


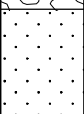
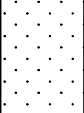
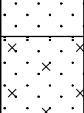
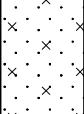
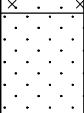
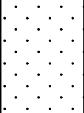
APPENDIX E

Sector 3 – Otaihanga Project Yard Logs

TEST PIT LOG

PROJECT: M2PP Expressway JOB NUMBER: 3320901
 SITE LOCATION: Otaihangā Landfill - proposed construction yard CLIENT: NZTA

CIRCUIT: NZTM TEST PIT LOCATION: Otaihangā landfill
 COORDINATES: N 5,471,309 m R L:
 E 1,770,495 m DATUM: MSL

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale (Blows/150mm)	SV	τ (kPa)	SAMPLES	DEPTH (m)
0.5			M		Medium dense, fine to medium sandy, coarse GRAVEL to BOULDERS, and REFUSE, some silt; brown; moist, non plastic, matrix supported. Gravel/ cobbles/ boulders: MW-SW, angular, greywacke and argillite (maximum ~250 mm diameter). Refuse: asphalt slabs, reinforced concrete slabs, brick, plastic, timber, tree stumps, hydrocarbon odour.	Fill	6				0.5
0.5 - 1.0			SP M		Very dense; moderately thin (100 - 150 mm) discontinuous sand lens (west side only). 'Loose', fine to medium SAND, some refuse, some rootlets, minor gravel; brown; moist, non plastic. Refuse: concrete, brick, plastic, timber, tree stumps, hydrocarbon odour.		19 for 130mm (bouncing)				1.0
1.0 - 1.5					Very loose.		0				1.5
1.5 - 2.0			SM W		Very loose, silty fine to medium SAND, some refuse, some rootlets; greyish brown; wet, non plastic. Refuse: concrete, brick, plastic, timber, tree stumps, hydrocarbon odour.		2				2.0
2.0 - 2.5					Loose.		2				2.5
2.5	3/4/2013		SP S		2.3 m depth, water table; saturated. 'Medium dense', fine to medium SAND, some silt, some rootlets; dark brown; saturated, non plastic, weakly cemented.	Holocene Sand	3				2.5
2.5 - 3.0							4				3.0
3.5					END OF LOG @ 3.4 m						3.5
4.0											4.0
4.5											4.5
5.0											5.0
5.5											5.5

DATE EXCAVATED: 3/4/13 CONTRACTOR: Goodmans Contractors Ltd COMMENTS:
 LOGGED BY: JUB EQUIPMENT: Hyundai 20 t Coordinates obtained from hand held GPS (stated accuracy +/- 3m). No RL available.
 SHEAR VANE No: METHOD: Excavation

FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS SEE KEY SHEET



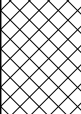



Revision A

TEST_PIT_P:\3320901\DESIGN\GEO\INVESTIGATION\DETAILED DESIGN\INVESTIGATION\TEST PIT PHOTOS\OTAIHANGA LANDFILL\OTAIHANGA LANDFILL (PRECAST YARD).GPJ BECA.GDT 16/4/13

TEST PIT LOG

 PROJECT: **M2PP Expressway** JOB NUMBER: **3320901**
 SITE LOCATION: **Otaihanga Landfill - proposed construction yard** CLIENT: **NZTA**

 CIRCUIT: **NZTM** TEST PIT LOCATION: **Otaihanga landfill**
 COORDINATES: **N 5,471,277 m** R L:
E 1,770,517 m DATUM: **MSL**

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale (Blows/150mm)	SV	τ (kPa)	SAMPLES	DEPTH (m)
0.0			GM	M	'Loose', silty fine to medium GRAVEL, light brown; moist, non plastic. Gravel: MW, angular to subangular, greywacke, clast supported.	Fill					
0.5			SP	M	'Loose', fine to medium SAND, some silt, some refuse; dark greenish grey and brown; moist, non plastic. Refuse: rags, metal sheets, wire, plastic, glass, brick.		3				0.5
1.0				W	Loose, REFUSE, some fine to medium sand, some silt; grey; wet, non plastic. Refuse: rags, metal sheets, wire, plastic, glass, brick.		4				
1.5	 3/4/2013		MH	W	Very soft, fine to medium sandy SILT, some clay, minor rootlets; greyish brown; wet, high plasticity.	Holocene Sand	3				1.0
1.8			SP	W	'Loose', fine to medium SAND; dark brown; wet, non plastic, weakly cemented.		2				1.5
2.0					END OF LOG @ 1.8 m						2.0
2.5											2.5
3.0											3.0
3.5											3.5
4.0											4.0
4.5											4.5
5.0											5.0
5.5											5.5

DATE EXCAVATED: 3/4/13	CONTRACTOR: Goodmans Contractors Ltd	COMMENTS: Coordinates obtained from hand held GPS (stated accuracy +/- 3m). No RL available.
LOGGED BY: JUB	EQUIPMENT: Hyundai 20 t	
SHEAR VANE No:	METHOD: Excavation	

FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS SEE KEY SHEET

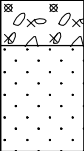
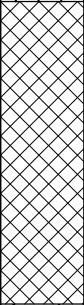
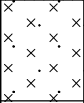
Revision A

TEST_PIT_P:\332\3320901\DESIGN\GEO\INVESTIGATION\DETAILED DESIGN\Otaihanga Landfill (PRECAST YARD).GPJ BECA.GDT 16/4/13

TEST PIT LOG

PROJECT: M2PP Expressway JOB NUMBER: 3320901
SITE LOCATION: Otaihanga Landfill - proposed construction yard CLIENT: NZTA

CIRCUIT: NZTM TEST PIT LOCATION: Otaihanga landfill
COORDINATES: N 5,471,267 m R L:
E 1,770,548 m DATUM: MSL

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale (Blows/150mm)	SV	τ (kPa)	SAMPLES	DEPTH (m)
0.5	3/4/2013		GM	M	'Loose', silty, medium to coarse GRAVEL, some fine to medium sand; orange-brown; moist, non plastic. Gravel: MW, angular greywacke.	Fill	3				0.5
			SP	M	Medium dense, fine to medium SAND, trace silt; light greyish brown; moist, non plastic. Loose.		6				
1.0	3/4/2013		M		Loose to medium dense, fine to medium SAND and REFUSE, minor silt; light brown; moist, non plastic. Refuse: tyres, rags, glass, timber, metal, concrete slabs, plastic, tree stumps and logs, corrugated iron sheets.	Fill	3				1.0
			S		1.25 m depth, water table; dark brown; saturated.		10				
2.0	3/4/2013		ML	W	Soft, fine to medium sandy SILT, minor organics, trace clay; light brown; wet, low plasticity. Organics: fine rootlets, roots and branches.	Holocene Sand	5				2.0
			SP	W	'Loose', fine to medium SAND, minor silt; dark orange-brown; wet, non plastic.						
2.5					END OF LOG @ 2.4 m						2.5
3.0											3.0
3.5											3.5
4.0											4.0
4.5											4.5
5.0											5.0
5.5											5.5

DATE EXCAVATED: 3/4/13 CONTRACTOR: Goodmans Contractors Ltd
LOGGED BY: JUB EQUIPMENT: Hyundai 20 t
SHEAR VANE No: METHOD: Excavation













COMMENTS:
Coordinates obtained from hand held GPS (stated accuracy +/- 3m). No RL available.

TEST_PIT_P:\332\3320901\DESIGN\GEO\INVESTIGATION\DETAILED DESIGN\INVESTIGATION\TEST PIT PHOTOS\OTAIHANGA LANDFILL\PRECAST YARD.GPJ BECA.GDT 16/4/13

TEST PIT LOG

PROJECT: M2PP Expressway JOB NUMBER: 3320901
 SITE LOCATION: Otaihanga Landfill - proposed construction yard CLIENT: NZTA

CIRCUIT: NZTM TEST PIT LOCATION: Otaihanga landfill
 COORDINATES: N 5,471,282 m R L:
 E 1,770,586 m DATUM: MSL

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale (Blows/150mm)	SV	σ_v (kPa)	SAMPLES	DEPTH (m)
0.5			GW	M	Medium dense, fine to medium sandy, fine to coarse GRAVEL, minor silt, minor cobbles, minor rootlets; light brown; moist, non plastic. Gravel/ cobbles: MW, subangular to angular greywacke.	Fill	10				0.5
			SP	M			17				
			SP	W	Medium dense, fine to medium SAND, trace silt; brown; moist, non plastic.		19				
					Very dense, fine to medium SAND, minor refuse; grey; wet, non plastic. Refuse: plastic, concrete, vegetation.		21				
1.0					Very loose.		0				1.0
1.5							2				1.5
2.0				W	Very loose, REFUSE, some silt, some sand; brown; wet, non plastic. Refuse: plastic, timber etc.		2				2.0
					Refuse: fine to medium sandy, black textile/ fibres, bitumen/ hydrocarbon odour.		1				
			PT	W	Very soft, silty PEAT, trace clay; dark brown; wet, low plasticity. Organics: fine fibrous, amorphous, branches, roots. [Peat H5]	Interdune Deposits (peat)	2				2.0
2.5											
3.0	3/4/2013				2.9 m depth, water table; saturated.						3.0
3.5			SP	S	'Loose', fine to medium SAND, minor silt; dark orange-brown; saturated, non plastic. [HOLOCENE SAND]						3.5
					END OF LOG @ 3.5 m						
4.0											4.0
4.5											4.5
5.0											5.0
5.5											5.5

DATE EXCAVATED: 3/4/13 CONTRACTOR: Goodmans Contractors Ltd
 LOGGED BY: JUB EQUIPMENT: Hyundai 20 t
 SHEAR VANE No: METHOD: Excavation

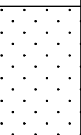

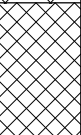
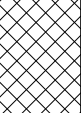


COMMENTS:
 Coordinates obtained from hand held GPS (stated accuracy +/- 3m). No RL available.

TEST_PIT_P:\332\3320901\DESIGN\GEO\TECH\INVESTIGATION\DETAILED DESIGN INVESTIGATION\TEST PIT PHOTOS\OTAIHANGA LANDFILL\OTAIHANGA LANDFILL (PRECAST YARD).GPJ BECA.GDT 16/4/13

TEST PIT LOG

PROJECT: M2PP Expressway JOB NUMBER: 3320901
SITE LOCATION: Otaihanga Landfill - proposed construction yard CLIENT: NZTA

CIRCUIT: NZTM TEST PIT LOCATION: Otaihanga landfill
COORDINATES: N 5,471,254 m R L:
E 1,770,586 m DATUM: MSL

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale (Blows/150mm)	SV	τ (kPa)	SAMPLES	DEPTH (m)
0.5			SP	M	Loose, fine to medium SAND, some rootlets, minor silt, trace refuse; brown; moist, non plastic. Light brown.	Fill	3				0.5
			ML	D	Medium dense. Stiff, SILT, minor fine sand, trace clay; light yellowish brown mottled orange; dry, low plasticity (when wetted).		4				
1.0			M		Loose, REFUSE and fine to medium SAND; light brown; moist, non plastic. Refuse: plastic, glass, clothing, wire rope, plastic sheeting, metal. 1.1 m depth, moderately thin (100 mm) layer of very loose, fine wood chips.		7				
1.5			S		Medium dense. 1.6 m depth, water table; saturated.		4				
3.0			PT	S	Soft, silty PEAT, trace clay; dark brown; saturated, low plasticity. Organics: fine fibrous, amorphous, roots. [Peat H5]	Interdune Deposits (peat)	1				1.5
4.5			SP	S	'Loose', fine to medium SAND; light brownish grey; saturated, non plastic. [HOLOCENE SAND]		5				2.0
4.7					END OF LOG @ 4.7 m						2.5
5.0											3.0
5.5											3.5
											4.0
											4.5
											5.0
											5.5

DATE EXCAVATED: 3/4/13 CONTRACTOR: Goodmans Contractors Ltd
LOGGED BY: JUB EQUIPMENT: Hyundai 20 t
SHEAR VANE No: METHOD: Excavation

COMMENTS:
Coordinates obtained from hand held GPS (stated accuracy +/- 3m). No RL available.

TEST_PIT_P:\332\3320901\DESIGN\GEO\TECH\INVESTIGATION\DETAILED DESIGN\INVESTIGATION\TEST PIT PHOTOS\OTAIHANGA LANDFILL\OTAIHANGA LANDFILL (PRECAST YARD).GPJ BECA.GDT 16/4/13

TEST PIT LOG

PROJECT: M2PP Expressway JOB NUMBER: 3320901
SITE LOCATION: Otaihanga Landfill - proposed construction yard CLIENT: NZTA

CIRCUIT: NZTM TEST PIT LOCATION: Otaihanga landfill
COORDINATES: N 5,471,205 m R L:
E 1,770,586 m DATUM: MSL

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale (Blows/150mm)	SV	τ (kPa)	SAMPLES	DEPTH (m)	
0.5	3/4/2013		ML	M	Loose, fine to coarse gravelly SILT; yellowish brown; moist, non plastic. Gravel: MW, subangular greywacke. 0.1 m depth, thin (50 mm) layer of fine to medium SAND, some silt; brown; moist, non plastic.	Fill	3				0.5	
			SP	W			Loose, fine to medium SAND, trace refuse, trace silt; light greyish brown; wet, non plastic. Refuse: plastic.	4				
1.0			OH	M	Firm, clayey ORGANIC SILT; dark brown; moist, high plasticity. Organics: fibrous, rootlets and amorphous.		3					
				W	Medium dense, fine to medium SAND and REFUSE; grey and light brown; wet, non plastic. Refuse: glass, plastic, timber, tyres, clothing, corrugated iron. Loose.		5					
1.5			S		1.3 m depth, water table; saturated.		2				1.0	
							4					
							4					
							6					
							4					
2.5			PT	W	Soft, silty PEAT, minor clay; reddish dark brown; wet, high plasticity. Organics: rootlets, branches, amorphous and small stumps. [Peat H5]	Interdune Deposits (peat)					2.5	
3.0												
3.5												
4.0												
4.5												
5.0												
5.5					END OF LOG @ 5.1 m						5.5	



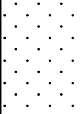


DATE EXCAVATED: 3/4/13 CONTRACTOR: Goodmans Contractors Ltd COMMENTS:
LOGGED BY: JUB EQUIPMENT: Hyundai 20 t Coordinates obtained from hand held GPS (stated accuracy +/- 3m). No RL available. Pit terminated before target layer, at limit of excavator reach.
SHEAR VANE No: METHOD: Excavation

TEST_PIT_P:\332\3320901\DESIGN\GEO\TECH\INVESTIGATION\DETAILED DESIGN\INVESTIGATION\TEST PIT PHOTOS\OTAIHANGA LANDFILL\OTAIHANGA LANDFILL (PRECAST YARD).GPJ BECA.GDT 16/4/13

TEST PIT LOG

PROJECT: M2PP Expressway JOB NUMBER: 3320901
SITE LOCATION: Otaihanga Landfill - proposed construction yard CLIENT: NZTA

CIRCUIT: NZTM TEST PIT LOCATION: Otaihanga landfill
COORDINATES: N 5,471,199 m R L:
E 1,770,623 m DATUM: MSL

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale (Blows/150mm)	SV	T (kPa)	SAMPLES	DEPTH (m)
0.5			SP	M	Dense, fine to coarse gravelly, fine to medium SAND, some silt, minor rootlets, trace refuse; brown; moist, non plastic. Gravel: MW-SW, rounded greywacke. Refuse: rags, timber, concrete, plastic.	Fill	10				0.5
			ML	M	Stiff, fine to medium sandy SILT, some rootlets, trace clay; brown; moist, low plasticity.		9				
			SP	M	Medium dense, fine to medium SAND; brown; moist, non plastic. Dense. Medium dense.		15 10 6				
1.0			W		Very loose, fine to medium SAND and REFUSE; dark grey; wet, non plastic. Refuse: concrete slabs, timber, corrugated iron, plastic, tyres, wire and vegetation. (Pit walls very unstable). Medium dense. 1.6 m depth, water table; saturated.		4 0 2 2 7				1.0
1.5	3/4/2013										1.5
2.0											2.0
2.5											2.5
3.0											3.0
3.5					Tree trunk.						3.5
4.0			PT	S	Soft, silty PEAT, trace clay; dark brown; saturated, low plasticity. Organics: logs, fine fibrous (some spongy), and amorphous. [Peat H5] [INTERDUNE DEPOSITS (PEAT)] END OF LOG @ 4 m						4.0
4.5											4.5
5.0											5.0
5.5											5.5

DATE EXCAVATED: 3/4/13 CONTRACTOR: Goodmans Contractors Ltd COMMENTS:
LOGGED BY: JUB EQUIPMENT: Hyundai 20 t Coordinates obtained from hand held GPS (stated accuracy +/- 3m). No RL available. Pit terminated before target layer due to instability, and at limit of excavator reach.
SHEAR VANE No: METHOD: Excavation

TEST_PIT_P:\332\3320901\DESIGN\GEO\TECH\INVESTIGATION\DETAILED DESIGN\INVESTIGATION\TEST PIT PHOTOS\OTAIHANGA LANDFILL (PRECAST YARD).GPJ BECA.GDT 16/4/13

TEST PIT LOG

PROJECT: M2PP Expressway JOB NUMBER: 3320901
SITE LOCATION: Otaihanga Landfill - proposed construction yard CLIENT: NZTA

CIRCUIT: NZTM TEST PIT LOCATION: Otaihanga landfill
COORDINATES: N 5,471,162 m R L:
E 1,770,630 m DATUM: MSL

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale (Blows/150mm)	SV	T (kPa)	SAMPLES	DEPTH (m)
0.0			SM	M	'Loose', silty fine to medium SAND, some rootlets; brown; moist, non plastic.	Fill					
0.5			W		'Loose', REFUSE, some silt, some fine to medium sand; brown; wet, non plastic. Refuse: concrete slabs, plastic, gravel fill and boulders (250 mm diameter).		(bouncing, concrete)				
1.0			SP	M	Loose, fine to medium SAND, some refuse, trace silt; grey; moist, non plastic. Moderately thin (100 - 200 mm) layer of silty, SAND; dark brown. Medium dense.		3 2 6 9 8				
1.6	3/4/2013		S		1.6 m depth, groundwater seepage (water table); saturated.						
3.0			PT	S	Soft, silty PEAT, trace clay; dark brown; saturated, low plasticity. Organics: fine fibrous (some spongy), logs, amorphous. [Peat H5]	Interdune Deposits (peat)					
5.0			SM SP	S S	'Loose', silty fine to medium SAND, minor organics, trace clay; light greyish brown; saturated, low plasticity. Organics: fine fibrous. [HOLOCENE SAND] 'Loose', fine to medium SAND; grey; saturated, non plastic. END OF LOG @ 5.2 m						

DATE EXCAVATED: 3/4/13 CONTRACTOR: Goodmans Contractors Ltd COMMENTS:
LOGGED BY: JUB EQUIPMENT: Hyundai 20 t Coordinates obtained from hand held GPS (stated accuracy +/- 3m). No RL available.
SHEAR VANE No: METHOD: Excavation












TEST_PIT_P:\332\3320901\DESIGN\GEO\TECH\INVESTIGATION\DETAILED DESIGN\INVESTIGATION\TEST PIT PHOTOS\OTAIHANGA LANDFILL\OTAIHANGA LANDFILL (PRECAST YARD).GPJ BECA.GDT 16/4/13

TEST PIT LOG

PROJECT: M2PP Expressway JOB NUMBER: 3320901
SITE LOCATION: Otaihanga Landfill - proposed construction yard CLIENT: NZTA

CIRCUIT: NZTM TEST PIT LOCATION: Otaihanga landfill
COORDINATES: N 5,471,209 m R L:
E 1,770,664 m DATUM: MSL

TEST_PIT_P:\332\3320901\DESIGN\GEO\TECH\INVESTIGATION\DETAILED DESIGN\INVESTIGATION\TEST PIT PHOTOS\OTAIHANGA LANDFILL\PRECAST YARD\GPJ BECA.GDT 16/4/13

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale (Blows/150mm)	SV	σ_v (kPa)	SAMPLES	DEPTH (m)
0.5			SP	M	Medium dense, fine to medium SAND, some rootlets, minor silt; brown; moist, non plastic (north side of pit) and some gravel, trace timber; brownish grey, interbedded with lenses of white silt (south side of pit).	Fill	5				0.5
1.0			SP	M	Medium dense, fine to medium SAND, trace silt, trace rootlets; light brown mottled dark brown; moist, non plastic. Dense.	Holocene Sand	9				1.0
1.5					Light brown. No rootlets. Very loose.		11				1.5
2.0							11				2.0
2.5							8				2.5
3.0							1				3.0
3.5					Loose.		2				3.5
4.0							3				4.0
4.5							2				4.5
5.0							5				5.0
5.5											5.5
					END OF LOG @ 3.5 m						3.5

DATE EXCAVATED: 3/4/13 CONTRACTOR: Goodmans Contractors Ltd COMMENTS:
LOGGED BY: JUB EQUIPMENT: Hyundai 20 t Coordinates obtained from hand held GPS (stated accuracy +/- 3m). No RL available. Water table not encountered.
SHEAR VANE No: METHOD: Excavation

TEST PIT LOG

PROJECT: M2PP Expressway JOB NUMBER: 3320901
SITE LOCATION: Otaihanga Landfill - proposed construction yard CLIENT: NZTA

CIRCUIT: NZTM TEST PIT LOCATION: Otaihanga landfill
COORDINATES: N 5,471,245 m R L:
E 1,770,631 m DATUM: MSL

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale (Blows/150mm)	SV	τ (kPa)	SAMPLES	DEPTH (m)
0.5			SM	M	Loose, silty fine to medium SAND, some refuse, minor rootlets; light brown; moist, non plastic. Refuse: plastic, glass, metal.	Fill	4				0.5
			SP	M	Medium dense, silty ORGANIC SAND, some refuse, minor rootlets; dark brown; moist, non plastic. Organics: fine fibrous, amorphous. Refuse: plastic, glass, metal.		5				
1.0			GW	M	Medium dense, fine to medium SAND; light greyish brown; moist, non plastic.	Fill	7				1.0
					Dense.		16				
1.5				M	Medium dense, fine to coarse GRAVEL, some fine to medium sand, some silt, minor refuse; yellowish brown and grey; moist, non plastic. Gravel: MW-SW, subrounded to subangular, greywacke.	Fill	5				1.5
					Loose to medium dense, REFUSE and fine to medium SAND; brown/ greyish brown; moist, non plastic. Refuse: rags, glass, plastic.		11				
					2.6 m depth, water table; saturated.		3				
3.5	3/4/2013		PT	W	Soft, silty PEAT, trace clay; dark brown; wet, low plasticity. Organics: fine fibrous, amorphous and branches. [Peat H5]	Interdune Deposits (peat)	11				3.5
							8				
4.0			SM	W	'Loose', silty fine to medium SAND, trace clay, trace organics; brown; wet, low plasticity. Organics: amorphous, fine fibrous.	Holocene Sand					4.0
			SP	W	'Loose', fine to medium SAND, some organics; light greyish brown; wet, non plastic. Organics: rootlets, roots.						
4.5					END OF LOG @ 4.5 m						4.5

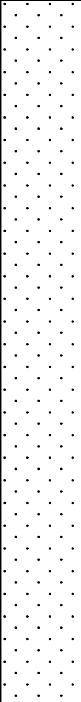
DATE EXCAVATED: 3/4/13 CONTRACTOR: Goodmans Contractors Ltd COMMENTS:
LOGGED BY: JUB EQUIPMENT: Hyundai 20 t Coordinates obtained from hand held GPS (stated accuracy +/- 3m). No RL available.
SHEAR VANE No: METHOD: Excavation

TEST_PIT_P:\332\3320901\DESIGN\GEO\INVESTIGATION\DETAILED DESIGN\INVESTIGATION\TEST PIT PHOTOS\OTAIHANGA LANDFILL\OTAIHANGA LANDFILL (PRECAST YARD).GPJ BECA.GDT 16/4/13

TEST PIT LOG

PROJECT: M2PP Expressway JOB NUMBER: 3320901
SITE LOCATION: Otaihanga Landfill - proposed construction yard CLIENT: NZTA

CIRCUIT: NZTM TEST PIT LOCATION: Otaihanga landfill
COORDINATES: N 5,471,335 m R L:
E 1,770,506 m DATUM: MSL

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale (Blows/150mm)	SV	τ (kPa)	SAMPLES	DEPTH (m)
0.5			SP	M	Loose, fine to medium SAND, trace silt; light greyish brown; moist, non plastic. Medium dense. Dense. Medium dense.	Holocene Sand	4				0.5
							8				
							14				
							15				
							8				
							9				
							7				
							6				
							8				
							9				
						9					
3.0					END OF LOG @ 2.8 m						3.0
3.5											3.5
4.0											4.0
4.5											4.5
5.0											5.0
5.5											5.5











DATE EXCAVATED: 3/4/13 CONTRACTOR: Goodmans Contractors Ltd COMMENTS:
LOGGED BY: JUB EQUIPMENT: Hyundai 20 t Coordinates obtained from hand held GPS (stated accuracy +/- 3m). No RL
SHEAR VANE No: METHOD: Excavation available. Water table not encountered. Test pit collapsing from surface, water
table not encountered.

TEST_PIT_P:\332\3320901\DESIGN\GEO\TECH\INVESTIGATION\DETAILED DESIGN\INVESTIGATION\TEST PIT PHOTOS\OTAIHANGA LANDFILL\OTAIHANGA LANDFILL (PRECAST YARD).GPJ BECA.GDT 16/4/13

TEST PIT LOG

PROJECT: M2PP Expressway JOB NUMBER: 3320901
SITE LOCATION: Otaihanga Landfill - proposed construction yard CLIENT: NZTA

CIRCUIT: NZTM TEST PIT LOCATION: Otaihanga landfill
COORDINATES: N 5,471,292 m R L:
E 1,770,482 m DATUM: MSL

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale (Blows/150mm)	SV	σ_v (kPa)	SAMPLES	DEPTH (m)
0.5			GW	D	'Medium dense', fine to coarse GRAVEL, some silt; yellowish brown; dry; non plastic. Gravel: MW, angular to subangular greywacke.	Fill	4				0.5
1.0			M	'Loose', fine to medium sandy REFUSE; dark grey; moist, non plastic. Refuse: shoes, clothing, plastic, concrete, timber, glass. Medium dense.	10						1.0
1.5			M	Medium dense, silty fine to medium SAND and REFUSE; black; moist, non plastic. Refuse: timber, metal, hydrocarbon odour.	8						1.5
2.0			SM	M	Loose, silty ORGANIC SAND, trace refuse; brown; moist, non plastic. Very loose.		6				2.0
2.5			PT	W	'Loose', PEAT, some silt; dark brown; wet, non plastic. Organics: fine fibrous (spongy), bark, branches. [Peat H5]	Interdune Deposits (peat)	5				2.5
3.0	3/4/2013		S		2.7m depth, water table; saturated.		4				3.0
3.5							2				3.5
4.0					Decomposing log.		2				4.0
4.5					Organics: spongy, fibrous; reddish brown.		3				4.5
5.0			SP	W	'Loose', fine to medium SAND, some rootlets; grey; wet, non plastic. [HOLOCENE SAND]		3				5.0
5.5					END OF LOG @ 5.4 m						5.5

DATE EXCAVATED: 3/4/13 CONTRACTOR: Goodmans Contractors Ltd
LOGGED BY: JUB EQUIPMENT: Hyundai 20 t
SHEAR VANE No: METHOD: Excavation

COMMENTS:
Coordinates obtained from hand held GPS (stated accuracy +/- 3m). No RL available.

