REPORT PREPARED FOR:
FULTON HOGAN LAND DEVELOPMENT LIMITED

Site Management & Remedial Action Plan
MILLDALE STAGES 10-13
WAINUI

Prepared by:
Groundwater and Environmental Services
PO Box 190
Cambridge
24 January 2025

EXECUTIVE SUMMARY

Groundwater and Environmental Services was engaged by Fulton Hogan Land Development Limited to prepare this site management and remedial action plan for identified contamination in parts of the Milldale Stages 10-13 residential development site. This plan outlines proposed remediation and management procedures for identified contamination areas at the site to minimise potential risks to human health and the environment. It also provides procedures for assessment and management of unexpected contamination that could be encountered during site earthworks.

A detailed site investigation identified limited areas where contamination levels are above applicable guideline levels for human health or environmental protection. Arsenic contamination above NES residential guidelines was identified around the farm shed south of the dwelling at 107 Cemetery Road, and in the former stockyard at 167 Argent Lane. Zinc contamination above permitted activity criteria for environmental protection was found also found around the farm shed south of the dwelling at 107 Cemetery Road, and in the south-east corner of the hay shed in the north-west of Lot 3 DP 488814. Asbestos contamination below the BRANZ soil guideline was found by the south-east corner of the hay shed in the north-west of Lot 3 DP 488814.

Asbestos was identified in building materials from the former shed location by 107 Cemetery Road, east of the Lot 3 DP 488814 hay shed, and at the former water tank location at 167 Argent Lane.

Remediation of contamination at levels above guidelines and soil with asbestos-containing materials is required prior to any other earthworks in these areas. If contamination at levels below guidelines remains following remediation, it will require management during site earthworks.

Further soil sampling and analysis is recommended prior to the start of any earthworks to better define the extent of contamination in each area.

The primary remediation objective for the site is to provide a site fit for the intended residential development. A secondary objective is to retain excess contaminated soils on site where possible.

Contamination that exceeds NES residential guidelines for protection of human health may be reused on site within designated recreational areas if desired, if it does not also exceed the guidelines for recreational land use. Any contamination that exceeds the recreational guidelines or permitted activity criteria must be remediated by off-site managed fill or landfill disposal as appropriate.

Small areas of recent rubbish burning are considered to be *de minimus* in terms of potential site contamination effects. This material should however be removed for appropriate off-site disposal prior to any earthworks in the areas.

Contamination at levels below applicable guidelines does not require remediation and will be permitted to remain on site within reserve areas or residential lots following the completion of redevelopment earthworks. Excess or unsuitable material may however be remediated by off-site managed fill or landfill disposal as required.

Material removed from site that has heavy metals at levels above their natural background ranges, asbestos or detectable levels of any other contaminants will require disposal at a registered managed fill or landfill depending on the degree of contamination. Appropriate validation of removal of contaminated material will be required prior to any subsequent removal of clean fill material from areas where contamination had been identified. No contaminated material is to be removed for off-site disposal as clean fill.

Provided that remaining levels of contamination on site are below the applicable guidelines for the land use at their location, it is highly unlikely that such material would present any significant risk to human health or the environment under that land use.

The remediation and management of contamination at the property will be carried out in accordance with the conditions of consents from Auckland Council.

A set of summary notes to the contractor, attached in Appendix A, provides an overview of key points from this plan.

A suitably qualified and experienced practitioner (SQEP) shall be engaged to monitor the earthworks to confirm that contaminated material is dealt with appropriately. All documentation relating to the excavation and disposal of contaminated material should be retained for inclusion in the site validation report. Procedures relating to health and safety, sediment control and dust control are presented in this plan. Additional asbestos specific procedures may be provided in an asbestos removal control plan if required.

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LIMITATIONS

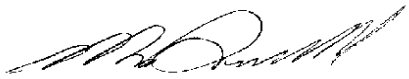
No liability is assumed for misrepresentation of data or for items not visible, accessible or present at the time of the site investigations conducted by Groundwater and Environmental Services that may affect the validity and/or accuracy of the interpretation of environmental data.

Interpretations and conclusions presented herein are based on data presented in this report, information from others and experience on similar projects. The available data does not preclude the presence of materials at other locations at the site, which presently or in the future may be considered hazardous. Services in respect of this investigation have been performed in accordance with professional standards for investigations of contamination assessment. No guarantees are either expressed or implied.

This document and the information contained herein have been prepared for the use of Fulton Hogan Land Development Limited in relation to the redevelopment of the subject site and should not be used or relied upon by any other person or entity for any other project, with the exception that the relevant territorial authority can rely on it for the purpose of processing those consent applications for which this report has been prepared. Any reliance on this report by any other parties shall be at such party's sole risk.

Report prepared: 24 January 2025

Report prepared by:



Andrew MacDonald, MSc(Hons), Principal

1 Introduction

This report has been prepared in support of the application by Fulton Hogan Land Development (FHLD) for a resource consent to the Environmental Protection Authority (EPA) under the Fast-Track Approvals Act 2024 (FTAA).

Resource consent is required for bulk earthworks, subdivision, streamworks, water permits and discharge consents for the development of 606 residential lots, 27 residential super lots, jointly owned access lots (JOALS) and roads to vest, esplanade and reserves to vest, and all associated works, landscaping and infrastructure.

Groundwater and Environmental Services (GES) has been engaged to prepare a contaminated site management and remedial action plan (SMP/RAP) for handling contaminated material as part of the bulk earthworks phase of Milldale Stages 10-13.

This SMP/RAP outlines proposed remediation and management procedures for identified contamination at the site to minimise potential risks to human health and the environment. It also provides procedures for assessment and management of unexpected contamination that could be encountered during site earthworks.

1.1 Site Identification

The site subject to this application is located within the Milldale development and referred to as the Milldale Stages 10 – 13 subdivision areas (the Site). The site consists of Land covered by LOT 9006 DP 602895; Lot 9007 DP 602895; Lot 3 DP 151229; Lot 1 DP 147739; Lot 1 DP 488814; Lot 2 DP 488814; Lot 3 DP 488814; and Lot 2 DP 147739. Stages 10 – 13 are located within the northern and western extents of the Milldale development and comprise the remaining undeveloped greenfield stages of Milldale.

Overall, the Site covers a total area of approximately 71 ha. The Site is bordered by Wainui Road to the north, Lysnar Road to the north-east, and undeveloped land to the west. Previously consented Milldale stages are located to the south of the Site including Stages 5 – 8 and the Milldale Town Centre.

A full description of the existing environment can be found in the AEE.

A copy of the masterplan for the site is attached as Figure 1.

Lot 9007 DP 602895 is not included in this plan.

Stage 10 is limited to the northeast part of LOT 9006 DP 602895 (131 Argent Lane) that includes the former property at 16 Lysnar Road.

Stage 11 includes Lot 1 DP 147739 (168 Argent Lane), Lot 3 DP 151229, and parts of LOT 9006 DP 602895 (131 Argent Lane), which were formerly separate properties (507 Wainui Road, 507a Wainui Road, and 525 Wainui Road).

Stage 12 includes Lot 2 DP 147739 (167 Argent Lane) and Lot 2 DP 488814.

Stage 13 includes Lot 1 DP 488814 (107 Cemetery Road) and Lot 3 DP 488814.

1.2 Project Description

FHLD are proposing the subdivision and development of the site into a medium density residential development. The proposal will result in the development of the site into 606 residential lots, 27 residential super lots, jointly owned access lots (JOALS) and roads to vest, esplanade and reserves to vest, and all associated works, landscaping and infrastructure.

The development will require land modification works to facilitate Stages 10-13 of the Milldale Fast Track application. This includes bulk earthworks across the site to refine the site to the required finished levels.

A full description of the project is provided in the application AEE.

Activities to be undertaken include topsoil stripping, stockpiling and placing back on site, and cut/fill bulk earthworks.

The intention for the redevelopment is to minimise off-site disposal of excess soil by retaining excavated material on-site where possible.

Soil with contaminant concentrations that exceed guidelines for the protection of human health on recreational land and/or the permitted activity criteria for environmental protection will be excavated and removed for appropriate off-site disposal.

Soil with contaminant concentrations below guidelines for the protection of the environment and human health on recreational land but above those for residential land with 10% home-grown produce consumption may be placed within specific reserve locations on-site in accordance with procedures provided in this plan. Where such contaminated material is not retained on site, this plan provides options and procedures for off-site disposal.

Soil with contaminant concentrations below guidelines for the protection of the environment and human health on residential land with 10% home-grown produce consumption may be retained on site. Where such material cannot be accommodated on site, this plan provides options and procedures for appropriate off-site disposal.

