

Site Validation Report

Neighbourhood: Aorere	Stage: 2	Superlot: AO-019
<p>Introduction (Objective and scope):</p> <p>This Site Validation Report (SVR) has been prepared for the Piritahi site located across 1 Winthrop Way and 35 Henwood Road (AO-019). The site, which covers a total area of approximately 1384 m², will be part of a larger residential housing re-development. The purpose of this report is to verify that identified impacted soil has been removed from the subject site. This SVR summarises the remedial ground works programme, the validation process, and documents the condition of the site post the earthworks undertaken to remove the impacted soil.</p> <p>Pre-remediation site contamination</p> <p>The pre-remediation site contamination conditions are detailed in the Piritahi, Site Specific Remediation and Management Plan¹ (SSR&MP) AO-019. In summary, the following soils requiring remediation were identified:</p> <ul style="list-style-type: none"> Metals (specifically arsenic and lead) were reported above NESCS² residential (10% produce) land use soil contaminant standards (SCS) and the AUP permitted activity (PA) criteria³. <p>The remedial areas and associated soil sample results are attached as Appendix A.</p>		<p>Remedial goal: impacted not a risk.</p> <p>Remaining soil concentrations at/or below:</p> <ul style="list-style-type: none"> NESCS residential (10% produce) soil contaminant standard (SCS) and AUP PA criteria for metals; and BRANZ⁴ residential soil guideline value for asbestos in soil. <p>Site remediation method:</p> <p>To remediate land by removing identified site contamination exceeding the remedial goal for disposal to an approved disposal facility consented to accept that level of contamination.</p>
<p>Applicable consent conditions</p> <p>This report has been prepared in accordance with Section 8 of the Site wide Soil Management Plan⁵ (SSMP) and to meet the requirements outlined in Condition 66 of BUN60354165⁶ (the consents).</p> <p>For this project, validation comprised confirmation that works were undertaken in accordance with the SSMP (Condition 21 of the consents), visual and laboratory confirmation via soil sampling overseen by a suitably qualified and experienced practitioner (SQEP⁷) (Condition 22 of the consents) of remaining materials, and documentation that the excavated materials were managed and disposed to an appropriate disposal facility (Condition 28 of the consents).</p>		
<p>Other reference documents:</p> <ul style="list-style-type: none"> Piritahi Land Remediation Investigation Report – Superlot AO-019⁸ 		
<p>Applicability</p> <p>This report has been prepared by the Piritahi Alliance. It is acknowledged that this report will be relied upon by Auckland Council for the purpose of undertaking its regulatory functions in relation to the work of the Piritahi Alliance. However, this report may not be relied upon in other contexts or for any other purpose, or by any other person, without the prior written agreement of the Piritahi Alliance.</p> <p>Recommendations and opinions contained in this report are based on our visual inspection and sampling of material within the remedial works area. The nature and continuity of the contamination away from the inspection and sampling locations is inferred but it must be appreciated that actual conditions may vary from the assumed model.</p>		

¹ Piritahi 2022. Site Specific Remediation and Management Plan, Aorere, AO-019, Prepared for Kāinga Ora by the Piritahi Alliance, dated 11 May 2022.

² Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS).

³ Auckland Unitary Plan (AUP) Standard E30.6.1.4.

⁴ Building Research Association New Zealand New Zealand “Guidelines for Assessing and Managing Asbestos in Soil”, 2017 (BRANZ).

⁵ Piritahi 2021. Site-Wide Soil Management Plan, Version 4, Aorere Development, Prepared for Kāinga Ora by the Piritahi Alliance, dated September 2021.

⁶ Comprising land use consent LUC60354165 and discharge consent DIS60354166.

⁷ Suitably qualified and experienced practitioner (SQEP) – as defined in the Ministry for the Environment “Users’ Guide National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health”, 2012.

⁸ Piritahi 2022. Land Remediation Investigation Report, Superlot AO-019, Prepared for Kāinga Ora by the Piritahi Alliance, dated May 2022.