TEST_PIT_P:\332\3320901\DESIGN\INVESTIGATION\DETAILED DESIGN\INVESTIGATION\TEST PIT PHOTOS\OTAIHANGA LANDFILL\OTAIHANGA LANDFILL (PRECAST YARD).GPJ BECA.GDT 16/4/13

TEST PIT LOG

PROJECT: M2PP Expressway JOB NUMBER: 3320901
SITE LOCATION: Otaihangā Landfill - proposed construction yard CLIENT: NZTA

CIRCUIT: NZTM TEST PIT LOCATION: Otaihangā landfill
COORDINATES: N 5,471,248 m R L:
E 1,770,527 m DATUM: MSL

DEPTH (m)	WATER LEVEL	GRAPHIC LOG	USCS	MOISTURE	SOIL / ROCK DESCRIPTION	GEOLOGICAL UNIT	Scale (Blows/150mm)	SV	T (kPa)	SAMPLES	DEPTH (m)
0.0	3/4/2013		GM SP	M M	Loose, silty fine to medium GRAVEL, light brown; moist, non plastic. Gravel: MW, angular to subangular, greywacke, gravel contacts.	Fill	2				0.0
0.2			W	Medium dense, fine to medium SAND, minor rootlets, trace silt, trace gravel, trace refuse; light brown; moist, non plastic. Refuse: plastic.	9						0.2
0.4			GM SP	W	'Medium dense', REFUSE, some silt, some fine to medium sand; brownish grey; wet, non plastic. Refuse: glass fragments.		8 for 50mm				0.4
0.5			SP W	W	Dense, silty, medium to coarse GRAVEL, minor clay; green, and yellowish brown; wet, low plasticity (matrix). Gravel: MW, angular to subangular greywacke, gravel contacts. Medium dense, fine to medium SAND, trace refuse; grey; wet, non plastic.		5 7				0.5
1.0			S	S	Medium dense, fine to medium SAND and REFUSE; grey; saturated, non plastic. Refuse: plastic and glass bottles, rags, metal, rubbish bags, vegetation. 1.2 m depth, groundwater seepage (water table); saturated.	9 7 8					1.0
2.0			PT SP	W S	Soft, silty PEAT, trace clay; dark brown; wet, low plasticity. Organics: fine fibrous (some spongy), roots, branches and amorphous. [Peat H5] 'Loose', fine to medium SAND, trace silt, trace rootlets; brown; saturated, non plastic. [HOLOCENE SAND]	Interdune Deposits (peat)					2.0
3.5					END OF LOG @ 3.5 m						

DATE EXCAVATED: 3/4/13 CONTRACTOR: Goodmans Contractors Ltd
LOGGED BY: JUB EQUIPMENT: Hyundai 20 t
SHEAR VANE No: METHOD: Excavation

COMMENTS:
Coordinates obtained from hand held GPS (stated accuracy +/- 3m). No RL available.

TEST_PIT_P:\332\3320901\DESIGN\GEO\INVESTIGATION\DETAILED DESIGN\INVESTIGATION\TEST PIT PHOTOS\OTAIHANGA LANDFILL\OTAIHANGA LANDFILL (PRECAST YARD).GPJ BECA.GDT 16/4/13

SECTOR 1 – 16 LEINSTER AVENUE

Laboratory Number	Test Pits
1111754	TP103LG, TP107LG, TP108LG, TP111LG, TP112LG
1111983	TP101LG to TP106LG, TP109LG, TP110LG

SECTOR 1 – 150 RAUMATI ROAD

Laboratory Number	Test Pits
1110964	TP101RB, TP102RB, TP1056RB to TP109RB
1111703	TP112RB to TP121RB
1111765	TP103RB to TP105RB, TP110RB, TP111RB



ANALYSIS REPORT

Client:	Beca Infrastructure Limited	Lab No:	1111754	SPV1
Contact:	Kate Ward C/- Beca Infrastructure Limited PO Box 6345 Wellesley Street AUCKLAND 1141	Date Registered:	15-Mar-2013	
		Date Reported:	25-Mar-2013	
		Quote No:	53976	
		Order No:		
		Client Reference:	13:024 3320901/1000/013	
		Submitted By:	Kate Ward	

Sample Type: Soil

Sample Name:	13:024 TP101 RR S1 0.2-0.3 14-Mar-2012 1:05 pm	13:024 TP102 RR S1 0.1-0.2 14-Mar-2013 12:10 pm	13:024 TP103 RR S2 0.4-0.5 14-Mar-2013	13:024 TP104 RR S1 (B) 0.1-0.2 14-Mar-2013 11:00 am	13:024 TP105 RR S1 0.1-0.2 14-Mar-2013 10:20 am
Lab Number:	1111754.1	1111754.3	1111754.6	1111754.9	1111754.12

Individual Tests

Dry Matter	g/100g as rcvd	90	95	92	97	93
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	4	3	4	4	6
Total Recoverable Cadmium	mg/kg dry wt	1.04	0.13	< 0.10	0.14	< 0.10
Total Recoverable Chromium	mg/kg dry wt	8	11	7	12	7
Total Recoverable Copper	mg/kg dry wt	22	14	13	13	7
Total Recoverable Lead	mg/kg dry wt	36	42	11.2	41	16.0
Total Recoverable Nickel	mg/kg dry wt	6	9	5	10	5
Total Recoverable Zinc	mg/kg dry wt	150	71	40	66	37
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 9	< 8	< 8	< 8	< 8
C10 - C14	mg/kg dry wt	< 20	< 20	< 20	< 20	< 20
C15 - C36	mg/kg dry wt	169	194	< 40	< 40	< 40
Total hydrocarbons (C7 - C36)	mg/kg dry wt	169	194	< 70	< 70	< 70

Sample Name:	13:024 TP106 RR S1 0.2-0.3 14-Mar-2013 10:00 am	13:024 TP112 LG S1 0.1-0.2 14-Mar-2013 3:00 pm	13:024 TP111 LG S1 0.1-0.2 14-Mar-2013 3:15 pm	13:024 TP108 LG S1 0.1-0.2 14-Mar-2013 3:35 pm	13:024 TP107 LG S1 0-0.1 14-Mar-2013 4:10 pm
Lab Number:	1111754.14	1111754.17	1111754.19	1111754.21	1111754.23

Individual Tests

Dry Matter	g/100g as rcvd	94	93	94	95	92
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	6	5	5	5	11
Total Recoverable Cadmium	mg/kg dry wt	0.15	< 0.10	< 0.10	< 0.10	0.11
Total Recoverable Chromium	mg/kg dry wt	12	10	12	10	11
Total Recoverable Copper	mg/kg dry wt	14	11	16	13	26
Total Recoverable Lead	mg/kg dry wt	38	17.8	26	33	40
Total Recoverable Nickel	mg/kg dry wt	9	7	12	9	29
Total Recoverable Zinc	mg/kg dry wt	95	46	76	92	95
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Acenaphthene	mg/kg dry wt	-	-	< 0.03	-	< 0.03
Acenaphthylene	mg/kg dry wt	-	-	< 0.03	-	< 0.03
Anthracene	mg/kg dry wt	-	-	< 0.03	-	< 0.03
Benzo[a]anthracene	mg/kg dry wt	-	-	0.07	-	< 0.03
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	-	0.10	-	< 0.03



This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.

The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked *, which are not accredited.

Sample Type: Soil						
Sample Name:	13:024 TP106 RR S1 0.2-0.3 14-Mar-2013 10:00 am	13:024 TP112 LG S1 0.1-0.2 14-Mar-2013 3:00 pm	13:024 TP111 LG S1 0.1-0.2 14-Mar-2013 3:15 pm	13:024 TP108 LG S1 0.1-0.2 14-Mar-2013 3:35 pm	13:024 TP107 LG S1 0-0.1 14-Mar-2013 4:10 pm	
Lab Number:	1111754.14	1111754.17	1111754.19	1111754.21	1111754.23	
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	-	-	0.14	-	< 0.03
Benzo[g,h,i]perylene	mg/kg dry wt	-	-	0.08	-	< 0.03
Benzo[k]fluoranthene	mg/kg dry wt	-	-	0.06	-	< 0.03
Chrysene	mg/kg dry wt	-	-	0.08	-	< 0.03
Dibenzo[a,h]anthracene	mg/kg dry wt	-	-	< 0.03	-	< 0.03
Fluoranthene	mg/kg dry wt	-	-	0.13	-	< 0.03
Fluorene	mg/kg dry wt	-	-	< 0.03	-	< 0.03
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	-	0.07	-	< 0.03
Naphthalene	mg/kg dry wt	-	-	< 0.13	-	< 0.13
Phenanthrene	mg/kg dry wt	-	-	0.04	-	< 0.03
Pyrene	mg/kg dry wt	-	-	0.13	-	< 0.03
Haloethers Trace in SVOC Soil Samples by GC-MS						
Bis(2-chloroethoxy) methane	mg/kg dry wt	-	< 0.12	-	< 0.12	-
Bis(2-chloroethyl)ether	mg/kg dry wt	-	< 0.12	-	< 0.12	-
Bis(2-chloroisopropyl)ether	mg/kg dry wt	-	< 0.12	-	< 0.12	-
4-Bromophenyl phenyl ether	mg/kg dry wt	-	< 0.12	-	< 0.12	-
4-Chlorophenyl phenyl ether	mg/kg dry wt	-	< 0.12	-	< 0.12	-
Nitrogen containing compounds Trace in SVOC Soil Samples, GC-MS						
3,3'-Dichlorobenzidine	mg/kg dry wt	-	< 0.6	-	< 0.6	-
2,4-Dinitrotoluene	mg/kg dry wt	-	< 0.3	-	< 0.3	-
2,6-Dinitrotoluene	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Nitrobenzene	mg/kg dry wt	-	< 0.12	-	< 0.12	-
N-Nitrosodi-n-propylamine	mg/kg dry wt	-	< 0.3	-	< 0.3	-
N-Nitrosodiphenylamine	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Organochlorine Pesticides Trace in SVOC Soil Samples by GC-MS						
Aldrin	mg/kg dry wt	-	< 0.12	-	< 0.12	-
alpha-BHC	mg/kg dry wt	-	< 0.12	-	< 0.12	-
beta-BHC	mg/kg dry wt	-	< 0.12	-	< 0.12	-
delta-BHC	mg/kg dry wt	-	< 0.12	-	< 0.12	-
gamma-BHC (Lindane)	mg/kg dry wt	-	< 0.12	-	< 0.12	-
4,4'-DDD	mg/kg dry wt	-	< 0.12	-	< 0.12	-
4,4'-DDE	mg/kg dry wt	-	< 0.12	-	< 0.12	-
4,4'-DDT	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Dieldrin	mg/kg dry wt	-	< 0.12	-	< 0.12	-
Endosulfan I	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Endosulfan II	mg/kg dry wt	-	< 0.5	-	< 0.5	-
Endosulfan sulphate	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Endrin	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Endrin ketone	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Heptachlor	mg/kg dry wt	-	< 0.12	-	< 0.12	-
Heptachlor epoxide	mg/kg dry wt	-	< 0.12	-	< 0.12	-
Hexachlorobenzene	mg/kg dry wt	-	< 0.12	-	< 0.12	-
Polycyclic Aromatic Hydrocarbons Trace in SVOC Soil Samples						
Acenaphthene	mg/kg dry wt	-	< 0.10	-	< 0.10	-
Acenaphthylene	mg/kg dry wt	-	0.15	-	< 0.10	-
Anthracene	mg/kg dry wt	-	0.13	-	< 0.10	-
Benzo[a]anthracene	mg/kg dry wt	-	0.77	-	< 0.10	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	0.73	-	< 0.12	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	-	0.84	-	0.13	-
Benzo[g,h,i]perylene	mg/kg dry wt	-	0.52	-	0.12	-
Benzo[k]fluoranthene	mg/kg dry wt	-	0.41	-	< 0.12	-
2-Chloronaphthalene	mg/kg dry wt	-	< 0.10	-	< 0.10	-

Sample Type: Soil

Sample Name:	13:024 TP106 RR S1 0.2-0.3 14-Mar-2013 10:00 am	13:024 TP112 LG S1 0.1-0.2 14-Mar-2013 3:00 pm	13:024 TP111 LG S1 0.1-0.2 14-Mar-2013 3:15 pm	13:024 TP108 LG S1 0.1-0.2 14-Mar-2013 3:35 pm	13:024 TP107 LG S1 0-0.1 14-Mar-2013 4:10 pm
Lab Number:	1111754.14	1111754.17	1111754.19	1111754.21	1111754.23

Polycyclic Aromatic Hydrocarbons Trace in SVOC Soil Samples

Chrysene	mg/kg dry wt	-	0.65	-	< 0.10	-
Dibenzo[a,h]anthracene	mg/kg dry wt	-	0.19	-	< 0.12	-
Fluoranthene	mg/kg dry wt	-	1.28	-	0.13	-
Fluorene	mg/kg dry wt	-	< 0.10	-	< 0.10	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	0.40	-	< 0.12	-
2-Methylnaphthalene	mg/kg dry wt	-	< 0.10	-	< 0.10	-
Naphthalene	mg/kg dry wt	-	< 0.10	-	< 0.10	-
Phenanthrene	mg/kg dry wt	-	0.49	-	< 0.10	-
Pyrene	mg/kg dry wt	-	1.19	-	0.14	-

Phenols Trace in SVOC Soil Samples by GC-MS

4-Chloro-3-methylphenol	mg/kg dry wt	-	< 0.5	-	< 0.5	-
2-Chlorophenol	mg/kg dry wt	-	< 0.2	-	< 0.2	-
2,4-Dichlorophenol	mg/kg dry wt	-	< 0.2	-	< 0.2	-
2,4-Dimethylphenol	mg/kg dry wt	-	< 0.4	-	< 0.4	-
3 & 4-Methylphenol (m- + p-cresol)	mg/kg dry wt	-	< 0.4	-	< 0.4	-
2-Methylphenol (o-Cresol)	mg/kg dry wt	-	< 0.2	-	< 0.2	-
2-Nitrophenol	mg/kg dry wt	-	< 0.4	-	< 0.4	-
Pentachlorophenol (PCP)	mg/kg dry wt	-	< 6	-	< 6	-
Phenol	mg/kg dry wt	-	< 0.3	-	< 0.3	-
2,4,5-Trichlorophenol	mg/kg dry wt	-	< 0.3	-	< 0.3	-
2,4,6-Trichlorophenol	mg/kg dry wt	-	< 0.3	-	< 0.3	-

Plasticisers Trace in SVOC Soil Samples by GC-MS

Bis(2-ethylhexyl)phthalate	mg/kg dry wt	-	< 0.5	-	< 0.5	-
Butylbenzylphthalate	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Di(2-ethylhexyl)adipate	mg/kg dry wt	-	< 0.2	-	< 0.2	-
Diethylphthalate	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Dimethylphthalate	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Di-n-butylphthalate	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Di-n-octylphthalate	mg/kg dry wt	-	< 0.3	-	< 0.3	-

Other Halogenated compounds Trace in SVOC Soil Samples by GC-MS

1,2-Dichlorobenzene	mg/kg dry wt	-	< 0.3	-	< 0.3	-
1,3-Dichlorobenzene	mg/kg dry wt	-	< 0.3	-	< 0.3	-
1,4-Dichlorobenzene	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Hexachlorobutadiene	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Hexachlorocyclopentadiene	mg/kg dry wt	-	< 0.6	-	< 0.6	-
Hexachloroethane	mg/kg dry wt	-	< 0.3	-	< 0.3	-
1,2,4-Trichlorobenzene	mg/kg dry wt	-	< 0.12	-	< 0.12	-

Other SVOC Trace in SVOC Soil Samples by GC-MS

Benzyl alcohol	mg/kg dry wt	-	< 1.2	-	< 1.2	-
Carbazole	mg/kg dry wt	-	< 0.12	-	< 0.12	-
Dibenzofuran	mg/kg dry wt	-	< 0.12	-	< 0.12	-
Isophorone	mg/kg dry wt	-	< 0.12	-	< 0.12	-

Total Petroleum Hydrocarbons in Soil

C7 - C9	mg/kg dry wt	< 8	< 8	< 8	< 8	< 8
C10 - C14	mg/kg dry wt	< 20	< 20	< 20	< 20	< 20
C15 - C36	mg/kg dry wt	< 40	< 40	< 40	< 40	< 40
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 70	< 70	< 70	< 70	< 70

Sample Name:	13:0.24 TP103 RR S1 0.1-0.2 14-Mar-2013				
Lab Number:	1111754.26				

Individual Tests

Sample Type: Soil

Sample Name:	13:0.24 TP103 RR S1 0.1-0.2 14-Mar-2013				
Lab Number:	1111754.26				

Individual Tests						
Dry Matter	g/100g as rcvd	97	-	-	-	-
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	5	-	-	-	-
Total Recoverable Cadmium	mg/kg dry wt	0.21	-	-	-	-
Total Recoverable Chromium	mg/kg dry wt	13	-	-	-	-
Total Recoverable Copper	mg/kg dry wt	44	-	-	-	-
Total Recoverable Lead	mg/kg dry wt	46	-	-	-	-
Total Recoverable Nickel	mg/kg dry wt	9	-	-	-	-
Total Recoverable Zinc	mg/kg dry wt	110	-	-	-	-
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 8	-	-	-	-
C10 - C14	mg/kg dry wt	< 20	-	-	-	-
C15 - C36	mg/kg dry wt	860	-	-	-	-
Total hydrocarbons (C7 - C36)	mg/kg dry wt	860	-	-	-	-

Analyst's Comments

Appendix No.1 - Total Petroleum Hydrocarbon Chromatograms
 Appendix No.2 - 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 clean 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.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Samples
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1, 3, 6, 9, 12, 14, 17, 19, 21, 23, 26
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	-	1, 3, 6, 9, 12, 14, 17, 19, 21, 23, 26
Polycyclic Aromatic Hydrocarbons Screening in Soil	Sonication extraction, Dilution or SPE cleanup (if required), GC-MS SIM analysis (modified US EPA 8270). Tested on as received sample.	-	19, 23
Semivolatile Organic Compounds Trace in Soil by GC-MS	Sonication extraction, GPC cleanup, GC-MS FS analysis. Tested on as received sample	-	17, 21
Total Petroleum Hydrocarbons in Soil	Sonication extraction in DCM, Silica cleanup, GC-FID analysis US EPA 8015B/MfE Petroleum Industry Guidelines. Tested on as received sample	-	1, 3, 6, 9, 12, 14, 17, 19, 21, 23, 26
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. US EPA 3550. (Free water removed before analysis).	0.10 g/100g as rcvd	1, 3, 6, 9, 12, 14, 17, 19, 21, 23, 26
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	1, 3, 6, 9, 12, 14, 17, 19, 21, 23, 26

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

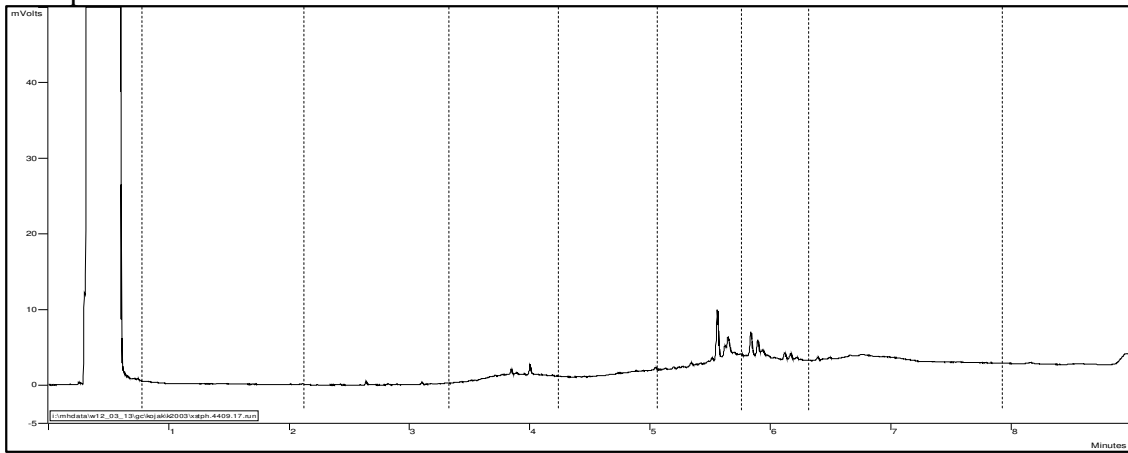
Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

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

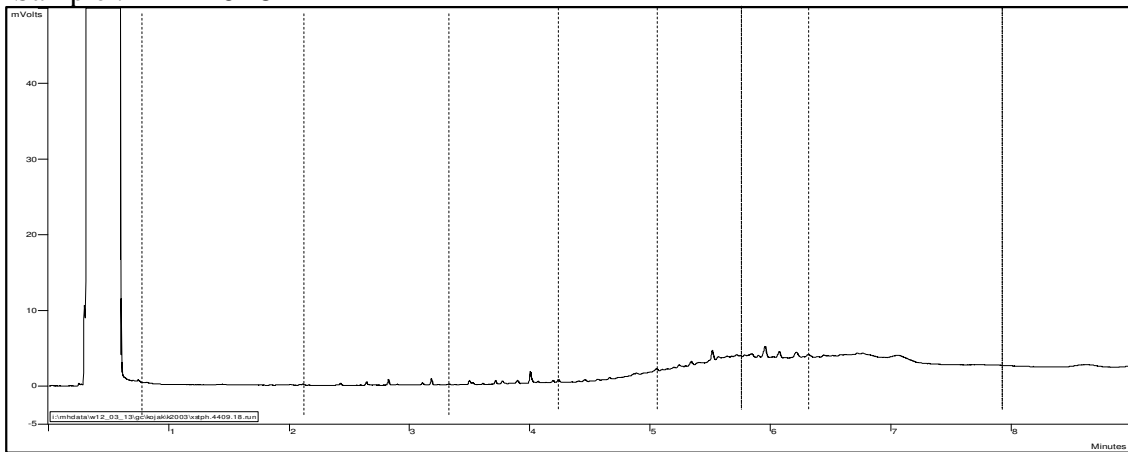
A handwritten signature in blue ink, consisting of several overlapping, stylized strokes.

Ara Heron BSc (Tech)
Client Services Manager - Environmental Division

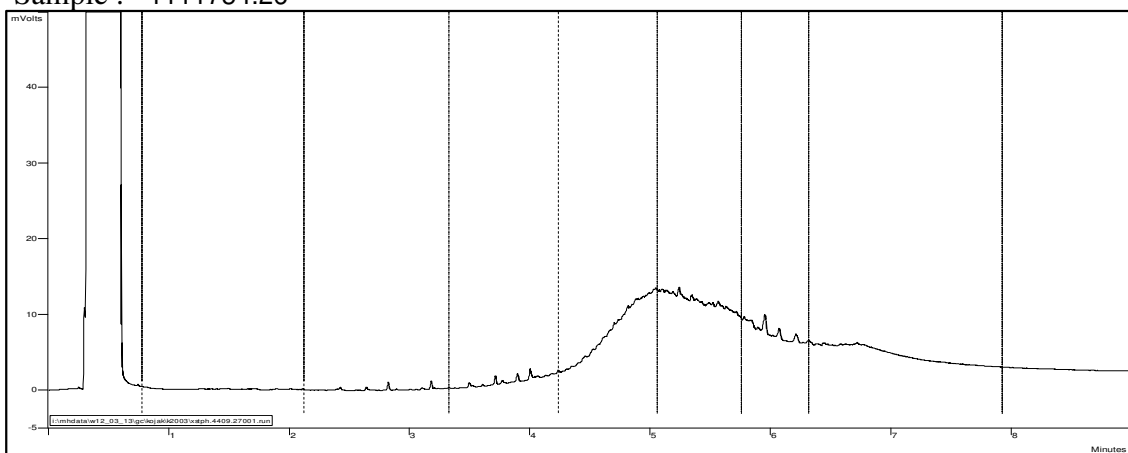
Sample : 1111754.1



Sample : 1111754.3



Sample : 1111754.26



C7 C10 C15 C20 C25 C30 C34 C44



ANALYSIS REPORT

Client:	Beca Infrastructure Limited	Lab No:	1111983	SPV1
Contact:	Kate Ward	Date Registered:	16-Mar-2013	
	C/- Beca Infrastructure Limited	Date Reported:	25-Mar-2013	
	PO Box 6345	Quote No:	53976	
	Wellesley Street	Order No:		
	AUCKLAND 1141	Client Reference:	13:024 3320901/1000/013	
		Submitted By:	Kate Ward	

Sample Type: Soil						
Sample Name:	13:024 TP102 LG S1 0.1-0.2 15-Mar-2013 8:45 am	13:024 TP103 LG S1 0-0.1 15-Mar-2013 10:00 am	13:024 TP1101 LG S1 0.1-0.2 15-Mar-2013 08:45	13:024 TP104 LG S1 0.1-0.2 15-Mar-2013 10:50 am	13:024 Q5 S1 15-Mar-2013 10:50 am	Lab Number:
	1111983.1	1111983.4	1111983.8	1111983.12	1111983.14	
Individual Tests						
Dry Matter	g/100g as rcvd	89	93	94	72	81
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	5	5	4	6	4
Total Recoverable Cadmium	mg/kg dry wt	< 0.11	< 0.11	< 0.11	0.34	0.17
Total Recoverable Chromium	mg/kg dry wt	8	7	7	13	11
Total Recoverable Copper	mg/kg dry wt	8	4	8	12	9
Total Recoverable Lead	mg/kg dry wt	11.4	6.3	12.8	11.3	8.0
Total Recoverable Nickel	mg/kg dry wt	6	5	5	7	6
Total Recoverable Zinc	mg/kg dry wt	43	30	47	56	46
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Acenaphthene	mg/kg dry wt	< 0.03	< 0.03	-	< 0.04	< 0.03
Acenaphthylene	mg/kg dry wt	< 0.03	< 0.03	-	< 0.04	< 0.03
Anthracene	mg/kg dry wt	< 0.03	< 0.03	-	< 0.04	< 0.03
Benzo[a]anthracene	mg/kg dry wt	< 0.03	< 0.03	-	< 0.04	< 0.03
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.03	< 0.03	-	< 0.04	< 0.03
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	0.03	< 0.03	-	< 0.04	< 0.03
Benzo[g,h,i]perylene	mg/kg dry wt	0.03	< 0.03	-	< 0.04	< 0.03
Benzo[k]fluoranthene	mg/kg dry wt	< 0.03	< 0.03	-	< 0.04	< 0.03
Chrysene	mg/kg dry wt	< 0.03	< 0.03	-	< 0.04	< 0.03
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.03	< 0.03	-	< 0.04	< 0.03
Fluoranthene	mg/kg dry wt	< 0.03	< 0.03	-	< 0.04	< 0.03
Fluorene	mg/kg dry wt	< 0.03	< 0.03	-	< 0.04	< 0.03
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.03	< 0.03	-	< 0.04	< 0.03
Naphthalene	mg/kg dry wt	< 0.14	< 0.12	-	< 0.16	< 0.14
Phenanthrene	mg/kg dry wt	< 0.03	< 0.03	-	< 0.04	< 0.03
Pyrene	mg/kg dry wt	< 0.03	< 0.03	-	< 0.04	< 0.03
Haloethers Trace in SVOC Soil Samples by GC-MS						
Bis(2-chloroethoxy) methane	mg/kg dry wt	-	-	< 0.12	-	-
Bis(2-chloroethyl)ether	mg/kg dry wt	-	-	< 0.12	-	-
Bis(2-chloroisopropyl)ether	mg/kg dry wt	-	-	< 0.12	-	-
4-Bromophenyl phenyl ether	mg/kg dry wt	-	-	< 0.12	-	-
4-Chlorophenyl phenyl ether	mg/kg dry wt	-	-	< 0.12	-	-
Nitrogen containing compounds Trace in SVOC Soil Samples, GC-MS						
3,3'-Dichlorobenzidine	mg/kg dry wt	-	-	< 0.6	-	-
2,4-Dinitrotoluene	mg/kg dry wt	-	-	< 0.3	-	-