2 Background

The investigation area is located within land that has historically been predominantly used for rural grazing as part of farms and lifestyle blocks. Much of the investigation area was historically in pasture or covered in vegetation.

Significant earthworks, including re-contouring of an unnamed tributary of Waterloo Stream, have been carried out to the south of Stages 10-13 as part of the Milldale development.

There do not appear to be any significant potentially contaminating activities currently being carried out across the investigation area.

Environmental investigations indicated that the parts of the site could have supported at least three separate HAIL classifications, including;

- Horticultural (Greenhouses, market gardens and orchards) - use of pesticides (Category A10) - possible.
- Asbestos products manufacture or disposal including sites with buildings containing asbestos products known to be in a deteriorated condition (Category E1) – Likely.
- Waste disposal to land (Category G5) - likely.

Inspection, soil sampling and analysis identified areas of contamination at the site, and these are summarised in the following section.

2.1 Summary of Contamination

A detailed site investigation (DSI) was carried out for the site by GES in late 2024/early 2025[1] to determine the contamination status of site soils that will be disturbed as part of the planned redevelopment earthworks. The investigation included soil sampling from hand auger boreholes within areas of potential concern at the site from October to November 2024. The sampling targeted areas of actual or potential concern identified in a previous preliminary site investigation (PSI)[2], an additional review of background information, and a walkover inspection of the site. The investigation and sampling included collection of soil and potential asbestos-containing material samples from identified areas of potential contamination at:

- 107 Cemetery Road
- 167 Argent Lane
- 131 Argent Lane
- Lot 3 DP 488814

No sampling was undertaken across the balance of the site.

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[1] Groundwater & Environmental Services (14 January 2025). Detailed Site Investigation, Milldale Stages 10-13, Wainui. Report prepared for Fulton Hogan Land Development Ltd.

[2] • Tonkin & Taylor (June 2020). Preliminary Site Investigation for ground contamination, Milldale Earthworks Precincts 2 and 3. Prepared for Fulton Hogan Land Development Ltd.

Key results from the DSI are included in the table below.

Table 1 Detected Contamination

Location	Sample number	Contamination
107 Cemetery Road		
NW corner of shed N of water tank & S of dwelling	MDL24007	Arsenic above NES residential guidelines & zinc above permitted activity criteria.
Former shed location – paper Road	MDL24011	Asbestos-cement material fragment
Lot 3 DP 488814		
Near northeast corner of shed	MDL24013	Asbestos-cement material fragment
	MDL24015	Asbestos-cement material fragment
Near southeast corner of shed	MDL24016	Asbestos in soil below BRANZ soil guideline
	MDL24017 & 018	Zinc above permitted activity criteria
167 Argent Lane		
Near water tank	MDL24020	Asbestos-cement material fragment
East end of stockyard, near loading ramp	MDL24023 & 24	Arsenic above NES residential guidelines

Aside from the locations set out in the table above, no heavy metal contamination was present at levels outside of the normal background ranges for the individual metals.

No polycyclic aromatic hydrocarbon (PAH) or multiresidue pesticide (MRP) contamination was present in any of the samples that were analysed for those contaminants at levels above the analytical detection limits.

The detected arsenic and zinc contamination in the sample MDL24007 west of the farm shed at 107 Cemetery Road presents a potential risk to human health (arsenic) and the environment (zinc) under the proposed residential land use and remediation is therefore likely to be required in the area of the sample prior to general earthworks.

Asbestos-containing fibrolite in the former shed area along the paper road alignment adjacent to 107 Cemetery Road presents a potential risk to human health if it is disturbed. The volume of asbestos-containing material appeared low however it is recommended that this material is removed along with the remaining pile of burnt demolition material prior to any earthworks being undertaken in that area.

The presence of asbestos-containing material in soil around the hay shed in the northwest of Lot 4 presents a potential risk to human health if the material is disturbed. The level of asbestos detected in soil is below the BRANZ soil guideline value and is therefore unlikely to present a significant risk to human health however its association with asbestos cement sheet pieces in the soil means that remediation of asbestos contamination is recommended. The zinc contamination in soil around the hay shed also presents a potential risk to the environment and should be remediated prior to any redevelopment earthworks in the area.

Asbestos-containing fibrolite found in the west of the house lot at 167 Argent Lane presents a potential risk to human health and should be remediated prior to any earthworks in the area. The arsenic in soil at levels above the NES residential guideline value also presents a risk to human health under future residential land use. Remediation of the arsenic contamination is also recommended.

2.1.1 Required Actions

The DSI identified several areas where contamination levels are above applicable guideline levels for human health or environmental protection or otherwise present a risk. Remediation is required prior to any other earthworks in these areas.

Further soil sampling and analysis is recommended prior to the start of remediation to better define the extent of contamination in each area.

The investigation also identified asbestos contamination in soil that was below the BRANZ soil guideline value. Management of low-level contaminated material is required during site earthworks however; the contamination is likely to be remediated to remove identified zinc contamination.

Restricted discretionary consent under the NES will be required under regulation 10(2).

Resource consent will also be required under the AUP as a controlled activity (E30.4.1 (A6)).

The locations of contamination remediation and management areas across the site are shown on Figures 2 and 3.

Material removed from site that has heavy metals at levels above their natural background ranges, or asbestos contamination would require disposal at a registered managed fill or landfill depending on the degree of contamination. Appropriate validation of removal of contaminated material will be required prior to any subsequent removal of clean fill material from areas where contamination had been identified.

3 Remediation & Management of Contamination

3.1 Remediation Goals and Targets

Contamination that exceeds any of the following guidelines requires remediation prior to any other earthworks in the area of contamination:

- AUP permitted activity criteria for environmental protection;
- NES guideline values for outdoor worker protection;
- NES guideline values for recreational land use;
- NES guideline values for residential land use with 10% home-grown produce consumption, or
- BRANZ soil guideline value.

The primary remediation objective for the site is to retain excess contaminated soils on site where possible and to provide a site fit for the intended residential development.

Contamination that exceeds applicable residential guidelines for protection of human health may be reused on site within designated recreational areas if it does not also exceed the NES guidelines for recreational land use. Contamination that exceeds the recreational guidelines or permitted activity criteria that cannot be reused on site will be remediated by off-site managed fill or landfill disposal as appropriate.

Contamination at levels below applicable guidelines does not specifically require remediation and will be permitted to remain on site within reserve areas (or on residential lots if desired) following the completion of redevelopment earthworks. Unsuitable material may however be remediated by off-site managed fill or landfill disposal where required.

Provided that remaining levels of contamination on site are below the applicable guidelines for the land use at their location, it is highly unlikely that such material would present any significant risk to human health or the environment under that land use.

The remediation and management of contamination at the property will be carried out in accordance with the conditions of consents from Auckland Council.

3.2 Remediation/Management Options and Alternatives

The recommended option for remediation of heavy metal contamination above the permitted activity criteria for environmental protection, NES guideline values for outdoor worker protection, and/or the NES recreational guideline values is excavation and off-site landfill disposal or disposal at a managed fill site **that holds consents to accept the identified levels of contamination**.

The recommended option for remediation of asbestos contamination in soil above the BRANZ soil guideline value, or for asbestos-containing material in soil is excavation and off-site landfill disposal or disposal at a managed fill site **that holds consents to accept the identified levels of contamination**.

The recommended option for remediation of heavy metal contamination above the NES residential guideline values for 10% home-grown produce consumption is excavation and off-site landfill disposal or disposal at a managed fill site **that holds consents to accept the identified levels of contamination**.

Contaminated material with concentrations below the applicable NES guideline values, the BRANZ soil guideline value, and the permitted activity criteria may remain on site. Where required, such material may be stockpiled and reused on site if its final location is recorded in the site validation report. Any such material that cannot be retained on site shall be disposed of at landfill or a managed fill site **that holds consents to accept the identified levels of contamination**.

General recommendations for contamination remediation and management at this property include:

1. All redevelopment earthworks shall be carried out under the control of the most recent version of this SMP/RAP;
2. Soil beneath or around contamination remediation or management areas shall be assumed to contain contamination unless proven otherwise by appropriate soil sampling and analysis;
3. Contaminated fill or soil with concentrations below the NES guideline values for recreational land, the BRANZ Soil Guideline Values, and the permitted activity criteria may be reused on site within designated reserve areas if removal is not required as part of the site redevelopment. Any such material removed from site shall however be taken to a licensed landfill or managed fill for disposal as appropriate;
4. Contaminated fill or soil with concentrations below the NES guideline values for residential land with 10% home-grown produce consumption, the BRANZ Soil Guideline Value, or the permitted activity criteria may be retained on site if removal is not required as part of the site redevelopment. Any such material removed from site shall however be taken to a licensed landfill or managed fill for disposal as appropriate; and
5. Any potential contamination encountered during redevelopment earthworks that differs from the known contamination shall be inspected by a SQEP and tested for potential contaminants as required. Auckland Council shall be notified and consulted regarding any significant additional contamination.

