

## SECTOR 1 – TEST PIT LOGS

Test Pits	Location
TP101 to TP121	150 Raumati Road

### SECTOR 1 – SUMMARY OF SOIL SAMPLING AND ANALYSIS

Location	Test Pit Depth (m bgl)	Laboratory Number	Sample Depth (m)	Soil Type	Analysis Suite
TP101	1.8	110964.20	0.2-0.3	Silt	HM, TPH, PAH
		110964.21	1.7-1.8	Peat	Hold Cold
TP102	2.2	110964.22	0.3-0.4	Silt	HM, TPH, PAH
		110964.23	1.4-1.5	Silt	TPH, PAH, HM
TP103	2.2	1111765.5	0.2-0.3	Silt	HM, TPH, PAH
		1111765.2	1.2-1.3	Silt	Hold Cold
		1111765.3	2.1-2.2	Silty clay	TPH, PAH, HM
TP104	1.7	1111765.4	0.2-0.3	Silt	TPH, PAH, HM
		1111765.6	1.4-1.5	Silt	HM, TPH, PAH
TP105	2.3	1111765.7	0.15-0.25	Sand	Hold Cold
		1111765.8	0.6-0.7	Gravelly silt	HM, TPH, PAH
		1111765.9	1.9-2	Silt	TPH, PAH
TP106	2	110964.18	0.3-0.4	Silt	HM, TPH, PAH
		110964.19	0.8-0.9	Silt	HM, TPH, PAH
TP107	2.4	110964.16	0.3-0.4	Sandy silt	TPH, PAH, HM
		110964.17	2.3-2.4	sand	Hold Cold
TP108	2	110964.14	0.8-0.9	Sandy silt	HM, TPH, PAH
		110964.15	1.8-1.9	Peat	Hold Cold
TP109	2	110964.11	0.1-0.2	Sandy silt	TPH, PAH, HM
		110964.12	1.0-1.1	Sandy silt	Hold Cold
		110964.13	1.6-1.7	Sandy silt	TPH, PAH, HM
		110964.24	1.9-2	Peat	Hold Cold

TP110	2.4	1111765.10	0.1-0.2	Silt	Hold Cold
		1111765.11	1.1-1.2	Gravelly silt	TPH, PAH, HM
		1111765.12	2.1-2.2	Gravelly silt	Hold Cold
TP111	2.4	1111765.13	0.4-0.5	Sand	HM, TPH, PAH
		1111765.14	1.4-1.5	Sand	Hold Cold
		1111765.15	2.3-2.4	Peat	Hold Cold
TP112	2.5	1111703.1	0.2-0.3	Silt	TPH, PAH, HM
		1111703.2	1.3-1.4	Gravelly silt	Hold Cold
		1111703.3	2.4-2.5	Sand	Hold Cold
TP113	2.1	1111703.7	0.2-0.3	Sandy silt	TPH, PAH, HM
		1111703.8	1.3-1.4	Silt	Hold Cold
		1111703.9	2-2.1	Silt	TPH, PAH, HM
TP114	2.5	1111703.4	0.1-0.2	Silt	HM, TPH, PAH
		1111703.5	1.1-1.2	Silt	Hold Cold
		1111703.6	2.4-2.5	Peat	Hold Cold
TP115	1.9	1111703.13	0.1-0.2	Silt	TPH, PAH, HM
		1111703.14	1.2-1.3	Gravelly silt	Hold Cold
		1111703.28	2.4-2.5	Peat	Hold Cold
TP116	2.8	1111703.10	0.1-0.2	Silt	TPH, PAH, HM
		1111703.11	1.2-1.3	Silt	HM, TPH, PAH
		1111703.12	2.5-2.6	Peat	Hold Cold
TP117	2.5	1111703.16	0.2-0.3	Sand	HM, TPH, PAH
		1111703.17	1.4-1.5	Sand	HM, TPH, PAH
		1111703.18	2.4-2.5	Sand	Hold Cold
TP118	2.5	1111703.23	0.2-0.3	Gravelly silt	HM, TPH, PAH
		1111703.24	0.6-0.7	Silt	HM, TPH, PAH
		1111703.25	2.1-2.2	Silt	Hold Cold
TP119	2	1111703.19	0.2-0.3	Gravelly silt	HM, TPH, PAH
		1111703.20	1.4-1.5	Sand	HM, TPH, PAH

TP120	2.5	1111703.21	0.3-0.4	Sand	HM, TPH, PAH
		1111703.22	1.3-1.4	Sand	Hold Cold
TP121	2.5	1111703.26	0.2-0.3	Sandy silt	HM, TPH, PAH
		1111703.27	1.4-1.5	Sand	Hold Cold

HM = heavy metals

TPH = total petroleum hydrocarbons

PAH = polycyclic aromatic hydrocarbons





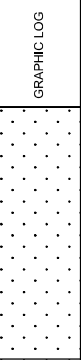







**TEST PIT LOG**

PROJECT: MacKays to Peka Peka Expressway      JOB NUMBER: 3320901/1000/013  
 SITE LOCATION: 150 Raumati Road, Paraparaumu      CLIENT: NZTA

CIRCUIT:      TEST PIT LOCATION:  
 COORDINATES: N 5,467,039.78 m      R L:  
                          E 1,767,649.06 m      DATUM:

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale	SV	$\tau$ (kPa)	SAMPLES	DEPTH (m)
0.5			SW	D	Fine to coarse SAND, some fine to coarse gravel; light brown; dry, non plastic. Gravel: Angular.	Fill				DS1	0.5
0.5 - 1.0			ML	M	Fine to coarse gravelly SILT, some clay; grey mottled orange and brown; moist, low plasticity. Gravel: Angular.					DS2	1.0
1.0 - 2.0			ML	D	SILT, some concrete, metal pipe, timber, plastic, wire and brick; dark brown; dry, non plastic. Strong hydrocarbon odour.					DS3	2.0
2.0 - 2.3				W	Becoming wet.						
2.3					END OF LOG @ 2.3 m						2.5

DATE EXCAVATED: 13/3/13      CONTRACTOR: Goodman Contractors Ltd      COMMENTS: S1 13:024 TP105RB S1 0.15-0.25m  
 LOGGED BY: KMW      EQUIPMENT: 12 tonne Kobelco      S2 13:024 TP105RB S2 0.6-0.7m  
 SHEAR VANE No:      METHOD: Excavation      S3 13:024 TP105RB S3 1.9-2.0m  
 Groundwater as slow seep at 2.3m

TEST\_PIT\_P:\332\3320901\TENICON LAND\PHASE 1B GROUND INVESTIGATION\_POST-LODGE\GINT LOGS\150 RAUMATI ROAD\150 RAUMATI ROAD.GPJ BECA.GDT 16/4/13





**TEST PIT LOG**

PROJECT: **MacKays to Peka Peka Expressway**      JOB NUMBER: **3320901/1000/013**  
 SITE LOCATION: **150 Raumati Road, Paraparaumu**      CLIENT: **NZTA**

CIRCUIT:      TEST PIT LOCATION:  
 COORDINATES: N 5,467,015.35 m      R L:  
                          E 1,767,631.84 m      DATUM:

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale	SV	$\tau$ (kPa)	SAMPLES	DEPTH (m)	
0.5			ML	D	Fine to coarse sandy SILT, minor plastic; light brown; dry, non plastic.	<b>Fill</b>				DS1	0.5	
1.0			PT	W	Fibrous PEAT; dark brown; wet, non plastic. Organic odour.							1.0
1.5					Concrete block.							1.5
2.0			GP	S	Coarse SAND; dark grey; saturated; non plastic.					DS2	2.0	
2.5	12/3/13				END OF LOG @ 2.4 m						2.5	

DATE EXCAVATED: 12/3/13	CONTRACTOR: Goodman Contractors Ltd	COMMENTS: S1 13:024 TP107RB S1 0.3-0.4m S2 13:024 TP107RB S2 2.3-2.4m Groundwater as moderate inflow at 2.3m
LOGGED BY: KMW	EQUIPMENT: 12 tonne Kobelco	
SHEAR VANE No:	METHOD: Excavation	


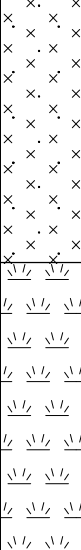



TEST\_PIT\_P:3320901\TENICON LAND\PHASE 1B\GROUND INVESTIGATION\_POST-LODGE\GINT LOGS\150 RAUMATI ROAD\150 RAUMATI ROAD.GPJ BECA.GDT 16/4/13

**TEST PIT LOG**

SHEET 1 of 1

PROJECT: **MacKays to Peka Peka Expressway** JOB NUMBER: **3320901/1000/013**  
 SITE LOCATION: **150 Raumati Road, Paraparaumu** CLIENT: **NZTA**

CIRCUIT: TEST PIT LOCATION:  
 COORDINATES: N 5,467,016.33 m R L:  
 E 1,767,645.01 m DATUM:

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale	SV	τ (kPa)	SAMPLES	DEPTH (m)
0.5			ML	D	Fine to coarse sandy SILT; light brown; dry, non plastic.	Fill					0.5
1.0			M		Dark brown; moist.  Pieces of reinforced concrete, wire, asphalt, brick.					DS1	1.0
1.5			PT	W	Fibrous PEAT; dark brown; wet, non plastic. Organic odour.	Interdune deposits (Peat)					1.5
2.0	12/3/13 				END OF LOG @ 2 m					DS2	2.0
2.5											2.5

DATE EXCAVATED: 12/3/13	CONTRACTOR: Goodman Contractors Ltd	COMMENTS: S1 13:024 TP109RB S1 0.8-0.9m S2 13:024 TP109RB S2 1.8-1.9m Groundwater as slow seep at 1.9m
LOGGED BY: KMW	EQUIPMENT: 12 tonne Kobelco	
SHEAR VANE No:	METHOD: Excavation	

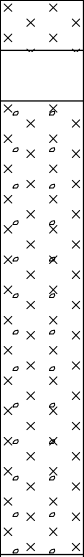
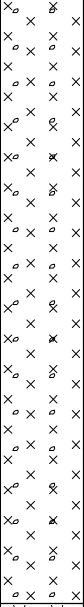
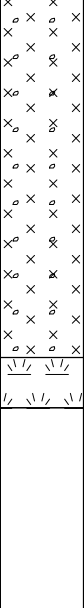


TEST\_PIT\_P:\3320901\TENICON LAND\PHASE 1B GROUND INVESTIGATION\_POST-LOGGEMENT\GINT LOGS\150 RAUMATI ROAD\150 RAUMATI ROAD.GPJ BECA.GDT 16/4/13



**TEST PIT LOG**

PROJECT: **MacKays to Peka Peka Expressway** JOB NUMBER: **3320901/1000/013**  
 SITE LOCATION: **150 Raumati Road, Paraparaumu** CLIENT: **NZTA**

CIRCUIT: TEST PIT LOCATION:  
 COORDINATES: N 5,466,986.54 m R L:  
 E 1,767,654.95 m DATUM:

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale	SV	$\gamma$ (kPa)	SAMPLES	DEPTH (m)		
0.5			ML	D	SILT, minor fine to coarse sand, minor fine to coarse gravel; light brown; dry, non plastic. Gravel: Angular.	<b>Fill</b>				DS1	0.5		
			OL	M	Organic SILT; dark brown; moist, non plastic. Organics: Bark.								
			ML	D	Fine to coarse gravelly SILT; dark brown; dry, non plastic. Gravel: Rounded.								
			ML	M	Fine to coarse gravelly SILT, some fill (brick, timber, wire, concrete, plastic); bluish grey; moist, non plastic. Gravel: Rounded.	DS2							
1.0			ML	D	Fine to coarse gravelly SILT, some fill (brick, timber, wire, concrete, plastic); bluish grey; moist, non plastic. Gravel: Rounded.	<b>Fill</b>				DS2	1.0		
ML	M		Fine to coarse gravelly SILT, some fill (brick, timber, wire, concrete, plastic); bluish grey; moist, non plastic. Gravel: Rounded.										
1.5				ML	D	Fine to coarse gravelly SILT, some fill (brick, timber, wire, concrete, plastic); bluish grey; moist, non plastic. Gravel: Rounded.	<b>Fill</b>					DS2	1.5
ML	M			Fine to coarse gravelly SILT, some fill (brick, timber, wire, concrete, plastic); bluish grey; moist, non plastic. Gravel: Rounded.									
2.0			ML	D	Fine to coarse gravelly SILT, some fill (brick, timber, wire, concrete, plastic); bluish grey; moist, non plastic. Gravel: Rounded.	<b>Fill</b>				DS2	2.0		
ML	M		Fine to coarse gravelly SILT, some fill (brick, timber, wire, concrete, plastic); bluish grey; moist, non plastic. Gravel: Rounded.										
2.5			PT	M	Fibrous PEAT; dark reddish brown; wet, non plastic. Organic odour.	<b>ID</b>				DS3		2.5	
PT	M		Fibrous PEAT; dark reddish brown; wet, non plastic. Organic odour.										
END OF LOG @ 2.4 m													

DATE EXCAVATED: 13/3/13 CONTRACTOR: Goodman Contractors Ltd COMMENTS: S1 13:024 TP110RB S1 0.1-0.2m  
 LOGGED BY: KMW EQUIPMENT: 12 tonne Kobelco S2 13:024 TP110RB S2 1.1-1.2m  
 SHEAR VANE No: METHOD: Excavation S3 13:024 TP110RB S3 2.1-2.2m  
 ID = Interdune deposits (Peat)

TEST\_PIT\_P:3320901\TENICON LAND\PHASE 1B\_GROUND INVESTIGATION\_POST-LODGE\GINT LOGS\150 RAUMATI ROAD\150 RAUMATI ROAD.GPJ BECA.GDT 16/4/13

**TEST PIT LOG**

PROJECT: MacKays to Peka Peka Expressway      JOB NUMBER: 3320901/1000/013  
 SITE LOCATION: 150 Raumati Road, Paraparaumu      CLIENT: NZTA

CIRCUIT:      TEST PIT LOCATION:  
 COORDINATES: N 5,466,992.94 m      R L:  
                          E 1,767,639.07 m      DATUM:

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale	SV	$\sigma_v$ (kPa)	SAMPLES	DEPTH (m)
0.5	▽	[Dotted pattern]	SW	D	Fine to coarse SAND, minor fine to coarse gravel, minor fill (plastic); light brown, non plastic. Gravel: Angular.	Fill				DS1	0.5
					Asphalt.						
1.0					Reinforced concrete, timber, wire. Faint hydrocarbon odour.						1.0
1.5										DS2	1.5
2.0											2.0
2.3	▽	[Diagonal lines]	PT	M	Fibrous PEAT; dark blackish brown; wet, non plastic. Organic odour.	ID				DS3	2.3
2.5					END OF LOG @ 2.4 m						2.5


