From:
Sent: Friday, 29 October 2021 11:21 AM
To:

Cc:

Subject: [EXTERNAL] RE: Eastern Busway - Asbestos confirmed
Attachments: 2749076-A2P-1.pdf; 2749076-SSFC-1.csv; 2749076-1.zip

Hi,

The results from the sample I delivered to Hill Laboratory yesterday detected white and brown asbestos. This sample was found in CPT204(E) @ 1m bgl during hydro excavation.

Please see the **attached** results for full details.

Cheers,

Alliance Engineering Geologist

Eastern Busway

From:
Sent: Monday, 18 October 2021 5:26 PM
To:

Cc:

Subject: Eastern Busway - Possible ACM found

Hi,

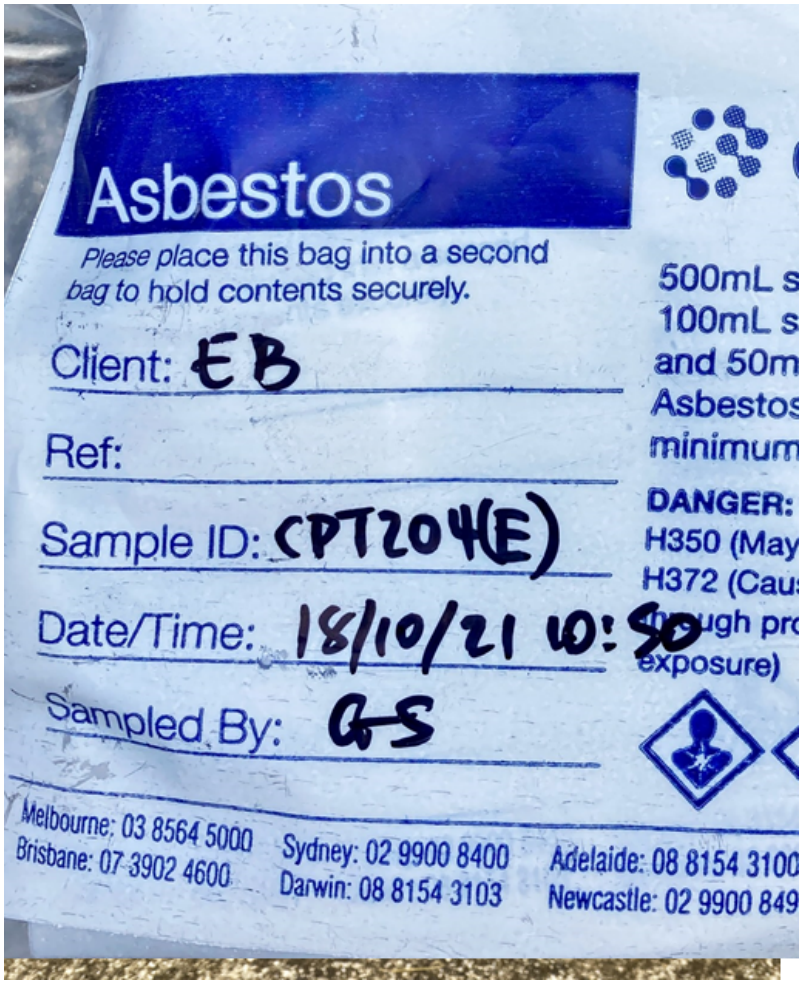
We came across some possible fragments of asbestos board today during the hydrovac of CPT204(E) - located by the public walkway at the end of Seven Oaks Dr.

I double bagged the pieces that were found at approximately 1m deep. There appeared to be some more smaller fragments at the base of the hole but we had stopped work. The hole was then backfilled with pea gravel. I have heard this CPT will now be completed on SEART road corridor under the night works lane closure.

has asked if we could take the sample to Hills Laboratory. I will call them tomorrow to arrange a drop off time for this week on my way home from site.

Please let me know if you need any further details. Feel free to forward this email if I missed anyone.

Kind regards,


Asbestos
Please place this bag into a second bag to hold contents securely.
Client: EB
Ref:
Sample ID: CPT204(E)
Date/Time: 18/10/21 10:30
Sampled By: GS
500mL s
100mL s
and 50m
Asbestos
minimum
DANGER:
H350 (May
H372 (Cau
exposure)
Melbourne: 03 8564 5000
Brisbane: 07 3902 4600
Sydney: 02 9900 8400
Darwin: 08 8154 3103
Adelaide: 08 8154 3100
Newcastle: 02 9900 849

Hill Laboratories
TRIED, TESTED AND TRUSTED

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

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

Certificate of Analysis

Client:	AECOM New Zealand Limited	**Lab No:**	2749076	A2Pv1
Contact:	Grace Sturgess	**Date Received:**	29-Oct-2021	
	C/- AECOM New Zealand Limited	**Date Reported:**	29-Oct-2021	
	PO Box 4241	**Quote No:**	82501	
	Shortland Street	**Order No:**	60644113/1.2	
	Auckland 1140	**Client Reference:**	60644113/1.2	
		Add. Client Ref:	Sampled: 18/10/21	
		Submitted By:	Grace Sturgess	

Sample Type: Building Material

Sample Name	Lab Number	Sample Category	Sample Weight on receipt (g)	Asbestos Presence / Absence	Description of Asbestos in Non Homogeneous Samples
CPT204 (E) @ 1m bgl	2749076.1	Fibre Cement	173.82	Amosite (Brown Asbestos) detected. Chrysotile (White Asbestos) detected.	N/A

Glossary of Terms

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

Analyst's Comments

Appendix No.1 - Chain of Custody

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: Building Material

Test	Method Description	Default Detection Limit	Sample No
Asbestos in Bulk Material			
Sample Category	Assessment of sample type. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	-	1
Sample Weight on receipt	Sample weight. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.01 g	1
Asbestos Presence / Absence	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	1
Description of Asbestos in Non Homogenous Samples	Form, dimensions and/or weight of asbestos fibres present. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	-	1

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

Testing was completed on 29-Oct-2021. 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.

Danielle Carter BSc, PGDipSci, MSc
Laboratory Technician - Asbestos

Job No: **274 9076** Date Recv: 29-Oct-21 09:08

Received by: Sanaya Hansotia

3127490765

AECOM

Q4AN(EV)-007-FM1

ANZ

FQM - Generic Chain of Custody Form

CONSULTANT: AECOM	ADDRESS / OFFICE:	SAMPLER: Grace Sturgess	
PROJECT MANAGER (PM): VIRGIL KARAN	SITE: 167 Edgewater Dr	MOBILE: 021346097	PHONE:
PROJECT NUMBER & TASK CODE: 60644113/ 1.2	P.O. NO.: 60644113/ 1.2	EMAIL REPORT TO: grace.sturgess@aecom.com	
RESULTS REQUIRED (Date): ASAP	QUOTE NO.:		

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:
Potential asbestos containing material

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

Notes: e.g. Highly contaminated samples e.g. "High PAHs expected". Extra volume for QC or trace LORs etc.

ALS ID	SAMPLE ID	MATRIX	DATE	Time	CONTAINER INFORMATION: Type / Code	Total bottles	BULK ID	HOLD	
	CPT204(E) @ 1m bgl		18/10/21		BAG		✓		ACM material

RELINQUISHED BY:		RECEIVED BY		RECEIVED BY		METHOD OF SHIPMENT
Name: Grace Sturgess	Date: 28/10/21	Name:	Date:	Name:	Date:	Con' Note No:
Of: AECOM	Time: 16:40	Of:	Time:	Of:	Time:	Transport Co:

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag. **Soil Container Codes:** Jar = Unpreserved glass jar

COC Page of

Annexure C – Test Pit Logs

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Test Pit Field Log

Project Name:	EBA	**Project Number:**	60644113	**Borehole No.:**	TP1
Project Location:	Dale Crescent	**Client:**	AT		
PM Name:	Kate Shaistley	**Date Commenced:**	2/3/22		
Test Pit Location:	TP1	**Date Completed:**	2/3/22	**Sheet**	of
Excavator Contractor:	Extreme Earthmoving	**Fieldwork Staff:**	AC + HJ		

Field Data

Method	Depth	Graphic Log	USCS Classification	Material Description: Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin, moisture	PID (ppm)	Sampling	Field Notes: Odour, staining, groundwater observations/regime, additional information
				grass cover			
excavator	0.0	topsoil		light brown sandy SILT with rootlets. Dry, firm.	0.1	As500 2x GSoil 300 @0.0-0.15	no odour / staining noted
	0.3			light brown silty CLAY, with rootlets, some orange mottling. Dry, stiff, ~~friable~~ friable.	0.0	As500 2x GSoil 300 @0.6	concrete block noted @ ~0.3 bgl No odour no staining
	0.9			light brown CLAY with some silt. with rootlets, dry, firm, mod. friable.		As500 2x GSoil 300 @0.9	No odour / staining
	1.5			same as 0.9 but with black flecks @ 1.5		2x GSoil 300 @1.5	no odour / staining
	1.8			dark brown / black CLAY with some silt, damp, soft to firm, with some rootlets.		2x GSoil 300 @1.8	no odour / staining
	2.0			E.O.H 2.0		2x GSoil 300 @2.0	no odour / no staining

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Test Pit Field Log

Project Name:	EBA	**Project Number:**	60644113	**Borehole No.:**	TP2
Project Location:	Dale Crescent	**Client:**	AT		
PM Name:	Kate Sheasby	**Date Commenced:**	2/3/22	**Sheet**	of
Test Pit Location:	TP2	**Date Completed:**	2/3/22		
Excavator Contractor:	Extreme Earthmoving	**Fieldwork Staff:**	ABC + HJ		