Sample Type: Soil						
Sample Name:	13:024 TP102 LG S1 0.1-0.2 15-Mar-2013 8:45 am	13:024 TP103 LG S1 0-0.1 15-Mar-2013 10:00 am	13:024 TP1101 LG S1 0.1-0.2 15-Mar-2013 08:45	13:024 TP104 LG S1 0.1-0.2 15-Mar-2013 10:50 am	13:024 Q5 S1 15-Mar-2013 10:50 am	
Lab Number:	1111983.1	1111983.4	1111983.8	1111983.12	1111983.14	
Nitrogen containing compounds Trace in SVOC Soil Samples, GC-MS						
2,6-Dinitrotoluene	mg/kg dry wt	-	-	< 0.3	-	-
Nitrobenzene	mg/kg dry wt	-	-	< 0.12	-	-
N-Nitrosodi-n-propylamine	mg/kg dry wt	-	-	< 0.3	-	-
N-Nitrosodiphenylamine	mg/kg dry wt	-	-	< 0.3	-	-
Organochlorine Pesticides Trace in SVOC Soil Samples by GC-MS						
Aldrin	mg/kg dry wt	-	-	< 0.12	-	-
alpha-BHC	mg/kg dry wt	-	-	< 0.12	-	-
beta-BHC	mg/kg dry wt	-	-	< 0.12	-	-
delta-BHC	mg/kg dry wt	-	-	< 0.12	-	-
gamma-BHC (Lindane)	mg/kg dry wt	-	-	< 0.12	-	-
4,4'-DDD	mg/kg dry wt	-	-	< 0.12	-	-
4,4'-DDE	mg/kg dry wt	-	-	< 0.12	-	-
4,4'-DDT	mg/kg dry wt	-	-	< 0.3	-	-
Dieldrin	mg/kg dry wt	-	-	< 0.12	-	-
Endosulfan I	mg/kg dry wt	-	-	< 0.3	-	-
Endosulfan II	mg/kg dry wt	-	-	< 0.5	-	-
Endosulfan sulphate	mg/kg dry wt	-	-	< 0.3	-	-
Endrin	mg/kg dry wt	-	-	< 0.3	-	-
Endrin ketone	mg/kg dry wt	-	-	< 0.3	-	-
Heptachlor	mg/kg dry wt	-	-	< 0.12	-	-
Heptachlor epoxide	mg/kg dry wt	-	-	< 0.12	-	-
Hexachlorobenzene	mg/kg dry wt	-	-	< 0.12	-	-
Polycyclic Aromatic Hydrocarbons Trace in SVOC Soil Samples						
Acenaphthene	mg/kg dry wt	-	-	< 0.10	-	-
Acenaphthylene	mg/kg dry wt	-	-	< 0.10	-	-
Anthracene	mg/kg dry wt	-	-	< 0.10	-	-
Benzo[a]anthracene	mg/kg dry wt	-	-	< 0.10	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	-	< 0.12	-	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	-	-	< 0.12	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	-	-	< 0.12	-	-
Benzo[k]fluoranthene	mg/kg dry wt	-	-	< 0.12	-	-
2-Chloronaphthalene	mg/kg dry wt	-	-	< 0.10	-	-
Chrysene	mg/kg dry wt	-	-	< 0.10	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	-	-	< 0.12	-	-
Fluoranthene	mg/kg dry wt	-	-	< 0.10	-	-
Fluorene	mg/kg dry wt	-	-	< 0.10	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	-	< 0.12	-	-
2-Methylnaphthalene	mg/kg dry wt	-	-	< 0.10	-	-
Naphthalene	mg/kg dry wt	-	-	< 0.10	-	-
Phenanthrene	mg/kg dry wt	-	-	< 0.10	-	-
Pyrene	mg/kg dry wt	-	-	< 0.10	-	-
Phenols Trace in SVOC Soil Samples by GC-MS						
4-Chloro-3-methylphenol	mg/kg dry wt	-	-	< 0.5	-	-
2-Chlorophenol	mg/kg dry wt	-	-	< 0.2	-	-
2,4-Dichlorophenol	mg/kg dry wt	-	-	< 0.2	-	-
2,4-Dimethylphenol	mg/kg dry wt	-	-	< 0.4	-	-
3 & 4-Methylphenol (m- + p-cresol)	mg/kg dry wt	-	-	< 0.4	-	-
2-Methylphenol (o-Cresol)	mg/kg dry wt	-	-	< 0.2	-	-
2-Nitrophenol	mg/kg dry wt	-	-	< 0.4	-	-
Pentachlorophenol (PCP)	mg/kg dry wt	-	-	< 6	-	-
Phenol	mg/kg dry wt	-	-	< 0.3	-	-
2,4,5-Trichlorophenol	mg/kg dry wt	-	-	< 0.3	-	-

Sample Type: Soil

Sample Name:	13:024 TP102 LG S1 0.1-0.2 15-Mar-2013 8:45 am	13:024 TP103 LG S1 0-0.1 15-Mar-2013 10:00 am	13:024 TP1101 LG S1 0.1-0.2 08:45 15-Mar-2013	13:024 TP104 LG S1 0.1-0.2 15-Mar-2013 10:50 am	13:024 Q5 S1 15-Mar-2013 10:50 am
Lab Number:	1111983.1	1111983.4	1111983.8	1111983.12	1111983.14

Phenols Trace in SVOC Soil Samples by GC-MS

2,4,6-Trichlorophenol	mg/kg dry wt	-	-	< 0.3	-	-
-----------------------	--------------	---	---	-------	---	---

Plasticisers Trace in SVOC Soil Samples by GC-MS

Bis(2-ethylhexyl)phthalate	mg/kg dry wt	-	-	< 0.5	-	-
Butylbenzylphthalate	mg/kg dry wt	-	-	< 0.3	-	-
Di(2-ethylhexyl)adipate	mg/kg dry wt	-	-	< 0.2	-	-
Diethylphthalate	mg/kg dry wt	-	-	< 0.3	-	-
Dimethylphthalate	mg/kg dry wt	-	-	< 0.3	-	-
Di-n-butylphthalate	mg/kg dry wt	-	-	< 0.3	-	-
Di-n-octylphthalate	mg/kg dry wt	-	-	< 0.3	-	-

Other Halogenated compounds Trace in SVOC Soil Samples by GC-MS

1,2-Dichlorobenzene	mg/kg dry wt	-	-	< 0.3	-	-
1,3-Dichlorobenzene	mg/kg dry wt	-	-	< 0.3	-	-
1,4-Dichlorobenzene	mg/kg dry wt	-	-	< 0.3	-	-
Hexachlorobutadiene	mg/kg dry wt	-	-	< 0.3	-	-
Hexachlorocyclopentadiene	mg/kg dry wt	-	-	< 0.6	-	-
Hexachloroethane	mg/kg dry wt	-	-	< 0.3	-	-
1,2,4-Trichlorobenzene	mg/kg dry wt	-	-	< 0.12	-	-

Other SVOC Trace in SVOC Soil Samples by GC-MS

Benzyl alcohol	mg/kg dry wt	-	-	< 1.2	-	-
Carbazole	mg/kg dry wt	-	-	< 0.12	-	-
Dibenzofuran	mg/kg dry wt	-	-	< 0.12	-	-
Isophorone	mg/kg dry wt	-	-	< 0.12	-	-

Total Petroleum Hydrocarbons in Soil

C7 - C9	mg/kg dry wt	< 8	< 8	< 8	< 10	< 9
C10 - C14	mg/kg dry wt	< 20	< 20	< 20	< 20	< 20
C15 - C36	mg/kg dry wt	< 40	< 40	< 40	< 40	< 40
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 70	< 70	< 70	< 70	< 70

Sample Name:	13:024 TP105 LG S1 0.1-0.2 15-Mar-2013 11:10 am	13:024 TP106 LS S1 0.1-0.2 15-Mar-2013 11:45 am	13:024 TP109 LG S1 0-0.1 15-Mar-2013 12:15 pm	13:024 TP110 LG S1 0-0.1 15-Mar-2013 12:50 pm	13:024 TP110 LG S3 1.2-1.3 15-Mar-2013 1:05 pm
Lab Number:	1111983.15	1111983.17	1111983.19	1111983.22	1111983.24

Individual Tests

Dry Matter	g/100g as rcvd	70	92	95	97	69
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	8	5	3	10	6
Total Recoverable Cadmium	mg/kg dry wt	0.52	< 0.10	< 0.11	< 0.10	0.12
Total Recoverable Chromium	mg/kg dry wt	17	12	6	13	10
Total Recoverable Copper	mg/kg dry wt	15	13	12	14	41
Total Recoverable Lead	mg/kg dry wt	14.9	20	12.8	17.2	103
Total Recoverable Nickel	mg/kg dry wt	9	10	4	7	8
Total Recoverable Zinc	mg/kg dry wt	75	64	75	113	67

Polycyclic Aromatic Hydrocarbons Screening in Soil

Acenaphthene	mg/kg dry wt	-	< 0.03	-	< 0.03	-
Acenaphthylene	mg/kg dry wt	-	< 0.03	-	< 0.03	-
Anthracene	mg/kg dry wt	-	< 0.03	-	0.05	-
Benzo[a]anthracene	mg/kg dry wt	-	0.03	-	0.36	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	0.04	-	0.53	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	-	0.05	-	0.81	-
Benzo[g,h,i]perylene	mg/kg dry wt	-	0.04	-	0.46	-
Benzo[k]fluoranthene	mg/kg dry wt	-	0.03	-	0.32	-
Chrysene	mg/kg dry wt	-	0.03	-	0.35	-

Sample Type: Soil						
Sample Name:	13:024 TP105 LG S1 0.1-0.2 15-Mar-2013 11:10 am	13:024 TP106 LS S1 0.1-0.2 15-Mar-2013 11:45 am	13:024 TP109 LG S1 0-0.1 15-Mar-2013 12:15 pm	13:024 TP110 LG S1 0-0.1 15-Mar-2013 12:50 pm	13:024 TP110 LG S3 1.2-1.3 15-Mar-2013 1:05 pm	
Lab Number:	1111983.15	1111983.17	1111983.19	1111983.22	1111983.24	
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Dibenzo[a,h]anthracene	mg/kg dry wt	-	< 0.03	-	0.16	-
Fluoranthene	mg/kg dry wt	-	0.04	-	0.62	-
Fluorene	mg/kg dry wt	-	< 0.03	-	< 0.03	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	0.03	-	0.44	-
Naphthalene	mg/kg dry wt	-	< 0.12	-	< 0.13	-
Phenanthrene	mg/kg dry wt	-	< 0.03	-	0.11	-
Pyrene	mg/kg dry wt	-	0.04	-	0.60	-
Haloethers Trace in SVOC Soil Samples by GC-MS						
Bis(2-chloroethoxy) methane	mg/kg dry wt	< 0.16	-	< 0.12	-	< 0.16
Bis(2-chloroethyl)ether	mg/kg dry wt	< 0.16	-	< 0.12	-	< 0.16
Bis(2-chloroisopropyl)ether	mg/kg dry wt	< 0.16	-	< 0.12	-	< 0.16
4-Bromophenyl phenyl ether	mg/kg dry wt	< 0.16	-	< 0.12	-	< 0.16
4-Chlorophenyl phenyl ether	mg/kg dry wt	< 0.16	-	< 0.12	-	< 0.16
Nitrogen containing compounds Trace in SVOC Soil Samples, GC-MS						
3,3'-Dichlorobenzidine	mg/kg dry wt	< 0.8	-	< 0.6	-	< 0.8
2,4-Dinitrotoluene	mg/kg dry wt	< 0.4	-	< 0.3	-	< 0.4
2,6-Dinitrotoluene	mg/kg dry wt	< 0.4	-	< 0.3	-	< 0.4
Nitrobenzene	mg/kg dry wt	< 0.16	-	< 0.12	-	< 0.16
N-Nitrosodi-n-propylamine	mg/kg dry wt	< 0.4	-	< 0.3	-	< 0.4
N-Nitrosodiphenylamine	mg/kg dry wt	< 0.4	-	< 0.3	-	< 0.4
Organochlorine Pesticides Trace in SVOC Soil Samples by GC-MS						
Aldrin	mg/kg dry wt	< 0.16	-	< 0.12	-	< 0.16
alpha-BHC	mg/kg dry wt	< 0.16	-	< 0.12	-	< 0.16
beta-BHC	mg/kg dry wt	< 0.16	-	< 0.12	-	< 0.16
delta-BHC	mg/kg dry wt	< 0.16	-	< 0.12	-	< 0.16
gamma-BHC (Lindane)	mg/kg dry wt	< 0.16	-	< 0.12	-	< 0.16
4,4'-DDD	mg/kg dry wt	< 0.16	-	< 0.12	-	< 0.16
4,4'-DDE	mg/kg dry wt	0.23	-	< 0.12	-	< 0.16
4,4'-DDT	mg/kg dry wt	< 0.4	-	< 0.3	-	< 0.4
Dieldrin	mg/kg dry wt	< 0.16	-	< 0.12	-	< 0.16
Endosulfan I	mg/kg dry wt	< 0.4	-	< 0.3	-	< 0.4
Endosulfan II	mg/kg dry wt	< 0.5	-	< 0.5	-	< 0.5
Endosulfan sulphate	mg/kg dry wt	< 0.4	-	< 0.3	-	< 0.4
Endrin	mg/kg dry wt	< 0.4	-	< 0.3	-	< 0.4
Endrin ketone	mg/kg dry wt	< 0.4	-	< 0.3	-	< 0.4
Heptachlor	mg/kg dry wt	< 0.16	-	< 0.12	-	< 0.16
Heptachlor epoxide	mg/kg dry wt	< 0.16	-	< 0.12	-	< 0.16
Hexachlorobenzene	mg/kg dry wt	< 0.16	-	< 0.12	-	< 0.16
Polycyclic Aromatic Hydrocarbons Trace in SVOC Soil Samples						
Acenaphthene	mg/kg dry wt	< 0.10	-	< 0.10	-	< 0.10
Acenaphthylene	mg/kg dry wt	< 0.10	-	< 0.10	-	< 0.10
Anthracene	mg/kg dry wt	< 0.10	-	< 0.10	-	0.18
Benzo[a]anthracene	mg/kg dry wt	< 0.10	-	< 0.10	-	1.03
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.16	-	< 0.12	-	1.10
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	< 0.16	-	< 0.12	-	1.35
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.16	-	< 0.12	-	0.87
Benzo[k]fluoranthene	mg/kg dry wt	< 0.16	-	< 0.12	-	0.62
2-Chloronaphthalene	mg/kg dry wt	< 0.10	-	< 0.10	-	< 0.10
Chrysene	mg/kg dry wt	< 0.10	-	< 0.10	-	0.90
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.16	-	< 0.12	-	0.33
Fluoranthene	mg/kg dry wt	< 0.10	-	< 0.10	-	1.82
Fluorene	mg/kg dry wt	< 0.10	-	< 0.10	-	< 0.10

Sample Type: Soil						
Sample Name:	13:024 TP105 LG S1 0.1-0.2 15-Mar-2013 11:10 am	13:024 TP106 LS S1 0.1-0.2 15-Mar-2013 11:45 am	13:024 TP109 LG S1 0-0.1 15-Mar-2013 12:15 pm	13:024 TP110 LG S1 0-0.1 15-Mar-2013 12:50 pm	13:024 TP110 LG S3 1.2-1.3 15-Mar-2013 1:05 pm	
Lab Number:	1111983.15	1111983.17	1111983.19	1111983.22	1111983.24	
Polycyclic Aromatic Hydrocarbons Trace in SVOC Soil Samples						
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.16	-	< 0.12	-	0.76
2-Methylnaphthalene	mg/kg dry wt	< 0.10	-	< 0.10	-	< 0.10
Naphthalene	mg/kg dry wt	< 0.10	-	< 0.10	-	< 0.10
Phenanthrene	mg/kg dry wt	< 0.10	-	< 0.10	-	0.63
Pyrene	mg/kg dry wt	< 0.10	-	< 0.10	-	1.61
Phenols Trace in SVOC Soil Samples by GC-MS						
4-Chloro-3-methylphenol	mg/kg dry wt	< 0.5	-	< 0.5	-	< 0.5
2-Chlorophenol	mg/kg dry wt	< 0.2	-	< 0.2	-	< 0.2
2,4-Dichlorophenol	mg/kg dry wt	< 0.2	-	< 0.2	-	< 0.2
2,4-Dimethylphenol	mg/kg dry wt	< 0.4	-	< 0.4	-	< 0.4
3 & 4-Methylphenol (m- + p-cresol)	mg/kg dry wt	< 0.4	-	< 0.4	-	< 0.4
2-Methylphenol (o-Cresol)	mg/kg dry wt	< 0.2	-	< 0.2	-	< 0.2
2-Nitrophenol	mg/kg dry wt	< 0.4	-	< 0.4	-	< 0.4
Pentachlorophenol (PCP)	mg/kg dry wt	< 6	-	< 6	-	< 6
Phenol	mg/kg dry wt	< 0.4	-	< 0.3	-	< 0.4
2,4,5-Trichlorophenol	mg/kg dry wt	< 0.4	-	< 0.3	-	< 0.4
2,4,6-Trichlorophenol	mg/kg dry wt	< 0.4	-	< 0.3	-	< 0.4
Plasticisers Trace in SVOC Soil Samples by GC-MS						
Bis(2-ethylhexyl)phthalate	mg/kg dry wt	< 0.7	-	0.7	-	< 0.7
Butylbenzylphthalate	mg/kg dry wt	< 0.4	-	< 0.3	-	< 0.4
Di(2-ethylhexyl)adipate	mg/kg dry wt	< 0.2	-	< 0.2	-	< 0.2
Diethylphthalate	mg/kg dry wt	< 0.4	-	< 0.3	-	< 0.4
Dimethylphthalate	mg/kg dry wt	< 0.4	-	< 0.3	-	< 0.4
Di-n-butylphthalate	mg/kg dry wt	< 0.4	-	< 0.3	-	< 0.4
Di-n-octylphthalate	mg/kg dry wt	< 0.4	-	< 0.3	-	< 0.4
Other Halogenated compounds Trace in SVOC Soil Samples by GC-MS						
1,2-Dichlorobenzene	mg/kg dry wt	< 0.4	-	< 0.3	-	< 0.4
1,3-Dichlorobenzene	mg/kg dry wt	< 0.4	-	< 0.3	-	< 0.4
1,4-Dichlorobenzene	mg/kg dry wt	< 0.4	-	< 0.3	-	< 0.4
Hexachlorobutadiene	mg/kg dry wt	< 0.4	-	< 0.3	-	< 0.4
Hexachlorocyclopentadiene	mg/kg dry wt	< 0.8	-	< 0.6	-	< 0.8
Hexachloroethane	mg/kg dry wt	< 0.4	-	< 0.3	-	< 0.4
1,2,4-Trichlorobenzene	mg/kg dry wt	< 0.16	-	< 0.12	-	< 0.16
Other SVOC Trace in SVOC Soil Samples by GC-MS						
Benzyl alcohol	mg/kg dry wt	< 1.6	-	< 1.2	-	< 1.6
Carbazole	mg/kg dry wt	< 0.16	-	< 0.12	-	< 0.16
Dibenzofuran	mg/kg dry wt	< 0.16	-	< 0.12	-	< 0.16
Isophorone	mg/kg dry wt	< 0.16	-	< 0.12	-	< 0.16
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 10	< 8	< 8	< 8	< 10
C10 - C14	mg/kg dry wt	< 20	< 20	< 20	< 20	< 20
C15 - C36	mg/kg dry wt	< 40	< 40	< 40	< 40	65
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 70	< 70	< 70	< 70	< 70

Analyst's Comments

Appendix No.1 - Total Petroleum Hydrocarbon Chromatograms

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 clean 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.

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Samples

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Samples
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1, 4, 8, 12, 14-15, 17, 19, 22, 24
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	-	1, 4, 8, 12, 14-15, 17, 19, 22, 24
Polycyclic Aromatic Hydrocarbons Screening in Soil	Sonication extraction, Dilution or SPE cleanup (if required), GC-MS SIM analysis (modified US EPA 8270). Tested on as received sample.	-	1, 4, 12, 14, 17, 22
Semivolatile Organic Compounds Trace in Soil by GC-MS	Sonication extraction, GPC cleanup, GC-MS FS analysis. Tested on as received sample	-	8, 15, 19, 24
Total Petroleum Hydrocarbons in Soil	Sonication extraction in DCM, Silica cleanup, GC-FID analysis US EPA 8015B/MfE Petroleum Industry Guidelines. Tested on as received sample	-	1, 4, 8, 12, 14-15, 17, 19, 22, 24
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. US EPA 3550. (Free water removed before analysis).	0.10 g/100g as rcvd	1, 4, 8, 12, 14-15, 17, 19, 22, 24
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	1, 4, 8, 12, 14-15, 17, 19, 22, 24

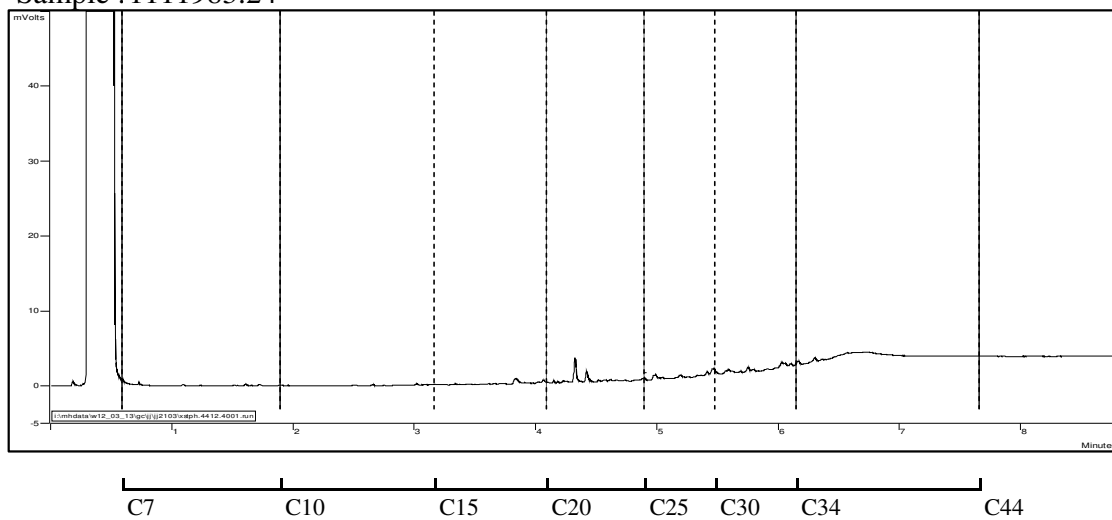
These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

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

Ara Heron BSc (Tech)
Client Services Manager - Environmental Division

Sample : 1111983.24





ANALYSIS REPORT

Client:	Beca Infrastructure Limited	Lab No:	1111703	SPV1
Contact:	Kate Ward C/- Beca Infrastructure Limited PO Box 6345 Wellesley Street AUCKLAND 1141	Date Registered:	15-Mar-2013	
		Date Reported:	25-Mar-2013	
		Quote No:	53976	
		Order No:		
		Client Reference:	13:024 3320901/1000/013	
		Submitted By:	Kate Ward	

Sample Type: Soil						
Sample Name:	13:024 TP112 RB S1 0.2-0.3 13-Mar-2013 10:20 am	13:024 TP114 RB S1 0.1-0.2 13-Mar-2013 11:40 am	13:024 TP113 RB S1 0.2-0.3 13-Mar-2013 12:20 pm	13:024 TP113 RB S3 2-2.1 13-Mar-2013 12:30 pm	13:024 TP116 RB S1 0.1-0.2 13-Mar-2013 2:50 pm	
Lab Number:	1111703.1	1111703.4	1111703.7	1111703.9	1111703.10	
Individual Tests						
Dry Matter	g/100g as rcvd	93	91	91	69	90
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	4	3	3	9	4
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	0.17	< 0.10	0.29	0.10
Total Recoverable Chromium	mg/kg dry wt	9	17	19	13	10
Total Recoverable Copper	mg/kg dry wt	13	16	13	30	12
Total Recoverable Lead	mg/kg dry wt	27	141	19.6	88	17.9
Total Recoverable Nickel	mg/kg dry wt	7	10	14	8	7
Total Recoverable Zinc	mg/kg dry wt	58	134	63	590	45
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Acenaphthene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.04	< 0.03
Acenaphthylene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.04	< 0.03
Anthracene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.04	< 0.03
Benzo[a]anthracene	mg/kg dry wt	0.09	0.07	< 0.03	< 0.04	0.09
Benzo[a]pyrene (BAP)	mg/kg dry wt	0.12	0.06	< 0.03	< 0.04	0.15
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	0.16	0.10	0.04	< 0.04	0.26
Benzo[g,h,i]perylene	mg/kg dry wt	0.12	0.06	0.03	< 0.04	0.14
Benzo[k]fluoranthene	mg/kg dry wt	0.07	0.04	< 0.03	< 0.04	0.10
Chrysene	mg/kg dry wt	0.11	0.09	< 0.03	< 0.04	0.11
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.04	0.04
Fluoranthene	mg/kg dry wt	0.18	0.15	0.03	0.07	0.17
Fluorene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.04	< 0.03
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	0.15	0.06	< 0.03	< 0.04	0.14
Naphthalene	mg/kg dry wt	< 0.12	< 0.13	< 0.14	< 0.17	< 0.14
Phenanthrene	mg/kg dry wt	0.06	0.05	< 0.03	< 0.04	0.03
Pyrene	mg/kg dry wt	0.19	0.14	0.04	0.04	0.17
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 8	< 8	< 8	< 10	< 9
C10 - C14	mg/kg dry wt	< 20	< 20	< 20	< 20	< 20
C15 - C36	mg/kg dry wt	< 40	< 40	< 40	< 40	107
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 70	< 70	< 70	< 70	107



Sample Type: Soil						
Sample Name:	13:024 TP116 RB S2 1.2-1.3 13-Mar-2013 2:00 pm	13:024 TP115 RB S1 0.1-0.2 13-Mar-2013 2:40 pm	13:024 Q3, S1 13-Mar-2013 2:40 pm	13:024 TP117 RB S1 0.2-0.3 13-Mar-2013 3:30 pm	13:024 TP117 RB S2 1.4-1.5 13-Mar-2013 3:40 pm	
Lab Number:	1111703.11	1111703.13	1111703.15	1111703.16	1111703.17	
Individual Tests						
Dry Matter	g/100g as rcvd	89	95	95	91	85
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	4	3	4	4	4
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	0.13
Total Recoverable Chromium	mg/kg dry wt	8	7	8	8	9
Total Recoverable Copper	mg/kg dry wt	8	10	10	6	11
Total Recoverable Lead	mg/kg dry wt	7.7	12.6	18.2	5.6	45
Total Recoverable Nickel	mg/kg dry wt	6	5	6	6	6
Total Recoverable Zinc	mg/kg dry wt	34	38	44	39	105
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Acenaphthene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	0.08
Acenaphthylene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	0.06
Benzo[a]anthracene	mg/kg dry wt	0.09	< 0.03	< 0.03	< 0.03	0.29
Benzo[a]pyrene (BAP)	mg/kg dry wt	0.15	< 0.03	< 0.03	< 0.03	0.37
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	0.22	< 0.03	< 0.03	< 0.03	0.57
Benzo[g,h,i]perylene	mg/kg dry wt	0.14	< 0.03	< 0.03	< 0.03	0.27
Benzo[k]fluoranthene	mg/kg dry wt	0.10	< 0.03	< 0.03	< 0.03	0.24
Chrysene	mg/kg dry wt	0.12	< 0.03	< 0.03	< 0.03	0.34
Dibenzo[a,h]anthracene	mg/kg dry wt	0.04	< 0.03	< 0.03	< 0.03	0.08
Fluoranthene	mg/kg dry wt	0.30	< 0.03	< 0.03	0.03	0.81
Fluorene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	0.05
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	0.12	< 0.03	< 0.03	< 0.03	0.26
Naphthalene	mg/kg dry wt	< 0.13	< 0.13	< 0.12	< 0.13	< 0.13
Phenanthrene	mg/kg dry wt	0.08	< 0.03	< 0.03	< 0.03	0.30
Pyrene	mg/kg dry wt	0.26	< 0.03	< 0.03	0.03	0.62
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 8	< 8	< 8	< 8	< 8
C10 - C14	mg/kg dry wt	< 20	< 20	< 20	< 20	< 20
C15 - C36	mg/kg dry wt	< 40	< 40	< 40	< 40	< 40
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 70	< 70	< 70	< 70	< 70
Sample Name:	13:024 TP119 RB S1 0.2-0.3 13-Mar-2013 4:00 pm	13:024 TP119 RB S2 1.4-1.5 13-Mar-2013 4:20 pm	13:024 TP120 RB S1 0.3-0.4 13-Mar-2013 4:10 pm	13:024 TP118 RB S1 0.2-0.3 13-Mar-2013 5:00 pm	13:024 TP118 RB S2 0.6-0.7 13-Mar-2013 5:05 pm	
Lab Number:	1111703.19	1111703.20	1111703.21	1111703.23	1111703.24	
Individual Tests						
Dry Matter	g/100g as rcvd	93	89	88	91	85
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	6	5	4	6	7
Total Recoverable Cadmium	mg/kg dry wt	0.14	< 0.10	0.13	0.20	< 0.10
Total Recoverable Chromium	mg/kg dry wt	16	9	8	18	10
Total Recoverable Copper	mg/kg dry wt	15	24	9	20	42
Total Recoverable Lead	mg/kg dry wt	34	62	11.0	27	46
Total Recoverable Nickel	mg/kg dry wt	9	6	6	17	7
Total Recoverable Zinc	mg/kg dry wt	88	149	43	98	117
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Acenaphthene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	0.15
Acenaphthylene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	0.23
Benzo[a]anthracene	mg/kg dry wt	0.05	< 0.03	< 0.03	< 0.03	0.57
Benzo[a]pyrene (BAP)	mg/kg dry wt	0.07	< 0.03	< 0.03	< 0.03	0.65