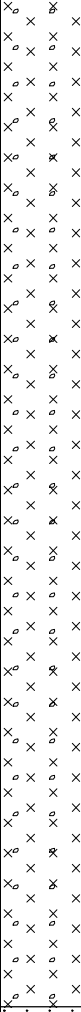

DATE EXCAVATED: 13/3/13      CONTRACTOR: Goodman Contractors Ltd      COMMENTS: S1 13:024 TP111RB S1 0.4-0.5m  
 LOGGED BY: KMW      EQUIPMENT: 12 tonne Kobelco      S2 13:024 TP115RB S2 1.5-1.6m  
 SHEAR VANE No:      METHOD: Excavation      S3 13:024 TP111RB S3 2.3-2.4m  
 Groundwater as slow seep at 2.3m  
 ID = Interdune deposits (Peat)

TEST\_PIT\_P:\332\3320901\TENCON LAND\PHASE 1B GROUND INVESTIGATION\_POST-LODGEMENT\GINT LOGS\150 RAUMATI ROAD\150 RAUMATI ROAD.GPJ BECA.GDT 16/4/13

**TEST PIT LOG**

PROJECT: **MacKays to Peka Peka Expressway** JOB NUMBER: **3320901/1000/013**  
 SITE LOCATION: **150 Raumatī Road, Paraparaumu** CLIENT: **NZTA**

CIRCUIT: TEST PIT LOCATION:  
 COORDINATES: N 5,466,995.98 m R L:  
 E 1,767,619.68 m DATUM:

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale	SV	$\tau$ (kPa)	SAMPLES	DEPTH (m)				
0.5			ML	D	SILT, minor fine to coarse sand; light brown; dry, non plastic.	Fill				DS1	0.5				
			ML	M	Fine to coarse gravelly SILT, some clay, minor concrete and timber; light grey; moist, low plasticity. Gravel: Rounded.										
1.0													DS2	1.5	
1.5															
2.0					Timber.										
2.5															
2.5			SW	W	Fine to coarse SAND; dark grey; wet, non plastic.									DS3	2.5
					END OF LOG @ 2.5 m										

DATE EXCAVATED: 13/3/13 CONTRACTOR: Goodman Contractors Ltd  
 LOGGED BY: KMW EQUIPMENT: 12 tonne Kobelco  
 SHEAR VANE No: METHOD: Excavation

COMMENTS:  
 S1 13:024 TP112RB S1 0.2-0.3m  
 S2 13:024 TP112RB S2 1.3-1.4m  
 S3 13:024 TP112RB S3 2.4-2.5m

TEST\_PIT\_P:\3320901\TENICON LAND\PHASE 1B\_GROUND INVESTIGATION\_POST-LODGEMENT\GINT LOGS\150 RAUMATI ROAD\150 RAUMATI ROAD.GPJ BECA.GDT 16/4/13









**TEST PIT LOG**

PROJECT: MacKays to Peka Peka Expressway JOB NUMBER: 3320901/1000/013  
 SITE LOCATION: 150 Raumati Road, Paraparaumu CLIENT: NZTA

CIRCUIT: TEST PIT LOCATION:  
 COORDINATES: N 5,466,945.87 m R L:  
 E 1,767,649.25 m DATUM:

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale	SV	γ (kPa)	SAMPLES	DEPTH (m)
										DS1	
0.5 1.0 1.5 2.0 2.5			ML	D	SILT, some fine to coarse gravel; light brown; dry, non plastic. Gravel: Angular.	Fill					DS1
			SW	M	Fine to coarse SAND, some fine to coarse gravel, minor concrete; dark grey; moist, non plastic. Gravel: Angular.						DS2
			ML	M	SILT, some fine to coarse sand, minor concrete and brick; dark brown; moist, non plastic.  Asphalt, plastic bags.						DS3
			PL	W	Fibrous PEAT; dark brown; wet, non plastic. Organic odour.	ID					
					END OF LOG @ 2.8 m						

DATE EXCAVATED: 13/3/13 CONTRACTOR: Goodman Contractors Ltd  
 LOGGED BY: KMW EQUIPMENT: 12 tonne Kobelco  
 SHEAR VANE No: METHOD: Excavation


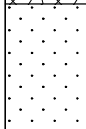
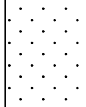
COMMENTS:  
 S1 13:024 TP116RB S1 0.2-0.3m  
 S2 13:024 TP116RB S2 1.3-1.4m  
 S3 13:024 TP116RB S3 2.5-2.6m  
 Groundwater as slow seep at 2.7m  
 ID = Interdune deposits (Peat)

**TEST PIT LOG**

SHEET 1 of 1

PROJECT: **MacKays to Peka Peka Expressway** JOB NUMBER: **3320901/1000/013**  
 SITE LOCATION: **150 Raumatī Road, Paraparāmu** CLIENT: **NZTA**

CIRCUIT: TEST PIT LOCATION:  
 COORDINATES: N 5,466,943.74 m R L:  
 E 1,767,627.72 m DATUM:

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scala	SV	τ (kPa)	SAMPLES	DEPTH (m)
0.5			GM	D	Silty fine to coarse GRAVEL, minor fine to coarse sand; light brown; dry, non plastic. Gravel: Angular.	<b>Fill</b>					DS1
			SW	D	Fine to coarse SAND, some fine to coarse gravel; dark brown; dry, non plastic. Gravel: Angular.						
					Pieces of timber, wire, tree branches, plastic and metal.						
1.5			SW	M	Fine to coarse SAND; dark grey; moist, non plastic.					DS2	
2.5					END OF LOG @ 2.5 m					DS3	

TEST\_PIT\_P:3320901\TENICON LAND\PHASE 1B GROUND INVESTIGATION\_POST-LODGE\GINT LOGS\150 RAUMATI ROAD\150 RAUMATI ROAD.GPJ BECA.GDT 16/4/13

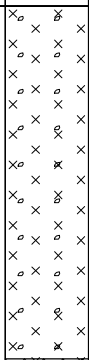
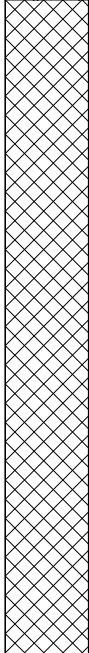
DATE EXCAVATED: 13/3/13 CONTRACTOR: Goodman Contractors Ltd COMMENTS:  
 LOGGED BY: KMW EQUIPMENT: 12 tonne Kobelco S1 13:024 TP117RB S1 0.2-0.3m  
 SHEAR VANE No: METHOD: Excavation S2 13:024 TP117RB S2 1.4-1.5m  
 S3 13:024 TP117RB S3 2.4-2.5m



**TEST PIT LOG**

PROJECT: MacKays to Peka Peka Expressway      JOB NUMBER: 3320901/1000/013  
 SITE LOCATION: 150 Raumati Road, Paraparaumu      CLIENT: NZTA

CIRCUIT:      TEST PIT LOCATION:  
 COORDINATES: N 5,466,927.95 m      R L:  
 E 1,767,605.34 m      DATUM:

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale	SV	$\sigma_v$ (kPa)	SAMPLES	DEPTH (m)
0.0 - 0.5			ML	D	Fine to coarse gravelly SILT; light brown; dry, non plastic. Gravel: Angular.	Fill				DS1	0.5
0.5 - 1.0				D	LANDFILL MATERIAL (timber, brick, metal, household refuse, car parts), some fine to coarse sand, some silt; light brown; dry, non plastic.						DS2
2.0					END OF LOG @ 2 m						2.0

DATE EXCAVATED: 13/3/13      CONTRACTOR: Goodman Contractors Ltd  
 LOGGED BY: KMW      EQUIPMENT: 12 tonne Kobelco  
 SHEAR VANE No:      METHOD: Excavation


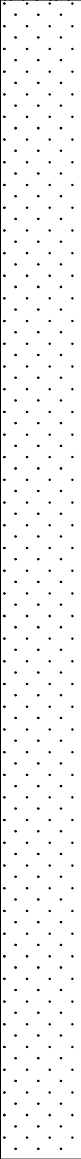
COMMENTS:  
 S1 13:024 TP119RB S1 0.2-0.3m  
 S2 13:024 TP119RB S2 1.4-1.5m

TEST\_PIT\_P:\332\3320901\TENICON LAND\PHASE 1B\GROUND INVESTIGATION\_POST-LODGE\GINT LOGS\150 RAUMATI ROAD\150 RAUMATI ROAD.GPJ BECA.GDT 16/4/13

**TEST PIT LOG**

PROJECT: **MacKays to Peka Peka Expressway** JOB NUMBER: 3320901/1000/013  
 SITE LOCATION: **150 Raumati Road, Paraparaumu** CLIENT: **NZTA**

CIRCUIT: TEST PIT LOCATION:  
 COORDINATES: N 5,466,922.99 m R L:  
 E 1,767,623.74 m DATUM:

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale	SV	τ (kPa)	SAMPLES	DEPTH (m)	
			GM	D	Silty fine to coarse GRAVEL, some fine to coarse sand; light brown; dry, non plastic. Gravel: Angular.	<b>Fill</b>						
			SW	M	Fine to coarse SAND; yellowish brown; dry, non plastic.		<b>Holocene Sand</b>				DS1	0.5
0.5					Silty fine to coarse SAND; dark grey.							
1.0					Fine to coarse SAND; yellowish brown.						DS2	1.5
1.5												
2.0												
2.5					END OF LOG @ 2.5 m							

DATE EXCAVATED: 13/3/13 CONTRACTOR: Goodman Contractors Ltd  
 LOGGED BY: KMW EQUIPMENT: 12 tonne Kobelco  
 SHEAR VANE No: METHOD: Excavation

COMMENTS:  
 S1 13:024 TP120RB S1 0.3-0.4m  
 S2 13:024 TP120RB S2 1.3-1.4m

TEST\_PIT\_P:3320901\TENICON LAND\PHASE 1B\_GROUND INVESTIGATION\_POST-LODGE\GINT LOGS\150 RAUMATI ROAD\150 RAUMATI ROAD.GPJ BECA.GDT 16/4/13





## APPENDIX D

Sector 2 – Laboratory Testing Summary Sheets, Logs and Investigation Summary

**SOIL ANALYSIS RESULTS: 55 RATA ROAD**

Sampling Date	13/02/2013	13/02/2013	13/02/2013	13/02/2013	13/02/2013	13/02/2013	13/02/2013	Assessment Criteria				
	TP215	TP215	TP216	TP216	TP217	TP217	TP217	Contaminated Site Assessment				NES Human Health Risk
Test Pit Number	TP215	TP215	TP216	TP216	TP217	TP217	TP217	Background Levels <sup>1</sup>	Environmental Risk <sup>2</sup>	Human Health Risk		
Sample Number	S2	S3	S1	S2	S2	S3	S4			Human Health Risk		NES Human Health Risk
Laboratory Number	1099950.2	1099950.3	1099950.5	1099950.6	1099950.1	1099950.11	1099950.12	Human Health Risk		NES Human Health Risk		
Sample Depth (m)	0.3 - 0.4	1.0 - 1.1	0.0 - 0.1	0.5 - 0.6	0.5 - 0.6	1.4 - 1.5	1.8 - 1.9	Human Health Risk			NES Human Health Risk	
Soil Type	Sand	Sand	Sand	Sand	Silt	Silt	Silt	Human Health Risk		NES Human Health Risk		
Heavy Metals (mg/kg dry weight)								Human Health Risk			NES Human Health Risk	
Arsenic	4	5	4	3	<b>119</b>	<u>11</u>	<u>11</u>	<2-7	12	500 <sup>3</sup>		70 <sup>5</sup>
Cadmium	< 0.10	< 0.10	< 0.10	< 0.10	<u>0.16</u>	< 0.10	<u>0.14</u>	<0.1-0.1	22	100 <sup>3</sup>	1300 <sup>5</sup>	
Chromium	9	8	9	6	<b>440</b>	<u>16</u>	8	7-12	86	500 <sup>3</sup>	NL <sup>5</sup>	
Copper	8	8	<u>11</u>	7	<b>146</b>	<u>15</u>	<u>13</u>	4-10	91	5000 <sup>3</sup>	NL <sup>5</sup>	
Lead	22	9.6	22	3.9	34	42	29	4.5-180	260	1500 <sup>3</sup>	3300 <sup>5</sup>	
Mercury	-	-	-	-	< 0.10	< 0.10	< 0.10	<0.1-0.1	24	75 <sup>3</sup>	4200 <sup>5</sup>	
Nickel	6	6	5	4	<u>12</u>	6	5	4-9	50	3000 <sup>3</sup>	2000 <sup>6</sup>	
Zinc	57	77	48	26	<u>104</u>	<u>163</u>	<u>95</u>	28-79	360	35000 <sup>3</sup>	31000 <sup>6</sup>	
Polycyclic Aromatic Hydrocarbons (mg/kg dry weight)										<1m	1m-4m	
Acenaphthene	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	-	-	-	-	
Acenaphthylene	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	-	-	-	-	
Anthracene	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	0.002-0.005	-	-	-	
Benzo[a]anthracene	< 0.03	0.07	0.03	0.08	< 0.03	< 0.03	0.06	-	-	-	-	
Benzo[a]pyrene (BAP)	<u>&lt; 0.03</u>	<u>0.07</u>	<u>0.05</u>	<u>0.08</u>	<u>&lt; 0.03</u>	<u>0.05</u>	<u>0.07</u>	0.002-0.005	0.7	-	-	
Benzo[b]fluoranthene + Benzo[j]fluoranthene	< 0.03	0.1	0.07	0.11	< 0.03	0.08	0.11	-	-	-	-	
Benzo[g,h,i]perylene	< 0.03	0.08	0.05	0.07	< 0.03	0.09	0.07	-	-	-	-	
Benzo[k]fluoranthene	< 0.03	0.04	0.03	0.05	< 0.03	0.03	0.04	-	-	-	-	
Chrysene	< 0.03	0.06	0.03	0.09	< 0.03	< 0.03	0.06	-	-	-	-	
Dibenzo[a,h]anthracene	< 0.03	0.03	< 0.03	0.03	< 0.03	0.03	0.03	-	-	-	-	
Fluoranthene	<u>&lt; 0.03</u>	<u>0.13</u>	<u>0.04</u>	<u>0.21</u>	<u>&lt; 0.03</u>	<u>0.04</u>	<u>0.15</u>	0.002-0.005	-	-	-	
Fluorene	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	-	-	-	-	
Indeno(1,2,3-c,d)pyrene	< 0.03	0.07	0.05	0.07	< 0.03	0.08	0.07	-	-	-	-	
Naphthalene	<u>&lt; 0.15</u>	<u>&lt; 0.13</u>	<u>&lt; 0.14</u>	<u>&lt; 0.14</u>	<u>&lt; 0.13</u>	<u>&lt; 0.14</u>	<u>&lt; 0.15</u>	0.002-0.005	-	190 (sand) <sup>4</sup> 210 (sandy silt) <sup>4</sup>	230 (sand) <sup>4</sup> 270 (sandy silt) <sup>4</sup>	
Phenanthrene	<u>&lt; 0.03</u>	<u>0.07</u>	< 0.03	<u>0.1</u>	<u>&lt; 0.03</u>	< 0.03	<u>0.06</u>	0.002-0.005	-	-	-	
Pyrene	<u>&lt; 0.03</u>	<u>0.12</u>	<u>0.04</u>	<u>0.17</u>	<u>&lt; 0.03</u>	<u>0.04</u>	<u>0.12</u>	0.002-0.005	-	NA (all soils) <sup>4</sup>	NA (all soils) <sup>4</sup>	
BaP equivalent	<0.07	0.13	0.08	0.14	<0.07	0.10	0.13	-	-	11 (all soils) <sup>4</sup>	25 (all soils) <sup>4</sup>	
BaP equivalent (inc. Fluoranthene)	<0.07	0.13	0.08	0.14	<0.07	0.10	0.13	-	-	-	35 <sup>5</sup>	
Total Petroleum Hydrocarbons in Soil (mg/kg)										<1m	1m-4m	
C7 - C9	< 9	< 8	< 9	< 9	< 8	< 9	< 9	-	-	120 (sand) <sup>4</sup> 500 (sandy silt) <sup>4</sup>	120 (sand) <sup>4</sup> 500 (sandy silt) <sup>4</sup>	
C10 - C14	< 20	< 20	< 20	< 20	< 20	< 20	< 20	-	-	1500 (sand) <sup>4</sup> 1700 (sandy silt) <sup>4</sup>	1900 (sand) <sup>4</sup> 2200 (sandy silt) <sup>4</sup>	
C15 - C36	< 40	< 40	< 40	< 40	46	85	< 40	-	-	NA (all soils) <sup>4</sup>	NA (all soils) <sup>4</sup>	
Total hydrocarbons (C7 - C36)	< 70	< 70	< 70	< 70	< 70	85	< 70	0.002-0.005	-	-	-	