Field Data

Method	Depth	Graphic Log	USCS Classification	Material Description: Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin, moisture	PID (ppm)	Sampling	Field Notes: Odour, staining, groundwater observations/regime, additional information
excavator	0.0			Grass cover Topsoil: light brown sandy SILT with rootlets, Dry, friable	0.2	Asb500 PS500ab 2×aSoil300	no odour / no staining
	0.3			light grey/~~mottled~~ orange ~~sat~~ silty CLAY, stiff, Dry, rootlets, friable		Asb500 2×aSoil300 taken@ 0.5 0.2ppm	no staining / odour
	0.7			light grey CLAY with some silt, rootlets, stiff		2×aSo.1300 @ 0.75	no staining / no odour
	1.4			light grey/orange silty SAND, soft, damp, rootlets.		2×aSoil300 @ 1.5	no staining / no odour
	1.75			dark brown/black CLAY with some silt, damp, soft to firm with some rootlets.		2×aSoil300 @ 1.75	no staining / no odour
	2.0			E.O.H @ 2.0m		2×aSoil300 @ 2.0	no staining / no odour

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Test Pit Field Log

Project Name:	FBA – Dale Crescent	**Project Number:**	60644113	**Borehole No.:**	TP3
Project Location:	18 Dale Crescent	**Client:**	AT		
PM Name:	Kate Shirley	**Date Commenced:**	3/3/22		
Test Pit Location:	TP3	**Date Completed:**	3/3/22	**Sheet**	of
Excavator Contractor:	Extreme Earthmoving	**Fieldwork Staff:**	MJS		

Field Data

Method	Depth	Graphic Log	USCS Classification	Material Description: Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin, moisture	PID (ppm)	Sampling	Field Notes: Odour, staining, groundwater observations/regime, additional information
	0.0			Grass Cover Topsoil: light brown sandy SILT, dry, friable with rootlets	0.1 ppm	AS5500 2xGSoil300	no odour no staining
	0.2			light Grey Silty CLAY with some rootlets, soft to firm, damp.	0.4 ppm	AS5500 2xGSoil300	no stain
	0.9			Black/orange Silty CLAY soft to firm, damp	0.2 ppm	Sample taken @ 0.4 m 2xGSoil300 @ 0.9m	no odour no stain
	1.1			dark brown/orange Silty CLAY soft to firm, damp	0.4 ppm	2xGSoil300 @ 1.1 m	no odour no stain no odour
					0.4	2xGSoil300 @ 1.5m	no stain no odour
	1.7			light grey/light brown Silty CLAY soft to firm, damp	0.2	2xGSoil300 @ 1.7m	no stain no odour
	2.0			E.O.H @ 2.0 m	0.2	2xGSoil300 @ 2.0 m	no stain no odour

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Test Pit Field Log

Project Name:	EBA	**Project Number:**	60644113	**Borehole No.:**	TP4
Project Location:	Dale Crescent	**Client:**	AT		
PM Name:	Kate S	**Date Commenced:**	2/3/22		
Test Pit Location:	TP4	**Date Completed:**	2/3/22	**Sheet**	of
Excavator Contractor:	Extreme Earthmoving	**Fieldwork Staff:**	ABC + HJ		

Field Data

Method	Depth	Graphic Log	USCS Classification	Material Description: Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin, moisture	PID (ppm)	Sampling	Field Notes: Odour, staining, groundwater observations/regime, additional information
excavator	0.0			Grass cover Topsoil: light brown sandy SILT, dry, friable, with rootlets	2.0	1pm Asb500 2xGSoil300	no odour / no staining
	0.3			light grey/orange Silty CLAY with some rootlets, ~~stiff~~ Dry stiff	0.2	1pm Asb500 2xGSoil300 taken @ 0.4m	no odour / no staining
	0.8			light grey Silty ~~SAND~~ SAND Soft, Dry	0.2	2xGSoil300 taken @ 0.9m	no odour no staining
	1.0			mottled light grey/orange silty CLAY, with rootlets, damp, soft to firm	0.2	2xGSoil300 taken @ 1.5	no odour / no staining
	1.8			dark brown/black CLAY with some silt, damp, soft to firm with some rootlets.	0.1	2xGSoil300 taken @ 1.8m	no odour no staining
	2.0			E.O.H @ 2.0m	0.1	2xGSoil300 taken @ 2.0m	no odour no staining

rusted metal noted in test pit somewhere between 0.0 – 0.4m

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ANZ

Test Pit Field Log

Project Name:	EBA - Dale Cres Test Pit	**Project Number:**	60644113	**Borehole No.:**	TP5
Project Location:	Dale Crescent	**Client:**	AT		
PM Name:	Kate Skalskey	**Date Commenced:**	3/3/22		
Test Pit Location:	TP5	**Date Completed:**	3/3/22	**Sheet**	of
Excavator Contractor:	Extreme Earthmoving	**Fieldwork Staff:**	HJ		

Field Data

Method	Depth	Material Description: Graphic Log	Material Description: USCS Classification	Material Description: Type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin, moisture	PID (ppm)	Sampling	Field Notes: Odour, staining, groundwater observations/regime, additional information
	0.0			Grass Cover Topsoil, light brown Sandy SILT dry, friable with rootlets	0.1 ppm	As 500 2x GSoil 300	No Stain No odour
	0.3			light grey/brown Silty CLAY, dry stiff with some rootlets	0.1 ppm	As 500 2x GSoil 300 @ 0.40m	No Stain No Odour
	0.7			light grey/brown Silty CLAY damp, soft to firm	0.1 ppm	2x GSoil 300 @ 0.90m	No Stain No odour
	1.5			Black/Dark brown Silty CLAY soft, damp.	0.1 ppm	2x GSoil 300 @ 1.5m	No Stain No Odour
	1.6			E.O.H @ 1.6m			

Annexure D – Site Photographs

Eastern Busway

Project Name:	Site Location:	Date of Photograph:
1R Dale Crescent Soil Quality Assessment	1R Dale Crescent, Pakuranga, Auckland 2010, NZ	2-March-2022

Plate Number:
1

Description:
View of location TP1 looking towards the southeast.

Project Name:	Site Location:	Date of Photograph:
1R Dale Crescent Soil Quality Assessment	1R Dale Crescent, Pakuranga, Auckland 2010, NZ	2-March-2022

Plate Number:
2

Description:
Location TP1 following excavation.

Eastern Busway

Project Name:	Site Location:	Date of Photograph:
1R Dale Crescent Soil Quality Assessment	1R Dale Crescent, Pakuranga, Auckland 2010, NZ	2-March-2022

Plate Number:
3

Description:
Excavated material from location TP1 prior to reinstatement.

Project Name:	Site Location:	Date of Photograph:
1R Dale Crescent Soil Quality Assessment	1R Dale Crescent, Pakuranga, Auckland 2010, NZ	2-March-2022

Plate Number:
4

Description:
View of location TP1 following reinstatement.

Eastern Busway

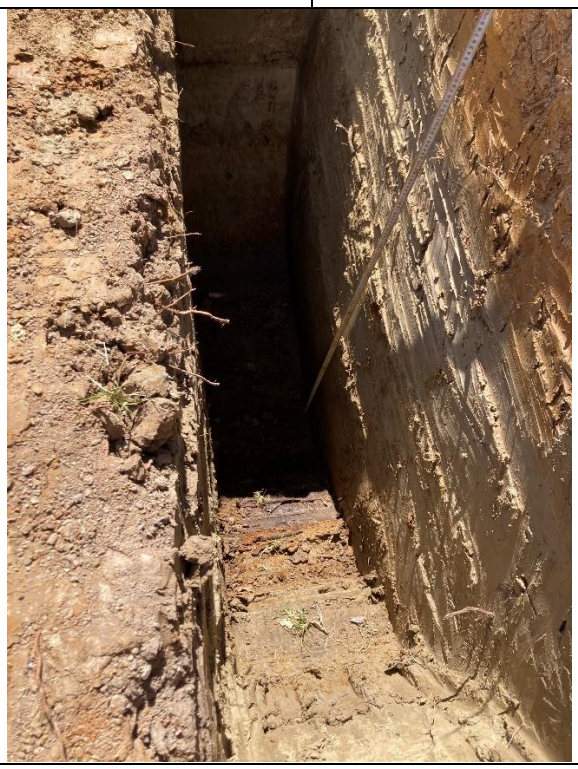
Project Name: 1R Dale Crescent Soil Quality Assessment	Site Location: 1R Dale Crescent, Pakuranga, Auckland 2010, NZ	Date of Photograph: 2-March-2022

Plate Number: **5**

Description: Location TP2 facing northeast.

Project Name: 1R Dale Crescent Soil Quality Assessment	Site Location: 1R Dale Crescent, Pakuranga, Auckland 2010, NZ	Date of Photograph: 2-March-2022

Plate Number: **6**



Description: Location TP2 following excavation.

Eastern Busway

Project Name:	Site Location:	Date of Photograph:
1R Dale Crescent Soil Quality Assessment	1R Dale Crescent, Pakuranga, Auckland 2010, NZ	2-March-2022

Plate Number:
7

Description:
Excavated material from location TP2 prior to reinstatement, facing northwest.