Sample Type: Soil						
Sample Name:	13:024 TP119 RB S1 0.2-0.3 13-Mar-2013 4:00 pm	13:024 TP119 RB S2 1.4-1.5 13-Mar-2013 4:20 pm	13:024 TP120 RB S1 0.3-0.4 13-Mar-2013 4:10 pm	13:024 TP118 RB S1 0.2-0.3 13-Mar-2013 5:00 pm	13:024 TP118 RB S2 0.6-0.7 13-Mar-2013 5:05 pm	
Lab Number:	1111703.19	1111703.20	1111703.21	1111703.23	1111703.24	
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	0.12	< 0.03	< 0.03	< 0.03	1.00
Benzo[g,h,i]perylene	mg/kg dry wt	0.07	< 0.03	< 0.03	< 0.03	0.42
Benzo[k]fluoranthene	mg/kg dry wt	0.06	< 0.03	< 0.03	< 0.03	0.40
Chrysene	mg/kg dry wt	0.07	< 0.03	< 0.03	< 0.03	0.59
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	0.15
Fluoranthene	mg/kg dry wt	0.12	< 0.03	< 0.03	< 0.03	1.53
Fluorene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	0.12
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	0.06	< 0.03	< 0.03	< 0.03	0.43
Naphthalene	mg/kg dry wt	< 0.12	< 0.14	< 0.13	< 0.12	< 0.14
Phenanthrene	mg/kg dry wt	0.03	< 0.03	< 0.03	< 0.03	0.78
Pyrene	mg/kg dry wt	0.11	< 0.03	< 0.03	< 0.03	1.13
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 8	< 9	< 8	< 8	< 8
C10 - C14	mg/kg dry wt	< 20	< 20	< 20	< 20	< 20
C15 - C36	mg/kg dry wt	< 40	< 40	< 40	< 40	83
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 70	< 70	< 70	< 70	83
Sample Name:	13:024 TP121 KB S1 0.2-0.3 13-Mar-2013 5:20 pm					
Lab Number:	1111703.26					
Individual Tests						
Dry Matter	g/100g as rcvd	96	-	-	-	-
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	6	-	-	-	-
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	-	-	-	-
Total Recoverable Chromium	mg/kg dry wt	12	-	-	-	-
Total Recoverable Copper	mg/kg dry wt	13	-	-	-	-
Total Recoverable Lead	mg/kg dry wt	22	-	-	-	-
Total Recoverable Nickel	mg/kg dry wt	10	-	-	-	-
Total Recoverable Zinc	mg/kg dry wt	55	-	-	-	-
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Acenaphthene	mg/kg dry wt	< 0.03	-	-	-	-
Acenaphthylene	mg/kg dry wt	< 0.03	-	-	-	-
Anthracene	mg/kg dry wt	0.05	-	-	-	-
Benzo[a]anthracene	mg/kg dry wt	0.44	-	-	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	0.80	-	-	-	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	1.16	-	-	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	0.61	-	-	-	-
Benzo[k]fluoranthene	mg/kg dry wt	0.47	-	-	-	-
Chrysene	mg/kg dry wt	0.47	-	-	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	0.24	-	-	-	-
Fluoranthene	mg/kg dry wt	0.71	-	-	-	-
Fluorene	mg/kg dry wt	< 0.03	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	0.59	-	-	-	-
Naphthalene	mg/kg dry wt	< 0.13	-	-	-	-
Phenanthrene	mg/kg dry wt	0.07	-	-	-	-
Pyrene	mg/kg dry wt	0.70	-	-	-	-
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 8	-	-	-	-
C10 - C14	mg/kg dry wt	< 20	-	-	-	-
C15 - C36	mg/kg dry wt	98	-	-	-	-

Sample Type: Soil					
Sample Name:	13:024 TP121 KB S1 0.2-0.3 13-Mar-2013 5:20 pm				
Lab Number:	1111703.26				
Total Petroleum Hydrocarbons in Soil					
Total hydrocarbons (C7 - C36)	mg/kg dry wt	98	-	-	-

Analyst's Comments					
Appendix No.1 - Total Petroleum Hydrocarbon Chromatograms					
Appendix No.2 - Total Petroleum Hydrocarbon Chromatograms					
Appendix No.3 - Total Petroleum Hydrocarbon Chromatograms					

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 clean 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.

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Samples
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1, 4, 7, 9-11, 13, 15-17, 19-21, 23-24, 26
TPH Oil Industry Profile + PAHscreen	Sonication in DCM extraction, SPE cleanup, GC-FID & GC-MS analysis. Tested on as received sample. US EPA 8015B/MfE Petroleum Industry Guidelines	-	1, 4, 7, 9-11, 13, 15-17, 19-21, 23-24, 26
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	-	1, 4, 7, 9-11, 13, 15-17, 19-21, 23-24, 26
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. US EPA 3550. (Free water removed before analysis).	0.10 g/100g as rcvd	1, 4, 7, 9-11, 13, 15-17, 19-21, 23-24, 26
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	1, 4, 7, 9-11, 13, 15-17, 19-21, 23-24, 26

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

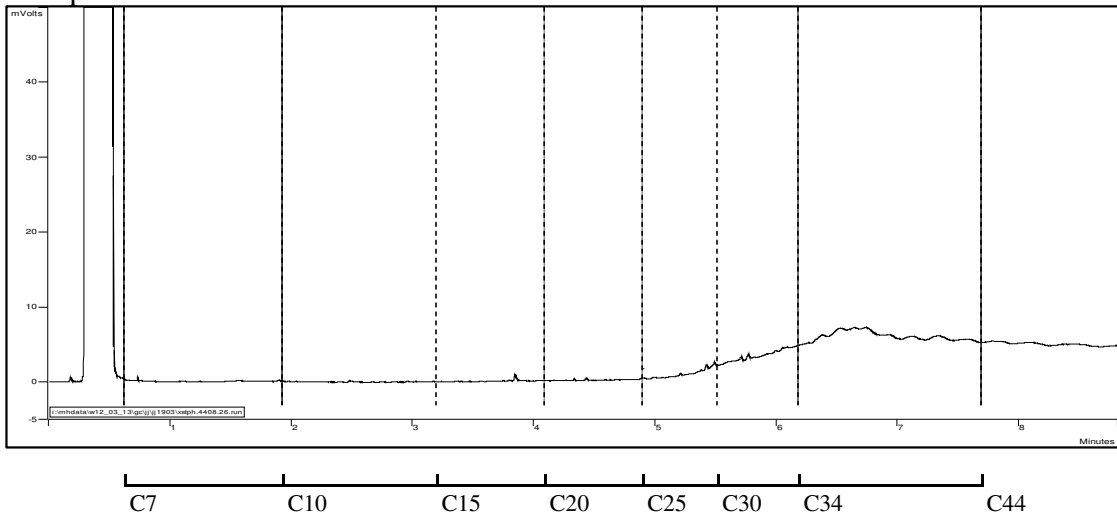
Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

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

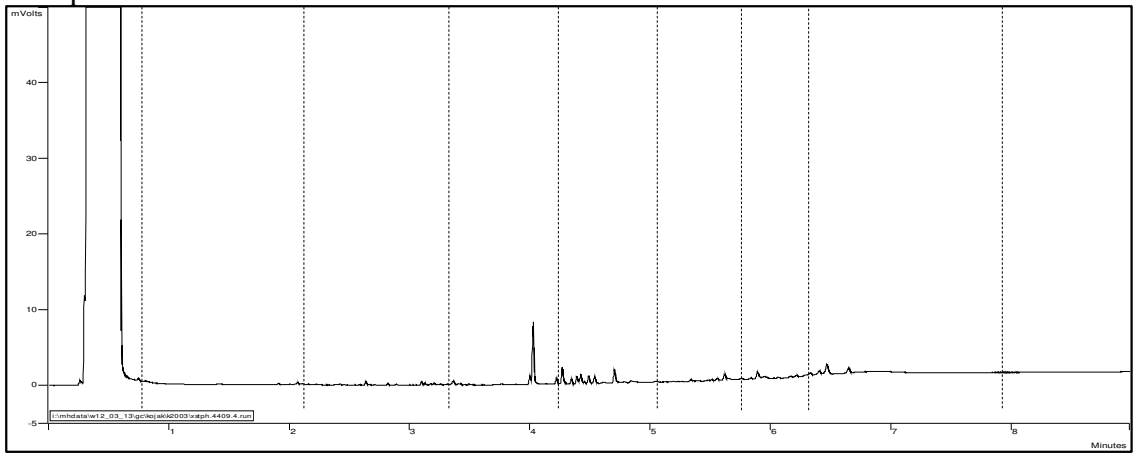


Ara Heron BSc (Tech)
Client Services Manager - Environmental Division

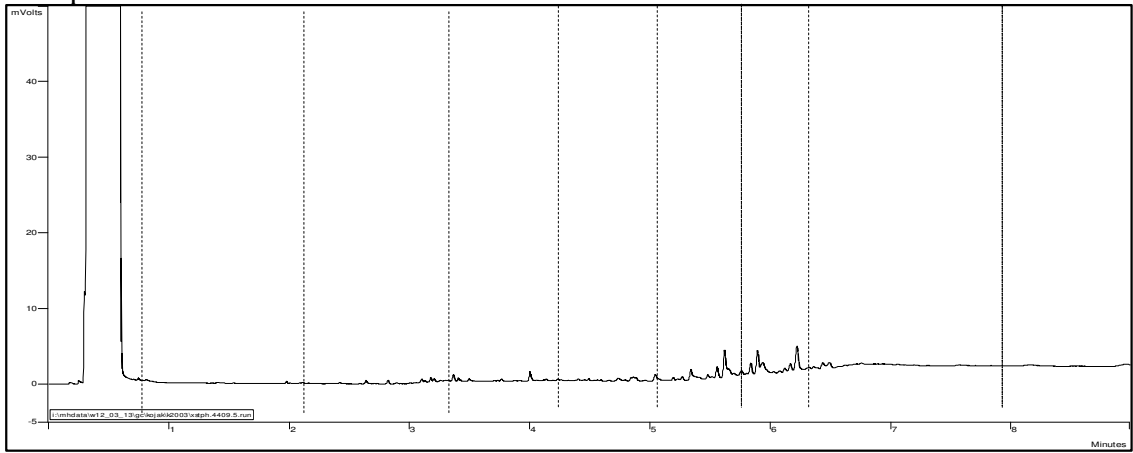
Sample : 1111703.1



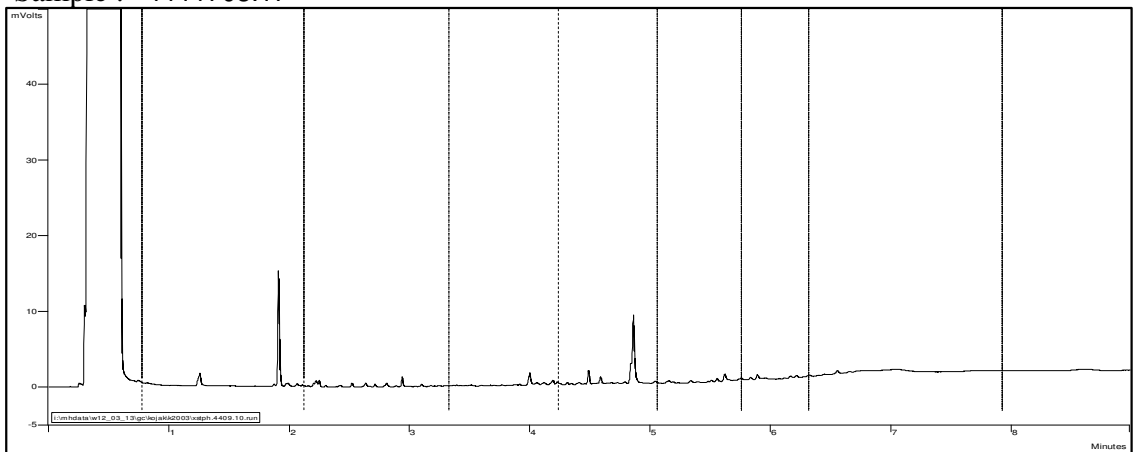
Sample : 1111703.9



Sample : 1111703.10



Sample : 1111703.17



C7 C10 C15 C20 C25 C30 C34 C44



ANALYSIS REPORT

Client:	Beca Infrastructure Limited	Lab No:	1111765	SPV1
Contact:	Kate Ward C/- Beca Infrastructure Limited PO Box 6345 Wellesley Street AUCKLAND 1141	Date Registered:	15-Mar-2013	
		Date Reported:	25-Mar-2013	
		Quote No:	53976	
		Order No:		
		Client Reference:	13:024 3320901/1000/013	
		Submitted By:	Kate Ward	

Sample Type: Soil

Sample Name:	13:024 TP103 RB S3 2.1-2.2 13-Mar-2013 7:40 am	13:024 TP104 RB S1 0.2-0.3 13-Mar-2013 9:00 am	13:024 TP103 RB S1 0.2-0.3 13-Mar-2013 7:30 am	13:024 TP104 RB S2 1.4-1.5 13-Mar-2013 9:15 am	13:024 TP105 RB S2 0.6-0.7 13-Mar-2013 8:25 am
Lab Number:	1111765.3	1111765.4	1111765.5	1111765.6	1111765.8

Individual Tests

Dry Matter	g/100g as rcvd	73	86	90	77	89
------------	----------------	----	----	----	----	----

Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn

Total Recoverable Arsenic	mg/kg dry wt	3	11	6	8	8
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	0.20	< 0.11	0.35	< 0.10
Total Recoverable Chromium	mg/kg dry wt	11	19	13	10	14
Total Recoverable Copper	mg/kg dry wt	10	72	15	45	25
Total Recoverable Lead	mg/kg dry wt	13.4	29	28	65	38
Total Recoverable Nickel	mg/kg dry wt	4	6	10	7	19
Total Recoverable Zinc	mg/kg dry wt	37	220	61	200	93

Polycyclic Aromatic Hydrocarbons Screening in Soil

Acenaphthene	mg/kg dry wt	< 0.03	< 0.03	0.04	< 0.03	< 0.03
Acenaphthylene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	mg/kg dry wt	< 0.03	< 0.03	0.13	< 0.03	< 0.03
Benzo[a]anthracene	mg/kg dry wt	< 0.03	< 0.03	0.34	< 0.03	< 0.03
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.03	< 0.03	0.37	< 0.03	< 0.03
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	< 0.03	< 0.03	0.55	< 0.03	< 0.03
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.03	< 0.03	0.26	< 0.03	< 0.03
Benzo[k]fluoranthene	mg/kg dry wt	< 0.03	< 0.03	0.24	< 0.03	< 0.03
Chrysene	mg/kg dry wt	< 0.03	< 0.03	0.38	< 0.03	< 0.03
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.03	< 0.03	0.09	< 0.03	< 0.03
Fluoranthene	mg/kg dry wt	0.03	< 0.03	1.05	< 0.03	< 0.03
Fluorene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.03	< 0.03	0.24	< 0.03	< 0.03
Naphthalene	mg/kg dry wt	< 0.15	< 0.14	< 0.13	< 0.15	< 0.14
Phenanthrene	mg/kg dry wt	< 0.03	< 0.03	0.47	< 0.03	< 0.03
Pyrene	mg/kg dry wt	0.04	< 0.03	0.78	< 0.03	< 0.03

Total Petroleum Hydrocarbons in Soil

C7 - C9	mg/kg dry wt	< 9	< 9	< 8	< 9	< 8
C10 - C14	mg/kg dry wt	< 20	< 20	< 20	< 20	< 20
C15 - C36	mg/kg dry wt	< 40	103	< 40	< 40	< 40
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 70	103	< 70	< 70	< 70



Sample Type: Soil						
Sample Name:	13:024 TP110 RB S2 1.1-1.2 13-Mar-2013 9:40 am	13:024 TP111 RB S1 0.4-0.5 13-Mar-2013 11:10 am	13:024 Q2 S1 13-Mar-2013 7:30 am			
Lab Number:	1111765.11	1111765.13	1111765.16			
Individual Tests						
Dry Matter	g/100g as rcvd	87	92	72	-	-
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	4	4	6	-	-
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	-	-
Total Recoverable Chromium	mg/kg dry wt	19	8	15	-	-
Total Recoverable Copper	mg/kg dry wt	14	7	17	-	-
Total Recoverable Lead	mg/kg dry wt	21	17.4	31	-	-
Total Recoverable Nickel	mg/kg dry wt	14	6	11	-	-
Total Recoverable Zinc	mg/kg dry wt	66	37	66	-	-
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Acenaphthene	mg/kg dry wt	< 0.03	< 0.03	< 0.04	-	-
Acenaphthylene	mg/kg dry wt	< 0.03	< 0.03	< 0.04	-	-
Anthracene	mg/kg dry wt	< 0.03	0.06	< 0.04	-	-
Benzo[a]anthracene	mg/kg dry wt	< 0.03	0.45	0.07	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.03	0.51	0.11	-	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	< 0.03	0.76	0.19	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.03	0.36	0.11	-	-
Benzo[k]fluoranthene	mg/kg dry wt	< 0.03	0.34	0.08	-	-
Chrysene	mg/kg dry wt	< 0.03	0.52	0.11	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.03	0.12	0.03	-	-
Fluoranthene	mg/kg dry wt	< 0.03	1.08	0.18	-	-
Fluorene	mg/kg dry wt	< 0.03	< 0.03	< 0.04	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.03	0.35	0.09	-	-
Naphthalene	mg/kg dry wt	< 0.13	< 0.12	< 0.18	-	-
Phenanthrene	mg/kg dry wt	< 0.03	0.23	0.07	-	-
Pyrene	mg/kg dry wt	< 0.03	0.81	0.16	-	-
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 8	< 8	< 11	-	-
C10 - C14	mg/kg dry wt	< 20	< 20	< 30	-	-
C15 - C36	mg/kg dry wt	< 40	< 40	80	-	-
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 70	< 70	80	-	-

Analyst's Comments

Appendix No.1 - Total Petroleum Hydrocarbon Chromatograms

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 clean 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.

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Samples
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	3-6, 8, 11, 13, 16
TPH Oil Industry Profile + PAHscreen	Sonication in DCM extraction, SPE cleanup, GC-FID & GC-MS analysis. Tested on as received sample. US EPA 8015B/MfE Petroleum Industry Guidelines	-	3-6, 8, 11, 13, 16
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	-	3-6, 8, 11, 13, 16
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. US EPA 3550. (Free water removed before analysis).	0.10 g/100g as rcvd	3-6, 8, 11, 13, 16
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	3-6, 8, 11, 13, 16

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

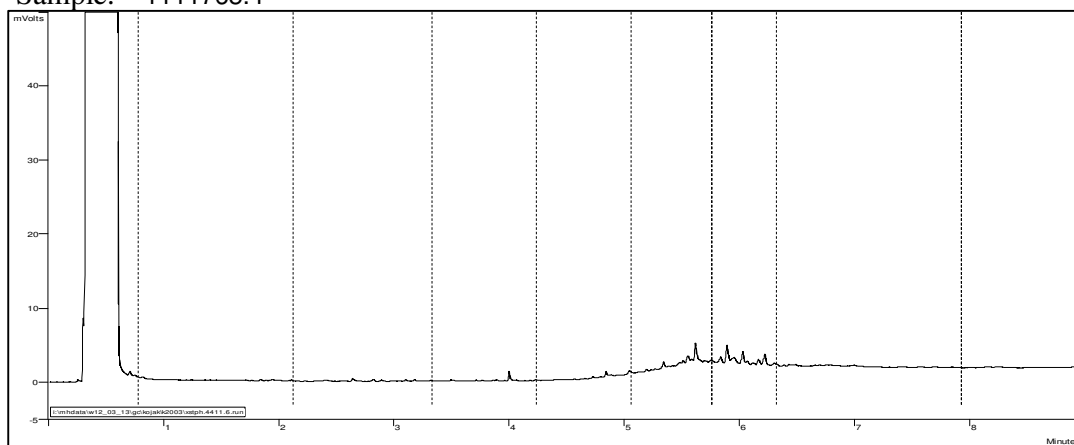
Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

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

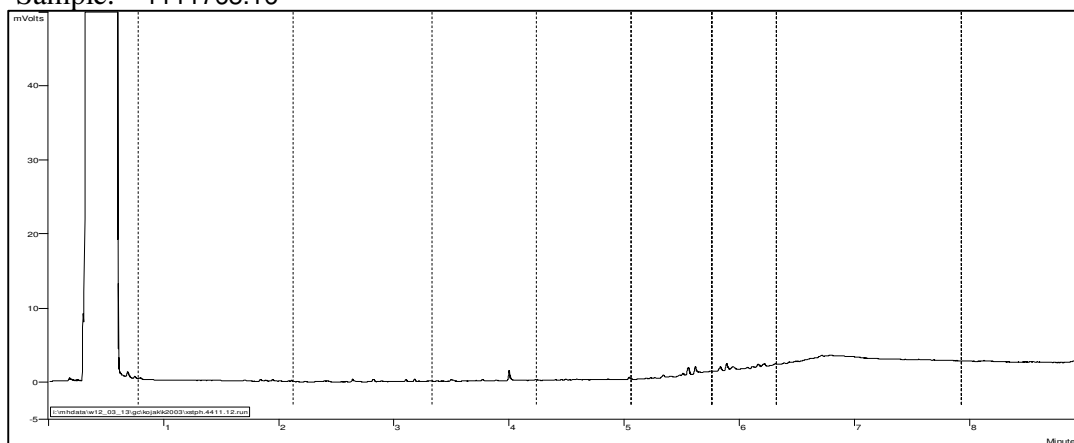
A handwritten signature in blue ink, consisting of several overlapping, stylized strokes.

Ara Heron BSc (Tech)
Client Services Manager - Environmental Division

Sample: 1111765.4



Sample: 1111765.16



C7 C10 C15 C20 C25 C30 C34 C44

SECTOR 2 – 55 RATA ROAD

Laboratory Number	Test Pits
1099950	TP215 to TP217

SECTOR 2 – 61 RATA ROAD

Laboratory Number	Test Pits
1111754	TP101RR to TP110RR

SECTOR 2 – 58 KIWI ROAD

Laboratory Number	Hand Augers
1099401	Composites 1 to 4, Composites 7 to 10
1099944	Composite 11 to 13, Composite 5, Composite 6, HA101, HA122, HA132

SECTOR 2 – 109 KĀPITI ROAD

Laboratory Number	Test Pits
1110684	TP101 to TP107, TP108, TP112, TP113
1110964	TP109 to TP111, TP114, TP115



ANALYSIS REPORT

Client:	Beca Infrastructure Limited	Lab No:	1099950	SPV1
Contact:	Kate Jackson	Date Registered:	14-Feb-2013	
	C/- Beca Infrastructure Limited	Date Reported:	21-Feb-2013	
	PO Box 6345	Quote No:	53458	
	Wellesley Street	Order No:		
	AUCKLAND 1141	Client Reference:	13:016 3320901/1000/013	
		Submitted By:	Kate Jackson	

Sample Type: Soil						
Sample Name:	13:016 TP215 S2 0.3-0.4m 13-Feb-2013 8:35 am	13:016 TP215 S3 1-1.1m 13-Feb-2013 8:45 am	13:016 TP216 S1 0-0.1m 13-Feb-2013 9:15 am	13:016 TP216 S2 0.5-0.6m 13-Feb-2013 9:30 am	13:016 TP217 S2 0.5-0.6m 13-Feb-2013 11:00 am	
Lab Number:	1099950.2	1099950.3	1099950.5	1099950.6	1099950.10	
Individual Tests						
Dry Matter	g/100g as rcvd	85	87	78	91	87
Heavy metals, screen As,Cd,Cr,Cu,Ni,Pb,Zn,Hg						
Total Recoverable Arsenic	mg/kg dry wt	-	-	-	-	119
Total Recoverable Cadmium	mg/kg dry wt	-	-	-	-	0.16
Total Recoverable Chromium	mg/kg dry wt	-	-	-	-	440
Total Recoverable Copper	mg/kg dry wt	-	-	-	-	146
Total Recoverable Lead	mg/kg dry wt	-	-	-	-	34
Total Recoverable Mercury	mg/kg dry wt	-	-	-	-	< 0.10
Total Recoverable Nickel	mg/kg dry wt	-	-	-	-	12
Total Recoverable Zinc	mg/kg dry wt	-	-	-	-	104
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	4	5	4	3	-
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	-
Total Recoverable Chromium	mg/kg dry wt	9	8	9	6	-
Total Recoverable Copper	mg/kg dry wt	8	8	11	7	-
Total Recoverable Lead	mg/kg dry wt	22	9.6	22	3.9	-
Total Recoverable Nickel	mg/kg dry wt	6	6	5	4	-
Total Recoverable Zinc	mg/kg dry wt	57	77	48	26	-
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Acenaphthene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo[a]anthracene	mg/kg dry wt	< 0.03	0.07	0.03	0.08	< 0.03
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.03	0.07	0.05	0.08	< 0.03
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	< 0.03	0.10	0.07	0.11	< 0.03
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.03	0.08	0.05	0.07	< 0.03
Benzo[k]fluoranthene	mg/kg dry wt	< 0.03	0.04	0.03	0.05	< 0.03
Chrysene	mg/kg dry wt	< 0.03	0.06	0.03	0.09	< 0.03
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.03	0.03	< 0.03	0.03	< 0.03
Fluoranthene	mg/kg dry wt	< 0.03	0.13	0.04	0.21	< 0.03
Fluorene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Indeno[1,2,3-c,d]pyrene	mg/kg dry wt	< 0.03	0.07	0.05	0.07	< 0.03
Naphthalene	mg/kg dry wt	< 0.15	< 0.13	< 0.14	< 0.14	< 0.13
Phenanthrene	mg/kg dry wt	< 0.03	0.07	< 0.03	0.10	< 0.03
Pyrene	mg/kg dry wt	< 0.03	0.12	0.04	0.17	< 0.03



Sample Type: Soil					
Sample Name:	13:016 TP215 S2 0.3-0.4m 13-Feb-2013 8:35 am	13:016 TP215 S3 1-1.1m 13-Feb-2013 8:45 am	13:016 TP216 S1 0-0.1m 13-Feb-2013 9:15 am	13:016 TP216 S2 0.5-0.6m 13-Feb-2013 9:30 am	13:016 TP217 S2 0.5-0.6m 13-Feb-2013 11:00 am
Lab Number:	1099950.2	1099950.3	1099950.5	1099950.6	1099950.10

Total Petroleum Hydrocarbons in Soil					
C7 - C9	mg/kg dry wt	< 9	< 8	< 9	< 8
C10 - C14	mg/kg dry wt	< 20	< 20	< 20	< 20
C15 - C36	mg/kg dry wt	< 40	< 40	< 40	46
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 70	< 70	< 70	< 70

Sample Name:	13:016 TP217 S3 1.4-1.5m 13-Feb-2013 11:05 am	13:016 TP217 S4 1.8-1.9m 13-Feb-2013 11:10 am			
Lab Number:	1099950.11	1099950.12			

Individual Tests					
Dry Matter	g/100g as rcvd	87	74	-	-
Heavy metals, screen As,Cd,Cr,Cu,Ni,Pb,Zn,Hg					
Total Recoverable Arsenic	mg/kg dry wt	11	11	-	-
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	0.14	-	-
Total Recoverable Chromium	mg/kg dry wt	16	8	-	-
Total Recoverable Copper	mg/kg dry wt	15	13	-	-
Total Recoverable Lead	mg/kg dry wt	42	29	-	-
Total Recoverable Mercury	mg/kg dry wt	< 0.10	< 0.10	-	-
Total Recoverable Nickel	mg/kg dry wt	6	5	-	-
Total Recoverable Zinc	mg/kg dry wt	163	95	-	-

Polycyclic Aromatic Hydrocarbons Screening in Soil					
Acenaphthene	mg/kg dry wt	< 0.03	< 0.03	-	-
Acenaphthylene	mg/kg dry wt	< 0.03	< 0.03	-	-
Anthracene	mg/kg dry wt	< 0.03	< 0.03	-	-
Benzo[a]anthracene	mg/kg dry wt	< 0.03	0.06	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	0.05	0.07	-	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	0.08	0.11	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	0.09	0.07	-	-
Benzo[k]fluoranthene	mg/kg dry wt	0.03	0.04	-	-
Chrysene	mg/kg dry wt	< 0.03	0.06	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	0.03	0.03	-	-
Fluoranthene	mg/kg dry wt	0.04	0.15	-	-
Fluorene	mg/kg dry wt	< 0.03	< 0.03	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	0.08	0.07	-	-
Naphthalene	mg/kg dry wt	< 0.14	< 0.15	-	-
Phenanthrene	mg/kg dry wt	< 0.03	0.06	-	-
Pyrene	mg/kg dry wt	0.04	0.12	-	-

Total Petroleum Hydrocarbons in Soil					
C7 - C9	mg/kg dry wt	< 9	< 9	-	-
C10 - C14	mg/kg dry wt	< 20	< 20	-	-
C15 - C36	mg/kg dry wt	85	< 40	-	-
Total hydrocarbons (C7 - C36)	mg/kg dry wt	85	< 70	-	-

Analyst's Comments

Appendix No.1 - Total Petroleum Hydrocarbon Chromatograms

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 clean 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.