4 Remediation & Contamination Management Work Plan

The proposed procedures for contamination remediation and management are outlined in the following paragraphs. A fuller description of the specific remediation and management activities that are proposed is provided in Section 5. All remediation and management activities will be subject to the provisions of the site health and safety plan for contamination to be provided prior to the start of works.

A set of summary notes to the contractor, attached in Appendix A, provides an overview of key points from this plan, and is intended to aid the site works. Where there is any uncertainty, the more detailed procedures in the full plan shall take precedence.

If applicable, an asbestos removal control plan (ARCP) will be provided by the asbestos remediation contractor. The ARCP will provide additional asbestos-specific procedures for excavation, transport, disposal health and safety, and environmental protection.

4.1 Contaminants of concern and remedial targets

The primary contaminants of concern (COC) are heavy metals and asbestos.

Arsenic concentrations in localised hotspots at 107 Cemetery Road and 167 Argent Lane exceed the NES human health criteria for residential land use with 10% home-grown produce consumption.

Zinc concentrations in localised hotspots at 107 Cemetery Road and Lot 3 DP 488814 exceed the permitted activity criteria for environmental protection.

Asbestos-containing materials and asbestos in soils at levels below the BRANZ soil guideline value are present in parts of 167 Argent Lane, Lot 3 DP 488814, and 107 Cemetery Road.

The remediation target for the above contaminants of concern is to remove the material (for on-site or off-site disposal) and validate that remaining soils in the remediation areas do not present a significant risk to human health or the environment.

4.2 Contamination Remediation – Off-site Disposal

The planned phases of remediation of contamination by excavation and off-site disposal are outlined below. These works will be undertaken under the supervision of a SQEP with all appropriate health, safety, and environmental protection controls in place. These will include appropriate barriers and signage to restrict access to the remediation areas and identify potential hazards.

The process for each remediation area is as follows:

1. Locate and mark out area to be remediated;
2. Provide appropriate barriers and signage to restrict access to the remediation area and identify potential hazards;
3. Excavate and remove the contaminated material from the identified area;

4. Transport contaminated material to the approved disposal site; and
5. Validate the remediated area by visual inspection, sampling, and analysis to determine remaining contamination levels.

Contaminated soil will be carefully excavated and transported in covered trucks to the selected landfill or managed fill disposal site in accordance with the consent conditions for that site.

4.3 Contamination Remediation – On-site Disposal in Reserve Areas

The planned phases of remediation of contamination by excavation and disposal in reserve areas are outlined below. These works will be undertaken under the supervision of a SQEP with all appropriate health, safety, and environmental protection controls in place. These will include appropriate barriers and signage to restrict access to the remediation area and identify potential hazards.

The remediation process is as follows:

1. Prepare recreational reserve area for placing of contaminated material. This may include excavation of clean topsoil and underlying material as appropriate;
2. Locate and mark out area(s) to be remediated;
3. Provide appropriate barriers and signage to restrict access to the remediation area(s) and identify potential hazards;
4. Excavate and remove the contaminated material from the identified area(s);
5. Transport contaminated material to the recreation reserve and place above the highest winter groundwater level in accordance with site earthworks requirements; and
6. Validate the remediated area by visual inspection, sampling, and analysis to determine remaining contamination levels.

No encapsulation of this material will be required as contaminant concentrations will be acceptable for recreational use, however an effort must be made to ensure the soils are adequately stabilised against sediment erosion and run-off and placed above the highest winter groundwater level.

4.3.1 On-site reuse locations

Contaminated topsoil removed from the remediation areas to be reused on site must only be placed in recreational areas, and not within any Esplanade Reserve or Temporary Stormwater areas.

The locations identified as applicable for reuse of contaminated soils will be determined during site earthworks planning.

4.4 Lower-level Contamination Management – On-site Disposal

Material with contamination at levels below residential guideline values and permitted activity criteria may be retained on site for reuse within all areas. The planned phases of general site earthworks requiring excavation and on-site relocation of lower-level contaminated soil are outlined below:

- Mark out areas with low-level contamination requiring excavation;
- Strip and stockpile topsoil as required;
- If required, carry out validation sampling and analysis to determine whether underlying soil is free from contamination and meets clean fill guidelines;
- Carry out bulk cut/fill as per the requirements of the site redevelopment earthworks;

- Re-spread topsoil across site; and
- Record the final locations and depths of relocated contaminated soil.

The works will be undertaken with all appropriate health, safety, and environmental protection controls in place. These will include appropriate signage to identify potential hazards.

4.5 Lower-level Contamination Management – Off-site Disposal

The objective is to retain soils on site where possible however, where required, soil with contamination at levels below residential guideline values and permitted activity criteria may be removed for off-site disposal if it cannot be retained on site. Disposal options for low-level contaminated soil removed from site include:

Clean-fill – Soil with minor exceedances of the background criteria for heavy metals (particularly arsenic and zinc) may be accepted for disposal as clean-fill with the approval of the clean-fill operator in accordance with their consents.

Managed Fill - Soil with heavy metals above background levels and/or with detectable levels of asbestos may be accepted for disposal at a managed fill site **that holds consents to accept the identified levels of contamination**.

Landfill - Soil with heavy metals above background levels and/or with detectable levels of asbestos may be accepted for disposal at a landfill **that holds consents to accept the identified levels of contamination**.

Work required for off-site disposal of low-level contaminated soil includes:

- Mark out areas with low-level contamination requiring excavation;
- Carry out excavation as per the requirements of the site redevelopment earthworks;
- Transport contaminated material to the approved disposal site; and
- If required, carry out validation sampling and analysis to determine whether underlying soil is free from contamination and meets clean fill guidelines.

The works will be undertaken with all appropriate health, safety, and environmental protection controls in place. These will include appropriate signage to identify potential hazards.

4.6 Extent and Location of Areas Requiring Remediation

Prior to the start of general earthworks at the subject site, contaminated soil with heavy metals above relevant guidelines, or contamination with asbestos-containing materials, shall be excavated for off-site disposal or on-site disposal in designated recreation reserves.

The lateral extent and volume of contaminated material to be remediated in each area has been estimated from the results of investigations to date. The initial estimates for the remediation areas are provided in **Table 2** below.

The contaminated soil shall be remediated from each identified area prior to any other earthworks being carried out in that area.

Higher or lower volumes of material may be removed from an area for on-site or off-site disposal if the actual volume of contamination at levels above the guidelines differs from the initial estimate.

The locations of the remediation areas across the site are shown on Figures 2 and 3.

The proposed remediation areas cover **0.1060 hectares** out of the total site area of approximately **71 hectares**. The total estimated volume of contaminated soil requiring remediation is **281 m^3**.

Estimates of contamination volumes involve assumptions about the depth and extent of contamination and are based on information available at the time the estimates are made. Higher or lower volumes of material may be removed for on-site or off-site disposal if the volume of contamination at levels above the guidelines differs from the initial estimates.

Low-level contaminated material included in the total above that does not require removal to enable the redevelopment may be retained in-situ or be placed elsewhere on site.

4.7 Extent and Location of Areas Requiring Management

As part of general earthworks at the subject site, contaminated soil with heavy metals or asbestos at levels below applicable health and environmental protection guidelines, can remain in situ or be excavated for re-use elsewhere on-site. It may also be removed for appropriate off-site disposal if it is deemed to be unsuitable to retain on site or if it is surplus to site requirements.

The lateral extent and volume of contaminated material requiring management during site earthworks will be determined following completion of remediation of contamination that exceeds guidelines.

Where validation sampling shows that there is contamination at levels below guidelines remaining after remediation has been completed. The area of remaining contamination shall be deemed a management area.

The locations of the management areas at the site are the same as the remediation areas shown on Figures 2 and 3.

Potential management areas will therefore cover **0.1060 hectares** out of the total site area of approximately **71 hectares**.

The estimate of potential management area extents is based on the currently assumed extent of remediation areas. Smaller or larger areas of low-level contaminated material may be present following validation sampling for remediation.