Project Name:	Site Location:	Date of Photograph:
1R Dale Crescent Soil Quality Assessment	1R Dale Crescent, Pakuranga, Auckland 2010, NZ	2-March-2022

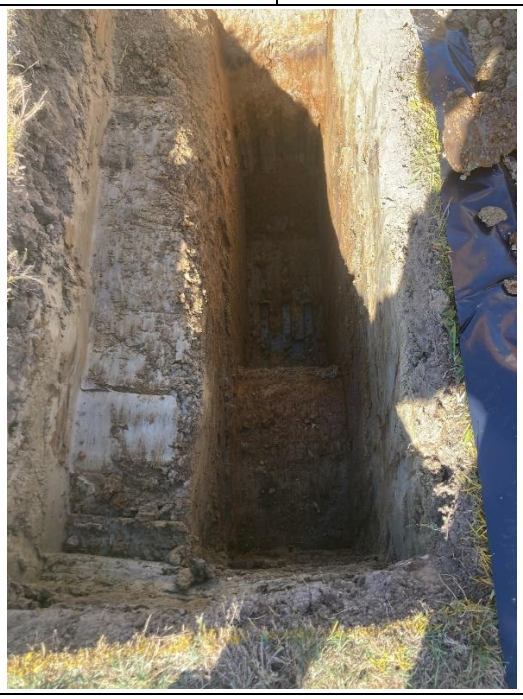
Plate Number:
8

Description:
View of location TP2 following reinstatement.

Eastern Busway

Project Name:	Site Location:	Date of Photograph:
1R Dale Crescent Soil Quality Assessment	1R Dale Crescent, Pakuranga, Auckland 2010, NZ	3-March-2022

Plate Number:
9



Description:
Location TP3 following excavation.

Project Name:	Site Location:	Date of Photograph:
1R Dale Crescent Soil Quality Assessment	1R Dale Crescent, Pakuranga, Auckland 2010, NZ	3-March-2022

Plate Number:
10

Description:
Excavated material from location TP3 prior to reinstatement, facing southeast.

Eastern Busway

Project Name:	Site Location:	Date of Photograph:
1R Dale Crescent Soil Quality Assessment	1R Dale Crescent, Pakuranga, Auckland 2010, NZ	2-March-2022

Plate Number:
11

Description:
Location TP4 following excavation.

Project Name:	Site Location:	Date of Photograph:
1R Dale Crescent Soil Quality Assessment	1R Dale Crescent, Pakuranga, Auckland 2010, NZ	2-March-2022

Plate Number:
12

Description:
Metal fragment excavated from location TP4 between approximately 0.0 and 0.4 m bgl.

Eastern Busway

Project Name:	Site Location:	Date of Photograph:
1R Dale Crescent Soil Quality Assessment	1R Dale Crescent, Pakuranga, Auckland 2010, NZ	2-March-2022

Plate Number:
13

Description:
Excavated material from location TP4 prior to reinstatement, facing south.

Project Name:	Site Location:	Date of Photograph:
1R Dale Crescent Soil Quality Assessment	1R Dale Crescent, Pakuranga, Auckland 2010, NZ	3-March-2022

Plate Number:
14

Description:
Location TP5 following excavation. Featuring groundwater infiltration at an approximate depth of 1.6 m bgl.

Eastern Busway

Project Name:	Site Location:	Date of Photograph:
1R Dale Crescent Soil Quality Assessment	1R Dale Crescent, Pakuranga, Auckland 2010, NZ	3-March-2022

Plate Number: 15

Description:
Excavated material from location TP5 prior to reinstatement, facing southwest.

Annexure E – Chain of Custody Documents and Analytical Reports as Received

Hill Laboratories
TRIED, TESTED AND TRUSTED

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

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

Certificate of Analysis

Client:	AECOM New Zealand Limited	**Lab No:**	2904201	SPv1
Contact:	Kate Shaskey	**Date Received:**	03-Mar-2022	
	C/- AECOM New Zealand Limited	**Date Reported:**	15-Mar-2022	
	PO Box 27277	**Quote No:**	81048	
	Marion Square	**Order No:**	60644113 / 1.1	
	Wellington 6141	**Client Reference:**	60644113 / 1.1	
		Submitted By:	Harry Jones	

Sample Type: Soil

Sample Name:		EBA_TP1_1.8 02-Mar-2022	EBA_TP1_2.0 02-Mar-2022	EBA_TP2_0.5 02-Mar-2022	EBA_TP2_0.75 02-Mar-2022	EBA_TP2_1.5 02-Mar-2022
Lab Number:		2904201.5	2904201.6	2904201.8	2904201.9	2904201.10
Individual Tests						
Dry Matter	g/100g as rcvd	-	49	73	72	-
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	3	-	-	-	4
Total Recoverable Cadmium	mg/kg dry wt	0.32	-	-	-	< 0.10
Total Recoverable Chromium	mg/kg dry wt	43	-	-	-	44
Total Recoverable Copper	mg/kg dry wt	49	-	-	-	21
Total Recoverable Lead	mg/kg dry wt	15.4	-	-	-	8.4
Total Recoverable Nickel	mg/kg dry wt	59	-	-	-	42
Total Recoverable Zinc	mg/kg dry wt	45	-	-	-	72
Haloethers in SVOC Soil Samples by GC-MS						
Bis(2-chloroethoxy) methane	mg/kg dry wt	-	-	-	< 0.5	-
Bis(2-chloroethyl)ether	mg/kg dry wt	-	-	-	< 0.5	-
Bis(2-chloroisopropyl)ether	mg/kg dry wt	-	-	-	< 0.5	-
4-Bromophenyl phenyl ether	mg/kg dry wt	-	-	-	< 0.4	-
4-Chlorophenyl phenyl ether	mg/kg dry wt	-	-	-	< 0.5	-
Nitrogen containing compounds in SVOC Soil Samples by GC-MS						
2,4-Dinitrotoluene	mg/kg dry wt	-	-	-	< 1.0	-
2,6-Dinitrotoluene	mg/kg dry wt	-	-	-	< 1.0	-
Nitrobenzene	mg/kg dry wt	-	-	-	< 0.5	-
N-Nitrosodi-n-propylamine	mg/kg dry wt	-	-	-	< 0.8	-
N-Nitrosodiphenylamine + Diphenylamine	mg/kg dry wt	-	-	-	< 0.8	-
Organochlorine Pesticides in SVOC Soil Samples by GC-MS						
Aldrin	mg/kg dry wt	-	-	-	< 0.5	-
alpha-BHC	mg/kg dry wt	-	-	-	< 0.5	-
beta-BHC	mg/kg dry wt	-	-	-	< 0.5	-
delta-BHC	mg/kg dry wt	-	-	-	< 0.5	-
gamma-BHC (Lindane)	mg/kg dry wt	-	-	-	< 0.5	-
4,4'-DDD	mg/kg dry wt	-	-	-	< 0.5	-
4,4'-DDE	mg/kg dry wt	-	-	-	< 0.5	-
4,4'-DDT	mg/kg dry wt	-	-	-	< 1.0	-
Dieldrin	mg/kg dry wt	-	-	-	< 0.5	-
Endosulfan I	mg/kg dry wt	-	-	-	< 1.0	-
Endosulfan II	mg/kg dry wt	-	-	-	< 2	-
Endosulfan sulphate	mg/kg dry wt	-	-	-	< 1.0	-
Endrin	mg/kg dry wt	-	-	-	< 0.8	-
Endrin ketone	mg/kg dry wt	-	-	-	< 1.0	-
Heptachlor	mg/kg dry wt	-	-	-	< 0.5	-

