
Phenanthrene	0.16	mg/kg	0.0001
Pyrene	1.6	mg/kg	0.0001
NU5E9 pH			
pH	6.4		0.1

HOLDING TIMES						
Test		Sampling Date	Holding End	Effective Holding (days)	Requirement (days)	Compliance
NU0M8	Arsenic (As)	22/07/2024	24/07/2024	2	180	True
NU0N8	Chromium (Cr)	22/07/2024	24/07/2024	2	180	True
NU0P8	Copper (Cu)	22/07/2024	24/07/2024	2	180	True
NU0Q8	Nickel (Ni)	22/07/2024	24/07/2024	2	180	True
NU0U5	Zinc (Zn)	22/07/2024	25/07/2024	3	180	True
NU0V3	Cadmium (Cd)	22/07/2024	24/07/2024	2	180	True
NU0Y3	Lead (Pb)	22/07/2024	26/07/2024	4	180	True
NU2A2	Mercury (Hg)	22/07/2024	24/07/2024	2	28	True
NU5E9	pH	22/07/2024	25/07/2024	3	7	True
NUKZ4	Antimony (Sb)	22/07/2024	02/08/2024	11	180	True
NWEBH	PAH BaP TEQ	22/07/2024	02/08/2024	11	7	False

SAMPLE CODE	816-2024-00178657				
Sample Name	SS07 0.4		Reception temperature:	13.7 °C	
Reception Date & Time:	23/07/2024 13:50		Analysis Ending Date:	02/08/2024	
Analysis Started on:	23/07/2024		Sampled By	EMMA NOLLY	
Sampled Date & Time	22/07/2024 12:05		Sample correctly preserved	Yes	
Attempt to Chill was evident	Yes				
Appropriate sample containers have been used	Yes				

METALS	RESULTS		LOQ
NU0Y3 Lead (Pb)			
Lead (Pb)	250	mg/kg	0.1

Environment Testing NZ

METALS	RESULTS		LOQ
NU0M8 Arsenic (As) Arsenic (As)	4.4	mg/kg	0.1
NU0N8 Chromium (Cr) Chromium (Cr)	13	mg/kg	0.1
NU0P8 Copper (Cu) Copper (Cu)	100	mg/kg	0.1
NU0Q8 Nickel (Ni) Nickel (Ni)	6.5	mg/kg	0.1
NUKZ4 Antimony (Sb) Antimony (Sb)	3.8	mg/kg	0.5
NU2A2 Mercury (Hg) Mercury (Hg)	0.25	mg/kg	0.01
NU0U5 Zinc (Zn) Zinc (Zn)	120	mg/kg	5
NU0V3 Cadmium (Cd) Cadmium (Cd)	0.12	mg/kg	0.01

METALS	RESULTS		LOQ
NU5E9 pH pH	6.3		0.1

HOLDING TIMES						
Test	Sampling Date	Holding End	Effective Holding (days)	Requirement (days)	Compliance	
NU0M8 Arsenic (As)	22/07/2024	24/07/2024	2	180	True	
NU0N8 Chromium (Cr)	22/07/2024	24/07/2024	2	180	True	
NU0P8 Copper (Cu)	22/07/2024	24/07/2024	2	180	True	
NU0Q8 Nickel (Ni)	22/07/2024	24/07/2024	2	180	True	
NU0U5 Zinc (Zn)	22/07/2024	24/07/2024	2	180	True	
NU0V3 Cadmium (Cd)	22/07/2024	24/07/2024	2	180	True	
NU0Y3 Lead (Pb)	22/07/2024	24/07/2024	2	180	True	
NU2A2 Mercury (Hg)	22/07/2024	24/07/2024	2	28	True	
NU5E9 pH	22/07/2024	25/07/2024	3	7	True	
NUKZ4 Antimony (Sb)	22/07/2024	02/08/2024	11	180	True	

SAMPLE CODE	816-2024-00178658		
Sample Name	SS08 0-0.1		
Reception Date & Time:	23/07/2024 13:50	Reception temperature:	13.7 °C
Analysis Started on:	23/07/2024	Analysis Ending Date:	02/08/2024
Sampled Date & Time	22/07/2024 12:15	Sampled By	EMMA NOLLY
Attempt to Chill was evident	Yes	Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes		

METALS	RESULTS		LOQ
NU0Y3 Lead (Pb) Lead (Pb)	3600	mg/kg	0.1
NU0M8 Arsenic (As) Arsenic (As)	41	mg/kg	0.1
NU0N8 Chromium (Cr) Chromium (Cr)	36	mg/kg	0.1

Environment Testing NZ

METALS	RESULTS	LOQ
NU0P8 Copper (Cu) Copper (Cu)	450 mg/kg	0.1
NU0Q8 Nickel (Ni) Nickel (Ni)	8.8 mg/kg	0.1
NUKZ4 Antimony (Sb) Antimony (Sb)	120 mg/kg	0.5
NU2A2 Mercury (Hg) Mercury (Hg)	0.079 mg/kg	0.01
NU0U5 Zinc (Zn) Zinc (Zn)	200 mg/kg	5
NU0V3 Cadmium (Cd) Cadmium (Cd)	0.25 mg/kg	0.01