Table 2 Proposed Remediation/Management Areas

Area	Location	Contaminants of Concern	Dimensions	Disposal Options
167 Argent Lane				
A	Near water tank	Asbestos-cement sheet fragments	**Area:** 60 m^2 **Depth:** 0.15 m **Volume:** 9 m^3	**On-site recreation reserve** **Off-site Landfill**
B	East end of stockyard, near loading ramp	Arsenic above NES residential guidelines	**Area:** 540 m^2 **Depth:** 0.3 m **Volume:** 162 m^3	**Off-site Landfill** **Off-site managed fill**
Lot 3 DP 488814				
C	Shed in northwest corner of lot	Zinc above permitted activity criteria Asbestos in soil below BRANZ soil guideline Asbestos-cement sheet fragments	**Area:** 260 m^2 **Depth:** 0.5 m **Volume:** 130 m^3	**Off-site Landfill** **Off-site managed fill**
107 Cemetery Road				
D	W of shed N of water tank (S of dwelling)	Arsenic above NES residential guidelines Zinc above permitted activity criteria.	**Area:** 100 m^2 **Depth:** 0.15 m **Volume**: 15 m^3	**Off-site Landfill**
E	Former shed location – paper Road	Asbestos-cement sheet fragments	**Area:** 100 m^2 **Depth:** 0.15 m **Volume:** 15 m^3	**Off-site Landfill**

4.8 Project Roles & Responsibilities

The key project roles and responsibilities for the remediation are set out in the table below.

Table 3 Key Organisational Roles & Responsibilities

Company/Organisation	Role and responsibilities
FHLDL	Consent holder, ultimately responsible for: • Ensuring compliance with consent conditions and requirements of the SMP/RAP. • Appointing a SQEP to liaise with the contractor during the works.
To be advised prior to start of works	FHLDL's representative, responsible for: • Distributing the SMP to the selected lead earthworks contractor. • Overseeing implementation of the SMP/RAP. • Providing approval of contingency measures and/or changes to the SMP/RAP on behalf of FHLDL.
Selected Lead Earthworks Contractor To be advised prior to start of works	Main contractor, responsible for: • Undertaking works in accordance with requirements of the SMP/RAP, conditions of consent, and other relevant plans/documentation. • Ensuring subcontractors are provided with and implement the SMP/RAP. • Ensuring that a copy of the current version of the SMP/RAP is onsite at all times.
Andrew MacDonald (GES)	Contaminated Land Specialist (SEQP) responsible for: • Provision of ground contamination advice during the works. • If necessary, acting as the Independent Competent Person under the requirements of Clause 41(3) of the Asbestos Regulations. • Undertaking site validation and reporting following completion of remediation.
Asbestos Remediation Contractor To be advised if required	Specialist Asbestos Remediation contractor responsible for: • Preparation of asbestos removal control plan appropriate to the degree of contamination. • Submission of notification of asbestos works to Worksafe. • Undertaking asbestos remediation works and implementing required environmental and health and safety controls.

5 Proposed Site Remediation and Management Works

The following are required prior to commencing earthworks:

- Confirm that all necessary authorisations and consents have been obtained;
- Ensure that pre-demolition asbestos surveys are carried out for site buildings. The results of the pre-demolition surveys and clearance certificates following asbestos removal should be evaluated to determine whether any further evaluation of potential asbestos contamination in soil is required;
- Carry out additional soil sampling and analysis as required to better define the extent of remediation and management areas;
- Establish exclusion zones around contamination remediation/management areas, clearly delineating, isolating, and securing these areas as required. The location of these areas will be established via instrument survey by the Contractor in consultation with the SQEP;
- Preparation of a works management plan, including this SMP/RAP. This plan will involve inclusion of supporting documents, such as:
  - Erosion and sediment control plan;
  - Health and safety plan;
  - Environmental management plan;
  - Asbestos management plan (if required); and
  - Dewatering plan (if required).

The remediation shall follow the prescribed sequence of works as outlined below:

1. Location of contaminated soil extents established via instrument survey by the Contractor;
2. Excavation of contaminated soil from each area to the depth specified in this plan;
3. Works stop in the remediation area, and validation inspection/sampling is carried out by the SQEP as specified Section 5.7;
4. Works remain halted until either confirmation received from the SQEP that all contaminated soils are removed, and bulk earthworks can continue, or further remediation is required; and
5. Where further excavation is required, the extent of excavation will be marked out by the SQEP, and steps 2 to 4 will be repeated until all contaminated soils are removed.

The following sections describe the contamination remediation and management activities that will be undertaken as part of the site redevelopment.

5.1 Council Notification

Auckland Council shall be notified in writing prior to any works commencing on site. The notification period shall be in accordance with the requirements set out in the relevant consents for the work. If required, a pre-start meeting shall also be arranged and held with Council and all relevant parties.

5.2 Contractor Selection and Briefing

Contractor(s) undertaking remediation, contamination management or redevelopment earthworks at the site will need to be capable of carrying out the excavation and disposal of the contaminated material in accordance with appropriate health and safety and environmental protection measures.

There will be a briefing and induction of all site staff prior to the start of work to ensure that they are aware of the nature and locations of the contaminated material and are familiar with and adhere to appropriate health and safety procedures for remediation/management and the provisions of the health and safety plans.

The induction process shall also cover the identification of potentially contaminated soils and contingency measures to be followed if unexpected contamination is encountered.

The above measures do not relieve the person in charge of a business or undertaking (PCBU) of responsibility for the health and safety of workers, contractors and the general public or responsibility for protection of the environment.

5.3 Site Establishment Works

Prior to the start of works, the contractor shall be responsible for establishing the site safety and environmental controls including:

- Appropriate fencing around the site to control entry;
- Signage at entry points to the site specifying relevant details of the work being undertaken and health and safety requirements;
- Provision of required personal protection equipment (PPE) and application/use instructions for site personnel dealing with contaminated material;
- Provision of appropriate washing/decontamination facilities for site personnel dealing with contaminated material; and
- Stormwater, silt, and sediment control measures as required by the relevant consent conditions.

Prior to the removal of any contaminated material from site, the contractor shall also be responsible for obtaining appropriate landfill or managed fill disposal permits for contaminated material.

5.4 Identification of areas to be remediated or managed

Areas requiring remediation or management will be identified and marked out on site by the contractor in consultation with the SQEP.

The contractor will be responsible for erecting suitable barriers around the contamination remediation or management areas (if required) with sufficient space inside the barriers to allow for any required earthworks to be carried out. The barriers will include signage detailing the nature of contamination and potential hazards.

5.5 Excavation and removal of contaminated material

The equipment that will be required for general remediation or contamination management excavations at the site includes:

- Personal protective equipment appropriate to the type and degree of contamination;
- A water supply for dust suppression;
- An excavator; and
- Suitable trucks for transporting contaminated material to on-site or off-site disposal locations.

Under dry conditions, excavation areas will be dampened down prior to work commencing. Areas will be kept damp whilst carrying out excavations to reduce the possibility of dust generation.

Contaminated material will be removed from remediation and management areas (where required) using an excavator of an appropriate size to the scale of work being undertaken.

Excavated contaminated material that exceeds the recreational guidelines or permitted activity criteria will be loaded onto a truck and completely covered for transport to the selected disposal facility.

Excavated lower-level contaminated material that cannot be retained on site will also be loaded onto a truck and completely covered for transport to the selected disposal facility.

Excavated contaminated material that exceeds the residential guidelines but is below the recreational guidelines and permitted activity criteria may be loaded into suitable trucks for transport to the specified contaminated soil reuse areas if desired.

Any excavated contaminated material with levels below the applicable guidelines that is going to be reused on site shall be stockpiled separately from uncontaminated material. Any such stockpiles shall be stabilised or covered to prevent the generation of contaminated dust. Stormwater run-off protection shall be put in place around any stockpiles of low-level contaminated material to prevent contaminant migration to clean areas.

The following measures should be adhered to in the loading of trucks with material containing contamination:

- Material shall be kept damp to reduce the potential for dust generation during excavation and loading;
- The drop heights of contaminated material from the excavator into the trucks shall be limited to reduce the potential for dust generation;
- Load sizes in each truck shall be managed to avoid the spillage of contaminated material; and
- The contaminated material in the truck shall be appropriately covered for transport to the approved disposal site.

Prior to leaving a contamination remediation/management area, trucks and all other machinery will be inspected to ensure that no soil or other contaminated material is tracked from that area to other parts of the site or to the public road network. Any material adhering to a truck or other machinery will be removed inside the area and placed into the truck. If required, a suitable vehicle wash will be established inside the site entry.

Appropriate personal decontamination procedures will be followed for staff leaving the remediation/management areas.

Managed fill or landfill weighbridge receipts will be retained to provide proof of the volumes of material that were disposed of. These will be attached to a site validation report.