**Annotations:**

- Determination of common pollutant background soil concentrations for the Wellington region, GWRC 2003. Values applicable to 'Main Soil Type 1 (Sand)' have been used.
- Canadian Soil Quality Guidelines, Canadian Council of Ministers of the Environment, 2012. Values applicable to 'commercial' land use have been selected.
- Guideline on the Investigation Levels for Soil and Groundwater, NEPC, 1999. Values applicable to 'Health Investigation Level F - commercial/industrial' have been used.
- Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand, Ministry for the Environment, 1999. Values for 'commercial/industrial' land use have been selected.
- Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations, 2011. Values applicable to 'commercial/industrial outdoor worker' have been used.
- USEPA Regional Screening Level Industrial Soil Table, April 2012

Results exceeding background levels are underlined  
 Results exceeding environmental risk criteria are shaded in grey  
 Results exceeding human health risk criteria are in **bold**  
 NL - No Limit. Derived value exceeds 10000 mg/kg.  
 NA - indicates contaminant not limiting. Greater than 20000 mg/kg for TPH and 10000 mg/kg for other contaminants.

**WASTE ACCEPTANCE CRITERIA: 55 RATA ROAD**

Sampling Date	13/02/2013	13/02/2013	13/02/2013	13/02/2013	13/02/2013	13/02/2013	13/02/2013	Waste Acceptance Criteria	
Test Pit Number	TP215	TP215	TP216	TP216	TP217	TP217	TP217		
Sample Number	S2	S3	S1	S2	S2	S3	S4		
Laboratory Number	1099950.2	1099950.3	1099950.5	1099950.6	1099950.1	1099950.11	1099950.12	Porirua City Council	Hutt City Council
Sample Depth (m)	0.3 - 0.4	1.0 - 1.1	0.0 - 0.1	0.5 - 0.6	0.5 - 0.6	1.4 - 1.5	1.8 - 1.9	Spicer Landfill (Class B)	Silverstream Landfill (Class A)
Soil Type	Sand	Sand	Sand	Sand	Silt	Silt	Silt	(mg/kg)	(mg/kg)
Heavy Metals (mg/kg dry weight)									
Arsenic	4	5	4	3	<b>119</b>	<b>11</b>	<b>11</b>	10	100
Cadmium	< 0.10	< 0.10	< 0.10	< 0.10	0.16	< 0.10	0.14	2	20
Chromium	9	8	9	6	<b>440</b>	<b>16</b>	8	10	100
Copper	8	8	<b>11</b>	7	<b>146</b>	<b>15</b>	<b>13</b>	10	28
Lead	<b>22</b>	9.6	<b>22</b>	3.9	<b>34</b>	<b>42</b>	<b>29</b>	10	100
Mercury	-	-	-	-	< 0.10	< 0.10	< 0.10	0.4	4
Nickel	6	6	5	4	12	6	5	20	40
Zinc	<b>57</b>	<b>77</b>	<b>48</b>	<b>26</b>	<b>104</b>	<b>163</b>	<b>95</b>	20	160
Polycyclic Aromatic Hydrocarbons (mg/kg dry weight)									
Acenaphthene	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	-	-
Acenaphthylene	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	-	-
Anthracene	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	-	-
Benzo[a]anthracene	< 0.03	0.07	0.03	0.08	< 0.03	< 0.03	0.06	-	-
Benzo[a]pyrene (BAP)	< 0.03	0.07	0.05	0.08	< 0.03	0.05	0.07	30	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	< 0.03	0.1	0.07	0.11	< 0.03	0.08	0.11	-	-
Benzo[g,h,i]perylene	< 0.03	0.08	0.05	0.07	< 0.03	0.09	0.07	-	-
Benzo[k]fluoranthene	< 0.03	0.04	0.03	0.05	< 0.03	0.03	0.04	-	-
Chrysene	< 0.03	0.06	0.03	0.09	< 0.03	< 0.03	0.06	-	-
Dibenzo[a,h]anthracene	< 0.03	0.03	< 0.03	0.03	< 0.03	0.03	0.03	-	-
Fluoranthene	< 0.03	0.13	0.04	0.21	< 0.03	0.04	0.15	-	-
Fluorene	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	-	-
Indeno(1,2,3-c,d)pyrene	< 0.03	0.07	0.05	0.07	< 0.03	0.08	0.07	-	-
Naphthalene	< 0.15	< 0.13	< 0.14	< 0.14	< 0.13	< 0.14	< 0.15	20	1
Phenanthrene	< 0.03	0.07	< 0.03	0.1	< 0.03	< 0.03	0.06	-	-
Pyrene	< 0.03	0.12	0.04	0.17	< 0.03	0.04	0.12	-	-
BaP equivalent	<0.07	0.13	0.08	0.14	<0.07	0.10	0.13	30	-
BaP equivalent (inc. Fluoranthene)	<0.07	0.13	0.08	0.14	<0.07	0.10	0.13	-	-
Total Petroleum Hydrocarbons in Soil (mg/kg)									
C7 - C9	< 9	< 8	< 9	< 9	< 8	< 9	< 9	-	-
C10 - C14	< 20	< 20	< 20	< 20	< 20	< 20	< 20	-	-
C15 - C36	< 40	< 40	< 40	< 40	46	85	< 40	-	-
Total hydrocarbons (C7 - C36)	< 70	< 70	< 70	< 70	< 70	85	< 70	-	-
Materials in Borehole Log which Preclude Soils as Cleanfill?	Yes	Yes	No	No	Yes	Yes	Yes		

**Annotations:**

Results exceeding Spicer Landfill (Class B) waste acceptance criteria are in **bold**

Results exceeding Silverstream Landfill (Class A) waste acceptance criteria are shaded in grey

**SOIL ANALYSIS RESULTS: 61 RATA ROAD**

Sample Date	14-Mar-13	14-Mar-13	14-Mar-13	14-Mar-13	14-Mar-13	14-Mar-13	Assessment Criteria			
Test Pit Number	TP101 RR	TP102 RR	TP103 RR	TP104 RR	TP105 RR	TP106 RR	Contaminated Site Assessment			NES Human Health Risk
Sample Number	S1	S1	S2	S1	S1	S1	Background Levels <sup>1</sup>	Environmental Risk <sup>2</sup>	Human Health Risk	
Laboratory Number	1111754.1	1111754.3	1111754.6	1111754.9	1111754.12	1111754.14				
Sample Depth (m)	0.2-0.3	0.1-0.2	0.4-0.5	0.1-0.2	0.1-0.2	0.2-0.3				
Soil Type	Sand	Silty gravel	Sand	Silty gravel	Sand	Silty gravel				
Heavy Metals (mg/kg dry weight)										
Arsenic	4	3	4	4	6	6	<2-7	12	500 <sup>3</sup>	70 <sup>5</sup>
Cadmium	<u>1.04</u>	<u>0.13</u>	< 0.10	<u>0.14</u>	< 0.10	<u>0.15</u>	<0.1-0.1	22	100 <sup>3</sup>	1300 <sup>5</sup>
Chromium	8	11	7	12	7	12	7-12	86	500 <sup>3</sup>	NL <sup>5</sup>
Copper	<u>22</u>	<u>14</u>	<u>13</u>	<u>13</u>	7	<u>14</u>	4-10	91	5000 <sup>3</sup>	NL <sup>5</sup>
Lead	36	42	11.2	41	16	38	4.5-180	260	1500 <sup>3</sup>	3300 <sup>5</sup>
Nickel	6	9	5	<u>10</u>	5	9	4-9	50	3000 <sup>3</sup>	2000 <sup>6</sup>
Zinc	<u>150</u>	71	40	66	37	<u>95</u>	28-79	360	35000 <sup>3</sup>	31000 <sup>6</sup>
Total Petroleum Hydrocarbons (mg/kg dry weight)										
C7 - C9	< 9	< 8	< 8	< 8	< 8	< 8	-	-	120 (sand) <sup>4</sup> 500 (sandy silt) <sup>4</sup>	120 (sand) <sup>4</sup> 500 (sandy silt) <sup>4</sup>
C10 - C14	< 20	< 20	< 20	< 20	< 20	< 20	-	-	1500 (sand) <sup>4</sup> 1700 (sandy silt) <sup>4</sup>	1500 (sand) <sup>4</sup> 1700 (sandy silt) <sup>4</sup>
C15 - C36	169	194	< 40	< 40	< 40	< 40	-	-	NA (sand) <sup>4</sup> NA (sandy silt) <sup>4</sup>	NA (sand) <sup>4</sup> NA (sandy silt) <sup>4</sup>
Total hydrocarbons (C7 - C36)	<u>169</u>	<u>194</u>	<u>&lt; 70</u>	<u>&lt; 70</u>	<u>&lt; 70</u>	<u>&lt; 70</u>	0.002-0.005	-	-	-

**Annotations:**

- 1 Determination of common pollutant background soil concentrations for the Wellington region, GWRC 2003. Values applicable to 'Main Soil Type 1 (Sand)' have been used.
- 2 Canadian Soil Quality Guidelines, Canadian Council of Ministers of the Environment, 2012. Values applicable to 'commercial' land use have been selected.
- 3 Guideline on the Investigation Levels for Soil and Groundwater, NEPC, 1999. Values applicable to 'Health Investigation Level F - commercial/industrial' have been used.
- 4 Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand, Ministry for the Environment, 1999. Values for 'commercial/industrial' land use have been selected.
- 5 Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations, 2011. Values applicable to 'commercial/industrial outdoor worker' have been used.
- 6 USEPA Regional Screening Level Industrial Soil Table, April 2012

Results exceeding background levels are underlined

Results exceeding environmental risk criteria are shaded in grey

Results exceeding human health risk criteria are in **bold**

NL - No Limit. Derived value exceeds 10000 mg/kg.

NA - indicates contaminant not limiting. Greater than 20000 mg/kg for TPH and 10000 mg/kg for other contaminants.