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Samples
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	2-3, 5-6, 10-12

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Samples
TPH Oil Industry Profile + PAHscreen	Sonication in DCM extraction, SPE cleanup, GC-FID & GC-MS analysis. Tested on as received sample. US EPA 8015B/MfE Petroleum Industry Guidelines	-	2-3, 5-6, 10-12
Heavy metals, screen As,Cd,Cr,Cu,Ni,Pb,Zn,Hg	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	-	10-12
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	-	2-3, 5-6
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. US EPA 3550. (Free water removed before analysis).	0.10 g/100g as rcvd	2-3, 5-6, 10-12
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	2-3, 5-6, 10-12

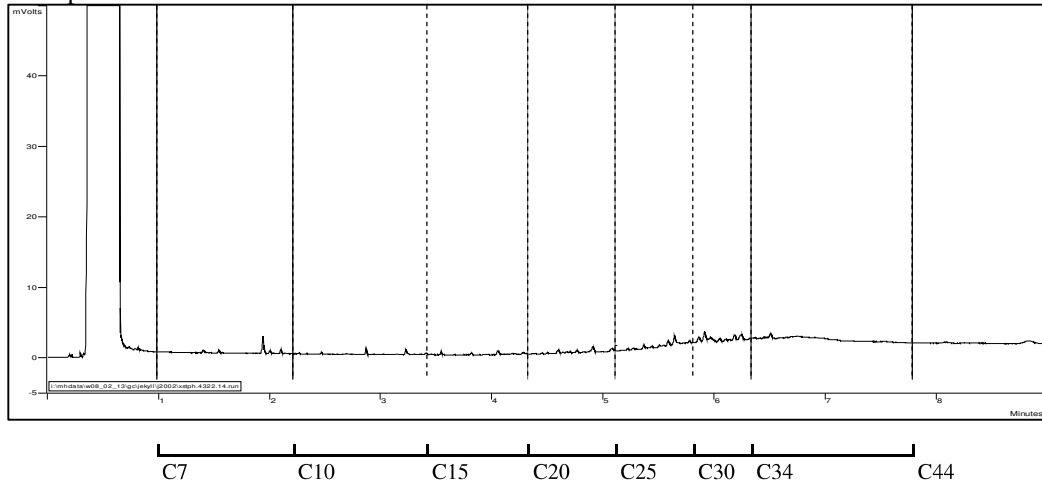
These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

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

Ara Heron BSc (Tech)
Client Services Manager - Environmental Division

Sample : 1099950.11





ANALYSIS REPORT

Client:	Beca Infrastructure Limited	Lab No:	1111754	SPV1
Contact:	Kate Ward	Date Registered:	15-Mar-2013	
	C/- Beca Infrastructure Limited	Date Reported:	25-Mar-2013	
	PO Box 6345	Quote No:	53976	
	Wellesley Street	Order No:		
	AUCKLAND 1141	Client Reference:	13:024 3320901/1000/013	
		Submitted By:	Kate Ward	

Sample Type: Soil

Sample Name:	13:024 TP101 RR S1 0.2-0.3 14-Mar-2012 1:05 pm	13:024 TP102 RR S1 0.1-0.2 14-Mar-2013 12:10 pm	13:024 TP103 RR S2 0.4-0.5 14-Mar-2013	13:024 TP104 RR S1 (B) 0.1-0.2 14-Mar-2013 11:00 am	13:024 TP105 RR S1 0.1-0.2 14-Mar-2013 10:20 am
Lab Number:	1111754.1	1111754.3	1111754.6	1111754.9	1111754.12

Individual Tests

Dry Matter	g/100g as rcvd	90	95	92	97	93
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	4	3	4	4	6
Total Recoverable Cadmium	mg/kg dry wt	1.04	0.13	< 0.10	0.14	< 0.10
Total Recoverable Chromium	mg/kg dry wt	8	11	7	12	7
Total Recoverable Copper	mg/kg dry wt	22	14	13	13	7
Total Recoverable Lead	mg/kg dry wt	36	42	11.2	41	16.0
Total Recoverable Nickel	mg/kg dry wt	6	9	5	10	5
Total Recoverable Zinc	mg/kg dry wt	150	71	40	66	37
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 9	< 8	< 8	< 8	< 8
C10 - C14	mg/kg dry wt	< 20	< 20	< 20	< 20	< 20
C15 - C36	mg/kg dry wt	169	194	< 40	< 40	< 40
Total hydrocarbons (C7 - C36)	mg/kg dry wt	169	194	< 70	< 70	< 70

Sample Name:	13:024 TP106 RR S1 0.2-0.3 14-Mar-2013 10:00 am	13:024 TP112 LG S1 0.1-0.2 14-Mar-2013 3:00 pm	13:024 TP111 LG S1 0.1-0.2 14-Mar-2013 3:15 pm	13:024 TP108 LG S1 0.1-0.2 14-Mar-2013 3:35 pm	13:024 TP107 LG S1 0-0.1 14-Mar-2013 4:10 pm
Lab Number:	1111754.14	1111754.17	1111754.19	1111754.21	1111754.23

Individual Tests

Dry Matter	g/100g as rcvd	94	93	94	95	92
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	6	5	5	5	11
Total Recoverable Cadmium	mg/kg dry wt	0.15	< 0.10	< 0.10	< 0.10	0.11
Total Recoverable Chromium	mg/kg dry wt	12	10	12	10	11
Total Recoverable Copper	mg/kg dry wt	14	11	16	13	26
Total Recoverable Lead	mg/kg dry wt	38	17.8	26	33	40
Total Recoverable Nickel	mg/kg dry wt	9	7	12	9	29
Total Recoverable Zinc	mg/kg dry wt	95	46	76	92	95
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Acenaphthene	mg/kg dry wt	-	-	< 0.03	-	< 0.03
Acenaphthylene	mg/kg dry wt	-	-	< 0.03	-	< 0.03
Anthracene	mg/kg dry wt	-	-	< 0.03	-	< 0.03
Benzo[a]anthracene	mg/kg dry wt	-	-	0.07	-	< 0.03
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	-	0.10	-	< 0.03



Sample Type: Soil						
Sample Name:	13:024 TP106 RR S1 0.2-0.3 14-Mar-2013 10:00 am	13:024 TP112 LG S1 0.1-0.2 14-Mar-2013 3:00 pm	13:024 TP111 LG S1 0.1-0.2 14-Mar-2013 3:15 pm	13:024 TP108 LG S1 0.1-0.2 14-Mar-2013 3:35 pm	13:024 TP107 LG S1 0-0.1 14-Mar-2013 4:10 pm	
Lab Number:	1111754.14	1111754.17	1111754.19	1111754.21	1111754.23	
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	-	-	0.14	-	< 0.03
Benzo[g,h,i]perylene	mg/kg dry wt	-	-	0.08	-	< 0.03
Benzo[k]fluoranthene	mg/kg dry wt	-	-	0.06	-	< 0.03
Chrysene	mg/kg dry wt	-	-	0.08	-	< 0.03
Dibenzo[a,h]anthracene	mg/kg dry wt	-	-	< 0.03	-	< 0.03
Fluoranthene	mg/kg dry wt	-	-	0.13	-	< 0.03
Fluorene	mg/kg dry wt	-	-	< 0.03	-	< 0.03
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	-	0.07	-	< 0.03
Naphthalene	mg/kg dry wt	-	-	< 0.13	-	< 0.13
Phenanthrene	mg/kg dry wt	-	-	0.04	-	< 0.03
Pyrene	mg/kg dry wt	-	-	0.13	-	< 0.03
Haloethers Trace in SVOC Soil Samples by GC-MS						
Bis(2-chloroethoxy) methane	mg/kg dry wt	-	< 0.12	-	< 0.12	-
Bis(2-chloroethyl)ether	mg/kg dry wt	-	< 0.12	-	< 0.12	-
Bis(2-chloroisopropyl)ether	mg/kg dry wt	-	< 0.12	-	< 0.12	-
4-Bromophenyl phenyl ether	mg/kg dry wt	-	< 0.12	-	< 0.12	-
4-Chlorophenyl phenyl ether	mg/kg dry wt	-	< 0.12	-	< 0.12	-
Nitrogen containing compounds Trace in SVOC Soil Samples, GC-MS						
3,3'-Dichlorobenzidine	mg/kg dry wt	-	< 0.6	-	< 0.6	-
2,4-Dinitrotoluene	mg/kg dry wt	-	< 0.3	-	< 0.3	-
2,6-Dinitrotoluene	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Nitrobenzene	mg/kg dry wt	-	< 0.12	-	< 0.12	-
N-Nitrosodi-n-propylamine	mg/kg dry wt	-	< 0.3	-	< 0.3	-
N-Nitrosodiphenylamine	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Organochlorine Pesticides Trace in SVOC Soil Samples by GC-MS						
Aldrin	mg/kg dry wt	-	< 0.12	-	< 0.12	-
alpha-BHC	mg/kg dry wt	-	< 0.12	-	< 0.12	-
beta-BHC	mg/kg dry wt	-	< 0.12	-	< 0.12	-
delta-BHC	mg/kg dry wt	-	< 0.12	-	< 0.12	-
gamma-BHC (Lindane)	mg/kg dry wt	-	< 0.12	-	< 0.12	-
4,4'-DDD	mg/kg dry wt	-	< 0.12	-	< 0.12	-
4,4'-DDE	mg/kg dry wt	-	< 0.12	-	< 0.12	-
4,4'-DDT	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Dieldrin	mg/kg dry wt	-	< 0.12	-	< 0.12	-
Endosulfan I	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Endosulfan II	mg/kg dry wt	-	< 0.5	-	< 0.5	-
Endosulfan sulphate	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Endrin	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Endrin ketone	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Heptachlor	mg/kg dry wt	-	< 0.12	-	< 0.12	-
Heptachlor epoxide	mg/kg dry wt	-	< 0.12	-	< 0.12	-
Hexachlorobenzene	mg/kg dry wt	-	< 0.12	-	< 0.12	-
Polycyclic Aromatic Hydrocarbons Trace in SVOC Soil Samples						
Acenaphthene	mg/kg dry wt	-	< 0.10	-	< 0.10	-
Acenaphthylene	mg/kg dry wt	-	0.15	-	< 0.10	-
Anthracene	mg/kg dry wt	-	0.13	-	< 0.10	-
Benzo[a]anthracene	mg/kg dry wt	-	0.77	-	< 0.10	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	0.73	-	< 0.12	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	-	0.84	-	0.13	-
Benzo[g,h,i]perylene	mg/kg dry wt	-	0.52	-	0.12	-
Benzo[k]fluoranthene	mg/kg dry wt	-	0.41	-	< 0.12	-
2-Chloronaphthalene	mg/kg dry wt	-	< 0.10	-	< 0.10	-

Sample Type: Soil

Sample Name:	13:024 TP106 RR S1 0.2-0.3 14-Mar-2013 10:00 am	13:024 TP112 LG S1 0.1-0.2 14-Mar-2013 3:00 pm	13:024 TP111 LG S1 0.1-0.2 14-Mar-2013 3:15 pm	13:024 TP108 LG S1 0.1-0.2 14-Mar-2013 3:35 pm	13:024 TP107 LG S1 0-0.1 14-Mar-2013 4:10 pm
Lab Number:	1111754.14	1111754.17	1111754.19	1111754.21	1111754.23

Polycyclic Aromatic Hydrocarbons Trace in SVOC Soil Samples

Chrysene	mg/kg dry wt	-	0.65	-	< 0.10	-
Dibenzo[a,h]anthracene	mg/kg dry wt	-	0.19	-	< 0.12	-
Fluoranthene	mg/kg dry wt	-	1.28	-	0.13	-
Fluorene	mg/kg dry wt	-	< 0.10	-	< 0.10	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	0.40	-	< 0.12	-
2-Methylnaphthalene	mg/kg dry wt	-	< 0.10	-	< 0.10	-
Naphthalene	mg/kg dry wt	-	< 0.10	-	< 0.10	-
Phenanthrene	mg/kg dry wt	-	0.49	-	< 0.10	-
Pyrene	mg/kg dry wt	-	1.19	-	0.14	-

Phenols Trace in SVOC Soil Samples by GC-MS

4-Chloro-3-methylphenol	mg/kg dry wt	-	< 0.5	-	< 0.5	-
2-Chlorophenol	mg/kg dry wt	-	< 0.2	-	< 0.2	-
2,4-Dichlorophenol	mg/kg dry wt	-	< 0.2	-	< 0.2	-
2,4-Dimethylphenol	mg/kg dry wt	-	< 0.4	-	< 0.4	-
3 & 4-Methylphenol (m- + p-cresol)	mg/kg dry wt	-	< 0.4	-	< 0.4	-
2-Methylphenol (o-Cresol)	mg/kg dry wt	-	< 0.2	-	< 0.2	-
2-Nitrophenol	mg/kg dry wt	-	< 0.4	-	< 0.4	-
Pentachlorophenol (PCP)	mg/kg dry wt	-	< 6	-	< 6	-
Phenol	mg/kg dry wt	-	< 0.3	-	< 0.3	-
2,4,5-Trichlorophenol	mg/kg dry wt	-	< 0.3	-	< 0.3	-
2,4,6-Trichlorophenol	mg/kg dry wt	-	< 0.3	-	< 0.3	-

Plasticisers Trace in SVOC Soil Samples by GC-MS

Bis(2-ethylhexyl)phthalate	mg/kg dry wt	-	< 0.5	-	< 0.5	-
Butylbenzylphthalate	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Di(2-ethylhexyl)adipate	mg/kg dry wt	-	< 0.2	-	< 0.2	-
Diethylphthalate	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Dimethylphthalate	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Di-n-butylphthalate	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Di-n-octylphthalate	mg/kg dry wt	-	< 0.3	-	< 0.3	-

Other Halogenated compounds Trace in SVOC Soil Samples by GC-MS

1,2-Dichlorobenzene	mg/kg dry wt	-	< 0.3	-	< 0.3	-
1,3-Dichlorobenzene	mg/kg dry wt	-	< 0.3	-	< 0.3	-
1,4-Dichlorobenzene	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Hexachlorobutadiene	mg/kg dry wt	-	< 0.3	-	< 0.3	-
Hexachlorocyclopentadiene	mg/kg dry wt	-	< 0.6	-	< 0.6	-
Hexachloroethane	mg/kg dry wt	-	< 0.3	-	< 0.3	-
1,2,4-Trichlorobenzene	mg/kg dry wt	-	< 0.12	-	< 0.12	-

Other SVOC Trace in SVOC Soil Samples by GC-MS

Benzyl alcohol	mg/kg dry wt	-	< 1.2	-	< 1.2	-
Carbazole	mg/kg dry wt	-	< 0.12	-	< 0.12	-
Dibenzofuran	mg/kg dry wt	-	< 0.12	-	< 0.12	-
Isophorone	mg/kg dry wt	-	< 0.12	-	< 0.12	-

Total Petroleum Hydrocarbons in Soil

C7 - C9	mg/kg dry wt	< 8	< 8	< 8	< 8	< 8
C10 - C14	mg/kg dry wt	< 20	< 20	< 20	< 20	< 20
C15 - C36	mg/kg dry wt	< 40	< 40	< 40	< 40	< 40
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 70	< 70	< 70	< 70	< 70

Sample Name:	13:0.24 TP103 RR S1 0.1-0.2 14-Mar-2013				
Lab Number:	1111754.26				

Individual Tests

Sample Type: Soil

Sample Name:	13:0.24 TP103 RR S1 0.1-0.2 14-Mar-2013				
Lab Number:	1111754.26				

Individual Tests						
Dry Matter	g/100g as rcvd	97	-	-	-	-
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	5	-	-	-	-
Total Recoverable Cadmium	mg/kg dry wt	0.21	-	-	-	-
Total Recoverable Chromium	mg/kg dry wt	13	-	-	-	-
Total Recoverable Copper	mg/kg dry wt	44	-	-	-	-
Total Recoverable Lead	mg/kg dry wt	46	-	-	-	-
Total Recoverable Nickel	mg/kg dry wt	9	-	-	-	-
Total Recoverable Zinc	mg/kg dry wt	110	-	-	-	-
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 8	-	-	-	-
C10 - C14	mg/kg dry wt	< 20	-	-	-	-
C15 - C36	mg/kg dry wt	860	-	-	-	-
Total hydrocarbons (C7 - C36)	mg/kg dry wt	860	-	-	-	-

Analyst's Comments

Appendix No.1 - Total Petroleum Hydrocarbon Chromatograms
 Appendix No.2 - 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 clean 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.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Samples
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1, 3, 6, 9, 12, 14, 17, 19, 21, 23, 26
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	-	1, 3, 6, 9, 12, 14, 17, 19, 21, 23, 26
Polycyclic Aromatic Hydrocarbons Screening in Soil	Sonication extraction, Dilution or SPE cleanup (if required), GC-MS SIM analysis (modified US EPA 8270). Tested on as received sample.	-	19, 23
Semivolatile Organic Compounds Trace in Soil by GC-MS	Sonication extraction, GPC cleanup, GC-MS FS analysis. Tested on as received sample	-	17, 21
Total Petroleum Hydrocarbons in Soil	Sonication extraction in DCM, Silica cleanup, GC-FID analysis US EPA 8015B/MfE Petroleum Industry Guidelines. Tested on as received sample	-	1, 3, 6, 9, 12, 14, 17, 19, 21, 23, 26
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. US EPA 3550. (Free water removed before analysis).	0.10 g/100g as rcvd	1, 3, 6, 9, 12, 14, 17, 19, 21, 23, 26
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	1, 3, 6, 9, 12, 14, 17, 19, 21, 23, 26

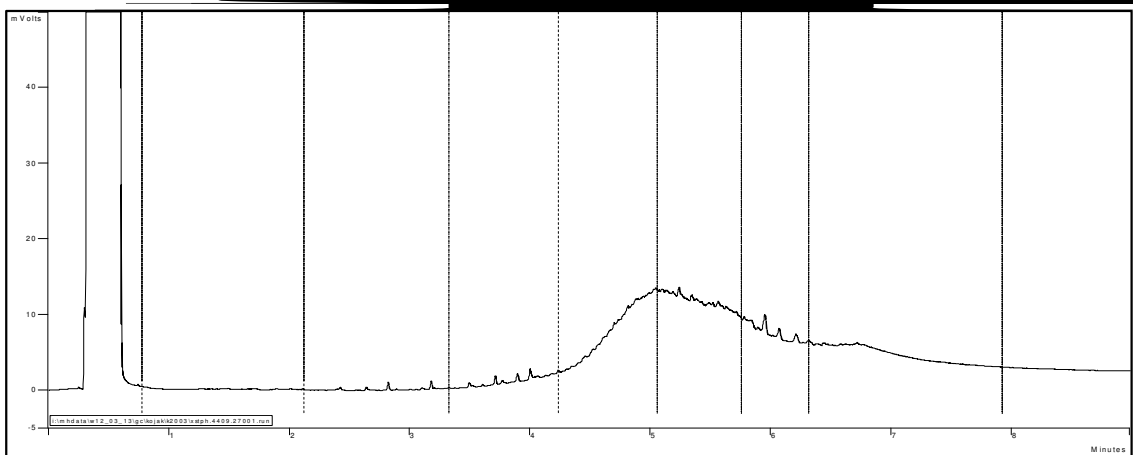
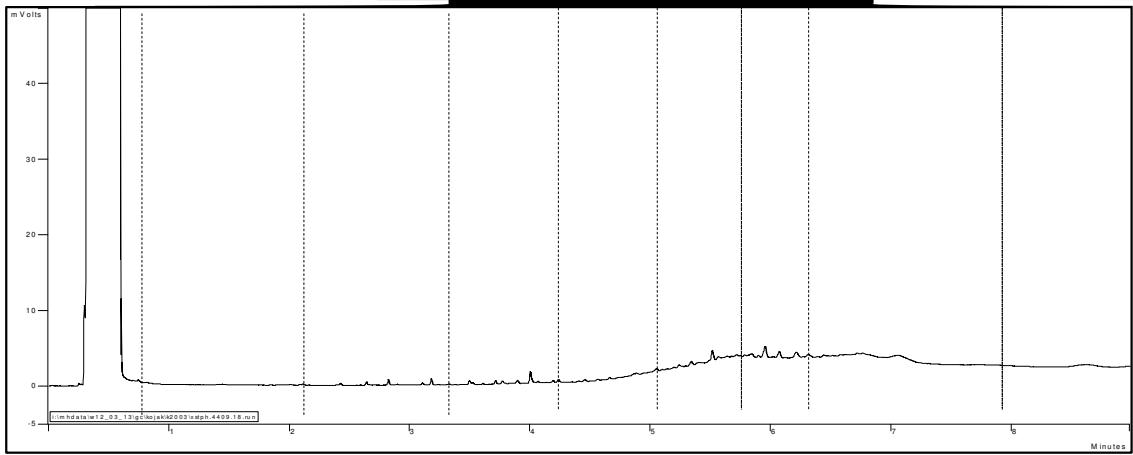
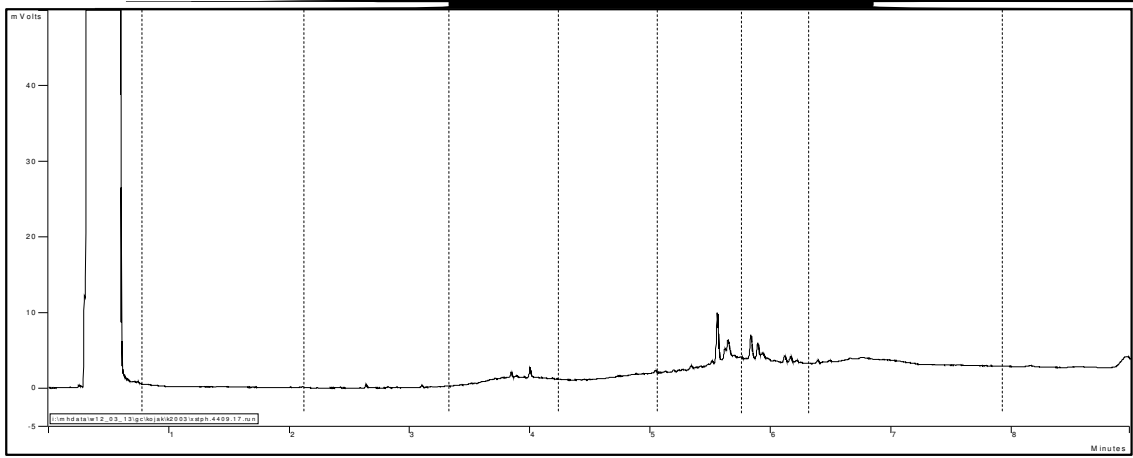
These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

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

A handwritten signature in blue ink, consisting of several overlapping, stylized strokes.

Ara Heron BSc (Tech)
Client Services Manager - Environmental Division





ANALYSIS REPORT

Client:	Beca Limited	Lab No:	1099401	SPv2
Contact:	Kate Ward	Date Registered:	13-Feb-2013	
	C/- Beca Limited	Date Reported:	17-Apr-2013	
	PO Box 6345	Quote No:	53458	
	Wellesley Street	Order No:		
	AUCKLAND 1141	Client Reference:	13:016 3320901/1000/013	
		Submitted By:	Kate Ward	

Amended Report

This report replaces an earlier report issued on the 21 Feb 2013 at 3:18 pm
 Following a request from the client, Arsenic has been added to samples
 29-32.

Sample Type: Soil

Sample Name:	13:016 Composite 10A 0-0.15 11-Feb-2013 3:20 pm	13:016 Composite 10B 0-0.15 11-Feb-2013 3:00 pm	13:016 Composite 10C 0-0.15 11-Feb-2013 3:40 pm	13:016 Composite 10D 0-0.15 11-Feb-2013 3:45 pm	Composite of 13:016 Composite 1A, 13:016 Composite 1B, 13:016 Composite 1C, 13:016 Composite 1D
Lab Number:	1099401.29	1099401.30	1099401.31	1099401.32	1099401.33

Individual Tests					
Dry Matter	g/100g as rcvd	-	-	-	69
Total Recoverable Arsenic	mg/kg dry wt	27	30	26	24
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn					
Total Recoverable Arsenic	mg/kg dry wt	-	-	-	14
Total Recoverable Cadmium	mg/kg dry wt	-	-	-	0.44
Total Recoverable Chromium	mg/kg dry wt	-	-	-	10
Total Recoverable Copper	mg/kg dry wt	-	-	-	88
Total Recoverable Lead	mg/kg dry wt	-	-	-	22
Total Recoverable Nickel	mg/kg dry wt	-	-	-	5
Total Recoverable Zinc	mg/kg dry wt	-	-	-	93
Organochlorine Pesticides Screening in Soil					
Aldrin	mg/kg dry wt	-	-	-	< 0.010
alpha-BHC	mg/kg dry wt	-	-	-	< 0.010
beta-BHC	mg/kg dry wt	-	-	-	< 0.010
delta-BHC	mg/kg dry wt	-	-	-	< 0.010
gamma-BHC (Lindane)	mg/kg dry wt	-	-	-	< 0.010
cis-Chlordane	mg/kg dry wt	-	-	-	< 0.010
trans-Chlordane	mg/kg dry wt	-	-	-	< 0.010
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	-	-	-	< 0.04
2,4'-DDD	mg/kg dry wt	-	-	-	0.061
4,4'-DDD	mg/kg dry wt	-	-	-	0.100
2,4'-DDE	mg/kg dry wt	-	-	-	0.019
4,4'-DDE	mg/kg dry wt	-	-	-	0.48
2,4'-DDT	mg/kg dry wt	-	-	-	0.141
4,4'-DDT	mg/kg dry wt	-	-	-	0.79
Dieldrin	mg/kg dry wt	-	-	-	< 0.010
Endosulfan I	mg/kg dry wt	-	-	-	< 0.010
Endosulfan II	mg/kg dry wt	-	-	-	< 0.010
Endosulfan sulphate	mg/kg dry wt	-	-	-	< 0.010
Endrin	mg/kg dry wt	-	-	-	< 0.010



This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.