5.6 Site Record Keeping and Monitoring Requirements

Records which should be kept on site during the project works include the following:

- Weather conditions each day and whether any actions are required to address weather conditions;
- Site conditions;
- Condition and replacement of erosion and sediment control measures;
- Progress / problems associated with the site work;
- Numbers of personnel on site and use of personal protective equipment;
- Monitoring data including stockpiles and movement of soil within the site;
- Record of validation inspections and sampling undertaken, and laboratory results;
- Remediation and validation photographs as appropriate;
- Any analyses of soil or water samples for disposal acceptance purposes;
- Safety, health and environmental discussions and safety non-compliance issues;
- Third party complaints lodged regarding the works, as well as all corrective measures implemented to limit such complaints from reoccurring;
- Waste disposal dockets for all soil and water transported off site;
- Details of the source site and any sample results (if applicable) from imported clean material;
- All incidents and near misses, and
- Any other relevant information.

These records will be used for preparation of the SVR once work at the site is complete.

5.7 Validation of Contamination Removal

At the completion of remediation excavations, the exposed sides and base of each remediation area will be visually inspected and sampled by the selected SQEP. The presence of any visual indications of remaining contamination will be logged and recorded. Photographs of remediation area excavation walls and base will be taken for inclusion in the site validation report.

Validation inspection and sampling is not specifically required following the excavation of contamination that was below the applicable NES residential guideline values and permitted activity criteria. Validation inspection and sampling may however be carried out for the purposes of determining whether underlying or surrounding material is free from contamination and could therefore be clean-fill for the purposes of off-site disposal or re-use elsewhere on site. Sampling

may also be carried out following the removal of lower-level contaminated material to determine the future application of the NES to parts of the site.

Validation samples will be collected from the base and edges of the excavation in accordance with the requirements of the MFE site investigation guidelines (Contaminated Land Management Guidelines No. 5. Site Investigation and Analysis of Soils. Ministry for the Environment. 2021) under the supervision of the SQEP. Samples will be analysed for the identified contaminants of concern for each remediation area.

Auckland Council will be given the opportunity to verify the removal of contaminated material if required.

5.8 Soil Replacement

Fill or soil imported to the site as part of the proposed redevelopment earthworks, shall be restricted to material coming only from inferred 'non-HAIL' activity sites, unless adequate environmental investigation of the source sites (in accordance with Contaminated Land Management Guidelines Document No. 5 Site Investigations and Analysis of Soils) determines the material to meet the 'clean fill' definition.

No contaminated material shall be permitted to be imported to the site.

5.8.1 Sampling and Classification of Fill Imported to Site

Soil, clay or hard-fill imported directly from approved quarries (virgin excavated natural material) does not require testing. Any imported fill material acquired from an alternative source should be assessed by a SQEP to determine its appropriateness for use on the site and to identify any potential discharge consent requirements.

Where no analytical data exists for a source, sampling and testing at a minimum rate of one sample for every 500 m^3 may be required, with not less than three samples tested per source. Background information about the source site (where available) may be used to determine which parameters to analyse for. Typical test suites include:

- Heavy metals;
- Polycyclic aromatic hydrocarbons (PAHs);
- Total petroleum hydrocarbons (TPH) – particularly if hydrocarbon odour or sheen is evident;
- Semi-volatile organic compounds suite (SVOC); and
- Asbestos presence/absence.

Testing on materials with a 50% or more by mass with a particle size greater than 2 mm may differ from that prescribed above and will be determined by the SQEP.

Analysis of samples shall be undertaken at an International Accreditation New Zealand (IANZ) accredited laboratory.

5.9 Contingency Measures

Responsibilities and actions to be taken in the event of the discovery of previously unknown contamination and/or potential discharges to the environment are outlined in the following sections.

5.9.1 Unexpected Contamination

If the earthworks or validation inspection/sampling reveals the presence of previously unknown contamination within a remediation/management area (or elsewhere on site), the following contingency measures are proposed:

1. If the contamination is significantly different from that observed on site to date and described in the most recent version of this plan, work in the area shall cease and the contamination shall be assessed by the SQEP. The material shall be covered if it presents any significant potential risk to human health or the environment;
2. The contractor shall record all details of unexpected contamination and hazardous materials discovery on an incident form, including the GPS location;
3. Auckland Council will be notified of the nature and extent of any significantly different contamination and consulted regarding the appropriate course of action;
4. If appropriate, the SQEP may advise the contractor to excavate the suspected contaminated material into a covered and contained receptacle to allow works to continue with minimum delay;
5. An asbestos consultant will be engaged if asbestos contamination at levels above the BRANZ soil guideline is found on site. The asbestos consultant will provide specific procedures for excavation of the asbestos contaminated material if required; and
6. Contamination at levels similar to those already observed on site may either be excavated or remain in-situ depending on the measured concentrations.

Typical indicators of contamination that may be encountered during earthworks include, but are not limited to:

- The presence of buried uncertified fill containing demolition material. Such fill can include asbestos-containing materials such as fragments of asbestos cement sheets or pipes;
- Dark staining on soil/fill, particularly associated with odour, may indicate significant hydrocarbon contamination;
- A multi-coloured sheen on the surface of water and excavations may also indicate significant hydrocarbon contamination (particularly if associated with hydrocarbon odours);
- Black gravel, silt, or sand may indicate the presence of ash material that can be high in heavy metals and PAHs; and
- Green/yellow staining on soil may indicate the presence of high levels of copper or chromium.

5.9.2 Contingency Responsibilities

The site contractor shall be responsible for implementation of this SMP/RAP and shall be required to notify the contaminated land specialist as soon as practicable following the

discovery of potential contamination that is significantly different from the contamination described in this plan or is located outside of the specified remediation and management areas.

In the event of any contamination-related incidents on site that had the potential to result in unauthorised discharges to the environment, the contractor shall be responsible for coordinating the response in order to minimise the immediate impact of the incident.

The site contractor shall notify the project manager and contaminated land specialist as soon as practicable following the discovery of unexpected contamination or discharges to the environment. The contractor shall also notify Auckland Council immediately in the case of discharges to the environment.

Following assessment of the unexpected contamination or discharge, the contaminated land specialist shall notify Auckland Council if the contamination is significantly different in either concentration or composition from that previously identified on site. Any proposed variations to the SMP/RAP because of the discovery of unexpected contamination shall be submitted to Auckland Council for approval prior to being issued to the site contractor.

5.10 Site Validation Report

A site validation report (SVR) documenting the results of the remediation/management, validation inspection and sampling will be prepared in accordance with the requirements of the MfE 2011 Contaminated Land Management Guidelines No 1. Reporting on Contaminated Sites in New Zealand (Revised 2021). The report will include plans showing the dimensions and location of the remediation/management area and the location(s) of any lower-level contaminated material retained on site.

The report shall be provided to Auckland Council within three months of completion of soil disturbance works at the site.

The SVR will include the following:

- Contextual information including a summary of the project and intended future land use, and references to previous reports and consents;
- The remediation management goals;
- A summary of the remediation/management work undertaken;
- Details of any unexpected contamination discovered at the site and a summary of actions undertaken to manage it;
- Details of validation including inspections, photographs, sampling, and analysis undertaken, sampling methodology, results, and assessment of results against guidelines;
- Landfill and/or managed fill disposal dockets for all contaminated material removed from site;
- An assessment of the effectiveness of the remediation/management against the goals, and whether long term management controls or monitoring should be implemented.

6 Health and Safety and Environmental Protection Measures

6.1 Health and Safety

Arsenic contamination measured in remediation areas B and D exceed their NES guideline values for residential land use with 10% home-grown produce consumption but are below NES guidelines for outdoor worker protection. The disturbance of material containing arsenic contamination at levels below the outdoor worker protection guideline values is highly unlikely to present a significant potential risk to the health of site workers.

Asbestos in soil at levels below the BRANZ soil guideline value (Area C) is highly unlikely to present a significant potential risk to the health of site workers.

Contamination of soil with asbestos-cement sheet fragments in areas A, C and E presents a low potential risk to the health of site workers if it is handled in accordance with guidelines.

All remediation and contamination management activities will be subject to the provisions of a health and safety plan for intrusive activities involving contaminated materials. A comprehensive health and safety plan addressing all site risks will be developed by the Contractor prior to commencement of works. The health and safety plan will define the site ingress and egress arrangements, haulage routes within the site, the location of any uncontaminated areas and location of site support/rest/decontamination facilities.

All personnel at the site must be inducted to the health and safety requirements (including hazards) at the site, and each person is then required to confirm that they have understood the requirements. The health and safety plan and inductions should discuss actions that need to be taken for handling potentially contaminated soil as described in this plan.