**WASTE ACCEPTANCE CRITERIA: 61 RATA ROAD**

Sample Date	14-Mar-13	14-Mar-13	14-Mar-13	14-Mar-13	14-Mar-13	14-Mar-13	Waste Acceptance Criteria	
Test Pit Number	TP101 RR	TP102 RR	TP103 RR	TP104 RR	TP105 RR	TP106 RR	Porirua City Council	Hutt City Council
Sample Number	S1	S1	S2	S1	S1	S1	Spicer Landfill (Class B)	Silverstream Landfill (Class A)
Laboratory Number	1111754.1	1111754.3	1111754.6	1111754.9	1111754.12	1111754.14	(mg/kg)	(mg/kg)
Sample Depth (m)	0.2-0.3	0.1-0.2	0.4-0.5	0.1-0.2	0.1-0.2	0.2-0.3		
Soil Type	Sand	Silty gravel	Sand	Silty gravel	Sand	Silty gravel		
Heavy Metals (mg/kg dry weight)								
Arsenic	4	3	4	4	6	6	10	100
Cadmium	1.04	0.13	< 0.10	0.14	< 0.10	0.15	2	20
Chromium	8	<b>11</b>	7	<b>12</b>	7	<b>12</b>	10	100
Copper	<b>22</b>	<b>14</b>	<b>13</b>	<b>13</b>	7	<b>14</b>	10	28
Lead	<b>36</b>	<b>42</b>	<b>11.2</b>	<b>41</b>	<b>16</b>	<b>38</b>	10	100
Nickel	6	9	5	10	5	9	20	40
Zinc	<b>150</b>	<b>71</b>	<b>40</b>	<b>66</b>	<b>37</b>	<b>95</b>	20	160
Total Petroleum Hydrocarbons (mg/kg dry weight)								
C7 - C9	< 9	< 8	< 8	< 8	< 8	< 8	-	-
C10 - C14	< 20	< 20	< 20	< 20	< 20	< 20	-	-
C15 - C36	169	194	< 40	< 40	< 40	< 40	-	-
Total hydrocarbons (C7 - C36)	169	194	< 70	< 70	< 70	< 70	-	-
Materials in Borehole Log which Preclude Soils as Cleanfill?	No	No	No	No	No	No		

**Annotations:**  
 Results exceeding Spicer Landfill (Class B) waste acceptance criteria are in **bold**  
 Results exceeding Silverstream Landfill (Class A) waste acceptance criteria are shaded in grey

SOIL ANALYSIS RESULTS: 58 KIWI ROAD (COMPOSITE SAMPLES)

Sample Date	11/02/2013	11/02/2013	11/02/2013	11/02/2013	12/02/2013	12/02/2013	11/02/2013	Assessment Criteria			
Hand Auger Number	Composite 1	Composite 2	Composite 3	Composite 4	Composite 5	Composite 6	Composite 7	Contaminated Site Assessment			
Sample Number	S1	S1	S1	S1	S1	S1	S1	Background Levels <sup>1</sup>	Environmental Risk <sup>2</sup>	Human Health Risk <sup>3</sup>	NES Human Health Risk
Laboratory Number	1099401.33	1099401.34	1099401.35	1099401.36	1099944.27	1099944.28	1099401.37				
Sample Depth (m)	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15				
Soil Type	Silty sand	Sand	Silt	Sandy silt	Sandy silt	Silt	Sandy silt				
Heavy Metals (mg/kg dry weight)											
Arsenic	<u>14</u>	<u>13</u>	<u>13</u>	<u>9</u>	5	<u>8</u>	<u>13</u>	<2-7	3	125	17.5 <sup>4</sup>
Cadmium	<u>0.44</u>	<u>0.36</u>	<u>0.22</u>	<u>0.31</u>	< 0.10	<u>0.35</u>	<u>0.16</u>	<0.1-0.1	5.5	25	325 <sup>4</sup>
Chromium	10	10	9	8	6	8	9	7-12	21.5	125	NL <sup>4</sup>
Copper	<u>88</u>	<u>76</u>	<u>59</u>	<u>42</u>	<u>21</u>	<u>53</u>	<u>18</u>	4-10	22.75	1250	NL <sup>4</sup>
Lead	22	26	13.7	8.9	7.7	20	8.8	4.5-180	65	375	825 <sup>4</sup>
Nickel	5	6	5	5	4	5	5	4-9	12.5	750	500 <sup>5</sup>
Zinc	<u>93</u>	<u>86</u>	79	<u>83</u>	50	76	68	28-79	90	8750	7750 <sup>5</sup>
Organochlorine Pesticides (mg/kg dry weight)											
Aldrin	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
Dieldrin	< 0.010	< 0.010	< 0.010	< 0.010	0.016	< 0.010	< 0.010	-	-	-	40 <sup>4</sup>
Aldrin + dieldrin	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	-	-	12.5	-
alpha-BHC	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
beta-BHC	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
delta-BHC	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
gamma-BHC (Lindane)	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
cis-Chlordane	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
trans-Chlordane	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
Total Chlordane [(cis+trans)*100/42]	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	-	-	62.5	-
2,4'-DDD	0.061	0.091	0.082	0.038	< 0.01	0.017	< 0.01	-	-	-	-
4,4'-DDD	0.1	0.138	0.147	0.068	0.018	0.059	< 0.01	-	-	-	-
2,4'-DDE	0.019	0.019	0.017	0.012	< 0.01	< 0.01	< 0.01	-	-	-	-
4,4'-DDE	0.48	0.42	0.42	0.54	0.082	0.42	0.036	-	-	-	-
2,4'-DDT	0.141	0.094	0.077	0.106	0.012	0.062	< 0.01	-	-	-	-
4,4'-DDT	0.79	0.54	0.44	0.56	0.046	0.31	0.054	-	-	-	-
Total DDT	1.591	1.302	1.183	1.324	0.168	0.873	0.11	-	3	250	250 <sup>4</sup>
Endosulfan I	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
Endosulfan II	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
Endosulfan sulphate	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
Endrin	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
Endrin Aldehyde	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
Endrin ketone	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
Heptachlor	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	12.5	-
Heptachlor epoxide	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
Hexachlorobenzene	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
Methoxychlor	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
Organonitro&phosphorus Pesticides (mg/kg dry weight)											
All compounds	Below detection							-	-	-	-

Annotations:

Note all assessment criteria have been adjusted by dividing by the number of subsamples in each composite sample, in each case four.

1 Determination of common pollutant background soil concentrations for the Wellington region, GWRC 2003. Values applicable to 'Main Soil Type 1 (Sand)' have been used.

2 Canadian Soil Quality Guidelines, Canadian Council of Ministers of the Environment, 2012. Values applicable to 'commercial' land use have been selected.

3 Guideline on the Investigation Levels for Soil and Groundwater, NEPC, 1999. Values applicable to 'Health Investigation Level F - commercial/industrial' have been used.

4 Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations, 2011. Values applicable to 'commercial/industrial outdoor worker' have been used.

5 USEPA Regional Screening Level Industrial Soil Table, April 2012

Results exceeding background levels are underlined

Results exceeding environmental risk criteria are shaded in grey

Results exceeding human health risk criteria are in **bold**

NL - No Limit. Derived value exceeds 10000 mg/kg.

SOIL ANALYSIS RESULTS: 58 KIWI ROAD (COMPOSITE SAMPLES)

Sample Date	11/02/2013	11/02/2013	11/02/2013	12/02/2013	12/02/2013	12/02/2013	Assessment Criteria			
Hand Auger Number	Composite 8	Composite 9	Composite 10	Composite 11	Composite 12	Composite 13				
Sample Number	S1	S1	S1	S1	S1	S1	Contaminated Site Assessment			NES Human Health Risk
Laboratory Number	1099401.38	1099401.39	1099401.4	1099944.24	1099944.25	1099944.26	Background Levels <sup>1</sup>	Environmental Risk <sup>2</sup>	Human Health Risk <sup>3</sup>	
Sample Depth (m)	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15				
Soil Type	Sandy silt	Sandy silt	Silt	Sandy silt	Sand	Sandy silt				
Heavy Metals (mg/kg dry weight)										
Arsenic	<u>12</u>	6	<u>26</u>	<u>13</u>	6	5	<2-7	3	125	17.5 <sup>4</sup>
Cadmium	<u>0.24</u>	< 0.10	<u>0.27</u>	<u>0.21</u>	<u>0.22</u>	<u>0.25</u>	<0.1-0.1	5.5	25	325 <sup>4</sup>
Chromium	8	7	11	8	8	9	7-12	21.5	125	NL <sup>4</sup>
Copper	<u>46</u>	10	<u>25</u>	<u>71</u>	<u>50</u>	<u>37</u>	4-10	22.75	1250	NL <sup>4</sup>
Lead	13	6.6	7.1	7.7	8	8.2	4.5-180	65	375	825 <sup>4</sup>
Nickel	5	4	3	4	4	5	4-9	12.5	750	500 <sup>5</sup>
Zinc	<u>84</u>	36	52	70	77	<u>80</u>	28-79	90	8750	7750 <sup>5</sup>
Organochlorine Pesticides (mg/kg dry weight)										
Aldrin	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
Dieldrin	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	40 <sup>4</sup>
Aldrin + dieldrin	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	-	-	12.5	-
alpha-BHC	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
beta-BHC	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
delta-BHC	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
gamma-BHC (Lindane)	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
cis-Chlordane	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
trans-Chlordane	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
Total Chlordane [(cis+trans)*100/42]	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	-	-	62.5	-
2,4'-DDD	0.038	< 0.010	0.024	0.075	0.025	0.012	-	-	-	-
4,4'-DDD	0.072	< 0.010	0.081	0.153	0.048	0.026	-	-	-	-
2,4'-DDE	< 0.01	< 0.010	< 0.01	0.018	< 0.01	< 0.01	-	-	-	-
4,4'-DDE	0.29	< 0.010	0.166	0.23	0.159	0.156	-	-	-	-
2,4'-DDT	0.059	< 0.010	0.057	0.037	0.024	0.02	-	-	-	-
4,4'-DDT	0.34	< 0.010	0.35	0.2	0.107	0.07	-	-	-	-
Total DDT	0.804	< 0.06	0.683	0.713	0.368	0.289	-	3	250	250 <sup>4</sup>
Endosulfan I	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
Endosulfan II	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
Endosulfan sulphate	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
Endrin	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
Endrin Aldehyde	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
Endrin ketone	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
Heptachlor	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	12.5	-
Heptachlor epoxide	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
Hexachlorobenzene	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
Methoxychlor	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-
Organonitro&phosphorus Pesticides (mg/kg dry weight)										
All compounds	Below detection						-	-	-	-

Annotations:

Note all assessment criteria have been adjusted by dividing by the number of subsamples in each composite sample, in each case four.

1 Determination of common pollutant background soil concentrations for the Wellington region, GWRC 2003. Values applicable to 'Main Soil Type 1 (Sand)' have been used.

2 Canadian Soil Quality Guidelines, Canadian Council of Ministers of the Environment, 2012. Values applicable to 'commercial' land use have been selected.

3 Guideline on the Investigation Levels for Soil and Groundwater, NEPC, 1999. Values applicable to 'Health Investigation Level F - commercial/industrial' have been used.

4 Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations, 2011. Values applicable to 'commercial/industrial outdoor worker' have been used.

5 USEPA Regional Screening Level Industrial Soil Table, April 2012

Results exceeding background levels are underlined

Results exceeding environmental risk criteria are shaded in grey

Results exceeding human health risk criteria are in **bold**

NL - No Limit. Derived value exceeds 10000 mg/kg.

**SOIL ANALYSIS RESULTS: 58 KIWI ROAD (INDIVIDUAL SAMPLES)**

Sample Date	11/02/2013	11/02/2013	11/02/2013	11/02/2013	12/02/2013	12/02/2013	12/02/2013	Assessment Criteria			
Hand Auger Number	Composite 10A	Composite 10B	Composite 10C	Composite 10D	HA101	HA122	HA132	Contaminated Site Assessment			
Sample Number	S1	S1	S1	S1	S1	S1	S1	Background Levels <sup>1</sup>	Environmental Risk <sup>2</sup>	Human Health Risk	NES Human Health Risk
Laboratory Number	1099401.29	1099401.30	1099401.31	1099401.32	1099944.21	1099944.22	1099944.23				
Sample Depth (m)	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15				
Soil Type	Silt	Silt	Silt	Silt	Sand	Sand	Silt				
<b>Heavy Metals (mg/kg dry weight)</b>											
Arsenic	<u>27</u>	<u>30</u>	<u>26</u>	<u>24</u>	4	3	<u>9</u>	<2-7	12	500 <sup>3</sup>	70 <sup>4</sup>
Cadmium	-	-	-	-	< 0.10	< 0.10	<u>0.59</u>	<0.1-0.1	22	100 <sup>3</sup>	1300 <sup>4</sup>
Chromium	-	-	-	-	6	6	<u>15</u>	7-12	86	500 <sup>3</sup>	NL <sup>4</sup>
Copper	-	-	-	-	7	6	<b>186</b>	4-10	91	5000 <sup>3</sup>	NL <sup>4</sup>
Lead	-	-	-	-	6	5	39	4.5-180	260	1500 <sup>3</sup>	3300 <sup>4</sup>
Nickel	-	-	-	-	4	5	5	4-9	50	3000 <sup>3</sup>	2000 <sup>5</sup>
Zinc	-	-	-	-	32	31	<u>210</u>	28-79	360	35000 <sup>3</sup>	31000 <sup>5</sup>
<b>Organochlorine Pesticides (mg/kg dry weight)</b>											
Aldrin	-	-	-	-	< 0.010	< 0.010	< 0.010	-	-	-	-
Dieldrin	-	-	-	-	< 0.010	< 0.010	< 0.010	-	-	-	160 <sup>4</sup>
Aldrin + dieldrin	-	-	-	-	< 0.02	< 0.02	< 0.02	-	-	50	-
alpha-BHC	-	-	-	-	< 0.010	< 0.010	< 0.010	-	-	-	-
beta-BHC	-	-	-	-	< 0.010	< 0.010	< 0.010	-	-	-	-
delta-BHC	-	-	-	-	< 0.010	< 0.010	< 0.010	-	-	-	-
gamma-BHC (Lindane)	-	-	-	-	< 0.010	< 0.010	< 0.010	-	-	-	-
cis-Chlordane	-	-	-	-	< 0.010	< 0.010	< 0.010	-	-	-	-
trans-Chlordane	-	-	-	-	< 0.010	< 0.010	< 0.010	-	-	-	-
Total Chlordane [(cis+trans)*100/42]	-	-	-	-	< 0.04	< 0.04	< 0.04	-	-	250	-
2,4'-DDD	-	-	-	-	< 0.010	< 0.010	0.13	-	-	-	-
4,4'-DDD	-	-	-	-	< 0.010	< 0.010	0.22	-	-	-	-
2,4'-DDE	-	-	-	-	< 0.010	< 0.010	0.027	-	-	-	-
4,4'-DDE	-	-	-	-	< 0.010	< 0.010	0.86	-	-	-	-
2,4'-DDT	-	-	-	-	< 0.010	< 0.010	0.105	-	-	-	-
4,4'-DDT	-	-	-	-	< 0.010	< 0.010	0.58	-	-	-	-
Total DDT	-	-	-	-	< 0.06	< 0.06	1.922	-	12	1000	1000 <sup>4</sup>
Endosulfan I	-	-	-	-	< 0.010	< 0.010	< 0.010	-	-	-	-
Endosulfan II	-	-	-	-	< 0.010	< 0.010	< 0.010	-	-	-	-
Endosulfan sulphate	-	-	-	-	< 0.010	< 0.010	< 0.010	-	-	-	-
Endrin	-	-	-	-	< 0.010	< 0.010	< 0.010	-	-	-	-
Endrin Aldehyde	-	-	-	-	< 0.010	< 0.010	< 0.010	-	-	-	-
Endrin ketone	-	-	-	-	< 0.010	< 0.010	< 0.010	-	-	-	-
Heptachlor	-	-	-	-	< 0.010	< 0.010	< 0.010	-	-	50	-
Heptachlor epoxide	-	-	-	-	< 0.010	< 0.010	< 0.010	-	-	-	-
Hexachlorobenzene	-	-	-	-	< 0.010	< 0.010	< 0.010	-	-	-	-
Methoxychlor	-	-	-	-	< 0.010	< 0.010	< 0.010	-	-	-	-
<b>Organonitro&amp;phosphorus Pesticides (mg/kg dry weight)</b>											
All compounds	-	-	-	-	Below Detection			-	-	-	-

**Annotations:**

- Determination of common pollutant background soil concentrations for the Wellington region, GWRC 2003. Values applicable to 'Main Soil Type 1 (Sand)' have been used.
- Canadian Soil Quality Guidelines, Canadian Council of Ministers of the Environment, 2012. Values applicable to 'commercial' land use have been selected.
- Guideline on the Investigation Levels for Soil and Groundwater, NEPC, 1999. Values applicable to 'Health Investigation Level F - commercial/industrial' have been used.
- Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations, 2011. Values applicable to 'commercial/industrial outdoor worker' have been used.
- USEPA Regional Screening Level Industrial Soil Table, April 2012

Results exceeding background levels are underlined

Results exceeding environmental risk criteria are shaded in grey

Results exceeding human health risk criteria are in **bold**

NL - No Limit. Derived value exceeds 10000 mg/kg.