RESULTS	LOQ
NU5E9 pH pH	6.2 0.1

HOLDING TIMES						
Test		Sampling Date	Holding End	Effective Holding (days)	Requirement (days)	Compliance
NU0M8	Arsenic (As)	22/07/2024	24/07/2024	2	180	True
NU0N8	Chromium (Cr)	22/07/2024	24/07/2024	2	180	True
NU0P8	Copper (Cu)	22/07/2024	26/07/2024	4	180	True
NU0Q8	Nickel (Ni)	22/07/2024	24/07/2024	2	180	True
NU0U5	Zinc (Zn)	22/07/2024	24/07/2024	2	180	True
NU0V3	Cadmium (Cd)	22/07/2024	24/07/2024	2	180	True
NU0Y3	Lead (Pb)	22/07/2024	26/07/2024	4	180	True
NU2A2	Mercury (Hg)	22/07/2024	24/07/2024	2	28	True
NU5E9	pH	22/07/2024	25/07/2024	3	7	True
NUKZ4	Antimony (Sb)	22/07/2024	02/08/2024	11	180	True

LIST OF METHODS	
NU0M8 Arsenic (As): Internal Method LTM-MET-3040, ICP-MS	NU0N8 Chromium (Cr): Internal Method LTM-MET-3040, ICP-MS
NU0P8 Copper (Cu): Internal Method LTM-MET-3040, ICP-MS	NU0Q8 Nickel (Ni): Internal Method LTM-MET-3040, ICP-MS
NU0U5 Zinc (Zn): Internal Method LTM-MET-3040, ICP-MS	NU0V3 Cadmium (Cd): Internal Method LTM-MET-3040, ICP-MS
NU0Y3 Lead (Pb): Internal Method LTM-MET-3040, ICP-MS	NU2A2 Mercury (Hg): Internal Method LTM-MET-3040, ICP-MS
NU5E9 pH: Internal Method LTM-GEN-7080, Potentiometry	NUKZ4 Antimony (Sb): Internal Method LTM-MET-3040, ICP-MS
NWEBH PAH BaP TEQ: Internal Method, GC-MS	

Signature

Gabriela Carvalhaes Manager Chemistry

EXPLANATORY NOTE

Environment Testing NZ

- ① Test is not accredited
- ② Test is subcontracted within Eurofins group and is accredited
- ③ Test is subcontracted within Eurofins group and is not accredited
- ④ Test is subcontracted outside Eurofins group and is accredited
- ⑤ Test is subcontracted outside Eurofins group and is not accredited
- ⑥ Test result is provided by the customer and is not accredited
- ⑦ Tested at the sampling point by Eurofins and is not accredited
- ⑧ Tested at the sampling point by Eurofins and is accredited
- ⑨ Test is RLP accredited
- ⑩ Test is subcontracted within Eurofins group and is RLP accredited

N/A means Not Applicable

Not Detected means not detected at or above the Limit of Quantification (LOQ)

LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

✘ (Unsatisfactory) means does not meet the specification

✔ (Satisfactory) means meets the specification

General

1. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
2. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
3. Actual LOQs are matrix dependent. Quoted LOQs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
5. Analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
6. Samples were analysed on an 'as received' basis.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the sampling date; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Holding times are expressed in days.

Units

mg/kg: milligrams per kilogram
µg/L: micrograms per litre
org/100 mL: Organisms per 100 millilitres
CFU: Colony Forming Unit

mg/L: milligrams per litre
ppb: parts per billion
NTU: Nephelometric Turbidity Units
Colour: Pt-Co Units (CU)

ppm: parts per million
%: Percentage
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA American Public Health Association
TCLP Toxicity Characteristic Leaching Procedure
US EPA United States Environmental Protection Agency

All test method Quality Controls including method blanks, reference samples, spikes, surrogates, and duplicate sample testing, have passed and are within the control limits.

The Customer acknowledges and accepts that: (a) where Eurofins is not responsible for sampling, the test result(s) in this report apply only to the sample as received. Customer is solely responsible for the sampling process and warrants that the sample provided to Eurofins is representative of the lot / batch from which the samples were drawn; and (b) Eurofins expresses no opinion and accepts no liability in respect of the Customer's production process or homogeneity of the product.

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The tests are identified by a five-digit code, their description is available on request.

Accreditation does not apply to comments or graphical representations.

Unless otherwise stated, all tests in this analytical report (except for subcontracted tests) are performed at 35 O'Rorke Road, Penrose, Auckland, NEW ZEALAND.

The laboratory is not responsible for the information provided by the customer which can affect the validity of the results, for example: sampling information such as date/time, field data etc.

Eurofins may subcontract the performance of part or all of the Services to a third party and the Customer authorises the release of all information necessary to the third party for the provision of the Services.

All samples become the property of Eurofins to the extent necessary for the performance of the Services.

Eurofins will not be required to store samples and may destroy or otherwise dispose of the samples or return the samples to the Customer (at the Customer's cost in all respects) immediately following analysis of the samples.

If the Customer pays for storage of the samples Eurofins will take commercially reasonable steps to store the samples for the agreed period in terms of industry practice.

The Eurofins water sampling service follows methodology based on AS/NZS 5667 and / or best practice to collect and transport samples that are fit for the purpose of analytical testing. The laboratory is not responsible for sampling activities unless explicitly indicated by the statement "Sampled by Eurofins" on the report for water samples.

The Customer acknowledges that the Services are provided using the current state of technology and methods developed and generally applied by Eurofins and involve analysis, interpretations, consulting work and conclusions. Eurofins shall use commercially reasonable degree of care in providing the Services.

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