The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked *, which are not accredited.

Sample Type: Soil					
Sample Name:	13:016 Composite 10A 0-0.15 11-Feb-2013 3:20 pm	13:016 Composite 10B 0-0.15 11-Feb-2013 3:00 pm	13:016 Composite 10C 0-0.15 11-Feb-2013 3:40 pm	13:016 Composite 10D 0-0.15 11-Feb-2013 3:45 pm	Composite of 13:016 Composite 1A, 13:016 Composite 1B, 13:016 Composite 1C, 13:016 Composite 1D
Lab Number:	1099401.29	1099401.30	1099401.31	1099401.32	1099401.33
Organochlorine Pesticides Screening in Soil					
Endrin Aldehyde	mg/kg dry wt	-	-	-	< 0.010
Endrin ketone	mg/kg dry wt	-	-	-	< 0.010
Heptachlor	mg/kg dry wt	-	-	-	< 0.010
Heptachlor epoxide	mg/kg dry wt	-	-	-	< 0.010
Hexachlorobenzene	mg/kg dry wt	-	-	-	< 0.010
Methoxychlor	mg/kg dry wt	-	-	-	< 0.010
Organonitro&phosphorus Pesticides Screen in Soil by GCMS					
Acetochlor	mg/kg	-	-	-	< 0.07
Alachlor	mg/kg	-	-	-	< 0.05
Atrazine	mg/kg	-	-	-	< 0.07
Atrazine-desethyl	mg/kg	-	-	-	< 0.07
Atrazine-desisopropyl	mg/kg	-	-	-	< 0.14
Azaconazole	mg/kg	-	-	-	< 0.04
Azinphos-methyl	mg/kg	-	-	-	< 0.14
Benalaxyl	mg/kg	-	-	-	< 0.04
Bitertanol	mg/kg	-	-	-	< 0.14
Bromacil	mg/kg	-	-	-	< 0.07
Bromopropylate	mg/kg	-	-	-	< 0.07
Butachlor	mg/kg	-	-	-	< 0.07
Captan	mg/kg	-	-	-	< 0.14
Carbaryl	mg/kg	-	-	-	< 0.07
Carbofuran	mg/kg	-	-	-	< 0.07
Chlorfluazuron	mg/kg	-	-	-	< 0.07
Chlorothalonil	mg/kg	-	-	-	< 0.07
Chlorpyrifos	mg/kg	-	-	-	< 0.07
Chlorpyrifos-methyl	mg/kg	-	-	-	< 0.07
Chlortoluron	mg/kg	-	-	-	< 0.14
Cyanazine	mg/kg	-	-	-	< 0.07
Cyfluthrin	mg/kg	-	-	-	< 0.07
Cyhalothrin	mg/kg	-	-	-	< 0.07
Cypermethrin	mg/kg	-	-	-	< 0.14
Deltamethrin (Tralomethrin)	mg/kg	-	-	-	< 0.07
Diazinon	mg/kg	-	-	-	< 0.04
Dichlofluanid	mg/kg	-	-	-	< 0.07
Dichloran	mg/kg	-	-	-	< 0.2
Dichlorvos	mg/kg	-	-	-	< 0.09
Difenoconazole	mg/kg	-	-	-	< 0.10
Dimethoate	mg/kg	-	-	-	< 0.14
Diphenylamine	mg/kg	-	-	-	< 0.14
Diuron	mg/kg	-	-	-	< 0.07
Fenpropimorph	mg/kg	-	-	-	< 0.07
Fluazifop-butyl	mg/kg	-	-	-	< 0.07
Fluometuron	mg/kg	-	-	-	< 0.07
Flusilazole	mg/kg	-	-	-	< 0.07
Fluvalinate	mg/kg	-	-	-	< 0.05
Furalaxyl	mg/kg	-	-	-	< 0.04
Haloxifop-methyl	mg/kg	-	-	-	< 0.07
Hexaconazole	mg/kg	-	-	-	< 0.07
Hexazinone	mg/kg	-	-	-	< 0.04
IPBC (3-Iodo-2-propynyl-n-butylcarbamate)	mg/kg dry wt	-	-	-	< 0.4

Sample Type: Soil						
Sample Name:	13:016 Composite 10A 0-0.15 11-Feb-2013 3:20 pm	13:016 Composite 10B 0-0.15 11-Feb-2013 3:00 pm	13:016 Composite 10C 0-0.15 11-Feb-2013 3:40 pm	13:016 Composite 10D 0-0.15 11-Feb-2013 3:45 pm	Composite of 13:016 Composite 1A, 13:016 Composite 1B, 13:016 Composite 1C, 13:016 Composite 1D	
Lab Number:	1099401.29	1099401.30	1099401.31	1099401.32	1099401.33	
Organonitro&phosphorus Pesticides Screen in Soil by GCMS						
Iprodione	mg/kg	-	-	-	-	< 0.07
Kresoxim-methyl	mg/kg	-	-	-	-	< 0.04
Linuron	mg/kg	-	-	-	-	< 0.07
Malathion	mg/kg	-	-	-	-	< 0.07
Metalaxyl (Mefenoxam)	mg/kg	-	-	-	-	< 0.07
Methamidophos	mg/kg	-	-	-	-	< 0.4
Metolachlor	mg/kg	-	-	-	-	< 0.05
Metribuzin	mg/kg	-	-	-	-	< 0.07
Molinate	mg/kg	-	-	-	-	< 0.14
Myclobutanil	mg/kg	-	-	-	-	< 0.07
Naled	mg/kg	-	-	-	-	< 0.4
Norflurazon	mg/kg	-	-	-	-	< 0.14
Oxadiazon	mg/kg	-	-	-	-	< 0.07
Oxyfluorfen	mg/kg	-	-	-	-	< 0.04
Paclobutrazol	mg/kg	-	-	-	-	< 0.07
Parathion-ethyl	mg/kg	-	-	-	-	< 0.07
Parathion-methyl	mg/kg	-	-	-	-	< 0.07
Pendimethalin	mg/kg	-	-	-	-	< 0.07
Permethrin	mg/kg	-	-	-	-	< 0.03
Pirimicarb	mg/kg	-	-	-	-	< 0.07
Pirimiphos-methyl	mg/kg	-	-	-	-	< 0.07
Prochloraz	mg/kg	-	-	-	-	< 0.4
Procymidone	mg/kg	-	-	-	-	< 0.07
Prometryn	mg/kg	-	-	-	-	< 0.04
Propachlor	mg/kg	-	-	-	-	< 0.07
Propanil	mg/kg	-	-	-	-	< 0.2
Propazine	mg/kg	-	-	-	-	< 0.04
Propiconazole	mg/kg	-	-	-	-	< 0.05
Pyriproxyfen	mg/kg	-	-	-	-	< 0.07
Quizalofop-ethyl	mg/kg	-	-	-	-	< 0.07
Simazine	mg/kg	-	-	-	-	< 0.07
Simetryn	mg/kg	-	-	-	-	< 0.07
Sulfentrazone	mg/kg	-	-	-	-	< 0.4
TCMTB [2-(thiocyanomethylthio) benzothiazole, Busan]	mg/kg dry wt	-	-	-	-	< 0.14
Tebuconazole	mg/kg	-	-	-	-	< 0.07
Terbacil	mg/kg	-	-	-	-	< 0.07
Terbufos	mg/kg	-	-	-	-	< 0.07
Terbumeton	mg/kg	-	-	-	-	< 0.07
Terbuthylazine	mg/kg	-	-	-	-	< 0.04
Terbuthylazine-desethyl	mg/kg	-	-	-	-	< 0.07
Terbutryn	mg/kg	-	-	-	-	< 0.07
Thiabendazole	mg/kg	-	-	-	-	< 0.4
Thiobencarb	mg/kg	-	-	-	-	< 0.07
Tolyfluanid	mg/kg	-	-	-	-	< 0.04
Triazophos	mg/kg	-	-	-	-	< 0.07
Trifluralin	mg/kg	-	-	-	-	< 0.07
Vinclozolin	mg/kg	-	-	-	-	< 0.07

Sample Type: Soil						
Sample Name:	Composite of 13:016 Composite 2A, 13:016 Composite 2B, 13:016 Composite 2C, 13:016 Composite 2D	Composite of 13:016 Composite 3A, 13:016 Composite 3B, 13:016 Composite 3C, 13:016 Composite 3D	Composite of 13:016 Composite 4A, 13:016 Composite 4B, 13:016 Composite 4C, 13:016 Composite 4D	Composite of 13:016 Composite 7A, 13:016 Composite 7B, 13:016 Composite 7C, 13:016 Composite 7D	Composite of 13:016 Composite 8A, 13:016 Composite 8B, 13:016 Composite 8C, 13:016 Composite 8D	
Lab Number:	1099401.34	1099401.35	1099401.36	1099401.37	1099401.38	
Individual Tests						
Dry Matter	g/100g as rcvd	65	60	69	66	68
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	13	13	9	13	12
Total Recoverable Cadmium	mg/kg dry wt	0.36	0.22	0.31	0.16	0.24
Total Recoverable Chromium	mg/kg dry wt	10	9	8	9	8
Total Recoverable Copper	mg/kg dry wt	76	59	42	18	46
Total Recoverable Lead	mg/kg dry wt	26	13.7	8.9	8.8	13.0
Total Recoverable Nickel	mg/kg dry wt	6	5	5	5	5
Total Recoverable Zinc	mg/kg dry wt	86	79	83	68	84
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
alpha-BHC	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
beta-BHC	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
delta-BHC	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
cis-Chlordane	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
trans-Chlordane	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
2,4'-DDD	mg/kg dry wt	0.091	0.082	0.038	< 0.010	0.038
4,4'-DDD	mg/kg dry wt	0.138	0.147	0.068	< 0.010	0.072
2,4'-DDE	mg/kg dry wt	0.019	0.017	0.012	< 0.010	< 0.010
4,4'-DDE	mg/kg dry wt	0.42	0.42	0.54	0.036	0.29
2,4'-DDT	mg/kg dry wt	0.094	0.077	0.106	< 0.010	0.059
4,4'-DDT	mg/kg dry wt	0.54	0.44	0.56	0.054	0.34
Dieldrin	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Endosulfan I	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Endosulfan II	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Endosulfan sulphate	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Endrin	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Endrin Aldehyde	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Endrin ketone	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Heptachlor	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Heptachlor epoxide	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Hexachlorobenzene	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Methoxychlor	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Organonitro&phosphorus Pesticides Screen in Soil by GCMS						
Acetochlor	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Alachlor	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Atrazine	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Atrazine-desethyl	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Atrazine-desisopropyl	mg/kg	< 0.15	< 0.16	< 0.14	< 0.15	< 0.14
Azaconazole	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Azinphos-methyl	mg/kg	< 0.15	< 0.16	< 0.14	< 0.15	< 0.14
Benalaxyl	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Bitertanol	mg/kg	< 0.15	< 0.16	< 0.14	< 0.15	< 0.14
Bromacil	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Bromopropylate	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Butachlor	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Captan	mg/kg	< 0.15	< 0.16	< 0.14	< 0.15	< 0.14
Carbaryl	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07

Sample Type: Soil

Sample Name:	Composite of 13:016 Composite 2A, 13:016 Composite 2B, 13:016 Composite 2C, 13:016 Composite 2D	Composite of 13:016 Composite 3A, 13:016 Composite 3B, 13:016 Composite 3C, 13:016 Composite 3D	Composite of 13:016 Composite 4A, 13:016 Composite 4B, 13:016 Composite 4C, 13:016 Composite 4D	Composite of 13:016 Composite 7A, 13:016 Composite 7B, 13:016 Composite 7C, 13:016 Composite 7D	Composite of 13:016 Composite 8A, 13:016 Composite 8B, 13:016 Composite 8C, 13:016 Composite 8D
Lab Number:	1099401.34	1099401.35	1099401.36	1099401.37	1099401.38

Organonitro&phosphorus Pesticides Screen in Soil by GCMS

Carbofuran	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Chlorfluazuron	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Chlorothalonil	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Chlorpyrifos	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Chlorpyrifos-methyl	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Chlortoluron	mg/kg	< 0.15	< 0.16	< 0.14	< 0.15	< 0.14
Cyanazine	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Cyfluthrin	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Cyhalothrin	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Cypermethrin	mg/kg	< 0.15	< 0.16	< 0.14	< 0.15	< 0.14
Deltamethrin (Tralomethrin)	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Diazinon	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Dichlofluanid	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Dichloran	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	mg/kg	< 0.09	< 0.09	< 0.09	< 0.09	< 0.09
Difenoconazole	mg/kg	< 0.11	< 0.12	< 0.10	< 0.11	< 0.10
Dimethoate	mg/kg	< 0.15	< 0.16	< 0.14	< 0.15	< 0.14
Diphenylamine	mg/kg	< 0.15	< 0.16	< 0.14	< 0.15	< 0.14
Diuron	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Fenpropimorph	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Fluazifop-butyl	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Fluometuron	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Flusilazole	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Fluvalinate	mg/kg	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05
Furalaxyl	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Haloxifop-methyl	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Hexaconazole	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Hexazinone	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
IPBC (3-Iodo-2-propynyl-n-butylcarbamate)	mg/kg dry wt	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Iprodione	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Kresoxim-methyl	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Linuron	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Malathion	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Metalaxyl (Mefenoxam)	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Methamidophos	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Metolachlor	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Metribuzin	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Molinate	mg/kg	< 0.15	< 0.16	< 0.14	< 0.15	< 0.14
Myclobutanil	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Naled	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Norflurazon	mg/kg	< 0.15	< 0.16	< 0.14	< 0.15	< 0.14
Oxadiazon	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Oxyfluorfen	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Paclobutrazol	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Parathion-ethyl	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Parathion-methyl	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Pendimethalin	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Permethrin	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Pirimicarb	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Pirimiphos-methyl	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07

Sample Type: Soil

Sample Name:	Composite of 13:016 Composite 2A, 13:016 Composite 2B, 13:016 Composite 2C, 13:016 Composite 2D	Composite of 13:016 Composite 3A, 13:016 Composite 3B, 13:016 Composite 3C, 13:016 Composite 3D	Composite of 13:016 Composite 4A, 13:016 Composite 4B, 13:016 Composite 4C, 13:016 Composite 4D	Composite of 13:016 Composite 7A, 13:016 Composite 7B, 13:016 Composite 7C, 13:016 Composite 7D	Composite of 13:016 Composite 8A, 13:016 Composite 8B, 13:016 Composite 8C, 13:016 Composite 8D
Lab Number:	1099401.34	1099401.35	1099401.36	1099401.37	1099401.38

Organonitro&phosphorus Pesticides Screen in Soil by GCMS						
Prochloraz	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Procymidone	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Prometryn	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Propachlor	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Propanil	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Propazine	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Propiconazole	mg/kg	< 0.06	< 0.06	< 0.05	< 0.06	< 0.05
Pyriproxyfen	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Quizalofop-ethyl	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Simazine	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Simetryn	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Sulfentrazone	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
TCMTB [2-(thiocyanomethylthio) benzothiazole, Busan]	mg/kg dry wt	< 0.15	< 0.16	< 0.14	< 0.15	< 0.14
Tebuconazole	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Terbacil	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Terbufos	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Terbumeton	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Terbuthylazine	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Terbuthylazine-desethyl	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Terbutryn	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Thiabendazole	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Thiobencarb	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Tolyfluanid	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Triazophos	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Trifluralin	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07
Vinclozolin	mg/kg	< 0.08	< 0.08	< 0.07	< 0.08	< 0.07

Sample Name:	Composite of 13:016 Composite 9A, 13:016 Composite 9B, 13:016 Composite 9C, 13:016 Composite 9D	Composite of 13:016 Composite 10A, 13:016 Composite 10B, 13:016 Composite 10C, 13:016 Composite 10D			
Lab Number:	1099401.39	1099401.40			

Individual Tests						
Dry Matter	g/100g as rcvd	72	48	-	-	-
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	6	26	-	-	-
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	0.27	-	-	-
Total Recoverable Chromium	mg/kg dry wt	7	11	-	-	-
Total Recoverable Copper	mg/kg dry wt	10	25	-	-	-
Total Recoverable Lead	mg/kg dry wt	6.6	7.1	-	-	-
Total Recoverable Nickel	mg/kg dry wt	4	3	-	-	-
Total Recoverable Zinc	mg/kg dry wt	36	52	-	-	-
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.010	< 0.010	-	-	-
alpha-BHC	mg/kg dry wt	< 0.010	< 0.010	-	-	-
beta-BHC	mg/kg dry wt	< 0.010	< 0.010	-	-	-
delta-BHC	mg/kg dry wt	< 0.010	< 0.010	-	-	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.010	< 0.010	-	-	-
cis-Chlordane	mg/kg dry wt	< 0.010	< 0.010	-	-	-

Sample Type: Soil

Sample Name:		Composite of 13:016 Composite 9A, 13:016 Composite 9B, 13:016 Composite 9C, 13:016 Composite 9D	Composite of 13:016 Composite 10A, 13:016 Composite 10B, 13:016 Composite 10C, 13:016 Composite 10D			
Lab Number:		1099401.39	1099401.40			
Organochlorine Pesticides Screening in Soil						
trans-Chlordane	mg/kg dry wt	< 0.010	< 0.010	-	-	-
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	-	-	-
2,4'-DDD	mg/kg dry wt	< 0.010	0.024	-	-	-
4,4'-DDD	mg/kg dry wt	< 0.010	0.081	-	-	-
2,4'-DDE	mg/kg dry wt	< 0.010	< 0.010	-	-	-
4,4'-DDE	mg/kg dry wt	< 0.010	0.166	-	-	-
2,4'-DDT	mg/kg dry wt	< 0.010	0.057	-	-	-
4,4'-DDT	mg/kg dry wt	< 0.010	0.35	-	-	-
Dieldrin	mg/kg dry wt	< 0.010	< 0.010	-	-	-
Endosulfan I	mg/kg dry wt	< 0.010	< 0.010	-	-	-
Endosulfan II	mg/kg dry wt	< 0.010	< 0.010	-	-	-
Endosulfan sulphate	mg/kg dry wt	< 0.010	< 0.010	-	-	-
Endrin	mg/kg dry wt	< 0.010	< 0.010	-	-	-
Endrin Aldehyde	mg/kg dry wt	< 0.010	< 0.010	-	-	-
Endrin ketone	mg/kg dry wt	< 0.010	< 0.010	-	-	-
Heptachlor	mg/kg dry wt	< 0.010	< 0.010	-	-	-
Heptachlor epoxide	mg/kg dry wt	< 0.010	< 0.010	-	-	-
Hexachlorobenzene	mg/kg dry wt	< 0.010	< 0.010	-	-	-
Methoxychlor	mg/kg dry wt	< 0.010	< 0.010	-	-	-
Organonitro&phosphorus Pesticides Screen in Soil by GCMS						
Acetochlor	mg/kg	< 0.07	< 0.10	-	-	-
Alachlor	mg/kg	< 0.05	< 0.05	-	-	-
Atrazine	mg/kg	< 0.07	< 0.10	-	-	-
Atrazine-desethyl	mg/kg	< 0.07	< 0.10	-	-	-
Atrazine-desisopropyl	mg/kg	< 0.14	< 0.2	-	-	-
Azaconazole	mg/kg	< 0.04	< 0.05	-	-	-
Azinphos-methyl	mg/kg	< 0.14	< 0.2	-	-	-
Benalaxyl	mg/kg	< 0.04	< 0.05	-	-	-
Bitertanol	mg/kg	< 0.14	< 0.2	-	-	-
Bromacil	mg/kg	< 0.07	< 0.10	-	-	-
Bromopropylate	mg/kg	< 0.07	< 0.10	-	-	-
Butachlor	mg/kg	< 0.07	< 0.10	-	-	-
Captan	mg/kg	< 0.14	< 0.2	-	-	-
Carbaryl	mg/kg	< 0.07	< 0.10	-	-	-
Carbofuran	mg/kg	< 0.07	< 0.10	-	-	-
Chlorfluazuron	mg/kg	< 0.07	< 0.10	-	-	-
Chlorothalonil	mg/kg	< 0.07	< 0.10	-	-	-
Chlorpyrifos	mg/kg	< 0.07	< 0.10	-	-	-
Chlorpyrifos-methyl	mg/kg	< 0.07	< 0.10	-	-	-
Chlortoluron	mg/kg	< 0.14	< 0.2	-	-	-
Cyanazine	mg/kg	< 0.07	< 0.10	-	-	-
Cyfluthrin	mg/kg	< 0.07	< 0.10	-	-	-
Cyhalothrin	mg/kg	< 0.07	< 0.10	-	-	-
Cypermethrin	mg/kg	< 0.14	< 0.2	-	-	-
Deltamethrin (Tralomethrin)	mg/kg	< 0.07	< 0.10	-	-	-
Diazinon	mg/kg	< 0.04	< 0.05	-	-	-
Dichlofluanid	mg/kg	< 0.07	< 0.10	-	-	-
Dichloran	mg/kg	< 0.2	< 0.3	-	-	-
Dichlorvos	mg/kg	< 0.09	< 0.10	-	-	-
Difenoconazole	mg/kg	< 0.10	< 0.14	-	-	-

Sample Type: Soil

Sample Name:	Composite of 13:016 Composite 9A, 13:016 Composite 9B, 13:016 Composite 9C, 13:016 Composite 9D	Composite of 13:016 Composite 10A, 13:016 Composite 10B, 13:016 Composite 10C, 13:016 Composite 10D			
Lab Number:	1099401.39	1099401.40			

Organonitro&phosphorus Pesticides Screen in Soil by GCMS

Dimethoate	mg/kg	< 0.14	< 0.2	-	-	-
Diphenylamine	mg/kg	< 0.14	< 0.2	-	-	-
Diuron	mg/kg	< 0.07	< 0.10	-	-	-
Fenpropimorph	mg/kg	< 0.07	< 0.10	-	-	-
Fluazifop-butyl	mg/kg	< 0.07	< 0.10	-	-	-
Fluometuron	mg/kg	< 0.07	< 0.10	-	-	-
Flusilazole	mg/kg	< 0.07	< 0.10	-	-	-
Fluvalinate	mg/kg	< 0.05	< 0.07	-	-	-
Furalaxyl	mg/kg	< 0.04	< 0.05	-	-	-
Haloxifop-methyl	mg/kg	< 0.07	< 0.10	-	-	-
Hexaconazole	mg/kg	< 0.07	< 0.10	-	-	-
Hexazinone	mg/kg	< 0.04	< 0.05	-	-	-
IPBC (3-Iodo-2-propynyl-n-butylcarbamate)	mg/kg dry wt	< 0.4	< 0.5	-	-	-
Iprodione	mg/kg	< 0.07	< 0.10	-	-	-
Kresoxim-methyl	mg/kg	< 0.04	< 0.05	-	-	-
Linuron	mg/kg	< 0.07	< 0.10	-	-	-
Malathion	mg/kg	< 0.07	< 0.10	-	-	-
Metalaxyl (Mefenoxam)	mg/kg	< 0.07	< 0.10	-	-	-
Methamidophos	mg/kg	< 0.4	< 0.5	-	-	-
Metolachlor	mg/kg	< 0.05	< 0.05	-	-	-
Metribuzin	mg/kg	< 0.07	< 0.10	-	-	-
Molinate	mg/kg	< 0.14	< 0.2	-	-	-
Myclobutanil	mg/kg	< 0.07	< 0.10	-	-	-
Naled	mg/kg	< 0.4	< 0.5	-	-	-
Norflurazon	mg/kg	< 0.14	< 0.2	-	-	-
Oxadiazon	mg/kg	< 0.07	< 0.10	-	-	-
Oxyfluorfen	mg/kg	< 0.04	< 0.05	-	-	-
Paclobutrazol	mg/kg	< 0.07	< 0.10	-	-	-
Parathion-ethyl	mg/kg	< 0.07	< 0.10	-	-	-
Parathion-methyl	mg/kg	< 0.07	< 0.10	-	-	-
Pendimethalin	mg/kg	< 0.07	< 0.10	-	-	-
Permethrin	mg/kg	< 0.03	< 0.03	-	-	-
Pirimicarb	mg/kg	< 0.07	< 0.10	-	-	-
Pirimiphos-methyl	mg/kg	< 0.07	< 0.10	-	-	-
Prochloraz	mg/kg	< 0.4	< 0.5	-	-	-
Procymidone	mg/kg	< 0.07	< 0.10	-	-	-
Prometryn	mg/kg	< 0.04	< 0.05	-	-	-
Propachlor	mg/kg	< 0.07	< 0.10	-	-	-
Propanil	mg/kg	< 0.2	< 0.2	-	-	-
Propazine	mg/kg	< 0.04	< 0.05	-	-	-
Propiconazole	mg/kg	< 0.05	< 0.07	-	-	-
Pyriproxyfen	mg/kg	< 0.07	< 0.10	-	-	-
Quizalofop-ethyl	mg/kg	< 0.07	< 0.10	-	-	-
Simazine	mg/kg	< 0.07	< 0.10	-	-	-
Simetryn	mg/kg	< 0.07	< 0.10	-	-	-
Sulfentrazone	mg/kg	< 0.4	< 0.5	-	-	-
TCMTB [2-(thiocyanomethylthio)benzothiazole, Busan]	mg/kg dry wt	< 0.14	< 0.2	-	-	-
Tebuconazole	mg/kg	< 0.07	< 0.10	-	-	-
Terbacil	mg/kg	< 0.07	< 0.10	-	-	-
Terbufos	mg/kg	< 0.07	< 0.10	-	-	-

Sample Type: Soil						
Sample Name:	Composite of 13:016 Composite 9A, 13:016 Composite 9B, 13:016 Composite 9C, 13:016 Composite 9D	Composite of 13:016 Composite 10A, 13:016 Composite 10B, 13:016 Composite 10C, 13:016 Composite 10D				
Lab Number:	1099401.39	1099401.40				
Organonitro&phosphorus Pesticides Screen in Soil by GCMS						
Terbutometon	mg/kg	< 0.07	< 0.10	-	-	-
Terbutylazine	mg/kg	< 0.04	< 0.05	-	-	-
Terbutylazine-desethyl	mg/kg	< 0.07	< 0.10	-	-	-
Terbutryn	mg/kg	< 0.07	< 0.10	-	-	-
Thiabendazole	mg/kg	< 0.4	< 0.5	-	-	-
Thiobencarb	mg/kg	< 0.07	< 0.10	-	-	-
Tolyfluanid	mg/kg	< 0.04	< 0.05	-	-	-
Triazophos	mg/kg	< 0.07	< 0.10	-	-	-
Trifluralin	mg/kg	< 0.07	< 0.10	-	-	-
Vinclozolin	mg/kg	< 0.07	< 0.10	-	-	-

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 clean 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.