Access to the site shall be restricted using security fencing, with access to contaminated areas within the site further restricted to authorised personnel. Personnel shall be authorised following completion of appropriate site induction procedures and following donning of required personal protective equipment (PPE).

If required, the asbestos removal control plan (ARCP) will include additional asbestos-specific health and safety procedures.

There will be no public access to remediation/management areas during site works.

Contractors and staff involved in the earthworks will also be expected to be familiar with and adhere to standard health and safety procedures for the activities that they are involved in and for the equipment that they are using. The contractors must also adhere to the requirements of the Health and Safety at Work Act 2015 and follow the relevant guidelines for the remediation of contaminated sites.

6.1.1 Potential Hazards

The health and safety plan (to be prepared prior to the start of works) will identify the following potential hazards related to the presence of contaminated material:

- Arsenic contamination is present in soil in remediation areas B and D at levels below the NES guideline value for outdoor worker protection. Contamination at levels below the NES guideline value is unlikely to present a significant potential risk to human health.
- Zinc contamination is present in soil in remediation areas C at levels below the NES guideline value for outdoor worker protection. Contamination at levels below the NES guideline value is unlikely to present a significant potential risk to human health.
- Asbestos cement materials are present in soil at remediation areas A, C and E. Fibrous asbestos/asbestos fines were measured in soil at area C at a concentration below the BRANZ soil guideline. Asbestos contamination at levels below the BRANZ soil guideline is unlikely to present a significant potential risk to human health.
- Chemical contamination in soil may possibly be inhaled or absorbed through exposed skin.
- Asbestos fibres may possibly be inhaled if mobilised into the air by wind or site works.

6.1.2 Asbestos in Soil

Works involving asbestos contamination shall be completed in accordance with WorkSafe Approved Code of Practice for Management and Removal of Asbestos (November 2016), Health and Safety at Work (Asbestos) Regulations 2016, and BRANZ New Zealand Guidelines for Assessing and Managing Asbestos in Soil (2017). A licensed asbestos removalist may be required to manage the soil disturbance work.

In addition to the general site requirements set out in this plan, the following actions may be required prior to carrying out any asbestos works:

- Establishment of the 'asbestos work area' as determined by the Licensed Asbestos Removalist by fencing and appropriate signage, including dust barriers where necessary. The controls should be sufficient to prevent accidental access to this area;
- Establishment of an access way to and from the 'asbestos work area';
- Establishment of a truck loading area and machinery decontamination area adjacent to the 'asbestos work area', to minimise the spread of asbestos contamination via machinery;
- Health and safety inductions are to be completed prior to allowing workers to operate within the 'asbestos work area', including works required as part of the site establishment; and
- Notification to WorkSafe of the intent to commence works.

Air monitoring requirements for asbestos shall be determined by the independent licensed asbestos assessor (if required), to provide assurance that the trace level and airborne contamination standard for asbestos in the Health and Safety at Work (Asbestos) Regulations 2016 are not exceeded.

Where required, air monitoring must be carried out:

- Immediately before the licensed asbestos removal work commences, if the assessor determines that it is likely that the air contains respirable asbestos fibres in a concentration greater than trace level; and

- While the licensed asbestos removal work is carried out.

6.1.3 Personal Protective Equipment

During site induction, potential hazards associated with exposure to contaminants will be communicated to all site workers. To mitigate the risks associated with the identified potential hazards, the following minimum personal protective equipment (PPE) shall be worn by all workers handling or coming into contact with potentially contaminated material:

- Impermeable disposable gloves appropriate for the type of work being carried out;
- Impermeable safety boots (such as gumboots);
- Eye protection (goggles) where necessary;
- Respirator suitable when dealing with asbestos contamination; and
- Disposable full-length overalls (Tyvek or similar) where necessary.

The PPE requirements above are in addition to the standard requirements for workers engaged in site earthworks.

6.1.4 Decontamination Procedures

On-site decontamination facilities and first aid points will be provided by the Contractor. A decontamination station shall be set up at the exit from remediation areas. The following decontamination procedures apply to workers exiting remediation areas:

- Removal of disposable overalls (if worn), disposable gloves, and respirator;
- Disposable materials are to be placed into plastic rubbish bags for disposal with the excavated contaminated material; and
- Washing of hands and face.

Eating drinking and/or smoking are not permitted within the remediation areas and should only be undertaken outside of the areas following decontamination and washing of hands and face.

6.2 Control of Contaminant Migration

Contamination control measures to protect the environment to be implemented during the remediation of contamination and during other earthworks involving known or potential contamination are outlined below.

These measures form part of a site-specific environmental management plan. A site-specific sediment and erosion control plan will also be prepared by the contractor.

The contractor shall ensure that the works are carried out to minimise any adverse effects on the environment. The contractor shall ensure that all materials and equipment removed from the site are either stored, or disposed of, legally and responsibly. This section provides a high-level description of items to be included in the Environmental Management Plan.

6.2.1 Dust Suppression

Dust suppression measures to be taken prior to, and during, excavation and during handling and transport are outlined above. Excavations shall be kept damp or covered to reduce the potential for dust generation. Adherence to these measures during management activities will prevent

the migration of potentially contaminated dust to uncontaminated areas of the site or to neighbouring properties.

6.2.2 Surface Water, Erosion, and Sediment Control

Earthworks shall be carried out in accordance with the requirements of Auckland Council's 'Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region (GD05)'.

Priority is to be given to protection of any adjacent watercourses and stormwater drains.

A site-specific erosion and sediment control plan will be prepared by the Contractor. This will detail the location(s) and nature of the erosion and sediment control device(s), having regard to the anticipated extent and quantity of earthworks, along with the site layout. The site-specific plan is to always be available on site during the earthworks and is to be reviewed and amended if required upon the commencement of, and during, the works.

Earthworks areas shall be stabilised as soon as practical to minimise erosion potential on site.

The primary mechanisms for sediment spreading on the site are spillage during excavation and tracking by machinery. Any soils tracked beyond the site boundary should be swept up promptly and appropriately disposed of.

Areas of significant contamination may require specific sediment and erosion control measures. As far as practicable, excavations involving the removal or stockpiling of contaminated material shall be graded so that surface water and sediment are retained within them.

Stormwater protection measures will be instigated to ensure that:

- Stormwater shall be diverted to prevent mixing with stormwater from areas where contamination is present;
- Stormwater falling on the shallow contaminated soil/fill shall be allowed to infiltrate to ground;
- Runoff from contaminated material shall be prevented from entering any water courses; and
- Sediment will be retained within the site.

If disposal of stormwater from the site is required (other than infiltration to ground); the following procedures shall be followed:

- Stormwater that comes into contact with contaminated materials shall be assumed to be contaminated unless proven to be suitable for stormwater disposal. If water quality meets the Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 2000 (ANZECC) 80% protection of species criteria, then excess water may be disposed of to the council's stormwater network in accordance with AUP Water quality and integrated management, Chapter E1.3.;
- Contaminated stormwater that does not meet the ANZECC guidelines shall be pumped out from a sump by a licensed liquid-based disposal contractor for appropriate disposal

or it may be discharged to trade waste under the control of an appropriate trade waste consent; and
- Following removal of contaminated fill/soil from the site, surface water shall be allowed to discharge to the stormwater provided that appropriate sediment removal has been undertaken.

6.2.3 Stockpiling

Stockpiling of contaminated soil shall be minimised during works. Where higher-level contaminated soils are to be temporarily stockpiled for staging prior to off-site disposal, the location of temporary stockpiling must be defined in an erosion and sediment control plan. If temporary stockpiling is required, the following controls should be implemented:

- Heavy duty plastic, such as high-density polyethylene (HDPE), shall be placed on any unsealed surface in a designated area prior to placing stockpiled material;
- Soil stockpiles shall be kept clean and tidy, no more than 4 m in height, and with a compacted stable slope;
- Stockpiles shall not be placed within 20 m of waterways (including dry stream channels/ephemeral waterways and overland flow paths, if known);
- Vehicular movement over stockpiled soil will not be allowed;
- Bunds or sediment fences shall be constructed or installed around the edges of the stockpile management area to prevent discharge of potentially contaminated stormwater or sediment; and
- Any spoil removed from an asbestos work area that is to be stockpiled must be kept separate from other stockpiles in a signed and security fenced area. When not being added to or removed, these stockpiles must be covered to prevent fibre release. Dust/fibre suppression should be followed when the stockpiles are being added to or removed.

Imported clean-fill required for backfilling excavations may be temporarily stockpiled in a designated clean area on site. All imported fill is required to be free from contaminants.