Summary of works	
Location and dimensions:	Remedial works comprised the excavation and removal of surficial soil as follows: <ul style="list-style-type: none"> At 35 Henwood Road the vicinity of the dwelling was excavated to 300 mm below ground surface (bgs) and a portion of the rear garden was excavated to a depth of 500 mm bgs as shown on the pre-remediation investigation and remedial excavation figure in Appendix A; Soil surrounding redundant utility services that were removed during the works.
Variations from the SSRAP	No variations from the approved SSRAP occurred during these works.
Asbestos Management:	The following asbestos-in-soils management was implemented in accordance with the BRANZ guidelines during the works: In accordance with Piritahi procedures, unlicensed asbestos works controls were implemented across the remedial areas.
Duration of remedial works:	Works commenced on 16 May 2022 and were completed on 26 May 2022.
Soil removal and disposal:	175 Tonnes (See attached Disposal Summary)
Hampton Downs Landfill	A total of some 70 tonnes was disposed to Hampton Downs Landfill from AO-019 as metals impacted soil (Type 2) and an additional 105 tonnes as metals impacted soil containing asbestos (Type 5).
Imported material:	No soil was imported to site (Condition 30 of LUC60354165)
Unexpected discoveries:	No unexpected discoveries outside of expected soil contamination were reported during the remediation works.
Complaints and incidents	No complaints or safety or environmental incidents related to soil contamination were reported during the remediation works.
<p>Validation results (refer validation plan):</p> <p>The validation work performed follows the general reporting and investigation methodology presented in the:</p> <ul style="list-style-type: none"> Ministry for the Environment (MfE) Contaminated Land Management Guidelines No. 1. Reporting on Contaminated Sites in New Zealand (Revised 2021); MfE Contaminated Land Management Guidelines No. 5. Site Investigation and Analysis of Soils (Revised 2021); and BRANZ Guidelines for Assessing and Managing Asbestos in Soil (2017) <p>This SVR was completed under the direction of a SQEP.</p> <p>The requirements of the SSMP and SSRAP were being followed and applicable resource consent conditions listed above were being met during site inspections completed by a Land Remediation staff member (SQEP).</p> <p>A visual inspection of the cut surface was undertaken prior to the collection of validation samples. A total of one validation soil sample (V1) was collected from the remediated area. The validation sample was analysed for metals (arsenic, cadmium, chromium, copper, lead, nickel and zinc) by International Accreditation New Zealand (IANZ) accredited laboratory using industry-standard methods. Laboratory transcripts are provided Appendix B and tabulated below.</p> <p>Soil samples collected and analysed as part of the validation works (including sample S09 collected at 0.5m depth prior to remediation – pre-validation sample reported previously in the SSRAP) reported no metals or asbestos concentrations above the remediation goals.</p> <p>In summary, the remediation was successful as validation soil samples reported concentrations below the remedial goals.</p>	
<p>Final site condition:</p> <ul style="list-style-type: none"> Identified impacted soil has been successfully removed from the site and validation samples indicate that the remediation goal was achieved. Based on the final validation results, no additional monitoring or management (beyond standard earthwork controls) is deemed to be required for the ongoing development and use of the site. 	



Figure 2 - Validation Sample Locations

 SuperLot

Validation results table

Table 1 - Validation results

					Asbestos ¹			Heavy Metals - Screen						
					Asbestos Containing Material (ACM) (Presence / absence and type)	Asbestos Containing Material (ACM) (% w/w)	Fibrous asbestos (FA) / Asbestos fines (AF) (% w/w)	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc
					-	%w/w	%w/w	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NES Soil - Residential (10% produce)²					NA	0.01%	0.001%	20	3	460	>10,000	210	400 ⁴	7,400 ⁴
Auckland Unitary Plan Permitted activity criteria³					NA	NA	NA	100	7.5	400	325	250	320 ⁵	1160 ⁵
Auckland Background Concentrations (volcanic range)⁵					NAD	<LoR	<LoR	0.4 - 12	<0.1 - 0.65	3 - 125	20 - 90	<5 - 65	4 - 320	54 - 1,160
Property Address	Sample ID	Sample depth (m bgl)	Material Type	Sampled Date										
35 Henwood Road	V01	0.0-0.1	Natural	11/08/2022	-	-	-	5	0.31	51	23	43	20	69

Comments

Results are in milligrams per kilogram (mg/kg) unless specified.

1 = BRANZ soil guideline value for asbestos based on relevant land use

2 = MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health.

3 = Auckland Unitary Plan Operative in part E30 Contaminated Land. Permitted Activity Soil Criteria Table E30.6.1.4.1

4 = in the absence of available NES Soil criterion for nickel and zinc, the criterion has been adopted from Assessment of Site Contamination National Environment Protection Measures (ASC NEPM) Toolbox – <http://www.nepc.gov.au/nepms/assessment-site-contamination/toolbox>.