**SOIL ANALYSIS RESULTS: 58 KIWI ROAD (COMPOSITE SAMPLES)**

Sample Date	11/02/2013	11/02/2013	11/02/2013	11/02/2013	12/02/2013	12/02/2013	11/02/2013	Waste Acceptance Criteria	
Hand Auger Number	Composite 1	Composite 2	Composite 3	Composite 4	Composite 5	Composite 6	Composite 7	Porirua City Council	Hutt City Council
Sample Number	S1	S1	S1	S1	S1	S1	S1	Spicer Landfill (Class B)	Silverstream Landfill (Class A)
Laboratory Number	1099401.33	1099401.34	1099401.35	1099401.36	1099944.27	1099944.28	1099401.37	(mg/kg)	(mg/kg)
Sample Depth (m)	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15		
Soil Type	Silty sand	Sand	Silt	Sandy silt	Sandy silt	Silt	Sandy silt		
Heavy Metals (mg/kg dry weight)									
Arsenic	<b>14</b>	<b>13</b>	<b>13</b>	9	5	8	<b>13</b>	10	100
Cadmium	0.44	0.36	0.22	0.31	< 0.10	0.35	0.16	2	20
Chromium	10	10	9	8	6	8	9	10	100
Copper	<b>88</b>	<b>76</b>	<b>59</b>	<b>42</b>	<b>21</b>	<b>53</b>	<b>18</b>	10	28
Lead	<b>22</b>	<b>26</b>	<b>13.7</b>	8.9	7.7	<b>20</b>	8.8	10	100
Nickel	5	6	5	5	4	5	5	20	40
Zinc	<b>93</b>	<b>86</b>	<b>79</b>	<b>83</b>	<b>50</b>	<b>76</b>	<b>68</b>	20	160
Organochlorine Pesticides (mg/kg dry weight)									
Aldrin	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.000016	0.02
Dieldrin	< 0.010	< 0.010	< 0.010	< 0.010	0.016	< 0.010	< 0.010	0.8	0.08
Aldrin + dieldrin	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	-	-
alpha-BHC	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
beta-BHC	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
delta-BHC	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
gamma-BHC (Lindane)	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
cis-Chlordane	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
trans-Chlordane	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
Total Chlordane [(cis+trans)*100/42]	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	-	-
2,4'-DDD	0.061	0.091	0.082	0.038	< 0.01	0.017	< 0.01	-	-
4,4'-DDD	0.1	0.138	0.147	0.068	0.018	0.059	< 0.01	-	-
2,4'-DDE	0.019	0.019	0.017	0.012	< 0.01	< 0.01	< 0.01	-	-
4,4'-DDE	0.48	0.42	0.42	0.54	0.082	0.42	0.036	-	-
2,4'-DDT	0.141	0.094	0.077	0.106	0.012	0.062	< 0.01	-	-
4,4'-DDT	0.79	0.54	0.44	0.56	0.046	0.31	0.054	-	-
Total DDT	1.591	1.302	1.183	1.324	0.168	0.873	0.11	-	-
Endosulfan I	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.6	4
Endosulfan II	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
Endosulfan sulphate	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
Endrin	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
Endrin Aldehyde	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
Endrin ketone	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
Heptachlor	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
Heptachlor epoxide	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
Hexachlorobenzene	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
Methoxychlor	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
Organonitro&phosphorus Pesticides (mg/kg dry weight)									
All compounds	Below detection							-	-

**Annotations:**

Results exceeding Spicer Landfill (Class B) waste acceptance criteria are in **bold**  
 Results exceeding Silverstream Landfill (Class A) waste acceptance criteria are shaded in grey

**SOIL ANALYSIS RESULTS: 58 KIWI ROAD (COMPOSITE SAMPLES)**

Sample Date	11/02/2013	11/02/2013	11/02/2013	12/02/2013	12/02/2013	12/02/2013	Waste Acceptance Criteria	
Hand Auger Number	Composite 8	Composite 9	Composite 10	Composite 11	Composite 12	Composite 13	Porirua City Council	Hutt City Council
Sample Number	S1	S1	S1	S1	S1	S1		
Laboratory Number	1099401.38	1099401.39	1099401.4	1099944.24	1099944.25	1099944.26	Spicer Landfill (Class B)	Silverstream Landfill (Class A)
Sample Depth (m)	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	(mg/kg)	(mg/kg)
Soil Type	Sandy silt	Sandy silt	Silt	Sandy silt	Sand	Sandy silt		
Heavy Metals (mg/kg dry weight)								
Arsenic	<b>12</b>	6	<b>26</b>	<b>13</b>	6	5	10	100
Cadmium	0.24	< 0.10	0.27	0.21	0.22	0.25	2	20
Chromium	8	7	<b>11</b>	8	8	9	10	100
Copper	<b>46</b>	10	<b>25</b>	<b>71</b>	<b>50</b>	<b>37</b>	10	28
Lead	<b>13</b>	6.6	7.1	7.7	8	8.2	10	100
Nickel	5	4	3	4	4	5	20	40
Zinc	<b>84</b>	<b>36</b>	<b>52</b>	<b>70</b>	<b>77</b>	<b>80</b>	20	160
Organochlorine Pesticides (mg/kg dry weight)								
Aldrin	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.000016	0.02
Dieldrin	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.8	0.08
Aldrin + dieldrin	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	-	-
alpha-BHC	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
beta-BHC	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
delta-BHC	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
gamma-BHC (Lindane)	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
cis-Chlordane	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
trans-Chlordane	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
Total Chlordane [(cis+trans)*100/42]	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	-	-
2,4'-DDD	0.038	< 0.010	0.024	0.075	0.025	0.012	-	-
4,4'-DDD	0.072	< 0.010	0.081	0.153	0.048	0.026	-	-
2,4'-DDE	< 0.01	< 0.010	< 0.01	0.018	< 0.01	< 0.01	-	-
4,4'-DDE	0.29	< 0.010	0.166	0.23	0.159	0.156	-	-
2,4'-DDT	0.059	< 0.010	0.057	0.037	0.024	0.02	-	-
4,4'-DDT	0.34	< 0.010	0.35	0.2	0.107	0.07	-	-
Total DDT	0.804	< 0.06	0.683	0.713	0.368	0.289	-	-
Endosulfan I	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.6	4
Endosulfan II	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
Endosulfan sulphate	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
Endrin	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
Endrin Aldehyde	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
Endrin ketone	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
Heptachlor	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
Heptachlor epoxide	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
Hexachlorobenzene	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
Methoxychlor	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-
Organonitro&phosphorus Pesticides (mg/kg dry weight)								
All compounds	Below detection						-	-

**Annotations:**

Results exceeding Spicer Landfill (Class B) waste acceptance criteria are in **bold**  
 Results exceeding Silverstream Landfill (Class A) waste acceptance criteria are shaded in grey

SOIL ANALYSIS RESULTS: 58 KIWI ROAD (INDIVIDUAL SAMPLES)

Sample Date	12/02/2013	12/02/2013	12/02/2013	Waste Acceptance Criteria	
Hand Auger Number	HA101	HA122	HA132		
Sample Number	S1	S1	S1	Porirua City Council	Hutt City Council
Laboratory Number	1099944.21	1099944.22	1099944.23	Spicer Landfill (Class B)	Silverstream Landfill (Class A)
Sample Depth (m)	0-0.15	0-0.15	0-0.15	(mg/kg)	(mg/kg)
Soil Type	Sand	Sand	Silt		
Heavy Metals (mg/kg dry weight)					
Arsenic	4	3	9	10	100
Cadmium	< 0.10	< 0.10	0.59	2	20
Chromium	6	6	<b>15</b>	10	100
Copper	7	6	<b>186</b>	10	28
Lead	6	5	<b>39</b>	10	100
Nickel	4	5	5	20	40
Zinc	<b>32</b>	<b>31</b>	<b>210</b>	20	160
Organochlorine Pesticides (mg/kg dry weight)					
Aldrin	< 0.010	< 0.010	< 0.010	0.000016	0.02
Dieldrin	< 0.010	< 0.010	< 0.010	0.8	0.08
Aldrin + dieldrin	< 0.02	< 0.02	< 0.02	-	-
alpha-BHC	< 0.010	< 0.010	< 0.010	-	-
beta-BHC	< 0.010	< 0.010	< 0.010	-	-
delta-BHC	< 0.010	< 0.010	< 0.010	-	-
gamma-BHC (Lindane)	< 0.010	< 0.010	< 0.010	-	-
cis-Chlordane	< 0.010	< 0.010	< 0.010	-	-
trans-Chlordane	< 0.010	< 0.010	< 0.010	-	-
Total Chlordane [(cis+trans)*100/42]	< 0.04	< 0.04	< 0.04	-	-
2,4'-DDD	< 0.010	< 0.010	0.13	-	-
4,4'-DDD	< 0.010	< 0.010	0.22	-	-
2,4'-DDE	< 0.010	< 0.010	0.027	-	-
4,4'-DDE	< 0.010	< 0.010	0.86	-	-
2,4'-DDT	< 0.010	< 0.010	0.105	-	-
4,4'-DDT	< 0.010	< 0.010	0.58	-	-
Total DDT	< 0.06	< 0.06	1.922	-	-
Endosulfan I	< 0.010	< 0.010	< 0.010	0.6	4
Endosulfan II	< 0.010	< 0.010	< 0.010	-	-
Endosulfan sulphate	< 0.010	< 0.010	< 0.010	-	-
Endrin	< 0.010	< 0.010	< 0.010	-	-
Endrin Aldehyde	< 0.010	< 0.010	< 0.010	-	-
Endrin ketone	< 0.010	< 0.010	< 0.010	-	-
Heptachlor	< 0.010	< 0.010	< 0.010	-	-
Heptachlor epoxide	< 0.010	< 0.010	< 0.010	-	-
Hexachlorobenzene	< 0.010	< 0.010	< 0.010	-	-
Methoxychlor	< 0.010	< 0.010	< 0.010	-	-
Organonitro&phosphorus Pesticides (mg/kg dry weight)					
All compounds	Below Detection			-	-

**Annotations:**

Results exceeding Spicer Landfill (Class B) waste acceptance criteria are in **bold**  
 Results exceeding Silverstream Landfill (Class A) waste acceptance criteria are shaded in grey