6.2.4 Dust and Odour Management

Investigations undertaken at the site to date have not identified any material that is likely to generate significant odour during the site excavation works. If significant odour generating materials are encountered during excavations, work shall cease in the area of the odour following covering of the material with non-odorous soil or other suitable cover.

The site manager shall be immediately advised of the discovery. The site manager shall then notify the contaminated land specialist so that the material can be inspected and any additional controls put in place.

Excavation, stockpiling, movement of plant and transport of soils may generate dust and/or release odours. The generation of dust and odour will be minimised by the following:

- Suspending or limiting excavation, stockpiling and transport of soils during periods of high wind;
- Limiting speed of travel on site;

- Limiting transport routes across site to designated haulage routes;
- Using a water spray on exposed soils;
- Covering areas of exposed soil; and
- Ensuring trucks transporting material from the site are covered and that vehicles are adequately cleaned of dirt before leaving site.

Additional dust suppression measures are required when asbestos is present in soil. These will be as described in the asbestos removal control plan.

6.2.5 Decontamination of Tools and Machinery

The SQEP may require that tools and machinery used during earthworks involving contaminated soil be decontaminated prior to leaving site or leaving the exclusion zone. Wash water from decontamination of tools and machinery shall be captured and disposed to a facility equipped to take the contaminated water.

6.2.6 Monitoring

Regular monitoring of sediment control, water accumulation and dust generation within, and around, the earthworks areas shall be undertaken by the contractor. The contractor shall carry out any required maintenance to ensure the effectiveness of the site control measures.

The contractor shall also inspect excavations for significant odours or any other potential indications of contamination (such as discolouration of the ground). If any indications of contamination are observed, the contractor shall immediately notify the contamination land specialist. The contaminated land specialist shall then inspect the area of concern and specify any further actions that need to be taken.

It is recommended that the contractor carry out inspections at least once per working day.

7 ASSESSMENT OF ENVIRONMENTAL EFFECTS

As discussed above, the procedures set out in this plan aim to reduce potential risks to human health and the environment from site contamination by:

- Remediation of zinc contamination that exceeds the permitted activity criteria for environmental protection by excavation and off-site landfill disposal;
- Remediation of contamination that exceeds NES residential guidelines (10% home-grown produce consumption) by excavation and placing in designated reserve areas on site **or** removing for off-site landfill or managed fill disposal; and
- Management of contamination below residential guidelines on site or by excavation and off-site landfill or managed fill disposal.

The following sections assess the potential environmental effects of the planned remediation and management.

7.1 Potential for Contaminant Migration

As discussed above, zinc contamination at levels above the permitted activity criteria was found in remediation area C around the shed in the northwest corner of Lot 3 DP 488814 (close to the boundary with Cemetery Road:

Arsenic, cadmium, and asbestos contamination at levels below the permitted activity criteria has been found in other areas on site

Based on the available information, it is considered unlikely that excavations into any of the contaminated material would encounter groundwater.

Removal of contaminated soil from the designated remediation areas will minimise the potential for effects on the environment through surface water run-off, seepage to groundwater or dust generation from the higher-level contaminated material.

Following the completion of earthworks, the stabilisation, or covering of a proportion of any remaining low-level contamination at the site with roads, buildings and other impermeable surfaces would also minimise the potential for effects on the environment. Given the type and concentrations of low-level contamination outside of the designated remediation areas, it is highly unlikely that any remaining low-level contamination in soil at the site will present a significant risk to the environment under the future residential land use.

Adherence to the provisions of this SMP/RAP during redevelopment work should prevent any significant impacts on underlying groundwater or downstream water bodies.

7.2 Potentially Sensitive Receiving Environments

The most significant potentially sensitive receiving environments for any contamination at the site would be surface water and underlying groundwater.

Surface water from the Site drains towards either a tributary of Waterloo Stream or Waterloo Stream itself, which discharges to the east into Orewa River.

Orewa River discharges to Whangaparaoa Bay through a tidal estuary located immediately south of Orewa.

Groundwater in the investigation area is also expected to eventually discharge to Orewa River.

In general, groundwater in the investigation area is likely to be perched above Northland Allochthon rock.

7.3 Potential Effects on Receiving Environments

There are unlikely to be any significant adverse impacts on receiving environments from the detected contamination during or following the remediation and other planned earthworks. The aim of this plan is to provide for the appropriate handling, disposal, or appropriate reuse of the contaminated material. Proposed dust, stormwater and sediment controls should prevent contamination from having adverse effects on the environment.

The excavation of higher-level contaminated soil for off-site disposal or placing in designated reserve areas, which will then be stabilised, will reduce the potential for migration of contamination from the site in dust, surface water or groundwater.

The covering of a considerable proportion of the site with roads, building footprints and other paved areas will also significantly reduce the potential for migration of contamination from the site in dust, surface water or groundwater.

The emission of significant volatile contaminants to the air from the site during the proposed earthworks is highly unlikely due to the nature of the contaminated materials encountered at the site.

7.4 Cultural Heritage Features

There are no other known cultural heritage features on the site or in the surrounding area that are likely to be adversely affected by the presence of contamination, the planned remediation, or the management of contamination at the site.

7.5 Natural Heritage Features

There are no known natural heritage features on the site or in the surrounding area that are likely to be adversely affected by the presence of contamination, the planned remediation, or the management of contamination at the site.

7.6 Off-site Disposal Locations

The disposal destinations for contaminated material removed from the site will be either a registered managed fill or landfill **that holds consents to accept the levels of heavy metals and asbestos** observed at the site. As long as the conditions of consent for any disposal site(s) are met, there are unlikely to be any adverse effects on the disposal site(s) or the surrounding environment.

Adherence to the remediation and management procedures provided in this plan should prevent any adverse effects on the environment due to the transporting of materials between the site and the disposal location.

7.7 Contaminant Source Areas & Pathways

Zinc contamination at levels above the permitted activity criteria was found in the area beside the farm shed in the northwest corner of Lot 3 DP 488814.

Heavy metal and asbestos contamination at levels below the permitted activity criteria is present in other parts of the site.

The most significant potential pathways for contaminant movements are currently:

- Infiltration of surface water through the contaminated material leading to migration of contamination beneath the site and the potential for contamination of underlying groundwater;
- Transport of contamination from the site in sediment and stormwater run-off during rainfall events; and
- Transport of contamination from the site in wind-blown dust during dry and windy conditions. Deposited dust could potentially enter Waterloo Stream or its tributaries, which run through the site.

The off-site managed fill or landfill disposal of contaminated material, coupled with the stabilisation of any remaining contaminated material at the site, should significantly reduce any potential for adverse effects on the environment due to the infiltration of water through, or off-site transport of, the contaminated material.

Adherence to the provisions of this plan for dealing with dust, stormwater and sediment control should prevent any significant adverse effects on the environment from stormwater or sediment discharge during earthworks.

8 SMP/RAP Certifying Statement

I **Andrew James MacDonald** of Groundwater and Environmental Services certify that:

This site management and remedial action plan 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:

- Prepared out by a suitably qualified and experienced practitioner;
- Reported on in accordance with the current edition of Contaminant Land Management Guidelines No 1 – Reporting on Contaminated Sites in New Zealand (June 2021); and
- Certified by a suitably qualified and experienced practitioner.

Evidence of the qualifications and experience of the suitably qualified and experienced practitioner who has prepared and certified this plan is appended as Appendix B.