5 = Auckland Regional Council, Technical Publication 153, October 2001. Background Concentrations of inorganic elements in soils from the Auckland Region: volcanic soils

6 = Landfill criteria may vary. Verify with landfill prior to disposal.

NA = Not Applicable.

NAD - No asbestos detected.

<LoR - below laboratory reporting limits.

- BOLD :** exceeded NES:CS SCS and AUP PA soil acceptance criteria
- BOLD :** exceeded one or more NES:CS SCS soil acceptance criteria
- BOLD :** exceeded AUP PA soil acceptance criteria
- BOLD :** above background concentrations
- : not tested for
- m bgl: metre below ground level

Photos



Sample location V01

Disposal Summary

Table 2 - Disposal summary

Date	Docket	Disposal Facility	Vehicle ID	Disposal Type	Weight (tonnes)
16/05/2022	WB00263011	Hampton Downs Landfill	DLG35	Metals impacted soil	13.52
16/05/2022	WB00263066	Hampton Downs Landfill	LEF356	Metals impacted soil	12.84
16/05/2022	WB00263117	Hampton Downs Landfill	LZW86	Metals impacted soil	12.30
16/05/2022	WB00263447	Hampton Downs Landfill	DLG35	Metals impacted soil	11.36
16/05/2022	WB00263472	Hampton Downs Landfill	LEF356	Metals impacted soil	10.64
16/05/2022	WB00263544	Hampton Downs Landfill	LZW86	Metals impacted soil	7.64
16/05/2022	WB00264103	Hampton Downs Landfill	LEF356	Metals and Asbestos impacted soil	11.28
16/05/2022	WB00264243	Hampton Downs Landfill	DLG35	Metals and Asbestos impacted soil	10.66
16/05/2022	WB00264278	Hampton Downs Landfill	LZW86	Metals and Asbestos impacted soil	11.12
17/05/2022	WB00265126	Hampton Downs Landfill	DLG35	Metals and Asbestos impacted soil	12.34
17/05/2022	WB00265148	Hampton Downs Landfill	LEF356	Metals and Asbestos impacted soil	12.76
17/05/2022	WB00265333	Hampton Downs Landfill	LZW86	Metals and Asbestos impacted soil	13.30
17/05/2022	WB00265474	Hampton Downs Landfill	LZW86	Metals and Asbestos impacted soil	12.78
17/05/2022	WB00265571	Hampton Downs Landfill	DLG35	Metals and Asbestos impacted soil	10.70
17/05/2022	WB00265794	Hampton Downs Landfill	LEF356	Metals and Asbestos impacted soil	11.16

Site Validation Report

Detail of Unexpected discoveries/Complaints			
No	Description of discovery	Date	Outcome
N/A			

Document Control				
Date	Version	Prepared by	Reviewed by	Authorised by
10 November 2022	1	C. Westerbur	S. Schiess	S. Schiess