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Samples
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	29-40
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	-	33-40
Organochlorine/nitro&phosphorus Pests Screen in Soils, GCMS	Sonication extraction, Dilution cleanup, GC-MS analysis. Tested on as received sample	-	33-40
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. US EPA 3550. (Free water removed before analysis).	0.10 g/100g as rcvd	33-40
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	29-40
Composite Environmental Solid Samples*	Individual sample fractions mixed together to form a composite fraction.	-	1-32
Total Recoverable Arsenic	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	2 mg/kg dry wt	29-32

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

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

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



Carole Rodgers-Carroll BA, NZCS
Client Services Manager - Environmental Division



ANALYSIS REPORT

Client:	Beca Infrastructure Limited	Lab No:	1099944	SPV1
Contact:	Kate Jackson C/- Beca Infrastructure Limited PO Box 6345 Wellesley Street AUCKLAND 1141	Date Registered:	14-Feb-2013	
		Date Reported:	22-Feb-2013	
		Quote No:	53458	
		Order No:		
		Client Reference:		
		Submitted By:	Kate Jackson	

Sample Type: Soil						
Sample Name:	13:016 HA101 12-Feb-2013 9:20 am	13:016 HA122 12-Feb-2013 9:20 am	13:016 HA132 12-Feb-2013 3:00 pm	Composite of 13:016 Composite 11A + 13:016 Composite 11B + 13:016 Composite 11C + 13:016 Composite 11D	Composite of 13:016 Composite 12A + 13:016 Composite 12B + 13:016 Composite 12C + 13:016 Composite 12D	
Lab Number:	1099944.21	1099944.22	1099944.23	1099944.24	1099944.25	
Individual Tests						
Dry Matter	g/100g as rcvd	78	85	71	66	77
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	4	3	9	13	6
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	0.59	0.21	0.22
Total Recoverable Chromium	mg/kg dry wt	6	6	15	8	8
Total Recoverable Copper	mg/kg dry wt	7	6	186	71	50
Total Recoverable Lead	mg/kg dry wt	6.0	5.0	39	7.7	8.0
Total Recoverable Nickel	mg/kg dry wt	4	5	5	4	4
Total Recoverable Zinc	mg/kg dry wt	32	31	210	70	77
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
alpha-BHC	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
beta-BHC	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
delta-BHC	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
cis-Chlordane	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
trans-Chlordane	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
2,4'-DDD	mg/kg dry wt	< 0.010	< 0.010	0.130	0.075	0.025
4,4'-DDD	mg/kg dry wt	< 0.010	< 0.010	0.22	0.153	0.048
2,4'-DDE	mg/kg dry wt	< 0.010	< 0.010	0.027	0.018	< 0.010
4,4'-DDE	mg/kg dry wt	< 0.010	< 0.010	0.86	0.23	0.159
2,4'-DDT	mg/kg dry wt	< 0.010	< 0.010	0.105	0.037	0.024
4,4'-DDT	mg/kg dry wt	< 0.010	< 0.010	0.58	0.20	0.107
Dieldrin	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Endosulfan I	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Endosulfan II	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Endosulfan sulphate	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Endrin	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Endrin Aldehyde	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Endrin ketone	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Heptachlor	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Heptachlor epoxide	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010



Sample Type: Soil						
Sample Name:	13:016 HA101 12-Feb-2013 9:20 am	13:016 HA122 12-Feb-2013 9:20 am	13:016 HA132 12-Feb-2013 3:00 pm	Composite of 13:016 Composite 11A + 13:016 Composite 11B + 13:016 Composite 11C + 13:016 Composite 11D	Composite of 13:016 Composite 12A + 13:016 Composite 12B + 13:016 Composite 12C + 13:016 Composite 12D	
Lab Number:	1099944.21	1099944.22	1099944.23	1099944.24	1099944.25	
Organochlorine Pesticides Screening in Soil						
Hexachlorobenzene	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Methoxychlor	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Organonitro&phosphorus Pesticides Screen in Soil by GCMS						
Acetochlor	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Alachlor	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Atrazine	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Atrazine-desethyl	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Atrazine-desisopropyl	mg/kg	< 0.13	< 0.12	< 0.14	< 0.15	< 0.13
Azaconazole	mg/kg	< 0.04	< 0.03	< 0.04	< 0.04	< 0.04
Azinphos-methyl	mg/kg	< 0.13	< 0.12	< 0.14	< 0.15	< 0.13
Benalaxyl	mg/kg	< 0.04	< 0.03	< 0.04	< 0.04	< 0.04
Bitertanol	mg/kg	< 0.13	< 0.12	< 0.14	< 0.15	< 0.13
Bromacil	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Bromopropylate	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Butachlor	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Captan	mg/kg	< 0.13	< 0.12	< 0.14	< 0.15	< 0.13
Carbaryl	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Carbofuran	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Chlorfluazuron	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Chlorothalonil	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Chlorpyrifos	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Chlorpyrifos-methyl	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Chlortoluron	mg/kg	< 0.13	< 0.12	< 0.14	< 0.15	< 0.13
Cyanazine	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Cyfluthrin	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Cyhalothrin	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Cypermethrin	mg/kg	< 0.13	< 0.12	< 0.14	< 0.15	< 0.13
Deltamethrin (Tralomethrin)	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Diazinon	mg/kg	< 0.04	< 0.03	< 0.04	< 0.04	< 0.04
Dichlofluanid	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Dichloran	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	mg/kg	< 0.09	< 0.09	< 0.09	< 0.09	< 0.09
Difenoconazole	mg/kg	< 0.09	< 0.09	< 0.10	< 0.11	< 0.09
Dimethoate	mg/kg	< 0.13	< 0.12	< 0.14	< 0.15	< 0.13
Diphenylamine	mg/kg	< 0.13	< 0.12	< 0.14	< 0.15	< 0.13
Diuron	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Fenpropimorph	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Fluazifop-butyl	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Fluometuron	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Flusilazole	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Fluvalinate	mg/kg	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05
Furalaxyl	mg/kg	< 0.04	< 0.03	< 0.04	< 0.04	< 0.04
Haloxifop-methyl	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Hexaconazole	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Hexazinone	mg/kg	< 0.04	< 0.03	< 0.04	< 0.04	< 0.04
IPBC (3-Iodo-2-propynyl-n-butylcarbamate)	mg/kg dry wt	< 0.4	< 0.3	< 0.4	< 0.4	< 0.4
Iprodione	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Kresoxim-methyl	mg/kg	< 0.04	< 0.03	< 0.04	< 0.04	< 0.04
Linuron	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Malathion	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07

Sample Type: Soil

Sample Name:	13:016 HA101 12-Feb-2013 9:20 am	13:016 HA122 12-Feb-2013 9:20 am	13:016 HA132 12-Feb-2013 3:00 pm	Composite of 13:016 Composite 11A + 13:016 Composite 11B + 13:016 Composite 11C + 13:016 Composite 11D	Composite of 13:016 Composite 12A + 13:016 Composite 12B + 13:016 Composite 12C + 13:016 Composite 12D
Lab Number:	1099944.21	1099944.22	1099944.23	1099944.24	1099944.25

Organonitro&phosphorus Pesticides Screen in Soil by GCMS

Metalaxyl (Mefenoxam)	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Methamidophos	mg/kg	< 0.4	< 0.3	< 0.4	< 0.4	< 0.4
Metolachlor	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Metribuzin	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Molinate	mg/kg	< 0.13	< 0.12	< 0.14	< 0.15	< 0.13
Myclobutanil	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Naled	mg/kg	< 0.4	< 0.3	< 0.4	< 0.4	< 0.4
Norflurazon	mg/kg	< 0.13	< 0.12	< 0.14	< 0.15	< 0.13
Oxadiazon	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Oxyfluorfen	mg/kg	< 0.04	< 0.03	< 0.04	< 0.04	< 0.04
Pacloubutrazol	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Parathion-ethyl	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Parathion-methyl	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Pendimethalin	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Permethrin	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Pirimicarb	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Pirimiphos-methyl	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Prochloraz	mg/kg	< 0.4	< 0.3	< 0.4	< 0.4	< 0.4
Procymidone	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Prometryn	mg/kg	< 0.04	< 0.03	< 0.04	< 0.04	< 0.04
Propachlor	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Propanil	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Propazine	mg/kg	< 0.04	< 0.03	< 0.04	< 0.04	< 0.04
Propiconazole	mg/kg	< 0.05	< 0.05	< 0.05	< 0.06	< 0.05
Pyriproxyfen	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Quizalofop-ethyl	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Simazine	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Simetryn	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Sulfentrazone	mg/kg	< 0.4	< 0.3	< 0.4	< 0.4	< 0.4
TCMTB [2-(thiocyanomethylthio) benzothiazole, Busan]	mg/kg dry wt	< 0.13	< 0.12	< 0.14	< 0.15	< 0.13
Tebuconazole	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Terbacil	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Terbufos	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Terbumeton	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Terbuthylazine	mg/kg	< 0.04	< 0.03	< 0.04	< 0.04	< 0.04
Terbuthylazine-desethyl	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Terbutryn	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Thiabendazole	mg/kg	< 0.4	< 0.3	< 0.4	< 0.4	< 0.4
Thiobencarb	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Tolyfluanid	mg/kg	< 0.04	< 0.03	< 0.04	< 0.04	< 0.04
Triazophos	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Trifluralin	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07
Vinclozolin	mg/kg	< 0.07	< 0.06	< 0.07	< 0.08	< 0.07

Sample Name:	Composite of 13:016 Composite 13A + 13:016 Composite 13B + 13:016 Composite 13C + 13:016 Composite 13D	Composite of 13:016 Composite 5A + 13:016 Composite 5B + 13:016 Composite 5C + 13:016 Composite 5D	Composite of 13:016 Composite 6A + 13:016 Composite 6B + 13:016 Composite 6C + 13:016 Composite 6D		
Lab Number:	1099944.26	1099944.27	1099944.28		

Individual Tests

Sample Type: Soil

Sample Name:	Composite of 13:016 Composite 13A + 13:016 Composite 13B + 13:016 Composite 13C + 13:016 Composite 13D	Composite of 13:016 Composite 5A + 13:016 Composite 5B + 13:016 Composite 5C + 13:016 Composite 5D	Composite of 13:016 Composite 6A + 13:016 Composite 6B + 13:016 Composite 6C + 13:016 Composite 6D		
Lab Number:	1099944.26	1099944.27	1099944.28		
Individual Tests					
Dry Matter	g/100g as rcvd	81	79	73	-
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn					
Total Recoverable Arsenic	mg/kg dry wt	5	5	8	-
Total Recoverable Cadmium	mg/kg dry wt	0.25	< 0.10	0.35	-
Total Recoverable Chromium	mg/kg dry wt	9	6	8	-
Total Recoverable Copper	mg/kg dry wt	37	21	53	-
Total Recoverable Lead	mg/kg dry wt	8.2	7.7	20	-
Total Recoverable Nickel	mg/kg dry wt	5	4	5	-
Total Recoverable Zinc	mg/kg dry wt	80	50	76	-
Organochlorine Pesticides Screening in Soil					
Aldrin	mg/kg dry wt	< 0.010	< 0.010	< 0.010	-
alpha-BHC	mg/kg dry wt	< 0.010	< 0.010	< 0.010	-
beta-BHC	mg/kg dry wt	< 0.010	< 0.010	< 0.010	-
delta-BHC	mg/kg dry wt	< 0.010	< 0.010	< 0.010	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.010	< 0.010	< 0.010	-
cis-Chlordane	mg/kg dry wt	< 0.010	< 0.010	< 0.010	-
trans-Chlordane	mg/kg dry wt	< 0.010	< 0.010	< 0.010	-
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	< 0.04	-
2,4'-DDD	mg/kg dry wt	0.012	< 0.010	0.017	-
4,4'-DDD	mg/kg dry wt	0.026	0.018	0.059	-
2,4'-DDE	mg/kg dry wt	< 0.010	< 0.010	< 0.010	-
4,4'-DDE	mg/kg dry wt	0.156	0.082	0.42	-
2,4'-DDT	mg/kg dry wt	0.020	0.012	0.062	-
4,4'-DDT	mg/kg dry wt	0.070	0.046	0.31	-
Dieldrin	mg/kg dry wt	< 0.010	0.016	< 0.010	-
Endosulfan I	mg/kg dry wt	< 0.010	< 0.010	< 0.010	-
Endosulfan II	mg/kg dry wt	< 0.010	< 0.010	< 0.010	-
Endosulfan sulphate	mg/kg dry wt	< 0.010	< 0.010	< 0.010	-
Endrin	mg/kg dry wt	< 0.010	< 0.010	< 0.010	-
Endrin Aldehyde	mg/kg dry wt	< 0.010	< 0.010	< 0.010	-
Endrin ketone	mg/kg dry wt	< 0.010	< 0.010	< 0.010	-
Heptachlor	mg/kg dry wt	< 0.010	< 0.010	< 0.010	-
Heptachlor epoxide	mg/kg dry wt	< 0.010	< 0.010	< 0.010	-
Hexachlorobenzene	mg/kg dry wt	< 0.010	< 0.010	< 0.010	-
Methoxychlor	mg/kg dry wt	< 0.010	< 0.010	< 0.010	-
Organonitro&phosphorus Pesticides Screen in Soil by GCMS					
Acetochlor	mg/kg	< 0.06	< 0.07	< 0.07	-
Alachlor	mg/kg	< 0.05	< 0.05	< 0.05	-
Atrazine	mg/kg	< 0.06	< 0.07	< 0.07	-
Atrazine-desethyl	mg/kg	< 0.06	< 0.07	< 0.07	-
Atrazine-desisopropyl	mg/kg	< 0.12	< 0.13	< 0.13	-
Azaconazole	mg/kg	< 0.03	< 0.04	< 0.04	-
Azinphos-methyl	mg/kg	< 0.12	< 0.13	< 0.13	-
Benalaxyl	mg/kg	< 0.03	< 0.04	< 0.04	-
Bitertanol	mg/kg	< 0.12	< 0.13	< 0.13	-
Bromacil	mg/kg	< 0.06	< 0.07	< 0.07	-
Bromopropylate	mg/kg	< 0.06	< 0.07	< 0.07	-
Butachlor	mg/kg	< 0.06	< 0.07	< 0.07	-
Captan	mg/kg	< 0.12	< 0.13	< 0.13	-
Carbaryl	mg/kg	< 0.06	< 0.07	< 0.07	-

Sample Type: Soil

Sample Name:		Composite of 13:016 Composite 13A + 13:016 Composite 13B + 13:016 Composite 13C + 13:016 Composite 13D	Composite of 13:016 Composite 5A + 13:016 Composite 5B + 13:016 Composite 5C + 13:016 Composite 5D	Composite of 13:016 Composite 6A + 13:016 Composite 6B + 13:016 Composite 6C+ 13:016 Composite 6D		
Lab Number:		1099944.26	1099944.27	1099944.28		
Organonitro&phosphorus Pesticides Screen in Soil by GCMS						
Carbofuran	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Chlorfluazuron	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Chlorothalonil	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Chlorpyrifos	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Chlorpyrifos-methyl	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Chlortoluron	mg/kg	< 0.12	< 0.13	< 0.13	-	-
Cyanazine	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Cyfluthrin	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Cyhalothrin	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Cypermethrin	mg/kg	< 0.12	< 0.13	< 0.13	-	-
Deltamethrin (Tralomethrin)	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Diazinon	mg/kg	< 0.03	< 0.04	< 0.04	-	-
Dichlofluanid	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Dichloran	mg/kg	< 0.2	< 0.2	< 0.2	-	-
Dichlorvos	mg/kg	< 0.09	< 0.09	< 0.09	-	-
Difenoconazole	mg/kg	< 0.09	< 0.09	< 0.10	-	-
Dimethoate	mg/kg	< 0.12	< 0.13	< 0.13	-	-
Diphenylamine	mg/kg	< 0.12	< 0.13	< 0.13	-	-
Diuron	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Fenpropimorph	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Fluazifop-butyl	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Fluometuron	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Flusilazole	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Fluvalinate	mg/kg	< 0.05	< 0.05	< 0.05	-	-
Furalaxyl	mg/kg	< 0.03	< 0.04	< 0.04	-	-
Haloxifop-methyl	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Hexaconazole	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Hexazinone	mg/kg	< 0.03	< 0.04	< 0.04	-	-
IPBC (3-Iodo-2-propynyl-n-butylcarbamate)	mg/kg dry wt	< 0.3	< 0.4	< 0.4	-	-
Iprodione	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Kresoxim-methyl	mg/kg	< 0.03	< 0.04	< 0.04	-	-
Linuron	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Malathion	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Metalaxyl (Mefenoxam)	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Methamidophos	mg/kg	< 0.3	< 0.4	< 0.4	-	-
Metolachlor	mg/kg	< 0.05	< 0.05	< 0.05	-	-
Metribuzin	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Molinate	mg/kg	< 0.12	< 0.13	< 0.13	-	-
Myclobutanil	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Naled	mg/kg	< 0.3	< 0.4	< 0.4	-	-
Norflurazon	mg/kg	< 0.12	< 0.13	< 0.13	-	-
Oxadiazon	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Oxyfluorfen	mg/kg	< 0.03	< 0.04	< 0.04	-	-
Paclobutrazol	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Parathion-ethyl	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Parathion-methyl	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Pendimethalin	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Permethrin	mg/kg	< 0.03	< 0.03	< 0.03	-	-
Pirimicarb	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Pirimiphos-methyl	mg/kg	< 0.06	< 0.07	< 0.07	-	-

Sample Type: Soil						
Sample Name:	Composite of 13:016 Composite 13A + 13:016 Composite 13B + 13:016 Composite 13C + 13:016 Composite 13D	Composite of 13:016 Composite 5A + 13:016 Composite 5B + 13:016 Composite 5C + 13:016 Composite 5D	Composite of 13:016 Composite 6A + 13:016 Composite 6B + 13:016 Composite 6C + 13:016 Composite 6D			
Lab Number:	1099944.26	1099944.27	1099944.28			
Organonitro&phosphorus Pesticides Screen in Soil by GCMS						
Prochloraz	mg/kg	< 0.3	< 0.4	< 0.4	-	-
Procymidone	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Prometryn	mg/kg	< 0.03	< 0.04	< 0.04	-	-
Propachlor	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Propanil	mg/kg	< 0.2	< 0.2	< 0.2	-	-
Propazine	mg/kg	< 0.03	< 0.04	< 0.04	-	-
Propiconazole	mg/kg	< 0.05	< 0.05	< 0.05	-	-
Pyriproxyfen	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Quizalofop-ethyl	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Simazine	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Simetryn	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Sulfentrazone	mg/kg	< 0.3	< 0.4	< 0.4	-	-
TCMTB [2-(thiocyanomethylthio) benzothiazole, Busan]	mg/kg dry wt	< 0.12	< 0.13	< 0.13	-	-
Tebuconazole	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Terbacil	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Terbufos	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Terbumeton	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Terbuthylazine	mg/kg	< 0.03	< 0.04	< 0.04	-	-
Terbuthylazine-desethyl	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Terbutryn	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Thiabendazole	mg/kg	< 0.3	< 0.4	< 0.4	-	-
Thiobencarb	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Tolyfluanid	mg/kg	< 0.03	< 0.04	< 0.04	-	-
Triazophos	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Trifluralin	mg/kg	< 0.06	< 0.07	< 0.07	-	-
Vinclozolin	mg/kg	< 0.06	< 0.07	< 0.07	-	-

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 clean 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.

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Samples
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	21-28
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	-	21-28
Organochlorine/nitro&phosphorus Pests Screen in Soils, GCMS	Sonication extraction, Dilution cleanup, GC-MS analysis. Tested on as received sample	-	21-28
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. US EPA 3550. (Free water removed before analysis).	0.10 g/100g as rcvd	21-28
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	21-28
Composite Environmental Solid Samples*	Individual sample fractions mixed together to form a composite fraction.	-	1-20

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

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

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

A handwritten signature in blue ink, consisting of several overlapping, stylized strokes that form a unique, illegible mark.

Ara Heron BSc (Tech)
Client Services Manager - Environmental Division



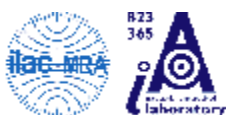
ANALYSIS REPORT

Client:	Beca Infrastructure Limited	Lab No:	1110684	SPV2
Contact:	Kate Ward C/- Beca Infrastructure Limited PO Box 6345 Wellesley Street AUCKLAND 1141	Date Registered:	13-Mar-2013	
		Date Reported:	21-Mar-2013	
		Quote No:		
		Order No:		
		Client Reference:	13:024 3320901/1000/013	
		Submitted By:	Kate Ward	

Amended Report

This report replaces an earlier report issued on the 19 Mar 2013 at 2:13 pm
 Following a request from the client, the sample name for . 23 has been changed.

Sample Type: Soil					
Sample Name:	13:024 TP104 S1	13:024 TP104 S2	13:024 TP105 S1	13:024 TP113 S1	13:024 TP113 S2
	0.1-0.15 m	0.6-0.7m	0.3-0.4m	0.2-0.3m	1.1-1.2m
	11-Mar-2013	11-Mar-2013	11-Mar-2013	11-Mar-2013	11-Mar-2013
	10:40 am	10:50 am	11:30 am	12:15 pm	12:30 pm
Lab Number:	1110684.1	1110684.2	1110684.4	1110684.7	1110684.8
Individual Tests					
Dry Matter	g/100g as rcvd	84	82	81	75
Heavy metal screen level	As,Cd,Cr,Cu,Ni,Pb,Zn				
Total Recoverable Arsenic	mg/kg dry wt	4	5	6	2
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	13	20	14	6
Total Recoverable Copper	mg/kg dry wt	12	15	16	8
Total Recoverable Lead	mg/kg dry wt	12.4	19.9	15.5	5.4
Total Recoverable Nickel	mg/kg dry wt	9	13	10	4
Total Recoverable Zinc	mg/kg dry wt	47	59	51	38
Polycyclic Aromatic Hydrocarbons Screening in Soil					
Acenaphthene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03
Benzo[a]anthracene	mg/kg dry wt	< 0.03	< 0.03	0.03	< 0.03
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.03	< 0.03	0.04	< 0.03
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	< 0.03	< 0.03	0.06	< 0.03
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03
Benzo[k]fluoranthene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	mg/kg dry wt	< 0.03	< 0.03	0.04	< 0.03
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	mg/kg dry wt	< 0.03	< 0.03	0.05	0.03
Fluorene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.03	< 0.03	0.04	< 0.03
Naphthalene	mg/kg dry wt	< 0.14	< 0.14	< 0.15	< 0.15
Phenanthrene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03
Pyrene	mg/kg dry wt	< 0.03	< 0.03	0.06	0.04
Total Petroleum Hydrocarbons in Soil					
C7 - C9	mg/kg dry wt	< 9	< 9	< 9	< 9
C10 - C14	mg/kg dry wt	< 20	< 20	< 20	< 20
C15 - C36	mg/kg dry wt	< 40	< 40	< 40	131
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 70	< 70	< 70	131



Sample Type: Soil

Sample Name:	13:024 TP106 S1 0.2-0.3m 11-Mar-2013 1:00 pm	13:024 Q1 S1 11-Mar-2013 1:30 pm	13:024 TP103 S1 0.2-0.3m 11-Mar-2013 1:30 pm	13:024 TP102 S1 0.4-0.5m 11-Mar-2013 2:25 pm	13:024 TP102 S2 1.1-1.2m 11-Mar-2013 2:35 pm
Lab Number:	1110684.10	1110684.13	1110684.15	1110684.17	1110684.18

Individual Tests

Dry Matter	g/100g as rcvd	84	87	87	80	83
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	5	4	5	5	4
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	12	14	14	19	16
Total Recoverable Copper	mg/kg dry wt	13	15	15	18	16
Total Recoverable Lead	mg/kg dry wt	11.9	19.1	18.2	19.3	18.5
Total Recoverable Nickel	mg/kg dry wt	9	11	11	13	12
Total Recoverable Zinc	mg/kg dry wt	44	58	57	62	61

Polycyclic Aromatic Hydrocarbons Screening in Soil

Acenaphthene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	0.07
Anthracene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	0.03
Benzo[a]anthracene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	0.07
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	0.22
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	0.27
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	0.18
Benzo[k]fluoranthene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	0.13
Chrysene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	0.09
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	0.13
Fluorene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	0.22
Naphthalene	mg/kg dry wt	< 0.13	< 0.13	< 0.14	< 0.15	< 0.13
Phenanthrene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	0.05
Pyrene	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	0.19

Total Petroleum Hydrocarbons in Soil

C7 - C9	mg/kg dry wt	< 8	< 8	< 8	< 9	< 8
C10 - C14	mg/kg dry wt	< 20	< 20	< 20	< 20	< 20
C15 - C36	mg/kg dry wt	< 40	< 40	< 40	< 40	370
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 70	< 70	< 70	< 70	370

Sample Name:	13:024 TP101 S1 0.1-0.2m 11-Mar-2013 3:10 pm	13:024 TP101 S2 1.2-1.3m 11-Mar-2013 3:15 pm	13:024 TP108 S1 0.1-0.2m 11-Mar-2013 4:00 pm	13:024 TP107 S1 0.2-0.3m 11-Mar-2013 4:35 pm	13:024 TP112 S1 0.1-0.2m 11-Mar-2013 5:10 pm
Lab Number:	1110684.20	1110684.21	1110684.23	1110684.25	1110684.27

Individual Tests

Dry Matter	g/100g as rcvd	72	79	87	74	72
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	4	5	10	2	3
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	6	23	14	5	6
Total Recoverable Copper	mg/kg dry wt	8	22	17	7	7
Total Recoverable Lead	mg/kg dry wt	4.4	24	26	4.8	4.7
Total Recoverable Nickel	mg/kg dry wt	3	16	13	4	4
Total Recoverable Zinc	mg/kg dry wt	27	73	62	27	29

Polycyclic Aromatic Hydrocarbons Screening in Soil

Acenaphthene	mg/kg dry wt	< 0.04	< 0.03	< 0.03	< 0.04	< 0.04
Acenaphthylene	mg/kg dry wt	< 0.04	< 0.03	< 0.03	< 0.04	< 0.04
Anthracene	mg/kg dry wt	< 0.04	< 0.03	< 0.03	< 0.04	< 0.04
Benzo[a]anthracene	mg/kg dry wt	< 0.04	< 0.03	< 0.03	< 0.04	< 0.04
Benzo[a]pyrene (BAP)	mg/kg dry wt	0.04	< 0.03	< 0.03	< 0.04	< 0.04

Sample Type: Soil						
Sample Name:	13:024 TP101 S1 0.1-0.2m 11-Mar-2013 3:10 pm	13:024 TP101 S2 1.2-1.3m 11-Mar-2013 3:15 pm	13:024 TP108 S1 0.1-0.2m 11-Mar-2013 4:00 pm	13:024 TP107 S1 0.2-0.3m 11-Mar-2013 4:35 pm	13:024 TP112 S1 0.1-0.2m 11-Mar-2013 5:10 pm	
Lab Number:	1110684.20	1110684.21	1110684.23	1110684.25	1110684.27	
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	0.05	< 0.03	< 0.03	< 0.04	< 0.04
Benzo[g,h,i]perylene	mg/kg dry wt	0.03	< 0.03	< 0.03	< 0.04	< 0.04
Benzo[k]fluoranthene	mg/kg dry wt	< 0.04	< 0.03	< 0.03	< 0.04	< 0.04
Chrysene	mg/kg dry wt	< 0.04	< 0.03	< 0.03	< 0.04	< 0.04
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.04	< 0.03	< 0.03	< 0.04	< 0.04
Fluoranthene	mg/kg dry wt	< 0.04	< 0.03	< 0.03	< 0.04	< 0.04
Fluorene	mg/kg dry wt	< 0.04	< 0.03	< 0.03	< 0.04	< 0.04
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	0.04	< 0.03	< 0.03	< 0.04	< 0.04
Naphthalene	mg/kg dry wt	< 0.16	< 0.14	< 0.13	< 0.16	< 0.16
Phenanthrene	mg/kg dry wt	< 0.04	< 0.03	< 0.03	< 0.04	< 0.04
Pyrene	mg/kg dry wt	0.03	< 0.03	< 0.03	< 0.04	< 0.04
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 10	< 9	< 8	< 10	< 10
C10 - C14	mg/kg dry wt	< 20	< 20	< 20	< 20	< 20
C15 - C36	mg/kg dry wt	142	< 40	< 40	66	104
Total hydrocarbons (C7 - C36)	mg/kg dry wt	142	< 70	< 70	< 70	104

Analyst's Comments

Appendix No.1 - Total Petroleum Hydrocarbon Chromatograms

Appendix No.2 - Total Petroleum Hydrocarbon Chromatograms

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 clean 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.