Sample Type: Soil							
Sample Name:		EBA_TP1_1.8 02-Mar-2022	EBA_TP1_2.0 02-Mar-2022	EBA_TP2_0.5 02-Mar-2022	EBA_TP2_0.75 02-Mar-2022	EBA_TP2_1.5 02-Mar-2022
Lab Number:		2904201.5	2904201.6	2904201.8	2904201.9	2904201.10
Organochlorine Pesticides in SVOC Soil Samples by GC-MS						
Heptachlor epoxide	mg/kg dry wt	-	-	-	< 0.5	-
Hexachlorobenzene	mg/kg dry wt	-	-	-	< 0.5	-
Polycyclic Aromatic Hydrocarbons in SVOC Soil Samples by GC-MS*						
Acenaphthene	mg/kg dry wt	-	-	-	< 0.5	-
Acenaphthylene	mg/kg dry wt	-	-	-	< 0.5	-
Anthracene	mg/kg dry wt	-	-	-	< 0.5	-
Benzo[a]anthracene	mg/kg dry wt	-	-	-	< 0.5	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	-	-	< 0.5	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	-	-	-	< 0.5	-
Benzo[g,h,i]perylene	mg/kg dry wt	-	-	-	< 0.5	-
Benzo[k]fluoranthene	mg/kg dry wt	-	-	-	< 0.5	-
1&2-Chloronaphthalene	mg/kg dry wt	-	-	-	< 0.5	-
Chrysene	mg/kg dry wt	-	-	-	< 0.5	-
Dibenzo[a,h]anthracene	mg/kg dry wt	-	-	-	< 0.5	-
Fluoranthene	mg/kg dry wt	-	-	-	< 0.5	-
Fluorene	mg/kg dry wt	-	-	-	< 0.5	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	-	-	< 0.5	-
2-Methylnaphthalene	mg/kg dry wt	-	-	-	< 0.5	-
Naphthalene	mg/kg dry wt	-	-	-	< 0.5	-
Phenanthrene	mg/kg dry wt	-	-	-	< 0.5	-
Pyrene	mg/kg dry wt	-	-	-	< 0.5	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	-	-	-	< 1.3	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	-	-	-	< 1.3	-
Phenols in SVOC Soil Samples by GC-MS						
4-Chloro-3-methylphenol	mg/kg dry wt	-	-	-	< 5	-
2-Chlorophenol	mg/kg dry wt	-	-	-	< 1.0	-
2,4-Dichlorophenol	mg/kg dry wt	-	-	-	< 1.0	-
2,4-Dimethylphenol	mg/kg dry wt	-	-	-	< 3	-
3 & 4-Methylphenol (m- + p-cresol)	mg/kg dry wt	-	-	-	< 3	-
2-Methylphenol (o-cresol)	mg/kg dry wt	-	-	-	< 1.0	-
2-Nitrophenol	mg/kg dry wt	-	-	-	< 5	-
Pentachlorophenol (PCP)	mg/kg dry wt	-	-	-	< 30	-
Phenol	mg/kg dry wt	-	-	-	< 1.0	-
2,4,5-Trichlorophenol	mg/kg dry wt	-	-	-	< 1.0	-
2,4,6-Trichlorophenol	mg/kg dry wt	-	-	-	< 1.0	-
Plasticisers in SVOC Soil Samples by GC-MS						
Bis(2-ethylhexyl)phthalate	mg/kg dry wt	-	-	-	< 5	-
Butylbenzylphthalate	mg/kg dry wt	-	-	-	< 1.0	-
Di(2-ethylhexyl)adipate	mg/kg dry wt	-	-	-	< 1.0	-
Diethylphthalate	mg/kg dry wt	-	-	-	< 1.0	-
Dimethylphthalate	mg/kg dry wt	-	-	-	< 1.0	-
Di-n-butylphthalate	mg/kg dry wt	-	-	-	< 1.0	-
Di-n-octylphthalate	mg/kg dry wt	-	-	-	< 1.0	-
Other Halogenated compounds in SVOC Soil Samples by GC-MS						
1,2-Dichlorobenzene	mg/kg dry wt	-	-	-	< 0.8	-
1,3-Dichlorobenzene	mg/kg dry wt	-	-	-	< 0.8	-
1,4-Dichlorobenzene	mg/kg dry wt	-	-	-	< 0.8	-
Hexachlorobutadiene	mg/kg dry wt	-	-	-	< 0.8	-
Hexachloroethane	mg/kg dry wt	-	-	-	< 0.8	-
1,2,4-Trichlorobenzene	mg/kg dry wt	-	-	-	< 0.5	-

Sample Type: Soil						
Sample Name:		EBA_TP1_1.8 02-Mar-2022	EBA_TP1_2.0 02-Mar-2022	EBA_TP2_0.5 02-Mar-2022	EBA_TP2_0.75 02-Mar-2022	EBA_TP2_1.5 02-Mar-2022
Lab Number:		2904201.5	2904201.6	2904201.8	2904201.9	2904201.10
Other compounds in SVOC Soil Samples by GC-MS						
Benzyl alcohol	mg/kg dry wt	-	-	-	< 10	-
Carbazole	mg/kg dry wt	-	-	-	< 0.5	-
Dibenzofuran	mg/kg dry wt	-	-	-	< 0.5	-
Isophorone	mg/kg dry wt	-	-	-	< 0.5	-
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	-	< 30	< 20	-	-
C10 - C14	mg/kg dry wt	-	< 30	< 20	-	-
C15 - C36	mg/kg dry wt	-	112	< 40	-	-
Total hydrocarbons (C7 - C36)	mg/kg dry wt	-	113	< 80	-	-

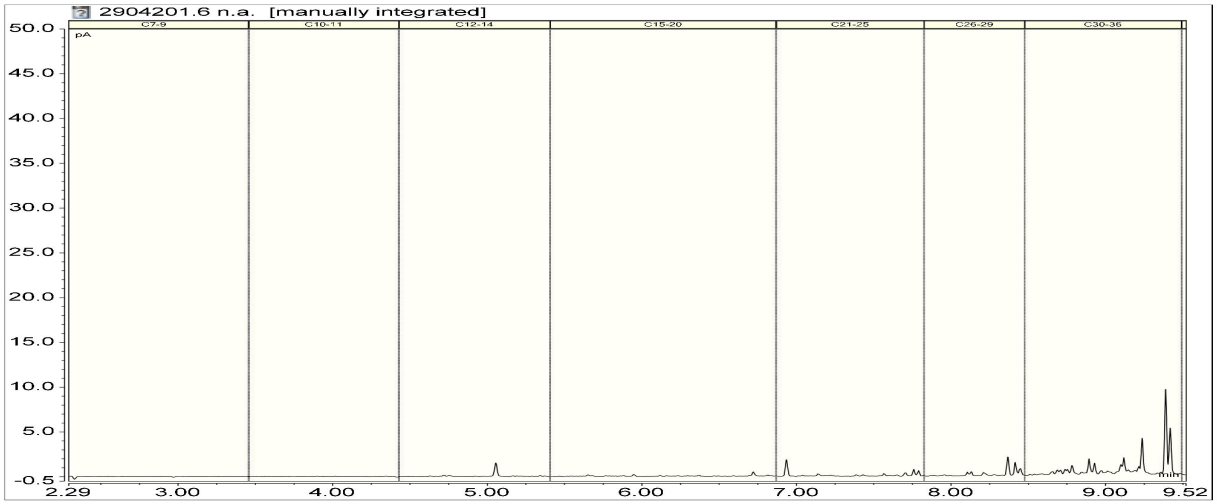
Sample Name:		EBA_TP4_0.0-0.15 02-Mar-2022	EBA_TP4_1.5 02-Mar-2022	EBA_TP3_0.4 03-Mar-2022	EBA_TP3_1.1 03-Mar-2022	EBA_TP5_0.4 03-Mar-2022
Lab Number:		2904201.13	2904201.16	2904201.20	2904201.22	2904201.27
Individual Tests						
Dry Matter	g/100g as rcvd	-	64	-	66	75
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	3	-	< 2	-	-
Total Recoverable Cadmium	mg/kg dry wt	0.14	-	< 0.10	-	-
Total Recoverable Chromium	mg/kg dry wt	34	-	39	-	-
Total Recoverable Copper	mg/kg dry wt	23	-	21	-	-
Total Recoverable Lead	mg/kg dry wt	51	-	10.8	-	-
Total Recoverable Nickel	mg/kg dry wt	41	-	30	-	-
Total Recoverable Zinc	mg/kg dry wt	115	-	52	-	-
Haloethers in SVOC Soil Samples by GC-MS						
Bis(2-chloroethoxy) methane	mg/kg dry wt	-	-	-	-	< 0.5
Bis(2-chloroethyl)ether	mg/kg dry wt	-	-	-	-	< 0.5
Bis(2-chloroisopropyl)ether	mg/kg dry wt	-	-	-	-	< 0.5
4-Bromophenyl phenyl ether	mg/kg dry wt	-	-	-	-	< 0.4
4-Chlorophenyl phenyl ether	mg/kg dry wt	-	-	-	-	< 0.5
Nitrogen containing compounds in SVOC Soil Samples by GC-MS						
2,4-Dinitrotoluene	mg/kg dry wt	-	-	-	-	< 1.0
2,6-Dinitrotoluene	mg/kg dry wt	-	-	-	-	< 1.0
Nitrobenzene	mg/kg dry wt	-	-	-	-	< 0.5
N-Nitrosodi-n-propylamine	mg/kg dry wt	-	-	-	-	< 0.8
N-Nitrosodiphenylamine + Diphenylamine	mg/kg dry wt	-	-	-	-	< 0.8
Organochlorine Pesticides in SVOC Soil Samples by GC-MS						
Aldrin	mg/kg dry wt	-	-	-	-	< 0.5
alpha-BHC	mg/kg dry wt	-	-	-	-	< 0.5
beta-BHC	mg/kg dry wt	-	-	-	-	< 0.5
delta-BHC	mg/kg dry wt	-	-	-	-	< 0.5
gamma-BHC (Lindane)	mg/kg dry wt	-	-	-	-	< 0.5
4,4'-DDD	mg/kg dry wt	-	-	-	-	< 0.5
4,4'-DDE	mg/kg dry wt	-	-	-	-	< 0.5
4,4'-DDT	mg/kg dry wt	-	-	-	-	< 1.0
Dieldrin	mg/kg dry wt	-	-	-	-	< 0.5
Endosulfan I	mg/kg dry wt	-	-	-	-	< 1.0
Endosulfan II	mg/kg dry wt	-	-	-	-	< 2
Endosulfan sulphate	mg/kg dry wt	-	-	-	-	< 1.0
Endrin	mg/kg dry wt	-	-	-	-	< 0.8
Endrin ketone	mg/kg dry wt	-	-	-	-	< 1.0
Heptachlor	mg/kg dry wt	-	-	-	-	< 0.5
Heptachlor epoxide	mg/kg dry wt	-	-	-	-	< 0.5
Hexachlorobenzene	mg/kg dry wt	-	-	-	-	< 0.5