Signed and dated:

24 January 2025

WOODS
Est.1970

Plot Date: 10:52:53 am,18 December 2024, FATINA

LEGEND

EXTENTS OF FAST TRACK APPLICATION

BOUNDARIES

REVISION DETAILS		BY	DATE
1	ISSEUED FOR CONSENT	JW	DEC 2024

SURVEYED	WOODS	SIDWELL ROAD WAINUI AUCKLAND
DESIGNED	WOODS	
DRAWN	FA	
CHECKED	JW	
APPROVED	JW	WOODS.CO.NZ

N

MILLDALE
Connecting Lifestyles

MILLDALE
FAST TRACK
STAGES 10 - 13

SITE LOCATION PLAN

STATUS	ISSEUED FOR CONSENT	REV
SCALE	1:7500 @ A3	1
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-128-00-0001-GE	

File: C:\12DSYNERGY\DATA\WIP-PEN-APP-01\P24-128 - MDL - FAST TRACK APPLICATION_21627\02 DRAWINGS\01 ENG\P24-128-00-0001-GE-SITE LOCATION PLAN.DWG

Figure 2: Remediation/Management Areas
107 Cemetery Road & Lot 3 DP 488814

0 10 20 30
Meters

Scale @ A4
= 1:2,500

Date Printed:
24/01/2025

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Figure 3: Remediation/Management Areas
167 Argent Lane

0 5 10 15
Meters

Scale @ A4
= 1:1,000

Date Printed:
5/11/2024

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Appendix A
Notes to Contractor

NOTES TO CONTRACTOR

SITE SUMMARY

ADDRESS: MILDALE – STAGES 10-13 (131 Argent Lane, 167 Argent Lane, 168 Argent Lane, Lot 2 DP 488814, Lot 3 DP 488814, & 107 Cemetery Road)

PROPOSED WORKS: RESIDENTIAL SUBDIVISION REDEVELOPMENT

SITE USE / HISTORY: RURAL FARMLAND, PASTURES, RURAL RESIDENTIAL LIFESTYLE

CONTAMINANTS OF CONCERN: HEAVY METALS, ASBESTOS

AREAS OF CONCERN: SHOWN ON FIGURES 2 – 4 FROM SMP/RAP – TO BE ATTACHED

KEY CONTACTS

KEY CONTACT	PERSON	CONTACT DETAILS
FULTON HOGAN LAND DEVELOPMENT	David MacLean	027 202 8024 david.maclean@fultonhogan.com
PRINCIPAL CONTRACTOR	TBC	TBC
SQEP	Andrew MacDonald	027 487 4410 andrew@gesnz.co.nz
SITE MANAGER	TBC	TBC
AUCKLAND COUNCIL	TBC	
WORKSAFE	TBC	0800 030 040

KEY RISKS

HEAVY METALS

- HEAVY METALS IN SOIL ABOVE HUMAN HEALTH (RESIDENTIAL) – Area B & D
- HEAVY METALS IN SOIL ABOVE ENVIRONMENTAL CRITIERA – Area C

ASBESTOS

- ASBESTOS-CONTAINING MATERIALS MAY PRESENT RISK IN SOIL – Areas A, C & E
- ASBESTOS-CONTAINING MATERIALS MAY PRESENT RISK IN SOIL FOLLOWING DEMOLITION – Asbestos survey required for site buildings

UNEXPECTED CONTAMINATION (including fill, farm dumps, offal pits, asbestos pipes)

- IF ENCOUNTERED, WORKS MUST BE STOPPED AND ADVICE SOUGHT FROM SQEP.

LEGISLATION / GUIDANCE

ALL WORKS MUST COMPLY WITH / SOILS MUST BE MANAGED IN ACCORDANCE WITH:

- HEALTH AND SAFETY AT WORK ACT 2015
- EROSION AND SEDIMENT CONTROL GUIDE FOR LAND DISTURBING ACTIVITIES IN THE AUCKLAND REGION (GD05)

FOR ANY WORK INVOLVING ASBESTOS:

- WORKSAFE APPROVED CODE OF PRACTICE FOR MANAGEMENT AND REMOVAL OF ASBESTOS (NOVEMBER 2016),
- BRANZ NEW ZEALAND GUIDELINES FOR ASSESSING AND MANAGING ASBESTOS IN SOIL (2017). MITIGATION CONTROLS ARE REQUIRED WHEN WORKING WITH ASBESTOS IN SOILS.

PERMITS / REPORTS / CONSENTS REQUIRED

- WORKS MANAGEMENT PLAN
- COUNCIL RESOURCE CONSENTS
- HEALTH AND SAFETY PLAN

- ENVIRONMENTAL MANAGEMENT PLAN
- EROSION AND SEDIMENT CONTROL PLAN
- APPROVAL FROM WASTE DISPOSAL FACILITY
- DEWATERING PLAN (if dewatering is proposed)
- TRADE WASTE PLAN (if dewatered water is to be disposed of to trade waste)
- WORKSAFE NOTIFICATION (if removing asbestos contaminated soil or for other notifiable activities)
- ASBESTOS MANAGEMENT PLAN (if removing asbestos contaminated soil >0.01% w/w)
- AIR MONITORING PLAN (Class A or B asbestos removal or for other airborne contaminants)
- ASBESTOS CLEARANCE CERTIFICATE (on completion, following asbestos removal)

ENVIRONMENTAL MANAGEMENT (SECTION 5)

- CONTRACTOR SHALL MAINTAIN DAILY RECORD OF ALL EARTHWORKS, INCIDENTS AND SITE CONDITIONS
- SOILS AND GROUNDWATER SHOULD BE ASSUMED TO BE CONTAMINATED UNLESS PROVEN OTHERWISE.
- COMPLY WITH EROSION AND SEDIMENT CONTROL GUIDELINES:
  - PROTECT WATERCOURSES / DRAINS
  - CAPTURE WATER / SEDIMENT RUN OFF
  - STOCKPILE MANAGEMENT / COVERING
  - DUST SUPRESSION, DEFINED HAULAGE ROUTES
- APPROPRIATE GROUNDWATER / STORMWATER MANAGEMENT / DISPOSAL
- APPROPRIATE WASTE MANAGEMENT / DISPOSAL

SOIL & WATER TESTING (SECTION 6)

FURTHER TESTING MAY BE REQUIRED FOR:

- DELINEATION AND QUANTIFICATION OF IDENTIFIED HOTSPOTS
- UNEXPECTED CONTAMINATED SOIL REQUIRING OFF-SITE DISPOSAL OR REUSE ON SITE
- VALIDATION TESTING FOLLOWING BUILDING DEMOLITIONS
- WATER (INCLUDING GROUNDWATER AND STORMWATER) SHOULD THESE REQUIRE OFF-SITE DISPOSAL
- IMPORTED FILL (except from approved clean-fill sources)

HEALTH AND SAFETY

THE CONTRACTOR SHOULD:

- INDUCT ALL WORKERS ON SMP/RAP
- CREATE SPECIFIC HEALTH AND SAFETY PLAN ADDRESSING ALL RISKS
- ESTABLISH AN EXCLUSION ZONE
- PROVIDE SUITABLE PPE/RPE
- PROVIDE SUPPORT/REST FACILITIES
- RESTRICT SITE ACCESS
- PROVIDE WATER FOR DRINKING AND CLEANING/HAND WASHING

PPE TO PROTECT AGAINST SOIL AND GROUNDWATER CONTAMINANTS

AT ALL TIMES	AS NECESSARY
	EYE PROTECTION (GOGGLES)
SAFETY FOOTWEAR	EAR DEFENDERS
EYE PROTECTION (SAFETY SPECTACLES)	COVERALLS
HI VISIBILITY CLOTHING	FLAME RETARDANT OVERALLS.
GLOVES	RESPIRATORS
HARD HAT	

Appendix B
Statement of Qualification

My full name is **Andrew James MacDonald**. I am an environmental consultant trading as **Groundwater and Environmental Services (GES)**.

I certify that I meet the requirements to operate as a suitably qualified and experienced practitioner (SQEP) under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NES) in contaminated land and groundwater assessment, management, and remediation.

I hold Bachelor of Science and Master of Science Honours degrees from Auckland University.

I have worked as a consultant in the field of contaminated land and groundwater assessment, management, and remediation since 1991. In that time, I have dealt with contamination issues at numerous industrial, commercial, horticultural, rural and residential sites throughout New Zealand on behalf of commercial, local government and central government clients.

CAPABILITIES

Environmental Site Investigation
Remediation of Contaminated Land
Environmental Effects Assessment
Contaminated Site Consents
Groundwater Investigation
Contaminant Transport Modelling
Groundwater Contamination Remediation

EDUCATION

Bachelor of Science (Geology)	University of Auckland, 1989
Master of Science, Hons (Geology)	University of Auckland, 1991
Environmental Law (COP)	University of Auckland, 1993
Resource Management (Planning) Law (COP)	University of Auckland, 1993

PROFESSIONAL HISTORY

1995 -	Groundwater and Environmental Services, Principal
1991 - 1995	Woodward-Clyde (NZ) Ltd, Environmental Scientist

REPRESENTATIVE EXPERIENCE

- Preliminary and detailed environmental site investigations of a wide range of potentially contaminated sites.
- Remedial action/site management plans for contaminated sites.
- Organisation and supervision of remediation at contaminated sites.
- Validation of remediation at contaminated sites.
- Long term contaminated site monitoring and management plans.
- Resource consents for site remediation and ongoing discharges of contaminants to ground at contaminated sites.
- Provision of expert evidence related to contamination issues.
- Peer review of contaminated site investigations.

- Drilling supervision, soil sampling and groundwater monitoring well installation at a range of sites for investigations of contaminated ground and groundwater.
- Computer modelling of groundwater contaminant transport and associated environmental effects.