**SOIL ANALYSIS RESULTS: 109 KAPITI ROAD**

Date	11-Mar-13	11-Mar-13	11-Mar-13	11-Mar-13	11-Mar-13	11-Mar-13	11-Mar-13	11-Mar-13	11-Mar-13	11-Mar-13	Assessment Criteria					
Test Pit Number	TP101	TP101	TP102	TP102	TP103	TP104	TP104	TP105	TP106	TP106	Contaminated Site Assessment					
Sample Number	S1	S2	S1	S2	S1	S1	S2	S1	S1	S2	Background Levels <sup>1</sup>	Environmental Risk <sup>2</sup>	Human Health Risk		NES Human Health Risk	
Laboratory Number	1110684.2	1110684.21	1110684.17	1110684.18	1110684.15	1110684.1	1110684.2	1110684.4	1110684.1	1110684.8						
Sample Depth (m)	0.1-0.2	1.2-1.3	0.4-0.5	1.1-1.2	0.2-0.3	0.1-0.2	0.6-0.7	0.3-0.4	0.2-0.3	1.0-1.1						
Soil Type	Sand	Clayey silt	Clayey silt	Clayey silt	Silt	Silt	Silt	Silt	Sandy silt	Sandy Silt						
<b>Heavy Metals (mg/kg dry weight)</b>																
Arsenic	4	5	5	4	5	4	5	6	5	5	<2-7	12	500 <sup>3</sup>	70 <sup>5</sup>		
Cadmium	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	<0.1-0.1	22	100 <sup>3</sup>	1300 <sup>5</sup>		
Chromium	6	<u>23</u>	<u>19</u>	<u>16</u>	<u>14</u>	<u>13</u>	<u>20</u>	<u>14</u>	12	<u>19</u>	7-12	86	500 <sup>3</sup>	NL <sup>5</sup>		
Copper	8	<u>22</u>	<u>18</u>	<u>16</u>	<u>15</u>	<u>12</u>	<u>15</u>	<u>16</u>	<u>13</u>	<u>18</u>	4-10	91	5000 <sup>3</sup>	NL <sup>5</sup>		
Lead	4.4	24	19.3	18.5	18.2	12.4	19.9	15.5	11.9	21	4.5-180	260	1500 <sup>3</sup>	3300 <sup>5</sup>		
Nickel	3	<u>16</u>	<u>13</u>	<u>12</u>	<u>11</u>	9	<u>13</u>	<u>10</u>	9	<u>14</u>	4-9	50	3000 <sup>3</sup>	2000 <sup>6</sup>		
Zinc	27	73	62	61	57	47	59	51	44	63	28-79	360	35000 <sup>3</sup>	31000 <sup>6</sup>		
<b>Polycyclic Aromatic Hydrocarbons (mg/kg dry weight)</b>													<1m	1m-4m		
Acenaphthene	< 0.04	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04	-	-	-	-		
Acenaphthylene	< 0.04	< 0.03	< 0.03	0.07	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04	-	-	-	-		
Anthracene	<u>&lt; 0.04</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>0.03</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>&lt; 0.04</u>	0.002-0.005	-	-	-		
Benzo[a]anthracene	< 0.04	< 0.03	< 0.03	0.07	< 0.03	< 0.03	< 0.03	0.03	< 0.03	< 0.04	-	-	-	-		
Benzo[a]pyrene (BAP)	<u>0.04</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>0.22</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>0.04</u>	<u>&lt; 0.03</u>	<u>&lt; 0.04</u>	0.002-0.005	0.7	-	-		
Benzo[b]fluoranthene + Benzo[j]fluoranthene	0.05	< 0.03	< 0.03	0.27	< 0.03	< 0.03	< 0.03	0.06	< 0.03	< 0.04	-	-	-	-		
Benzo[g,h,i]perylene	0.03	< 0.03	< 0.03	0.18	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04	-	-	-	-		
Benzo[k]fluoranthene	< 0.04	< 0.03	< 0.03	0.13	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04	-	-	-	-		
Chrysene	< 0.04	< 0.03	< 0.03	0.09	< 0.03	< 0.03	< 0.03	0.04	< 0.03	< 0.04	-	-	-	-		
Dibenzo[a,h]anthracene	< 0.04	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04	-	-	-	-		
Fluoranthene	<u>&lt; 0.04</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>0.13</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>0.05</u>	<u>&lt; 0.03</u>	<u>&lt; 0.04</u>	0.002-0.005	-	-	-		
Fluorene	< 0.04	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04	-	-	-	-		
Indeno(1,2,3-c,d)pyrene	0.04	< 0.03	< 0.03	0.22	< 0.03	< 0.03	< 0.03	0.04	< 0.03	< 0.04	-	-	-	-		
Naphthalene	<u>&lt; 0.16</u>	<u>&lt; 0.14</u>	<u>&lt; 0.15</u>	<u>&lt; 0.13</u>	<u>&lt; 0.14</u>	<u>&lt; 0.14</u>	<u>&lt; 0.14</u>	<u>&lt; 0.15</u>	<u>&lt; 0.13</u>	<u>&lt; 0.16</u>	0.002-0.005	-	190 (sand) <sup>4</sup> 210 (sandy silt) <sup>4</sup> 230 (silty clay) <sup>4</sup>	230 (sand) <sup>4</sup> 270 (sandy silt) <sup>4</sup> 1100 (silty clay) <sup>4</sup>	-	
Phenanthrene	<u>&lt; 0.04</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>0.05</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>&lt; 0.04</u>	0.002-0.005	-	-	-		
Pyrene	<u>0.03</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>0.19</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>0.06</u>	<u>&lt; 0.03</u>	<u>&lt; 0.04</u>	0.002-0.005	-	NA (all soil types) <sup>4</sup>	NA (all soil types) <sup>4</sup>	-	
BaP equivalent	0.07	<0.07	<0.07	0.30	<0.07	<0.07	<0.07	0.07	<0.07	<0.05	-	-	11 (all soil types) <sup>4</sup>	25 (all soil types) <sup>4</sup>	-	
BaP equivalent (inc. Fluoranthene)	0.07	<0.07	<0.07	0.31	<0.07	<0.07	<0.07	0.07	<0.07	<0.05	-	-	-	35 <sup>5</sup>		
<b>Total Petroleum Hydrocarbons (mg/kg dry weight)</b>													<1m	1m-4m	<1m	1m-4m
C7 - C9	< 10	< 9	< 9	< 8	< 8	< 9	< 9	< 9	< 8	< 10	-	-	120 (sand) <sup>4</sup> 500 (sandy silt) 8800 (silty clay) <sup>4</sup>	120 (sand) <sup>4</sup> 500 (sandy silt) 20000 (silty clay) <sup>4</sup>	120 (sand) <sup>4</sup> 500 (sandy silt) 8800 (silty clay) <sup>4</sup>	120 (sand) <sup>4</sup> 500 (sandy silt) 20000 (silty clay) <sup>4</sup>
C10 - C14	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	-	-	1500 (sand) <sup>4</sup> 1700 (sandy silt) <sup>4</sup> 1900 (sandy silt) <sup>4</sup>	1900 (sand) <sup>4</sup> 2200 (sandy silt) <sup>4</sup> 8900 (silty sand) <sup>4</sup>	1500 (sand) <sup>4</sup> 1700 (sandy silt) <sup>4</sup> 1900 (sandy silt) <sup>4</sup>	1900 (sand) <sup>4</sup> 2200 (sandy silt) <sup>4</sup> 8900 (silty sand) <sup>4</sup>
C15 - C36	142	< 40	< 40	370	< 40	< 40	< 40	< 40	< 40	< 40	-	-	NA (all soil types) <sup>4</sup>	NA (all soil types) <sup>4</sup>	NA (all soil types) <sup>4</sup>	NA (all soil types) <sup>4</sup>
Total hydrocarbons (C7 - C36)	<u>142</u>	<u>&lt; 70</u>	<u>&lt; 70</u>	<u>370</u>	<u>&lt; 70</u>	<u>&lt; 70</u>	<u>&lt; 70</u>	<u>&lt; 70</u>	<u>&lt; 70</u>	<u>&lt; 70</u>	0.002-0.005	-	-	-	-	

**Annotations:**

- Determination of common pollutant background soil concentrations for the Wellington region, GWRC 2003. Values applicable to 'Main Soil Type 1 (Sand)' have been used.
- Canadian Soil Quality Guidelines, Canadian Council of Ministers of the Environment, 2012. Values applicable to 'commercial' land use have been used.
- Guideline on the Investigation Levels for Soil and Groundwater, NEPC, 1999. Values applicable to 'Health Investigation Level F - commercial/industrial' have been used.
- Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand, Ministry for the Environment, 1999. Values for 'commercial/industrial' land use have been used.
- Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations, 2011. Values applicable to 'commercial/industrial outdoor worker' have been used.
- USEPA Regional Screening Level Industrial Soil Table, April 2012

Results exceeding background levels are underlined  
 Results exceeding environmental risk criteria are shaded in grey  
 Results exceeding human health risk criteria are in **bold**  
 NL - No Limit. Derived value exceeds 10000 mg/kg.  
 NA - indicates contaminant not limiting. Greater than 20000 mg/kg for TPH and 10000 mg/kg for other contaminants.

SOIL ANALYSIS RESULTS: 109 KAPITI ROAD

Date	11-Mar-13	11-Mar-13	12-Mar-13	12-Mar-13	12-Mar-13	11-Mar-13	11-Mar-13	12-Mar-13	12-Mar-13	Assessment Criteria					
Test Pit Number	TP107	TP108	TP109	TP110	TP111	TP112	TP113	TP114	TP115	Contaminated Site Assessment					
Sample Number	S1	S1	S1	S1	S1	S1	S1	S1	S1	Background Levels <sup>1</sup>	Environmental Risk <sup>2</sup>	Human Health Risk		NES Human Health Risk	
Laboratory Number	1110684.25	1110684.23	1110964.3	1110964.5	1110964.1	1110684.27	1110684.7	1110964.9	1110964.7						
Sample Depth (m)	0.2-0.3	0.1-0.2	0.2-0.3	0.2-0.3	0.2-0.3	0.1-0.2	0.2-0.3	0.2-0.3	0.1-0.2						
Soil Type	Sand	Sandy silt	Gravelly silt	Silt	Silt	Silty sand	Silty sand	Silty gravel	Silt						
Heavy Metals (mg/kg dry weight)															
Arsenic	2	<u>10</u>	4	4	4	3	2	5	4	<2-7	12	500 <sup>3</sup>	70 <sup>5</sup>		
Cadmium	< 0.10	< 0.10	< 0.10	< 0.10	<u>0.13</u>	< 0.10	< 0.10	< 0.10	<u>0.11</u>	<0.1-0.1	22	100 <sup>3</sup>	1300 <sup>5</sup>		
Chromium	5	<u>14</u>	<u>14</u>	<u>19</u>	<u>19</u>	6	6	<u>18</u>	<u>18</u>	7-12	86	500 <sup>3</sup>	NL <sup>5</sup>		
Copper	7	<u>17</u>	<u>17</u>	<u>14</u>	<u>16</u>	7	8	<u>20</u>	<u>14</u>	4-10	91	5000 <sup>3</sup>	NL <sup>5</sup>		
Lead	4.8	26	21	18	21	4.7	5.4	31	23	4.5-180	260	1500 <sup>3</sup>	3300 <sup>5</sup>		
Nickel	4	<u>13</u>	<u>14</u>	<u>13</u>	<u>13</u>	4	4	<u>16</u>	<u>13</u>	4-9	50	3000 <sup>3</sup>	2000 <sup>6</sup>		
Zinc	27	62	67	52	75	29	38	79	63	28-79	360	35000 <sup>3</sup>	31000 <sup>6</sup>		
Polycyclic Aromatic Hydrocarbons (mg/kg dry weight)															
Acenaphthene	< 0.04	< 0.03	0.06	< 0.03	< 0.04	< 0.04	< 0.03	< 0.03	< 0.03	-	-	<1m	1m-4m		
Acenaphthylene	< 0.04	< 0.03	< 0.03	< 0.03	< 0.04	< 0.04	< 0.03	< 0.03	< 0.03	-	-	-	-		
Anthracene	<u>&lt; 0.04</u>	<u>&lt; 0.03</u>	<u>0.17</u>	<u>&lt; 0.03</u>	<u>&lt; 0.04</u>	<u>&lt; 0.04</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	0.002-0.005	-	-	-		
Benzo[a]anthracene	< 0.04	< 0.03	0.69	< 0.03	< 0.04	< 0.04	< 0.03	< 0.03	< 0.03	-	-	-	-		
Benzo[a]pyrene (BAP)	<u>&lt; 0.04</u>	<u>&lt; 0.03</u>	<u>1.02</u>	<u>&lt; 0.03</u>	<u>&lt; 0.04</u>	<u>&lt; 0.04</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	0.002-0.005	0.7	-	-		
Benzo[b]fluoranthene + Benzo[j]fluoranthene	< 0.04	< 0.03	1.29	< 0.03	< 0.04	< 0.04	< 0.03	0.03	< 0.03	-	-	-	-		
Benzo[g,h,i]perylene	< 0.04	< 0.03	0.67	< 0.03	< 0.04	< 0.04	< 0.03	0.04	< 0.03	-	-	-	-		
Benzo[k]fluoranthene	< 0.04	< 0.03	0.52	< 0.03	< 0.04	< 0.04	< 0.03	< 0.03	< 0.03	-	-	-	-		
Chrysene	< 0.04	< 0.03	0.66	< 0.03	< 0.04	< 0.04	< 0.03	< 0.03	< 0.03	-	-	-	-		
Dibenzo[a,h]anthracene	< 0.04	< 0.03	0.29	< 0.03	< 0.04	< 0.04	< 0.03	< 0.03	< 0.03	-	-	-	-		
Fluoranthene	<u>&lt; 0.04</u>	<u>&lt; 0.03</u>	<u>1.33</u>	<u>&lt; 0.03</u>	<u>&lt; 0.04</u>	<u>&lt; 0.04</u>	<u>0.03</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	0.002-0.005	-	-	-		
Fluorene	< 0.04	< 0.03	0.03	< 0.03	< 0.04	< 0.04	< 0.03	< 0.03	< 0.03	-	-	-	-		
Indeno(1,2,3-c,d)pyrene	< 0.04	< 0.03	0.64	< 0.03	< 0.04	< 0.04	< 0.03	< 0.03	< 0.03	-	-	-	-		
Naphthalene	<u>&lt; 0.16</u>	<u>&lt; 0.13</u>	<u>&lt; 0.12</u>	<u>&lt; 0.14</u>	<u>&lt; 0.16</u>	<u>&lt; 0.16</u>	<u>&lt; 0.15</u>	<u>&lt; 0.12</u>	<u>&lt; 0.14</u>	0.002-0.005	-	190 (sand) <sup>4</sup> 210 (sandy silt) <sup>4</sup> 230 (silty clay) <sup>4</sup>	230 (sand) <sup>4</sup> 270 (sandy silt) <sup>4</sup> 1100 (silty clay) <sup>4</sup>	-	
Phenanthrene	<u>&lt; 0.04</u>	<u>&lt; 0.03</u>	<u>0.62</u>	<u>&lt; 0.03</u>	<u>&lt; 0.04</u>	<u>&lt; 0.04</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	<u>&lt; 0.03</u>	0.002-0.005	-	-	-		
Pyrene	<u>&lt; 0.04</u>	<u>&lt; 0.03</u>	<u>1.13</u>	<u>&lt; 0.03</u>	<u>&lt; 0.04</u>	<u>&lt; 0.04</u>	<u>0.04</u>	<u>0.02</u>	<u>&lt; 0.03</u>	0.002-0.005	-	NA (all soil types) <sup>4</sup>	NA (all soil types) <sup>4</sup>	-	
BaP equivalent	<0.05	<0.07	1.63	<0.07	<0.05	<0.05	0.04	0.04	<0.07	-	-	11 (all soil types) <sup>4</sup>	25 (all soil types) <sup>4</sup>	-	
BaP equivalent (inc. Fluoranthene)	<0.05	<0.07	1.64	<0.07	<0.05	<0.05	0.04	0.04	<0.07	-	-	-	35 <sup>5</sup>		
Total Petroleum Hydrocarbons (mg/kg dry weight)															
C7 - C9	< 10	< 8	< 8	< 9	< 10	< 10	< 9	< 8	< 9	-	-	120 (sand) <sup>4</sup> 500 (sandy silt) 8800 (silty clay) <sup>4</sup>	120 (sand) <sup>4</sup> 500 (sandy silt) 20000 (silty clay) <sup>4</sup>	120 (sand) <sup>4</sup> 500 (sandy silt) 8800 (silty clay) <sup>4</sup>	120 (sand) <sup>4</sup> 500 (sandy silt) 20000 (silty clay) <sup>4</sup>
C10 - C14	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	-	-	1500 (sand) <sup>4</sup> 1700 (sandy silt) <sup>4</sup> 1900 (sandy silt) <sup>4</sup>	1900 (sand) <sup>4</sup> 2200 (sandy silt) <sup>4</sup> 8900 (silty sand) <sup>4</sup>	1500 (sand) <sup>4</sup> 1700 (sandy silt) <sup>4</sup> 1900 (sandy silt) <sup>4</sup>	1900 (sand) <sup>4</sup> 2200 (sandy silt) <sup>4</sup> 8900 (silty sand) <sup>4</sup>
C15 - C36	66	< 40	46	< 40	< 40	104	131	360	< 40	-	-	NA (all soil types) <sup>4</sup>	NA (all soil types) <sup>4</sup>	NA (all soil types) <sup>4</sup>	NA (all soil types) <sup>4</sup>
Total hydrocarbons (C7 - C36)	<u>&lt; 70</u>	<u>&lt; 70</u>	<u>&lt; 70</u>	<u>&lt; 70</u>	<u>&lt; 70</u>	<u>104</u>	<u>131</u>	<u>360</u>	<u>&lt; 70</u>	0.002-0.005	-	-	-	-	

Annotations:

- Determination of common pollutant background soil concentrations for the Wellington region, GWRC 2003. Values applicable to 'Main Soil Type 1 (Sand)' have been used.
- Canadian Soil Quality Guidelines, Canadian Council of Ministers of the Environment, 2012. Values applicable to 'commercial' land use have been used.
- Guideline on the Investigation Levels for Soil and Groundwater, NEPC, 1999. Values applicable to 'Health Investigation Level F - commercial/industrial' have been used.
- Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand, Ministry for the Environment, 1999. Values for 'commercial/industrial' land use have been used.
- Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations, 2011. Values applicable to 'commercial/industrial outdoor worker' have been used.
- USEPA Regional Screening Level Industrial Soil Table, April 2012

Results exceeding background levels are underlined

Results exceeding environmental risk criteria are shaded in grey

Results exceeding human health risk criteria are in **bold**

NL - No Limit. Derived value exceeds 10000 mg/kg.