Sample Type: Soil							
Sample Name:		EBA_TP4_0.0-0.15 02-Mar-2022	EBA_TP4_1.5 02-Mar-2022	EBA_TP3_0.4 03-Mar-2022	EBA_TP3_1.1 03-Mar-2022	EBA_TP5_0.4 03-Mar-2022
Lab Number:		2904201.13	2904201.16	2904201.20	2904201.22	2904201.27
Polycyclic Aromatic Hydrocarbons in SVOC Soil Samples by GC-MS*						
Acenaphthene	mg/kg dry wt	-	-	-	-	< 0.5
Acenaphthylene	mg/kg dry wt	-	-	-	-	< 0.5
Anthracene	mg/kg dry wt	-	-	-	-	< 0.5
Benzo[a]anthracene	mg/kg dry wt	-	-	-	-	< 0.5
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	-	-	-	< 0.5
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	-	-	-	-	< 0.5
Benzo[g,h,i]perylene	mg/kg dry wt	-	-	-	-	< 0.5
Benzo[k]fluoranthene	mg/kg dry wt	-	-	-	-	< 0.5
1&2-Chloronaphthalene	mg/kg dry wt	-	-	-	-	< 0.5
Chrysene	mg/kg dry wt	-	-	-	-	< 0.5
Dibenzo[a,h]anthracene	mg/kg dry wt	-	-	-	-	< 0.5
Fluoranthene	mg/kg dry wt	-	-	-	-	< 0.5
Fluorene	mg/kg dry wt	-	-	-	-	< 0.5
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	-	-	-	< 0.5
2-Methylnaphthalene	mg/kg dry wt	-	-	-	-	< 0.5
Naphthalene	mg/kg dry wt	-	-	-	-	< 0.5
Phenanthrene	mg/kg dry wt	-	-	-	-	< 0.5
Pyrene	mg/kg dry wt	-	-	-	-	< 0.5
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	-	-	-	-	< 1.3
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	-	-	-	-	< 1.3
Phenols in SVOC Soil Samples by GC-MS						
4-Chloro-3-methylphenol	mg/kg dry wt	-	-	-	-	< 5
2-Chlorophenol	mg/kg dry wt	-	-	-	-	< 1.0
2,4-Dichlorophenol	mg/kg dry wt	-	-	-	-	< 1.0
2,4-Dimethylphenol	mg/kg dry wt	-	-	-	-	< 3
3 & 4-Methylphenol (m- + p-cresol)	mg/kg dry wt	-	-	-	-	< 3
2-Methylphenol (o-cresol)	mg/kg dry wt	-	-	-	-	< 1.0
2-Nitrophenol	mg/kg dry wt	-	-	-	-	< 5
Pentachlorophenol (PCP)	mg/kg dry wt	-	-	-	-	< 30
Phenol	mg/kg dry wt	-	-	-	-	< 1.0
2,4,5-Trichlorophenol	mg/kg dry wt	-	-	-	-	< 1.0
2,4,6-Trichlorophenol	mg/kg dry wt	-	-	-	-	< 1.0
Plasticisers in SVOC Soil Samples by GC-MS						
Bis(2-ethylhexyl)phthalate	mg/kg dry wt	-	-	-	-	< 5
Butylbenzylphthalate	mg/kg dry wt	-	-	-	-	< 1.0
Di(2-ethylhexyl)adipate	mg/kg dry wt	-	-	-	-	< 1.0
Diethylphthalate	mg/kg dry wt	-	-	-	-	< 1.0
Dimethylphthalate	mg/kg dry wt	-	-	-	-	< 1.0
Di-n-butylphthalate	mg/kg dry wt	-	-	-	-	< 1.0
Di-n-octylphthalate	mg/kg dry wt	-	-	-	-	< 1.0
Other Halogenated compounds in SVOC Soil Samples by GC-MS						
1,2-Dichlorobenzene	mg/kg dry wt	-	-	-	-	< 0.8
1,3-Dichlorobenzene	mg/kg dry wt	-	-	-	-	< 0.8
1,4-Dichlorobenzene	mg/kg dry wt	-	-	-	-	< 0.8
Hexachlorobutadiene	mg/kg dry wt	-	-	-	-	< 0.8
Hexachloroethane	mg/kg dry wt	-	-	-	-	< 0.8
1,2,4-Trichlorobenzene	mg/kg dry wt	-	-	-	-	< 0.5
Other compounds in SVOC Soil Samples by GC-MS						
Benzyl alcohol	mg/kg dry wt	-	-	-	-	< 10
Carbazole	mg/kg dry wt	-	-	-	-	< 0.5
Dibenzofuran	mg/kg dry wt	-	-	-	-	< 0.5
Isophorone	mg/kg dry wt	-	-	-	-	< 0.5

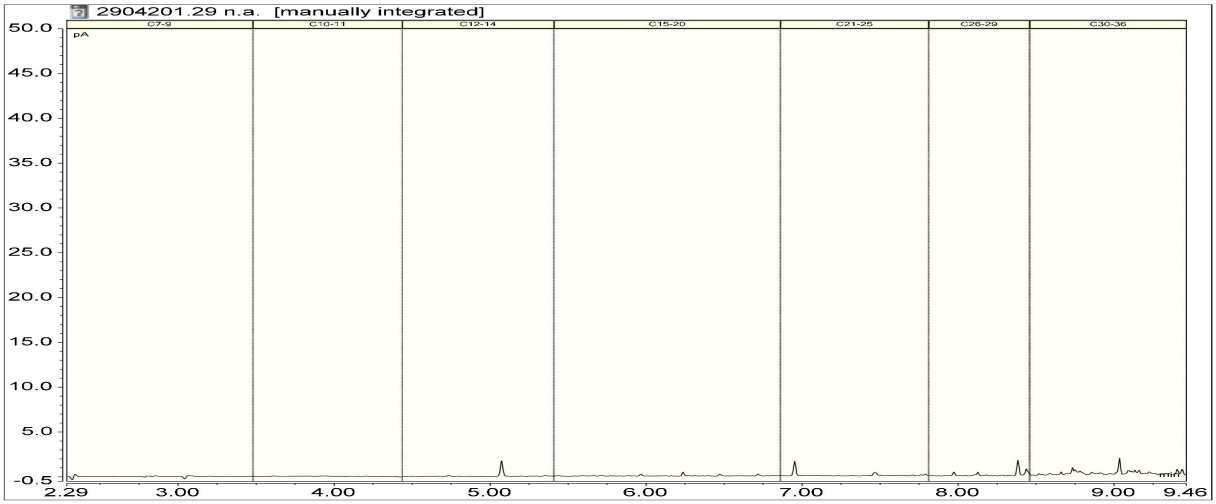
Sample Type: Soil						
Sample Name:		EBA_TP4_0.0-0.15 02-Mar-2022	EBA_TP4_1.5 02-Mar-2022	EBA_TP3_0.4 03-Mar-2022	EBA_TP3_1.1 03-Mar-2022	EBA_TP5_0.4 03-Mar-2022
Lab Number:		2904201.13	2904201.16	2904201.20	2904201.22	2904201.27
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	-	< 30	-	< 30	-
C10 - C14	mg/kg dry wt	-	< 20	-	< 20	-
C15 - C36	mg/kg dry wt	-	< 40	-	< 40	-
Total hydrocarbons (C7 - C36)	mg/kg dry wt	-	< 90	-	< 90	-

Sample Name:		EBA_TP5_0.9 03-Mar-2022	EBA_TP5_1.5 03-Mar-2022			
Lab Number:		2904201.28	2904201.29			
Individual Tests						
Dry Matter	g/100g as rcvd	-	59	-	-	-
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	< 2	-	-	-	-
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	-	-	-	-
Total Recoverable Chromium	mg/kg dry wt	31	-	-	-	-
Total Recoverable Copper	mg/kg dry wt	23	-	-	-	-
Total Recoverable Lead	mg/kg dry wt	11.2	-	-	-	-
Total Recoverable Nickel	mg/kg dry wt	34	-	-	-	-
Total Recoverable Zinc	mg/kg dry wt	59	-	-	-	-
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	-	< 30	-	-	-
C10 - C14	mg/kg dry wt	-	< 20	-	-	-
C15 - C36	mg/kg dry wt	-	66	-	-	-
Total hydrocarbons (C7 - C36)	mg/kg dry wt	-	< 90	-	-	-

2904201.6
EBA_TP1_2.0 02-Mar-2022
Client Chromatogram for TPH by FID



2904201.29
EBA_TP5_1.5 03-Mar-2022
Client Chromatogram for TPH by FID



Analyst's Comments

Appendix No.1 - Chain of Custody

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
Individual Tests			
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	5, 10, 13, 20, 28
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	6, 8-9, 16, 22, 27, 29
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	5, 10, 13, 20, 28
Semivolatile Organic Compounds Screening in Soil by GC-MS	Sonication extraction, GC-MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.002 - 30 mg/kg dry wt	9, 27
Total Petroleum Hydrocarbons in Soil			
Client Chromatogram for TPH by FID	Small peaks associated with QC compounds may be visible in chromatograms with low TPH concentrations. QC peaks are as follows: one peak in the C12 - 14 band, the C21 - 25 band and the C30 - 36 band. All QC peaks are corrected for in the reported TPH concentrations.	-	6, 29
C7 - C9	Solvent extraction, GC-FID analysis. In-house based on US EPA 8015.	20 mg/kg dry wt	6, 8, 16, 22, 29
C10 - C14	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	20 mg/kg dry wt	6, 8, 16, 22, 29
C15 - C36	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	40 mg/kg dry wt	6, 8, 16, 22, 29
Total hydrocarbons (C7 - C36)	Calculation: Sum of carbon bands from C7 to C36. In-house based on US EPA 8015.	70 mg/kg dry wt	6, 8, 16, 22, 29

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

Testing was completed between 10-Mar-2022 and 15-Mar-2022. For completion dates of individual analyses please contact the laboratory.