Appendix A: Investigation plan and soil sample results

Pre-remediation investigation and remedial excavation plan



Site Validation Report

Table 3 - Pre-remediation investigation results

					Asbestos ¹			Heavy Metals - Screen						
					Asbestos Containing Material (ACM) (Presence / absence and type)	Asbestos Containing Material (ACM) (% w/w)	Fibrous asbestos (FA) / Asbestos fines (AF) (% w/w)	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc
					-	%w/w	%w/w	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NES Soil - Commercial / Industrial²					NA	0.05%	0.001%	70	1,300	>10,000	>10,000	3,300	6,000⁴	400,000⁴
NES Soil - Residential (10% produce)²					NA	0.01%	0.001%	20	3	460	>10,000	210	400⁴	7,400⁴
Auckland Unitary Plan Permitted activity criteria³					NA	NA	NA	100	7.5	400	325	250	320⁵	1160⁵
Auckland Background Concentrations (volcanic range)⁵					NAD	<LoR	<LoR	0.4 - 12	<0.1 - 0.65	3 - 125	20 - 90	<5 - 65	4 - 320	54 - 1,160
Waste Acceptance Criteria - Managed fill (Ridge Road Quarry)⁶					Presence	0.01	0.01	70	7.5	400	325	250	320	400
Waste Acceptance Criteria - EnviroFill South⁶					Trace	Trace	Trace	70	1.2	362	107	210	320	1,160
Property Address	Sample ID	Sample depth (m bgl)	Material Type	Sampled Date										
1 Winthrop Way	S01	0.00m		10/12/2021	Asbestos NOT detected.	-	-	5	0.18	48	21	30	29	77
	S02	0.00m		10/12/2021	Asbestos NOT detected.	-	-	6	0.3	49	25	64	27	280
	S03	0.00m		10/12/2021	Asbestos NOT detected.	-	-	4	0.2	41	16	27	18	60
	S04	0.00m		10/12/2021	Asbestos NOT detected.	-	-	8	0.94	48	88	142	27	210
	S05	0.00m		10/12/2021	Asbestos NOT detected.	-	-	4	0.22	44	37	74	34	93
35 Henwood Road	S06	0.00m		15/12/2021	Asbestos NOT detected.	-	-	12	0.34	59	45	73	23	114
	S07	0.00m		15/12/2021	Asbestos NOT detected.	-	-	13	0.58	83	170	390	41	198
	S08	0.00m		15/12/2021	Asbestos NOT detected.	-	-	10	1.02	160	78	145	31	240
	S09	0.00m		15/12/2021	Chrysotile (White Asbestos) detected.	< 0.001	< 0.001	27	1.63	87	135	970	35	350
	S09-0.3	0.30m		15/12/2021	Chrysotile (White Asbestos) detected.	< 0.001	< 0.001	12	0.64	58	50	230	29	178
	S09-0.5	0.50m		15/12/2021	Asbestos NOT detected.	-	-	7	0.2	69	25	81	39	79

Comments

Results are in milligrams per kilogram (mg/kg) unless specified.

1 = BRANZ soil guideline value for asbestos based on relevant land use

2 = MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health.

3 = Auckland Unitary Plan Operative in part E30 Contaminated Land. Permitted Activity Soil Criteria Table E30.6.1.4.1

4 = in the absence of available NES Soil criterion for nickel and zinc, the criterion has been adopted from Assessment of Site Contamination National Environment Protection Measures (ASC NEPM) Toolbox – <http://www.nepc.gov.au/nepms/assessment-site-contamination/toolbox>.

5 = Auckland Regional Council, Technical Publication 153, October 2001. Background Concentrations of inorganic elements in soils from the Auckland Region: volcanic soils

6 = Landfill criteria may vary. Verify with landfill prior to disposal.

NA = Not Applicable.

AD - Asbestos detected.

NAD - No asbestos detected.

<LoR - below laboratory reporting limits.

BOLD : exceeded NES:CS SCS and AUP PA soil acceptance criteria

BOLD : exceeded one or more NES:CS SCS

BOLD : exceeded AUP PA soil acceptance criteria

BOLD : above background concentrations

BOLD : exceeded Managed Fill acceptance criteria for Ridge Road Quarry

BOLD : exceeded Landfill acceptance criteria for EnviroFill South

- : not tested for

m bgl: metre below ground level

Appendix B: Validation Sample Laboratory Transcripts



Certificate of Analysis

Page 1 of 1

Client:	Piritahi Alliance	Lab No:	3052838	SPV1
Contact:	Cliff Westerbur C/- Piritahi Alliance Level 8, 139 Quay Street Auckland Central Auckland 1010	Date Received:	11-Aug-2022	
		Date Reported:	15-Aug-2022	
		Quote No:	96975	
		Order No:	K0014720	
		Client Reference:	1007708.2086	
		Add. Client Ref:	COC1008283	
		Submitted By:	Jonti Hine	

Sample Type: Soil

Sample Name:	AO-019_V01_0.00m-0.10m 11-Aug-2022 10:39 am		
Lab Number:	3052838.1		
Heavy Metals, Screen Level			
Total Recoverable Arsenic	mg/kg dry wt	5	
Total Recoverable Cadmium	mg/kg dry wt	0.31	
Total Recoverable Chromium	mg/kg dry wt	51	
Total Recoverable Copper	mg/kg dry wt	23	
Total Recoverable Lead	mg/kg dry wt	43	
Total Recoverable Nickel	mg/kg dry wt	20	
Total Recoverable Zinc	mg/kg dry wt	69	

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.

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
Heavy Metals, Screen Level*	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	1

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

Testing was completed on 15-Aug-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



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.