NA - indicates contaminant not limiting. Greater than 20000 mg/kg for TPH and 10000 mg/kg for other contaminants.

**WASTE ACCEPTANCE CRITERIA: 109 KAPITI ROAD**

Date	11-Mar-13	11-Mar-13	11-Mar-13	11-Mar-13	11-Mar-13	11-Mar-13	11-Mar-13	11-Mar-13	11-Mar-13	11-Mar-13	Waste Acceptance Criteria	
Test Pit Number	TP101	TP101	TP102	TP102	TP103	TP104	TP104	TP105	TP106	TP106		
Sample Number	S1	S2	S1	S2	S1	S1	S2	S1	S1	S2		
Laboratory Number	1110684.2	1110684.21	1110684.17	1110684.18	1110684.15	1110684.1	1110684.2	1110684.4	1110684.1	1110684.8	Porirua City Council	Hutt City Council
Sample Depth (m)	0.1-0.2	1.2-1.3	0.4-0.5	1.1-1.2	0.2-0.3	0.1-0.2	0.6-0.7	0.3-0.4	0.2-0.3	1.0-1.1	Spicer Landfill (Class B)	Silverstream Landfill (Class A)
Soil Type	Sand	Clayey silt	Clayey silt	Clayey silt	Silt	Silt	Silt	Silt	Sandy silt	Sandy Silt	(mg/kg)	(mg/kg)
<b>Heavy Metals (mg/kg dry weight)</b>												
Arsenic	4	5	5	4	5	4	5	6	5	5	10	100
Cadmium	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	2	20
Chromium	6	<b>23</b>	<b>19</b>	<b>16</b>	<b>14</b>	<b>13</b>	<b>20</b>	<b>14</b>	<b>12</b>	<b>19</b>	10	100
Copper	8	<b>22</b>	<b>18</b>	<b>16</b>	<b>15</b>	<b>12</b>	<b>15</b>	<b>16</b>	<b>13</b>	<b>18</b>	10	28
Lead	4.4	<b>24</b>	<b>19.3</b>	<b>18.5</b>	<b>18.2</b>	<b>12.4</b>	<b>19.9</b>	<b>15.5</b>	<b>11.9</b>	<b>21</b>	10	100
Nickel	3	16	13	12	11	9	13	10	9	14	20	40
Zinc	<b>27</b>	<b>73</b>	<b>62</b>	<b>61</b>	<b>57</b>	<b>47</b>	<b>59</b>	<b>51</b>	<b>44</b>	<b>63</b>	20	160
<b>Polycyclic Aromatic Hydrocarbons (mg/kg dry weight)</b>												
Acenaphthene	< 0.04	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04	-	-
Acenaphthylene	< 0.04	< 0.03	< 0.03	0.07	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04	-	-
Anthracene	< 0.04	< 0.03	< 0.03	0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04	-	-
Benzo[a]anthracene	< 0.04	< 0.03	< 0.03	0.07	< 0.03	< 0.03	< 0.03	0.03	< 0.03	< 0.04	-	-
Benzo[a]pyrene (BAP)	0.04	< 0.03	< 0.03	0.22	< 0.03	< 0.03	< 0.03	0.04	< 0.03	< 0.04	30	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	0.05	< 0.03	< 0.03	0.27	< 0.03	< 0.03	< 0.03	0.06	< 0.03	< 0.04	-	-
Benzo[g,h,i]perylene	0.03	< 0.03	< 0.03	0.18	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04	-	-
Benzo[k]fluoranthene	< 0.04	< 0.03	< 0.03	0.13	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04	-	-
Chrysene	< 0.04	< 0.03	< 0.03	0.09	< 0.03	< 0.03	< 0.03	0.04	< 0.03	< 0.04	-	-
Dibenzo[a,h]anthracene	< 0.04	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04	-	-
Fluoranthene	< 0.04	< 0.03	< 0.03	0.13	< 0.03	< 0.03	< 0.03	0.05	< 0.03	< 0.04	-	-
Fluorene	< 0.04	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04	-	-
Indeno(1,2,3-c,d)pyrene	0.04	< 0.03	< 0.03	0.22	< 0.03	< 0.03	< 0.03	0.04	< 0.03	< 0.04	-	-
Naphthalene	< 0.16	< 0.14	< 0.15	< 0.13	< 0.14	< 0.14	< 0.14	< 0.15	< 0.13	< 0.16	20	1
Phenanthrene	< 0.04	< 0.03	< 0.03	0.05	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.04	-	-
Pyrene	0.03	< 0.03	< 0.03	0.19	< 0.03	< 0.03	< 0.03	0.06	< 0.03	< 0.04	-	-
BaP equivalent	0.07	<0.07	<0.07	0.30	<0.07	<0.07	<0.07	0.07	<0.07	<0.05	30	-
BaP equivalent (inc. Fluoranthene)	0.07	<0.07	<0.07	0.31	<0.07	<0.07	<0.07	0.07	<0.07	<0.05	-	-
<b>Total Petroleum Hydrocarbons (mg/kg dry weight)</b>												
C7 - C9	< 10	< 9	< 9	< 8	< 8	< 9	< 9	< 9	< 8	< 10	-	-
C10 - C14	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	-	-
C15 - C36	142	< 40	< 40	370	< 40	< 40	< 40	< 40	< 40	< 40	-	-
Total hydrocarbons (C7 - C36)	142	< 70	< 70	370	< 70	< 70	< 70	< 70	< 70	< 70	-	-
<b>Materials in Borehole Log which Preclude Soils as Cleanfill?</b>	Yes	No	Yes	No	No	No	No	No	No	No		

**Annotations:**

Results exceeding Spicer Landfill (Class B) waste acceptance criteria are in **bold**

Results exceeding Silverstream Landfill (Class A) waste acceptance criteria are shaded in grey

**WASTE ACCEPTANCE CRITERIA: 109 KAPITI ROAD**

Date	11-Mar-13	11-Mar-13	12-Mar-13	12-Mar-13	12-Mar-13	11-Mar-13	11-Mar-13	12-Mar-13	12-Mar-13	Waste Acceptance Criteria	
Test Pit Number	TP107	TP108	TP109	TP110	TP111	TP112	TP113	TP114	TP115		
Sample Number	S1	S1	S1	S1	S1	S1	S1	S1	S1		
Laboratory Number	1110684.25	1110684.23	1110964.3	1110964.5	1110964.1	1110684.27	1110684.7	1110964.9	1110964.7	Porirua City Council	Hutt City Council
Sample Depth (m)	0.2-0.3	0.1-0.2	0.2-0.3	0.2-0.3	0.2-0.3	0.1-0.2	0.2-0.3	0.2-0.3	0.1-0.2	Spicer Landfill (Class B)	Silverstream Landfill (Class A)
Soil Type	Sand	Sandy silt	Gravelly silt	Silt	Silt	Silty sand	Silty sand	Silty gravel	Silt	(mg/kg)	(mg/kg)
<b>Heavy Metals (mg/kg dry weight)</b>											
Arsenic	2	10	4	4	4	3	2	5	4	10	100
Cadmium	< 0.10	< 0.10	< 0.10	< 0.10	0.13	< 0.10	< 0.10	< 0.10	0.11	2	20
Chromium	5	<b>14</b>	<b>14</b>	<b>19</b>	<b>19</b>	6	6	<b>18</b>	<b>18</b>	10	100
Copper	7	<b>17</b>	<b>17</b>	<b>14</b>	<b>16</b>	7	8	<b>20</b>	<b>14</b>	10	28
Lead	4.8	<b>26</b>	<b>21</b>	<b>18</b>	<b>21</b>	4.7	5.4	<b>31</b>	<b>23</b>	10	100
Nickel	4	13	14	13	13	4	4	16	13	20	40
Zinc	<b>27</b>	<b>62</b>	<b>67</b>	<b>52</b>	<b>75</b>	<b>29</b>	<b>38</b>	<b>79</b>	<b>63</b>	20	160
<b>Polycyclic Aromatic Hydrocarbons (mg/kg dry weight)</b>											
Acenaphthene	< 0.04	< 0.03	0.06	< 0.03	< 0.04	< 0.04	< 0.03	< 0.03	< 0.03	-	-
Acenaphthylene	< 0.04	< 0.03	< 0.03	< 0.03	< 0.04	< 0.04	< 0.03	< 0.03	< 0.03	-	-
Anthracene	< 0.04	< 0.03	0.17	< 0.03	< 0.04	< 0.04	< 0.03	< 0.03	< 0.03	-	-
Benzo[a]anthracene	< 0.04	< 0.03	0.69	< 0.03	< 0.04	< 0.04	< 0.03	< 0.03	< 0.03	-	-
Benzo[a]pyrene (BAP)	< 0.04	< 0.03	1.02	< 0.03	< 0.04	< 0.04	< 0.03	< 0.03	< 0.03	30	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	< 0.04	< 0.03	1.29	< 0.03	< 0.04	< 0.04	< 0.03	0.03	< 0.03	-	-
Benzo[g,h,i]perylene	< 0.04	< 0.03	0.67	< 0.03	< 0.04	< 0.04	< 0.03	0.04	< 0.03	-	-
Benzo[k]fluoranthene	< 0.04	< 0.03	0.52	< 0.03	< 0.04	< 0.04	< 0.03	< 0.03	< 0.03	-	-
Chrysene	< 0.04	< 0.03	0.66	< 0.03	< 0.04	< 0.04	< 0.03	< 0.03	< 0.03	-	-
Dibenzo[a,h]anthracene	< 0.04	< 0.03	0.29	< 0.03	< 0.04	< 0.04	< 0.03	< 0.03	< 0.03	-	-
Fluoranthene	< 0.04	< 0.03	1.33	< 0.03	< 0.04	< 0.04	0.03	< 0.03	< 0.03	-	-
Fluorene	< 0.04	< 0.03	0.03	< 0.03	< 0.04	< 0.04	< 0.03	< 0.03	< 0.03	-	-
Indeno(1,2,3-c,d)pyrene	< 0.04	< 0.03	0.64	< 0.03	< 0.04	< 0.04	< 0.03	< 0.03	< 0.03	-	-
Naphthalene	< 0.16	< 0.13	< 0.12	< 0.14	< 0.16	< 0.16	< 0.15	< 0.12	< 0.14	20	1
Phenanthrene	< 0.04	< 0.03	0.62	< 0.03	< 0.04	< 0.04	< 0.03	< 0.03	< 0.03	-	-
Pyrene	< 0.04	< 0.03	1.13	< 0.03	< 0.04	< 0.04	0.04	0.02	< 0.03	-	-
BaP equivalent	<0.05	<0.07	1.63	<0.07	<0.05	<0.05	0.04	0.04	<0.07	30	-
BaP equivalent (inc. Fluoranthene)	<0.05	<0.07	1.64	<0.07	<0.05	<0.05	0.04	0.04	<0.07	-	-
<b>Total Petroleum Hydrocarbons (mg/kg dry weight)</b>											
C7 - C9	< 10	< 8	< 8	< 9	< 10	< 10	< 9	< 8	< 9	-	-
C10 - C14	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	-	-
C15 - C36	66	< 40	46	< 40	< 40	104	131	360	< 40	-	-
Total hydrocarbons (C7 - C36)	< 70	< 70	< 70	< 70	< 70	104	131	360	< 70	-	-
<b>Materials in Borehole Log which Preclude Soils as Cleanfill?</b>	No	No	No	Yes	Yes	No	Yes	No	No		

**Annotations:**

Results exceeding Spicer Landfill (Class B) waste acceptance criteria are in **bold**

Results exceeding Silverstream Landfill (Class A) waste acceptance criteria are shaded in grey

## SECTOR 2 – TEST PIT LOGS

Test Pits	Location
TP215 to TP217	55 Rata Road

### SECTOR 2 – SUMMARY OF SOIL SAMPLING AND ANALYSIS

Location	Test Pit Depth (m bgl)	Laboratory Number	Sample Depth (m)	Soil Type	Analysis Suite
TP215	2.5	1099950.1	0.0	Sawdust	Hold Cold
		1099950.2	0.3	Silty sand	Heavy Metals, TPH, PAH
		1099950.3	1.0	Silty sand	Heavy Metals, TPH, PAH
		1099950.4	1.9	Peat	Hold Cold
TP216	2.5	1099950.5	0.0	Silty sand	Heavy Metals, TPH, PAH
		1099950.6	0.5	Sand	Heavy Metals, TPH, PAH
		1099950.7	1.5	Peaty sand	Hold Cold
		1099950.8	2.4	Peaty sand	Hold Cold
TP217	3	1099950.9	0.0	Gravelly silt	Hold Cold
		1099950.10	0.5	Gravelly silt	Heavy Metals, TPH, PAH
		1099950.11	1.4	Gravelly silt	Heavy Metals, TPH, PAH
		1099950.12	1.8	Gravelly silt	Heavy Metals, TPH, PAH
		1099950.13	2.9	Gravelly silt	Hold Cold

HM = heavy metals

TPH = total petroleum hydrocarbons

PAH = polycyclic aromatic hydrocarbons



**TEST PIT LOG**

PROJECT: **MacKays to Peka Peka Expressway** JOB NUMBER: **3320901/1000/013**  
 SITE LOCATION: **55 Rata Road, Paraparaumu, Wellington** CLIENT: **New Zealand Transport Agency**

CIRCUIT: TEST PIT LOCATION: **Rata Road, Paraparaumi, Wellington**  
 COORDINATES: N **5,468,317.48 m** R L:  
 E **1,767,729.21 m** DATUM:

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale	SV	$\gamma$ (kPa)	SAMPLES	DEPTH (m)
					Sawdust	<b>Fill</b>				DS1	
0.5			SM	M	Silty fine to coarse SAND, some fine to coarse gravel, minor fill (metal, concrete); dark brown speckled grey; moist, non-plastic. Gravel: sub-angular.  No fill					DS2	0.5
1.0					Concrete Blocks					DS3	1.0
2.0			PT	M	PEAT; blackish brown; moist, non-plastic.	<b>Interdune Deposits (Peat)</b>				DS4	2.0
2.5					END OF LOG @ 2.5 m						2.5