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

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

Ara Heron BSc (Tech)
Client Services Manager - Environmental

Hill Laboratories
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ANALYSIS REQUEST

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Parnell
Auckland 1052, New Zealand

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W www.hill-laboratories.com

Job No: **290 4201**

Date Recv: **03-Mar-22 14:09**

Received by: Sanaya Hansotia

3129042010

Quote No

Primary Contact Kate Shaskey

Submitted By Harry Jones

Client Name AECOM

Address 8 Mahuhu Crescent
AKL CBD *Postcode* 2

Phone *Mobile* 021348 799

Email Kate.Shaskey@aecom.com

Charge To ~~AECOM~~ AECOM

Client Reference 60644113 / 1.1

Order No 60644113 / 1.1

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

☑ Email Primary Contact ☑ Email Submitter ☐ Email Client

☐ Email Other Harry.Jones@aecom.com

☐ Other

CHAIN OF CUSTODY RECORD

Sent to Hill Laboratories

Date & Time:

Name:

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

Signature:

Samples will be processed at a Hill Lab testing capability and capacity. Please ir samples to be retained and analysed at

Received at Hill Laboratories

Date & Tim

Name:

Signature:

Temperature On Arrival

1.9 °C

Temperature was measured on one or more arbitrarily chosen samples in this batch.

ADDITIONAL INFORMATION

Priority ☐ Low ☐ Normal ☐ High

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

Requested Reporting Date:

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

No.	Sample Name	Sample Material	Sample Location	Sample Date	Tests Required (if not as per Quote)
1	EBA_TP1_0.0-0.5	Soil	—	2-3-22	Hold Cold.
2	EBA_TP1_0.6				
3	EBA_TP1_0.9				
4	EBA_TP1_1.5				
5	EBA_TP1_1.8				
6	EBA_TP1_2.0				
7	EBA_TP2_0.0-0.5				
8	EBA_TP2_0.5				
9	EBA_TP2_0.75				
10	EBA_TP2_1.5				

11	EBA_TP2_1.75	Soil	—	2.3.22	Hold Cold
12	EBA_TP2_2.0		—		
13	EBA_TP4_0.0-0.15		—		
14	EBA_TP4_0.4		—		
15	EBA_TP4_0.9		—		
16	EBA_TP4_1.5		—		
17	EBA_TP4_1.8		—		
18	EBA_TP4_2.0		—		
19	EBA_TP3_0.0-0.15		—	3.3.22	
20	EBA_TP3_0.4		—		
21	EBA_TP3_0.9		—		
22	EBA_TP3_1.1		—		
23	EBA_TP3_1.5		—		
24	EBA_TP3_1.7		—		
25	EBA_TP3_2.0		—		
26	EBA_TP5_0.0-0.15		—		
27	EBA_TP5_0.4		—		
28	EBA_TP5_0.9		—		
29	EBA_TP5_1.5		—		
30	~~EBA~~				
31					
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37					
38					
39					
40					

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Job Information Summary

Client:	AECOM New Zealand Limited	**Lab No:**	2904201
Contact:	Kate Shaskey	**Date Registered:**	04-Mar-2022 11:48 am
	C/- AECOM New Zealand Limited	**Priority:**	High
	PO Box 27277	**Quote No:**	81048
	Marion Square	**Order No:**	60644113 / 1.1
	Wellington 6141	**Client Reference:**	60644113 / 1.1
		Add. Client Ref:	
		Submitted By:	Harry Jones
		Charge To:	AECOM New Zealand Limited
		Target Date:	14-Mar-2022 4:30 pm

Samples

No	Sample Name	Sample Type	Containers	Tests Requested
1	EBA_TP1_0.0-0.15 02-Mar-2022	Soil	GSoil300, GSoil300	Hold Cold
2	EBA_TP1_0.6 02-Mar-2022	Soil	GSoil300, GSoil300	Hold Cold
3	EBA_TP1_0.9 02-Mar-2022	Soil	GSoil300, GSoil300	Hold Cold
4	EBA_TP1_1.5 02-Mar-2022	Soil	GSoil300, GSoil300	Hold Cold
5	EBA_TP1_1.8 02-Mar-2022	Soil	GSoil300, GSoil300	Heavy Metals, Screen Level
6	EBA_TP1_2.0 02-Mar-2022	Soil	GSoil300, GSoil300	Total Petroleum Hydrocarbons in Soil
7	EBA_TP2_0.0-0.15 02-Mar-2022	Soil	GSoil300, GSoil300	Hold Cold
8	EBA_TP2_0.5 02-Mar-2022	Soil	GSoil300, GSoil300	Total Petroleum Hydrocarbons in Soil
9	EBA_TP2_0.75 02-Mar-2022	Soil	GSoil300, GSoil300	Semivolatile Organic Compounds Screening in Soil by GC-MS
10	EBA_TP2_1.5 02-Mar-2022	Soil	GSoil300, GSoil300	Heavy Metals, Screen Level
11	EBA_TP2_1.75 02-Mar-2022	Soil	GSoil300, GSoil300	Hold Cold
12	EBA_TP2_2.0 02-Mar-2022	Soil	GSoil300, GSoil300	Hold Cold
13	EBA_TP4_0.0-0.15 02-Mar-2022	Soil	GSoil300, GSoil300	Heavy Metals, Screen Level
14	EBA_TP4_0.4 02-Mar-2022	Soil	GSoil300, GSoil300	Hold Cold
15	EBA_TP4_0.9 02-Mar-2022	Soil	GSoil300, GSoil300	Hold Cold
16	EBA_TP4_1.5 02-Mar-2022	Soil	GSoil300, GSoil300	Total Petroleum Hydrocarbons in Soil
17	EBA_TP4_1.8 02-Mar-2022	Soil	GSoil300, GSoil300	Hold Cold
18	EBA_TP4_2.0 02-Mar-2022	Soil	GSoil300, GSoil300	Hold Cold
19	EBA_TP3_0.0-0.15 03-Mar-2022	Soil	GSoil300, GSoil300	Hold Cold
20	EBA_TP3_0.4 03-Mar-2022	Soil	GSoil300, GSoil300	Heavy Metals, Screen Level
21	EBA_TP3_0.9 03-Mar-2022	Soil	GSoil300, GSoil300	Hold Cold
22	EBA_TP3_1.1 03-Mar-2022	Soil	GSoil300, GSoil300	Total Petroleum Hydrocarbons in Soil
23	EBA_TP3_1.5 03-Mar-2022	Soil	GSoil300, GSoil300	Hold Cold
24	EBA_TP3_1.7 03-Mar-2022	Soil	GSoil300, GSoil300	Hold Cold
25	EBA_TP3_2.0 03-Mar-2022	Soil	GSoil300, GSoil300	Hold Cold
26	EBA_TP5_0.0-0.15 03-Mar-2022	Soil	GSoil300, GSoil300	Hold Cold
27	EBA_TP5_0.4 03-Mar-2022	Soil	GSoil300, GSoil300	Semivolatile Organic Compounds Screening in Soil by GC-MS
28	EBA_TP5_0.9 03-Mar-2022	Soil	GSoil300, cGSoil	Heavy Metals, Screen Level
29	EBA_TP5_1.5 03-Mar-2022	Soil	GSoil300, GSoil300	Total Petroleum Hydrocarbons in Soil

Summary of Methods

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

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Individual Tests			

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Environmental Solids Sample Drying	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	5, 10, 13, 20, 28
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	6, 8-9, 16, 22, 27, 29
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	5, 10, 13, 20, 28
Semivolatile Organic Compounds Screening in Soil by GC-MS	Sonication extraction, GC-MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.002 - 30 mg/kg dry wt	9, 27
Total Petroleum Hydrocarbons in Soil			
Client Chromatogram for TPH by FID	Small peaks associated with QC compounds may be visible in chromatograms with low TPH concentrations. QC peaks are as follows: one peak in the C12 - 14 band, the C21 - 25 band and the C30 - 36 band. All QC peaks are corrected for in the reported TPH concentrations.	-	6, 29
C7 - C9	Solvent extraction, GC-FID analysis. In-house based on US EPA 8015.	20 mg/kg dry wt	6, 8, 16, 22, 29
C10 - C14	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	20 mg/kg dry wt	6, 8, 16, 22, 29
C15 - C36	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	40 mg/kg dry wt	6, 8, 16, 22, 29
Total hydrocarbons (C7 - C36)	Calculation: Sum of carbon bands from C7 to C36. In-house based on US EPA 8015.	70 mg/kg dry wt	6, 8, 16, 22, 29

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Parnell
Auckland 1052 New Zealand

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T +64 7 858 2000
E mail@hill-labs.co.nz
W www.hill-laboratories.com

Certificate of Analysis

Client:	AECOM New Zealand Limited	**Lab No:**	2904207	A2Pv1
Contact:	Kate Shaskey	**Date Received:**	03-Mar-2022	
	C/- AECOM New Zealand Limited	**Date Reported:**	10-Mar-2022	
	PO Box 27277	**Quote No:**	81048	
	Marion Square	**Order No:**	60644113 / 1.1	
	Wellington 6141	**Client Reference:**	60644113 / 1.1	
		Add. Client Ref:	Sampled: 2/3/22	
		Submitted By:	Harry Jones	

Sample Type: Soil

Sample Name:		EBA_TP1_0.0-0.15	EBA_TP4_0.0-0.15			
Lab Number:		2904207.1	2904207.6			
Asbestos Presence / Absence		Asbestos NOT detected.	Asbestos NOT detected.	-	-	-
Description of Asbestos Form		-	-	-	-	-
Asbestos in ACM as % of Total Sample*	% w/w	< 0.001	< 0.001	-	-	-
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	-	-	-
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w	< 0.001	< 0.001	-	-	-
Asbestos as Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	-	-	-
As Received Weight	g	501.4	582.2	-	-	-
Dry Weight	g	416.3	470.4	-	-	-
Moisture	%	17	19	-	-	-
Sample Fraction >10mm*	g dry wt	< 0.1	< 0.1	-	-	-
Sample Fraction <10mm to >2mm*	g dry wt	269.2	299.3	-	-	-
Sample Fraction <2mm*	g dry wt	147.0	171.0	-	-	-
<2mm Subsample Weight*	g dry wt	52.0	50.4	-	-	-
Weight of Asbestos in ACM (Non-Friable)	g dry wt	< 0.00001	< 0.00001	-	-	-
Weight of Asbestos as Fibrous Asbestos (Friable)*	g dry wt	< 0.00001	< 0.00001	-	-	-
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt	< 0.00001	< 0.00001	-	-	-

Glossary of Terms

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

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

The following assumptions have been made:

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

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

Summary of Methods

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

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
New Zealand Guidelines Semi Quantitative Asbestos in Soil			
As Received Weight	Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g	1, 6
Dry Weight	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g	1, 6
Moisture	Sample dried at 100 to 105°C. Calculation = (As received weight - Dry weight) / as received weight x 100.	1 %	1, 6
Sample Fraction >10mm*	Sample dried at 100 to 105°C, 10mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g dry wt	1, 6
Sample Fraction <10mm to >2mm*	Sample dried at 100 to 105°C, 10mm and 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g dry wt	1, 6
Sample Fraction <2mm*	Sample dried at 100 to 105°C, 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g dry wt	1, 6
Asbestos Presence / Absence	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	1, 6
Description of Asbestos Form	Description of asbestos form and/or shape if present. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	-	1, 6
Weight of Asbestos in ACM (Non-Friable)	Measurement on analytical balance, from the >10mm Fraction. Weight of asbestos based on assessment of ACM form. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1, 6
Asbestos in ACM as % of Total Sample*	Calculated from weight of asbestos in ACM and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1, 6
Weight of Asbestos as Fibrous Asbestos (Friable)*	Measurement on analytical balance, from the >10mm Fraction. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1, 6
Asbestos as Fibrous Asbestos as % of Total Sample*	Calculated from weight of fibrous asbestos and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1, 6
Weight of Asbestos as Asbestos Fines (Friable)*	Measurement on analytical balance, from the <10mm Fractions. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1, 6
Asbestos as Asbestos Fines as % of Total Sample*	Calculated from weight of asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1, 6

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	Calculated from weight of fibrous asbestos plus asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1, 6

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

Testing was completed on 10-Mar-2022. For completion dates of individual analyses please contact the laboratory.

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

Mahaleel (May) Alfante BSc, PGDipSci
Laboratory Technician - Asbestos

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ANALYSIS REQUEST

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

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

Job No: **290 4207**

Date Recv: **03-Mar-22 14:12**

Received by: Sanaya Hansotia

3129042073

Quote No

Primary Contact Kate Shaskey

Submitted By Hany Jones

Client Name AECOM

Address 8 Mahuhu Crescent
AKL CBD *Postcode* 2

Phone *Mobile* 021348 799

Email Kate.shaskey@aecom.com

Charge To ~~AECOM~~ AECOM

Client Reference 60644113 / 1.1

Order No 60644113 / 1.1

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

☑ Email Primary Contact ☑ Email Submitter ☐ Email Client

☐ Email Other Hany.Jones@aecom.com

☐ Other

CHAIN OF CUSTODY RECORD

Sent to Hill Laboratories *Date & Time:*

Name:

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

Signature:

Samples will be processed at a Hill Labo testing capability and capacity. Please ir samples to be retained and analysed at

Received at Hill Laboratories *Date & Tim* *Name:* *Signature:*

Temperature On Arrival
1.9 °C
Temperature was measured on one or more arbitrarily chosen samples in this batch.

ADDITIONAL INFORMATION

Priority ☐ Low ☐ Normal ☐ High

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

Requested Reporting Date:

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

No.	Sample Name	Sample Material	Sample Location	Sample Date	Tests Required (if not as per Quote)
1	EBA_TP1_0.0-0.15	Soil	—	2-3-22	Hold Cold.
2	EBA_TP1_0.6				
3	EBA_TP1_0.9				
4	EBA_TP1_1.5				
5	EBA_TP1_1.8				
6	EBA_TP1_2.0				
7	EBA_TP2_0.0-0.5				
8	EBA_TP2_0.5				
9	EBA_TP2_0.75				
10	EBA_TP2_1.5				

11	EBA_TP2_1.75	Soil	—	2.3.22	Hold Cold
12	EBA_TP2_2.0		—		
13	FBA_TP4_0.0-0.15		—		
14	EBA_TP4_0.4		—		
15	EBA_TP4_0.9		—		
16	EBA_TP4_1.5		—		
17	EBA_TP4_1.8		—		
18	EBA_TP4_2.0		—		
19	EBA_TP3_0.0-015		—	3.3.22	
20	EBA_TP3_0.4		—		
21	EBA_TP3_0.9		—		
22	FBA_TP3_1.1		—		
23	EBA_TP3_1.5		—		
24	EBA_TP3_1.7		—		
25	EBA_TP3_2.0		—		
26	EBA_TP5_0.0-0.15		—		
27	EBA_TP5_0.4		—		
28	EBA_TP5_0.9		—		
29	EBA_TP5_1.5		—		
30	~~EBA~~				
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40					

Hill Laboratories
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Private Bag 3205
Hamilton 3240 New Zealand

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T +64 7 858 2000
E mail@hill-labs.co.nz
W www.hill-laboratories.com

Job Information Summary

Client:	AECOM New Zealand Limited	**Lab No:**	2904207
Contact:	Kate Shaskey	**Date Registered:**	03-Mar-2022 3:18 pm
	C/- AECOM New Zealand Limited	**Priority:**	High
	PO Box 27277	**Quote No:**	81048
	Marion Square	**Order No:**	60644113 / 1.1
	Wellington 6141	**Client Reference:**	60644113 / 1.1
		Add. Client Ref:	Sampled: 2/3/22
		Submitted By:	Harry Jones
		Charge To:	AECOM New Zealand Limited
		Target Date:	11-Mar-2022 4:30 pm

Samples

No	Sample Name	Sample Type	Containers	Tests Requested
1	EBA_TP1_0.0-0.15	Soil	PSoil500Asb	New Zealand Guidelines Semi Quantitative Asbestos in Soil
2	EBA_TP1_0.6	Soil	PSoil500Asb	Hold
3	EBA_TP1_0.9	Soil	PSoil500Asb	Hold
4	EBA_TP2_0.0-0.15	Soil	PSoil500Asb	Hold
5	EBA_TP2_0.5	Soil	PSoil500Asb	Hold
6	EBA_TP4_0.0-0.15	Soil	PSoil500Asb	New Zealand Guidelines Semi Quantitative Asbestos in Soil
7	EBA_TP4_0.4	Soil	PSoil500Asb	Hold
8	EBA_TP3_0.0-0.15	Soil	PSoil500Asb	Hold
9	EBA_TP3_0.4	Soil	PSoil500Asb	Hold
10	EBA_TP5_0.0-0.15	Soil	PSoil500Asb	Hold
11	EBA_TP5_0.4	Soil	PSoil500Asb	Hold

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
New Zealand Guidelines Semi Quantitative Asbestos in Soil			
As Received Weight	Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g	1, 6
Dry Weight	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g	1, 6
Moisture	Sample dried at 100 to 105°C. Calculation = (As received weight - Dry weight) / as received weight x 100.	1 %	1, 6
Sample Fraction >10mm	Sample dried at 100 to 105°C, 10mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g dry wt	1, 6
Sample Fraction <10mm to >2mm	Sample dried at 100 to 105°C, 10mm and 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g dry wt	1, 6
Sample Fraction <2mm	Sample dried at 100 to 105°C, 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g dry wt	1, 6
Asbestos Presence / Absence	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	1, 6
Description of Asbestos Form	Description of asbestos form and/or shape if present. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	-	1, 6

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Weight of Asbestos in ACM (Non-Friable)	Measurement on analytical balance, from the >10mm Fraction. Weight of asbestos based on assessment of ACM form. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1, 6
Asbestos in ACM as % of Total Sample	Calculated from weight of asbestos in ACM and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1, 6
Weight of Asbestos as Fibrous Asbestos (Friable)	Measurement on analytical balance, from the >10mm Fraction. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1, 6
Asbestos as Fibrous Asbestos as % of Total Sample	Calculated from weight of fibrous asbestos and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1, 6
Weight of Asbestos as Asbestos Fines (Friable)	Measurement on analytical balance, from the <10mm Fractions. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1, 6
Asbestos as Asbestos Fines as % of Total Sample	Calculated from weight of asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1, 6
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample	Calculated from weight of fibrous asbestos plus asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1, 6