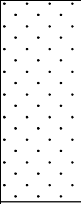
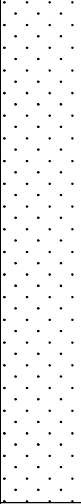
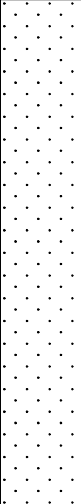

DATE EXCAVATED: 13/2/13 CONTRACTOR:  
 LOGGED BY: KMW EQUIPMENT:  
 SHEAR VANE No: METHOD:

COMMENTS:  
 S1 13:016 TP215 0.0-0.1m  
 S2 13:016 TP215 0.3-0.4m  
 S3 13:016 TP215 1.0-1.1m  
 S4 13:016 TP215 1.9-2.0m

**TEST PIT LOG**

PROJECT: MacKays to Peka Peka Expressway      JOB NUMBER: 3320901/1000/013  
 SITE LOCATION: 55 Rata Road, Paraparaumu, Wellington      CLIENT: New Zealand Transport Agency

CIRCUIT:      TEST PIT LOCATION: Rata Road, Paraparaumi, Wellington  
 COORDINATES: N 5,468,309.86 m      R L:  
                          E 1,767,714.17 m      DATUM:

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale	SV	$\sigma_v$ (kPa)	SAMPLES	DEPTH (m)
			SM	M	Silty fine to coarse SAND, some fine to coarse gravel; dark brown; moist, non-plastic. Gravel: subangular.	FILL				DS1	
0.5			SW	M	Fine to coarse SAND; light grey; moist, non-plastic.						DS2
1.0			SM	W	Peaty fine to coarse SAND; dark brown; wet, non-plastic. Organic odour. Peat: Fibrous.	Interdune Deposits (Peat)				DS3	1.5
1.5					Groundwater as rapid inflow.						DS4
2.0					END OF LOG @ 2.5 m						2.5
2.5	13/02/2013										

DATE EXCAVATED: 13/2/13      CONTRACTOR:  
 LOGGED BY: KMW      EQUIPMENT:  
 SHEAR VANE No:      METHOD:  
 COMMENTS:  
 S1 13:016 TP216 0.0-0.1m  
 S2 13:016 TP216 0.5-0.6m  
 S3 13:016 TP216 1.5-1.6m  
 S4 13:016 TP216 2.4-2.5m

TEST\_PIT\_P:\3320901\TENICON LAND\PHASE 1B GROUND INVESTIGATION\_POST-LODGE\GINT LOGS\55 RATA ROAD\55 RATA ROAD\_GPJ\_BECA.GDT 16/4/13



## SECTOR 2 – TEST PIT LOGS

Test Pits	Location
TP101 to TP110	61 Rata Road

### SECTOR 2 – SUMMARY OF SOIL SAMPLING AND ANALYSIS

Location	Test Pit Depth (m bgl)	Laboratory Number	Sample Depth (m)	Soil Type	Analysis Suite
TP101	1.5	1111754.1	0.2-0.3	Sand	HM, TPH
		1111754.2	1.4-1.5	Sand	Hold Cold
TP102	1.7	1111754.3	0.1-0.2	Silty gravel	HM, TPH
		1111754.4	0.6-0.7	Sand	Hold Cold
		1111754.5	1.5-1.6	Sand	Hold Cold
TP103	2	1111754.26	0.1-0.2	Silty gravel	HM, TPH
		1111754.6	0.4-0.5	Sand	HM, TPH
		1111754.7	1.4-1.5	Sand	Hold Cold
TP104	1.5	1111754.9	0.1-0.2	Silty gravel	HM, TPH
		1111754.10	0.5-0.6	Sand	Hold Cold
		1111754.11	1.3-1.4	Sand	Hold Cold
TP105	1.5	1111754.12	0.1-0.2	Sand	HM, TPH
		1111754.13	1.4-1.5	Sand	Hold Cold
TP106	2.2	1111754.14	0.2-0.3	Silty gravel	HM, TPH
		1111754.15	0.7-0.8	Sand	Hold Cold
		1111754.16	1.8-1.9	Peat	Hold Cold

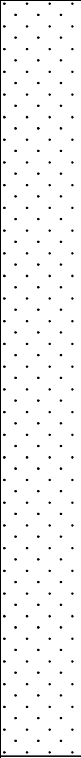
HM = Heavy metals

TPH = Total Petroleum Hydrocarbons

**TEST PIT LOG**

PROJECT: **MacKays to Peka Peka Expressway** JOB NUMBER: **3320901/1000/013**  
 SITE LOCATION: **61 Rata Road, Paraparaumu** CLIENT: **NZTA**

CIRCUIT: TEST PIT LOCATION:  
 COORDINATES: N 5,468,371.26 m R L:  
 E 1,767,658.66 m DATUM:

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale	SV	$\tau$ (kPa)	SAMPLES	DEPTH (m)
0.5			SW	D	Fine to coarse SAND, minor fine to coarse gravel; greyish brown; dry, non plastic. Gravel: Rounded.					DS1	0.5
1.0					No gravel; light yellowish brown; moist.						1.0
1.5					END OF LOG @ 1.5 m					DS2	1.5
2.0											2.0
2.5											2.5

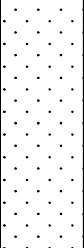
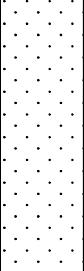
DATE EXCAVATED: 14/3/13 CONTRACTOR: Goodman Contractors Ltd  
 LOGGED BY: KMW EQUIPMENT: 12 tonne Kobelco  
 SHEAR VANE No: METHOD: Excavation

COMMENTS:  
 S1 13:024 TP101RR S1 0.2-0.3m  
 S2 13:024 TP101RR S2 1.4-1.5m

**TEST PIT LOG**

PROJECT: MacKays to Peka Peka Expressway      JOB NUMBER: 3320901/1000/013  
 SITE LOCATION: 61 Rata Road, Paraparaumu      CLIENT: NZTA

CIRCUIT:      TEST PIT LOCATION:  
 COORDINATES: N 5,468,361.63 m      R L:  
                          E 1,767,650.8 m      DATUM:

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale	SV	$\sigma_v$ (kPa)	SAMPLES	DEPTH (m)
			GM	D	Silty fine to coarse GRAVEL, some fine to coarse sand; light brown; dry, non plastic. Gravel: Angular.	Fill				DS1	
0.5			SW	M	Fine to coarse SAND; greyish brown; moist, non plastic.	Holocene Sand				DS2	0.5
1.0			SW	M	Some organics; dark blackish brown. Organics: branches.  No organics; greyish brown.					DS3	1.0
1.5											1.5
2.0					END OF LOG @ 1.7 m						2.0
2.5											2.5

DATE EXCAVATED: 14/3/13      CONTRACTOR: Goodman Contractors Ltd  
 LOGGED BY: KMW      EQUIPMENT: 12 tonne Kobelco  
 SHEAR VANE No:      METHOD: Excavation


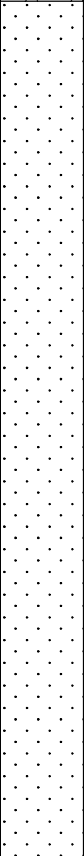
COMMENTS:  
 S1 13:024 TP102RR S1 0.1-0.2m  
 S2 13:024 TP102RR S2 0.6-0.7m  
 S3 13:024 TP102RR S3 1.5-1.6m

TEST\_PIT\_P:\3320901\TENICON LAND\PHASE 1B GROUND INVESTIGATION\_POST-LODGE\GINT LOGS\61 RATA ROAD\61 RATA ROAD\GDT\_16/4/13

**TEST PIT LOG**

PROJECT: **MacKays to Peka Peka Expressway** JOB NUMBER: **3320901/1000/013**  
 SITE LOCATION: **61 Rata Road, Paraparaumu** CLIENT: **NZTA**

CIRCUIT: TEST PIT LOCATION:  
 COORDINATES: N 5,468,349.59 m R L:  
 E 1,767,659.35 m DATUM:

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale	SV	$\sigma_v$ (kPa)	SAMPLES	DEPTH (m)
			GM	D	Silty fine to coarse GRAVEL, some sand; light brown; dry, non plastic, Gravel: Angular.	Fill				DS1	
0.5			SW	M	Fine to coarse SAND; greyish brown; moist, non plastic.  Some organics; dark blackish brown. Organics: Branches.  No organics; greyish brown streaked orange.	Holocene Sand				DS2	0.5
1.0											
1.5										DS3	1.5
2.0					END OF LOG @ 2 m						2.0
2.5											2.5


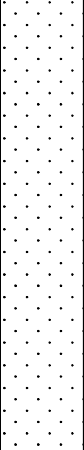
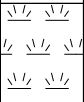
DATE EXCAVATED: 14/3/13 CONTRACTOR: Goodman Contractors Ltd  
 LOGGED BY: KMW EQUIPMENT: 12 tonne Kobelco  
 SHEAR VANE No: METHOD: Excavation

COMMENTS:  
 S1 13:024 TP103RR S1 0.1-0.2m  
 S2 13:024 TP103RR S2 0.4-0.5m  
 S3 13:024 TP103RR S3 1.4-1.5m

**TEST PIT LOG**

PROJECT: MacKays to Peka Peka Expressway      JOB NUMBER: 3320901/1000/013  
 SITE LOCATION: 61 Rata Road, Paraparaumu      CLIENT: NZTA

CIRCUIT:      TEST PIT LOCATION:  
 COORDINATES: N 5,468,343.49 m      R L:  
                          E 1,767,653.89 m      DATUM:

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale	SV	τ (kPa)	SAMPLES	DEPTH (m)
			GM	D	Silty fine to coarse GRAVEL, some sand; light brown; moist, non plastic. Gravel: Angular.	Fill				DS1	
0.5			SW	M	Fine to coarse SAND, some organics; dark blackish brown; moist, non plastic. Organics: Branches.	Holocene Sand				DS2	0.5
1.5			PT	M	Amorphous PEAT; dark blackish brown; moist, non plastic.	ID				DS3	1.5
1.5					END OF LOG @ 1.5 m						1.5
2.0											2.0
2.5											2.5

DATE EXCAVATED: 14/3/13	CONTRACTOR: Goodman Contractors Ltd	COMMENTS: S1 13:024 TP104RR S1 0.1-0.2m S2 13:024 TP104RR S2 0.5-0.6m S3 13:024 TP104RR S3 1.3-1.4m ID = Interdune Deposits (Peat)
LOGGED BY: KMW	EQUIPMENT: 12 tonne Kobelco	
SHEAR VANE No:	METHOD: Excavation	

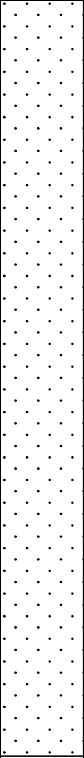
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**TEST PIT LOG**

PROJECT: **MacKays to Peka Peka Expressway** JOB NUMBER: **3320901/1000/013**  
 SITE LOCATION: **61 Rata Road, Paraparaumu** CLIENT: **NZTA**

CIRCUIT: TEST PIT LOCATION:  
 COORDINATES: N 5,468,335.34 m R L:  
 E 1,767,675.28 m DATUM:

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale	SV	$\gamma$ (kPa)	SAMPLES	DEPTH (m)
0.5			SW	M	Fine to coarse SAND; light yellowish brown; moist, non plastic.	<b>Holocene Sand</b>				DS1	0.5
1.0										DS2	1.5
1.5					END OF LOG @ 1.5 m						1.5
2.0											2.0
2.5											2.5

DATE EXCAVATED: 14/3/13 CONTRACTOR: Goodman Contractors Ltd  
 LOGGED BY: KMW EQUIPMENT: 12 tonne Kobelco  
 SHEAR VANE No: METHOD: Excavation

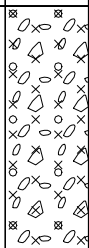
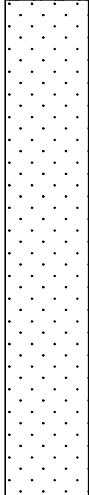
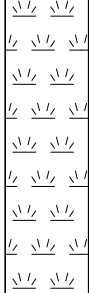

COMMENTS:  
 S1 13:024 TP105RR S1 0.1-0.2m  
 S2 13:024 TP105RR S2 1.4-1.5m

TEST\_PIT\_P:\3320901\TENICON LAND\PHASE 1B GROUND INVESTIGATION\_POST-LODGE\GINT LOGS\61 RATA ROAD\RATA ROAD LOGS.GPJ BECA\_GDT\_16/4/13

**TEST PIT LOG**

PROJECT: MacKays to Peka Peka Expressway SITE LOCATION: 61 Rata Road, Paraparaumu	JOB NUMBER: 3320901/1000/013 CLIENT: NZTA
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CIRCUIT: COORDINATES: N 5,468,331.39 m E 1,767,657.82 m	TEST PIT LOCATION: R L: DATUM:
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DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale	SV	γ (kPa)	SAMPLES	DEPTH (m)
0.5			GM	D	Silty fine to coarse GRAVEL, minor fine to coarse sand; light grey; moist, non plastic. Gravel: Angular.	Fill				DS1	0.5
1.0			SW	M	Fine to coarse SAND, some silt; dark brown; moist, non plastic.	Holocene Sand				DS2	1.0
1.5			PT	W	Fibrous PEAT; dark brown; wet, non plastic. Organic odour.	ID				DS3	1.5
2.0			SW	M	Fine to coarse SAND; bluish grey; moist, non plastic.	HS					2.0
2.5					END OF LOG @ 2.2 m						2.5

DATE EXCAVATED: 14/3/13 LOGGED BY: KMW SHEAR VANE No:	CONTRACTOR: Goodman Contractors Ltd EQUIPMENT: 12 tonne Kobelco METHOD: Excavation	COMMENTS: S1 13:024 TP106RR S1 0.2-0.3m S2 13:024 TP106RR S2 0.7-0.8m S3 13:024 TP106RR S3 1.8-1.9m ID = Interdune Deposits (Peat) HS = Holocene Sand
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TEST\_PIT\_P:\3320901\TENCON LAND\PHASE 1B\_GROUND INVESTIGATION\_POST-LODGEMENT\GINT LOGS\61 RATA ROAD\RATA ROAD LOGS.GPJ BECA\_GDT\_16/4/13