Annexure F – Analytical Results Tables

Table 3: Eastern Busway - 1R Dale Crescent
Soil Analytical Results Table

Source Area	Sample Details and Analytical Results												Guideline Values							
AECOM Sample Reference	EBA_TP1_1.8	EBA_TP1_2.0	EBA_TP2_0.5	EBA_TP2_0.75	EBA_TP2_1.5	EBA_TP3_0.4	EBA_TP3_1.1	EBA_TP4_0.0-0.15	EBA_TP4_1.5	EBA_TP5_0.4	EBA_TP5_0.9	EBA_TP5_1.5	NES CS[1] (Human Health)		Auckland Background Concentrations[2]	Auckland Permitted Activity Soil Acceptance Criteria[5,6]	Oil Industry Guidelines: Tier 1 Soil Acceptance Criteria[7]			
Laboratory Sample Reference	2904201.5	2904201.6	2904201.8	2904201.9	2904201.10	2904201.20	2904201.22	2904201.13	2904201.16	2904201.27	2904201.28	2904201.29	Soil Contaminant Standard[2]				All Pathways Soil Acceptance Criteria - Commercial / Industrial[8]			
Date Sampled	02-Mar-22	02-Mar-22	02-Mar-22	02-Mar-22	02-Mar-22	03-Mar-22	03-Mar-22	02-Mar-22	02-Mar-22	03-Mar-22	03-Mar-22	03-Mar-22					Contamination Depth Surface (<1m) / 1-4m			
Sample Location	1R Dale Crescent												Recreation	Commercial / Industrial Outdoor Worker (Unpaved)	Non-Volcanic Range[4]		SAND	SANDY SILT	SILTY CLAY	CLAY
	TP1		TP2			TP3		TP4		TP5										
Excavation Method	Excavator	Excavator	Excavator	Excavator	Excavator	Excavator	Excavator	Excavator	Excavator	Excavator	Excavator	Excavator								
Sample Depth (m below ground level)	1.8	2.0	0.5	0.75	1.5	0.4	1.1	0.2	1.5	0.4	0.9	1.5								
Sample Soil Type	CLAY	CLAY	Silty CLAY	CLAY	Silty SAND	Silty CLAY	Silty CLAY	Sandy SILT	Silty CLAY	Silty CLAY	Silty CLAY	Silty CLAY								
Guideline Soil Type[9]	CLAY	CLAY	SILTY CLAY	CLAY	SAND	SILTY CLAY	SILTY CLAY	SANDY SILT	SILTY CLAY	SILTY CLAY	SILTY CLAY	SILTY CLAY								
Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg								
Total Petroleum Hydrocarbons (TPH)																				
C_7-C_9	-	< 30	< 20	-	-	-	< 30	-	< 30	-	-	< 30	-	-	-	-	**120[m] / 120[m]**	**(500)[m] / (500)[m]**	**(8,800)[v] / (20,000)[m]**	**NA / NA**
C_{10}-C_{14}	-	< 30	< 20	-	-	-	< 20	-	< 20	-	-	< 20	-	-	-	-	**(1,500)[v] / (1,900)[v]**	**(1,700)[v] / (2,200)[v]**	**(1,900)[v] / (8,900)[v]**	**(1,900)[v] / (9,700)[v]**
C_{15}-C_{36}	-	112	< 40	-	-	-	< 40	-	< 40	-	-	66	-	-	-	-	**NA / NA**	**NA / NA**	**NA / NA**	**NA / NA**
Total hydrocarbons (C_7 - C_{36})	-	113	< 80	-	-	-	< 90	-	< 90	-	-	< 90	-	-	-	-	-	-	-	-
Semi-volatile Organic Compounds (SVOCs)*																				
Pyrene	-	-	-	< 0.5	-	-	-	-	-	< 0.5	-	-	-	-	-	-	**NA / NA**	**NA / NA**	**NA / NA**	**NA / NA**
Naphthalene	-	-	-	< 0.5	-	-	-	-	-	< 0.5	-	-	-	-	-	-	**(190)[v] / (230)[v]**	**(210)[v] / (270)[v]**	**(230)[v] / (1,100)[v]**	**(230)[v] / (1,200)[v]**
Dieldrin	-	-	-	< 0.5	-	-	-	-	-	< 0.5	-	-	70	160	-	-	-	-	-	-
DDT	-	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-	400	1,000	-	12	-	-	-	-
Benzo(a)pyrene Equivalent**	-	-	-	< 1.2	-	-	-	-	-	< 1.2	-	-	40	35	-	20	**(11)[d] / (25)[m]**	**(11)[d] / (25)[m]**	**(11)[d] / (25)[m]**	**(11)[d] / (25)[m]**
Heavy Metals																				
Arsenic	3	-	-	-	4	< 2	-	3	-	-	< 2	-	80	70	0.4 - 12	100	-	-	-	-
Cadmium	0.32	-	-	-	< 0.10	< 0.10	-	0.14	-	-	< 0.10	-	400	1,300	< 0.1 - 0.65	7.5	-	-	-	-
Chromium	43	-	-	-	44	39	-	34	-	-	31	-	2,700	6,300	2 - 55	400	-	-	-	-
Copper	49	-	-	-	21	21	-	23	-	-	23	-	> 10,000	> 10,000	1 - 45	325	-	-	-	-
Lead	15.4	-	-	-	8.4	10.8	-	51	-	-	11.2	-	880	3,300	< 1.5 - 65	250	-	-	-	-
Nickel	59	-	-	-	42	30	-	41	-	-	34	-	-	-	0.9 - 35	105	-	-	-	-
Zinc	45	-	-	-	72	52	-	115	-	-	59	-	-	-	9 - 180	400	-	-	-	-

Notes
Blue - exceeds AC Permitted Activity Criteria.
Underlined - exceeds Auckland Background Criteria.
Bold - exceeds the Oil Industry Guidelines.
Red - exceeds the NES CS.

1. Ministry for the Environment, 2011. *National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health - Soil Contaminant Standard* (NES CS).
2. Values taken from Appendix Tables B2 and B3 of the NES CS.
3. Auckland Regional Council, 2001. *Technical Publication Background Concentrations of inorganic elements in soils from the Auckland Region* (Auckland Background Crtieria).
4. Values taken from Table 3 of Auckland Background Criteria.
5. Auckland Council Unitary Plan Operative in Part, 2016 (updated 12 June 2020). *Permitted Activity Soil Acceptance Criteria* (AC Permitted Activity Criteria).
6. Values taken from Table E30.6.1.4.1.
7. Ministry for the Environment, 1999. *Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand* (Oil Industry Guidelines).
8. Values taken from Table 4.11 and 4.14 of the Oil Industry Guidelines.
9. Conservative soil category chosen for comparison with Oil Industry Guidelines Tier 1 acceptance criteria to best represent soils observed on site.

NA - indicates contaminant is not limiting as estimated health-based criterion is significantly higher than that likely to be encountered on site.
Brackets denote values exceed threshold likely to correspond to formation of residual separate phase hydrocarbons.
The following notes indicate the limiting pathway for each criterion:
v - volatilisation, **s** - soil ingestion, **d** - dermal exposure, **p** - produce ingestion, **m** - maintenance/excavation worker exposure, **x** – PAH surrogate.
*All remaining SVOCs were reported below the laboratory limit of reporting.
**For benzo(a)pyrene, the equivalent BaP concentration is calculated as the sum of each of the detected concentrations of nine carcinogenic PAHs (benzo(a)anthracene, benzo(b)fluoranthene, benzo(j)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene, fluoranthene and indeno(1,2,3-cd) pyrene), multiplied by their respective potency equivalency factors.

Table 4: Eastern Busway - 1R Dale Crescent
Soil Asbestos Analytical Results Table

Sample Reference		EBA_TP1_0.0-0.15	EBA_TP4_0.0-0.15	BRANZ Guidelines [1]	
Laboratory Sample Reference		2904207.1	2904207.6		
Date sampled		2-Mar-22	2-Mar-22		
Sample Location		1R Dale Crescent			
		TP1	TP4		
Sample depth (m below ground level)		0.2	0.2		
Asbestos Presence / Absence	Unit	Asbestos NOT detected.	Asbestos NOT detected.	All Land Uses[2]	Commercial / Industrial Uses[2]
Description of Asbestos Form		-	-		
Asbestos in ACM as % of Total Sample	% w/w	< 0.001	< 0.001	-	**0.05**
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample	% w/w	< 0.001	< 0.001	**0.001**	-
Asbestos as Fibrous Asbestos as % of Total Sample	% w/w	< 0.001	< 0.001	-	-
Asbestos as Asbestos Fines as % of Total Sample	% w/w	< 0.001	< 0.001		
Weight of Asbestos in ACM (Non-Friable)	g of ashed wt	< 0.00001	< 0.00001	-	-
Weight of Asbestos as Fibrous Asbestos (Friable)	g of ashed wt	< 0.00001	< 0.00001	-	-
Weight of Asbestos as Asbestos Fines (Friable)	g of ashed wt	< 0.00001	< 0.00001	-	-

Notes
% w/w - Percent weight by weight (asbestos to sample weight)
<0.001 Less than Laboratory Limit of Reporting (LOR)
Bold - asbestos form detected in sample.
Red - exceeds the BRANZ Guidelines.

1. Building Research Association of New Zealand, November 2017. *New Zealand Guidelines for Assessing and Managing Asbestos in Soil* (BRANZ Guidelines).
2. Values taken from Table 5 of the BRANZ Guidelines.