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Samples
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-2, 4, 7-8, 10, 13, 15, 17-18, 20-21, 23, 25, 27
TPH Oil Industry Profile + PAHscreen	Sonication in DCM extraction, SPE cleanup, GC-FID & GC-MS analysis. Tested on as received sample. US EPA 8015B/MfE Petroleum Industry Guidelines	-	1-2, 4, 7-8, 10, 13, 15, 17-18, 20-21, 23, 25, 27
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	-	1-2, 4, 7-8, 10, 13, 15, 17-18, 20-21, 23, 25, 27
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. US EPA 3550. (Free water removed before analysis).	0.10 g/100g as rcvd	1-2, 4, 7-8, 10, 13, 15, 17-18, 20-21, 23, 25, 27
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	1-2, 4, 7-8, 10, 13, 15, 17-18, 20-21, 23, 25, 27

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

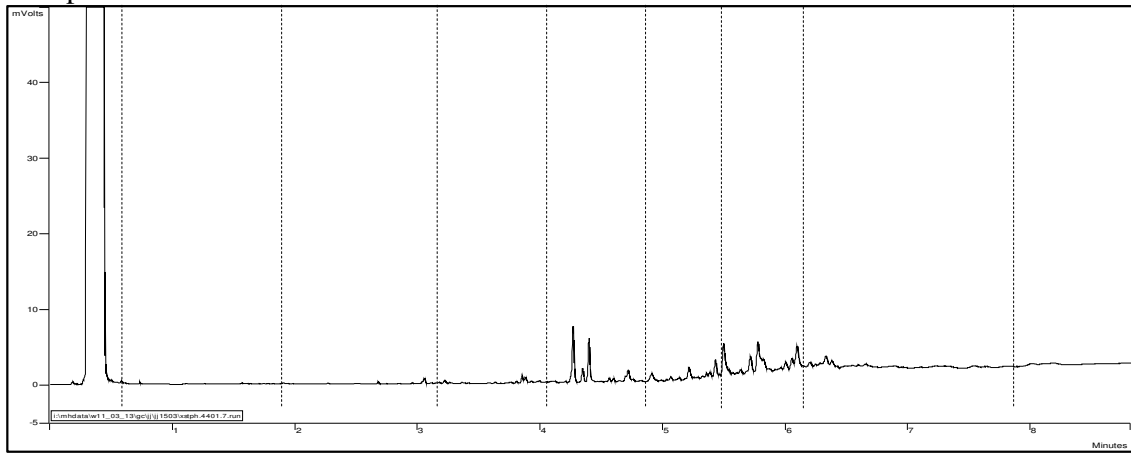
Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

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

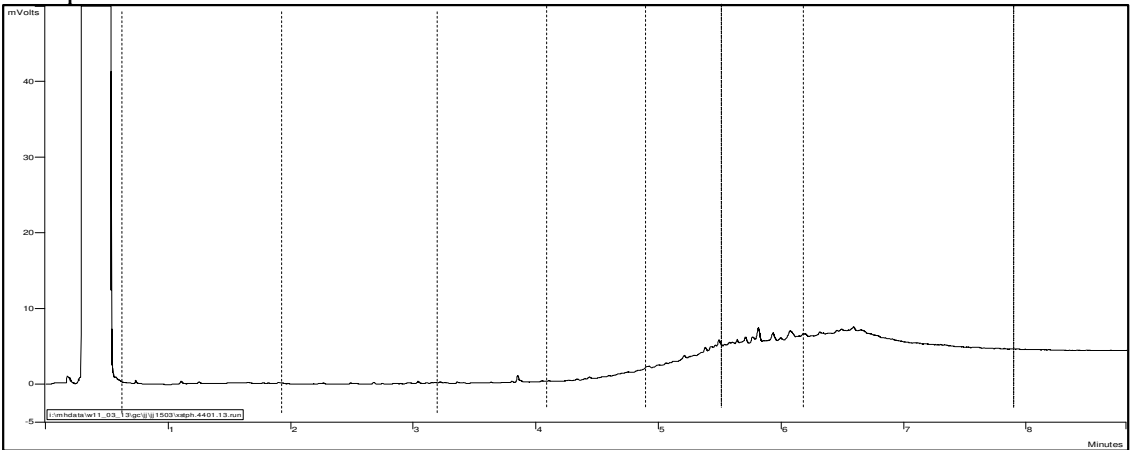
A handwritten signature in blue ink, consisting of several overlapping, stylized strokes that form a unique, illegible mark.

Ara Heron BSc (Tech)
Client Services Manager - Environmental Division

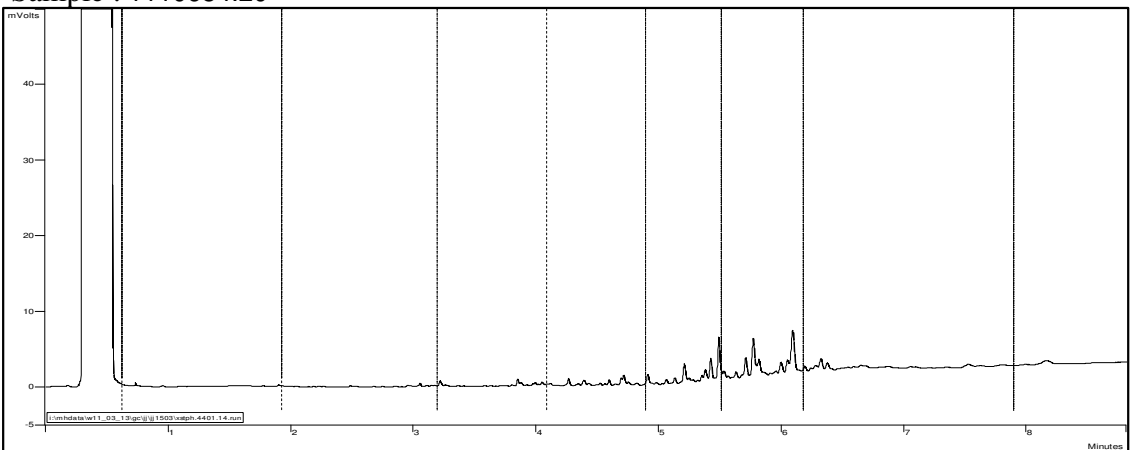
Sample : 1110684.7



Sample : 1110684.18

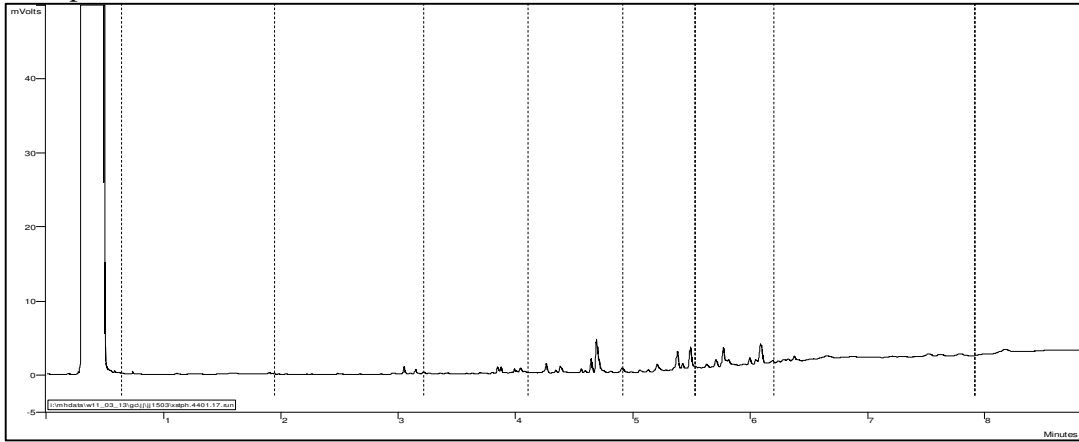


Sample : 1110684.20

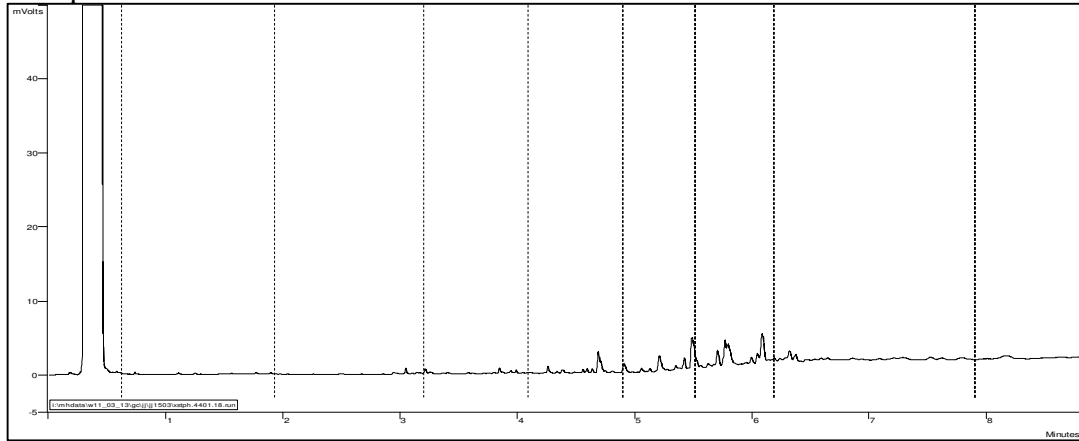


C7 C10 C15 C20 C25 C30 C34 C44

Sample: 1110684.25



Sample: 1110684.27



C7 C10 C15 C20 C25 C30 C34 C44



ANALYSIS REPORT

Client:	Beca Infrastructure Limited	Lab No:	1110964	SPV1
Contact:	Kate Ward	Date Registered:	14-Mar-2013	
	C/- Beca Infrastructure Limited	Date Reported:	20-Mar-2013	
	PO Box 6345	Quote No:		
	Wellesley Street	Order No:		
	AUCKLAND 1141	Client Reference:	13:024 3320901/1000/013	
		Submitted By:	Kate Ward	

Sample Type: Soil						
Sample Name:	13.024 TP111 S1 0.2-0.3 12-Mar-2013 7:30 am	13.024 TP109 S1 0.2-0.3 12-Mar-2013 8:00 am	13.024 TP110 S1 0.2-0.3 12-Mar-2013 8:30 am	13.024 TP115 S1 0.1-0.3 12-Mar-2013 8:55 am	13.024 TP114 S1 0.2-0.3 12-Mar-2013 9:20 am	
Lab Number:	1110964.1	1110964.3	1110964.5	1110964.7	1110964.9	
Individual Tests						
Dry Matter	g/100g as rcvd	73	94	84	86	92
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	4	4	4	4	5
Total Recoverable Cadmium	mg/kg dry wt	0.13	< 0.10	< 0.10	0.11	< 0.10
Total Recoverable Chromium	mg/kg dry wt	19	14	19	18	18
Total Recoverable Copper	mg/kg dry wt	16	17	14	14	20
Total Recoverable Lead	mg/kg dry wt	21	21	18.0	23	31
Total Recoverable Nickel	mg/kg dry wt	13	14	13	13	16
Total Recoverable Zinc	mg/kg dry wt	75	67	52	63	79
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Acenaphthene	mg/kg dry wt	< 0.04	0.06	< 0.03	< 0.03	< 0.03
Acenaphthylene	mg/kg dry wt	< 0.04	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	mg/kg dry wt	< 0.04	0.17	< 0.03	< 0.03	< 0.03
Benzo[a]anthracene	mg/kg dry wt	< 0.04	0.69	< 0.03	< 0.03	< 0.03
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.04	1.02	< 0.03	< 0.03	< 0.03
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	< 0.04	1.29	< 0.03	< 0.03	0.03
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.04	0.67	< 0.03	< 0.03	0.04
Benzo[k]fluoranthene	mg/kg dry wt	< 0.04	0.52	< 0.03	< 0.03	< 0.03
Chrysene	mg/kg dry wt	< 0.04	0.66	< 0.03	< 0.03	< 0.03
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.04	0.29	< 0.03	< 0.03	< 0.03
Fluoranthene	mg/kg dry wt	< 0.04	1.33	< 0.03	< 0.03	< 0.03
Fluorene	mg/kg dry wt	< 0.04	0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.04	0.64	< 0.03	< 0.03	< 0.03
Naphthalene	mg/kg dry wt	< 0.16	< 0.12	< 0.14	< 0.14	< 0.12
Phenanthrene	mg/kg dry wt	< 0.04	0.62	< 0.03	< 0.03	< 0.03
Pyrene	mg/kg dry wt	< 0.04	1.13	< 0.03	< 0.03	0.02
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 10	< 8	< 9	< 9	< 8
C10 - C14	mg/kg dry wt	< 20	< 20	< 20	< 20	< 20
C15 - C36	mg/kg dry wt	< 40	46	< 40	< 40	360
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 70	< 70	< 70	< 70	360



Sample Type: Soil						
Sample Name:	13.024 TP109 RB S1 0.1-0.2 12-Mar-2013 1:30 pm	13.024 TP109 RB S3 1.6-1.7 12-Mar-2013 1:40 pm	13.024 TP108 RB S1 0.8-0.9 12-Mar-2013 2:05 pm	13.024 TP107 RB S1 0.3-0.4 12-Mar-2013 2:40 pm	13.024 TP106 RB S1 0.3-0.4 12-Mar-2013 3:10 pm	
Lab Number:	1110964.11	1110964.13	1110964.14	1110964.16	1110964.18	
Individual Tests						
Dry Matter	g/100g as rcvd	90	69	86	82	82
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	7	4	4	7	5
Total Recoverable Cadmium	mg/kg dry wt	0.15	< 0.10	0.10	0.14	0.32
Total Recoverable Chromium	mg/kg dry wt	10	11	9	10	13
Total Recoverable Copper	mg/kg dry wt	26	41	14	15	17
Total Recoverable Lead	mg/kg dry wt	47	54	49	24	350
Total Recoverable Nickel	mg/kg dry wt	8	7	6	6	8
Total Recoverable Zinc	mg/kg dry wt	110	920	123	113	310
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Acenaphthene	mg/kg dry wt	< 0.03	< 0.04	< 0.03	< 0.03	< 0.03
Acenaphthylene	mg/kg dry wt	< 0.03	< 0.04	< 0.03	< 0.03	< 0.03
Anthracene	mg/kg dry wt	< 0.03	< 0.04	< 0.03	< 0.03	0.28
Benzo[a]anthracene	mg/kg dry wt	0.03	< 0.04	0.03	0.04	0.03
Benzo[a]pyrene (BAP)	mg/kg dry wt	0.04	< 0.04	0.04	0.06	0.04
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	0.06	0.04	0.05	0.07	0.05
Benzo[g,h,i]perylene	mg/kg dry wt	0.04	< 0.04	0.03	0.04	0.03
Benzo[k]fluoranthene	mg/kg dry wt	0.03	< 0.04	0.03	0.03	< 0.03
Chrysene	mg/kg dry wt	0.03	< 0.04	0.04	0.05	0.04
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.03	< 0.04	< 0.03	< 0.03	< 0.03
Fluoranthene	mg/kg dry wt	0.06	0.04	0.06	0.06	0.08
Fluorene	mg/kg dry wt	< 0.03	< 0.04	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	0.03	< 0.04	0.03	0.04	< 0.03
Naphthalene	mg/kg dry wt	< 0.13	< 0.17	< 0.13	< 0.15	< 0.14
Phenanthrene	mg/kg dry wt	< 0.03	< 0.04	< 0.03	< 0.03	< 0.03
Pyrene	mg/kg dry wt	0.06	0.04	0.06	0.07	0.07
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 8	< 10	< 8	< 9	< 9
C10 - C14	mg/kg dry wt	< 20	< 20	< 20	< 20	< 20
C15 - C36	mg/kg dry wt	88	< 40	< 40	40	< 40
Total hydrocarbons (C7 - C36)	mg/kg dry wt	88	< 70	< 70	< 70	< 70
Sample Name:	13.024 TP106 RB S2 0.8-0.9 12-Mar-2013 3:20 pm	13.024 TP101 RB S1 0.2-0.3 12-Mar-2013 3:40 pm	13.024 TP102 RB S1 0.3-0.4 12-Mar-2013 4:00 pm	13.024 TP102 RB S2 1.4-1.5 12-Mar-2013 4:10 pm		
Lab Number:	1110964.19	1110964.20	1110964.22	1110964.23		
Individual Tests						
Dry Matter	g/100g as rcvd	67	22	92	85	-
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	4	< 2	5	3	-
Total Recoverable Cadmium	mg/kg dry wt	0.24	< 0.10	0.13	0.10	-
Total Recoverable Chromium	mg/kg dry wt	8	3	13	9	-
Total Recoverable Copper	mg/kg dry wt	33	2	29	22	-
Total Recoverable Lead	mg/kg dry wt	33	0.7	42	67	-
Total Recoverable Nickel	mg/kg dry wt	5	< 2	9	6	-
Total Recoverable Zinc	mg/kg dry wt	240	6	93	54	-
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Acenaphthene	mg/kg dry wt	< 0.04	< 0.11	< 0.03	< 0.03	-
Acenaphthylene	mg/kg dry wt	< 0.04	< 0.11	< 0.03	< 0.03	-
Anthracene	mg/kg dry wt	< 0.04	< 0.11	0.03	< 0.03	-
Benzo[a]anthracene	mg/kg dry wt	0.09	< 0.11	0.08	0.04	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	0.11	< 0.11	0.11	0.06	-

Sample Type: Soil						
Sample Name:	13.024 TP106 RB S2 0.8-0.9 12-Mar-2013 3:20 pm	13.024 TP101 RB S1 0.2-0.3 12-Mar-2013 3:40 pm	13.024 TP102 RB S1 0.3-0.4 12-Mar-2013 4:00 pm	13.024 TP102 RB S2 1.4-1.5 12-Mar-2013 4:10 pm		
Lab Number:	1110964.19	1110964.20	1110964.22	1110964.23		
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	0.12	< 0.11	0.16	0.08	-
Benzo[g,h,i]perylene	mg/kg dry wt	0.06	< 0.11	0.10	0.05	-
Benzo[k]fluoranthene	mg/kg dry wt	0.06	< 0.11	0.06	0.04	-
Chrysene	mg/kg dry wt	0.09	< 0.11	0.09	0.05	-
Dibenzo[a,h]anthracene	mg/kg dry wt	0.04	< 0.11	0.03	< 0.03	-
Fluoranthene	mg/kg dry wt	0.20	< 0.11	0.21	0.07	-
Fluorene	mg/kg dry wt	< 0.04	< 0.11	< 0.03	< 0.03	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	0.05	< 0.11	0.06	0.04	-
Naphthalene	mg/kg dry wt	< 0.18	< 0.6	< 0.12	< 0.14	-
Phenanthrene	mg/kg dry wt	0.07	< 0.11	0.12	< 0.03	-
Pyrene	mg/kg dry wt	0.17	< 0.11	0.18	0.07	-
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 11	< 40	< 8	< 8	-
C10 - C14	mg/kg dry wt	< 30	< 70	< 20	< 20	-
C15 - C36	mg/kg dry wt	< 50	200	270	< 40	-
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 80	< 300	270	< 70	-

Analyst's Comments

Appendix No.1 - Total Petroleum Hydrocarbon Chromatograms

Appendix No.2 - Total Petroleum Hydrocarbon Chromatograms

Appendix No.3 - Total Petroleum Hydrocarbon Chromatograms

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 clean 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.

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Samples
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1, 3, 5, 7, 9, 11, 13-14, 16, 18-20, 22-23
TPH Oil Industry Profile + PAHscreen	Sonication in DCM extraction, SPE cleanup, GC-FID & GC-MS analysis. Tested on as received sample. US EPA 8015B/MfE Petroleum Industry Guidelines	-	1, 3, 5, 7, 9, 11, 13-14, 16, 18-20, 22-23
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	-	1, 3, 5, 7, 9, 11, 13-14, 16, 18-20, 22-23
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. US EPA 3550. (Free water removed before analysis).	0.10 g/100g as rcvd	1, 3, 5, 7, 9, 11, 13-14, 16, 18-20, 22-23
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	1, 3, 5, 7, 9, 11, 13-14, 16, 18-20, 22-23

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

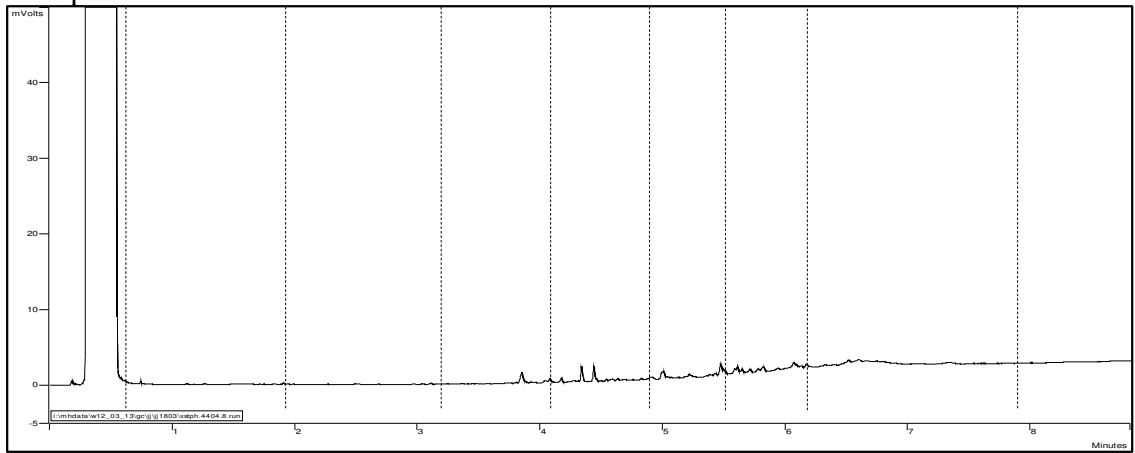
Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

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

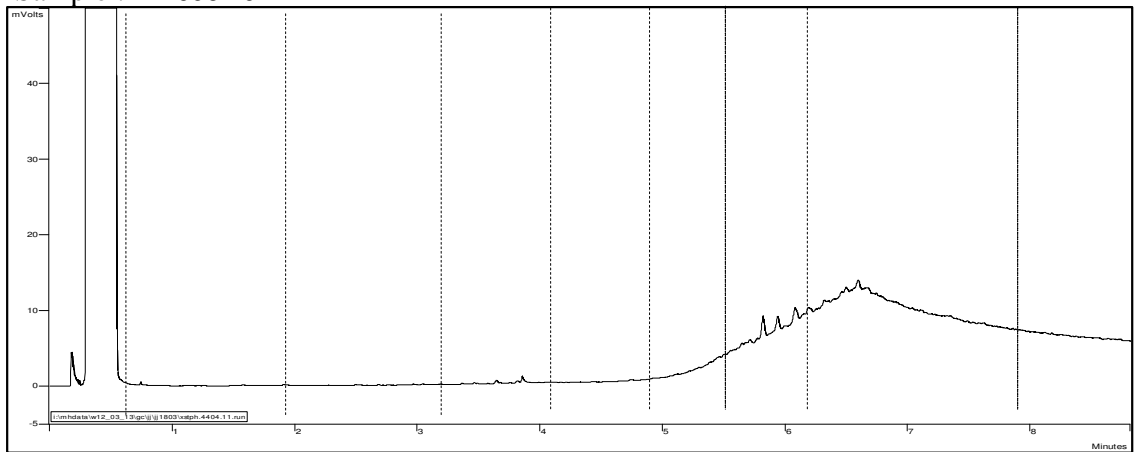
A handwritten signature in blue ink, consisting of several overlapping, stylized strokes that form a unique, illegible mark.

Ara Heron BSc (Tech)
Client Services Manager - Environmental Division

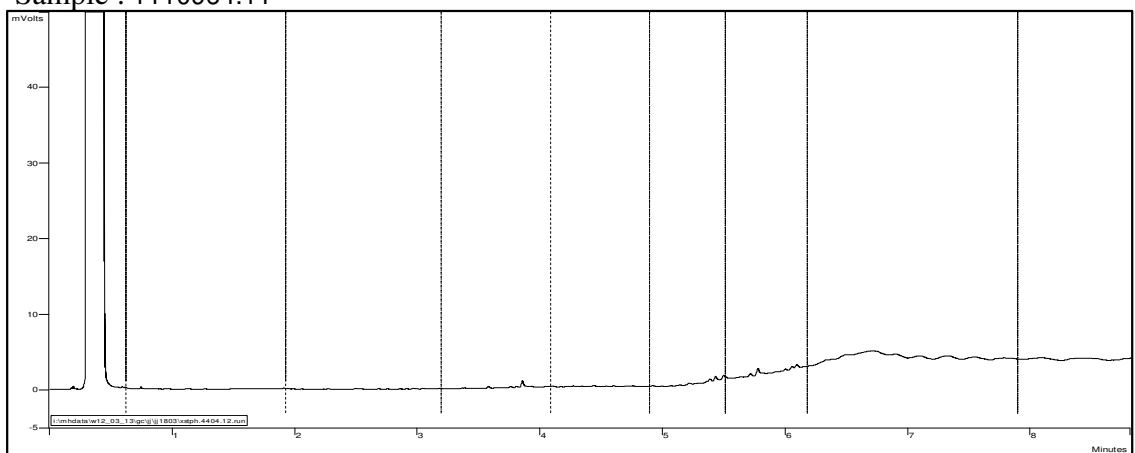
Sample : 1110964.3



Sample : 1110964.9

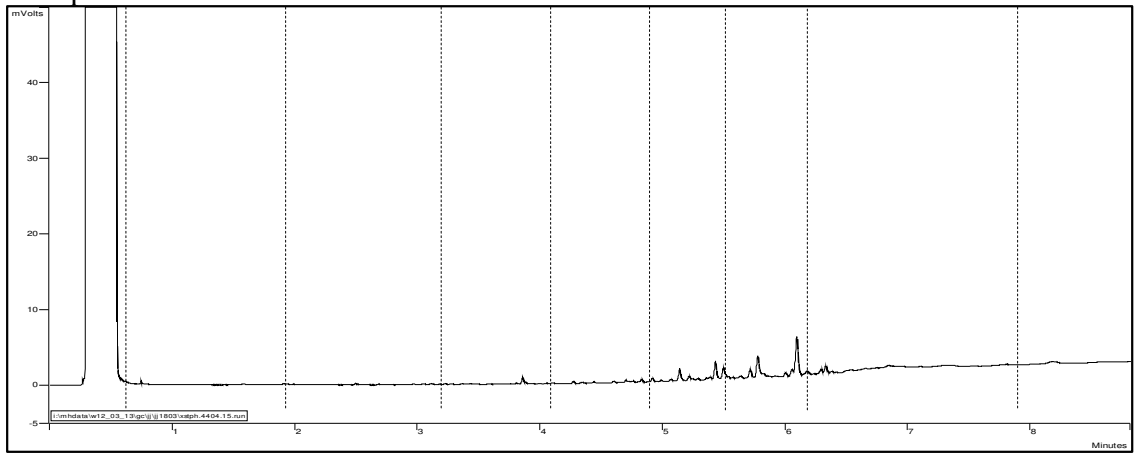


Sample : 1110964.11

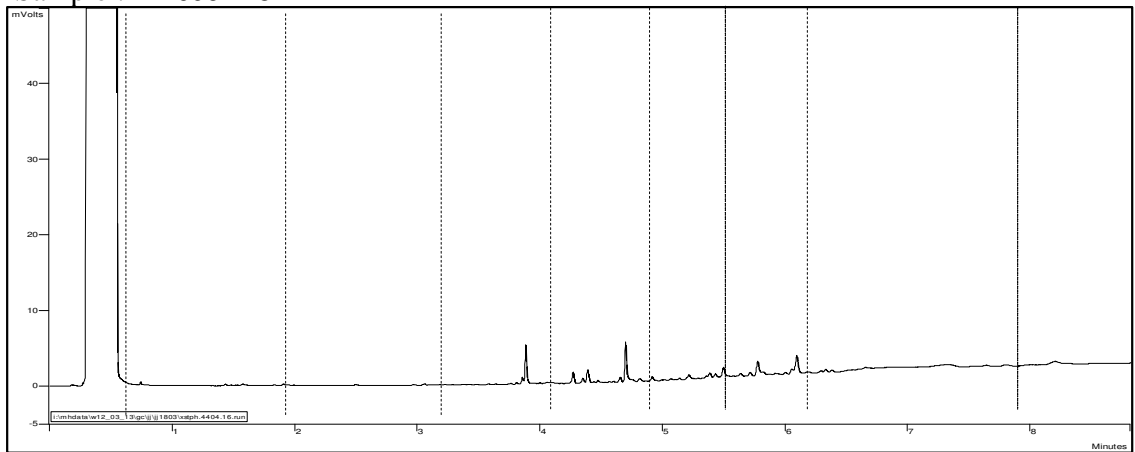


C7 C10 C15 C20 C25 C30 C34 C44

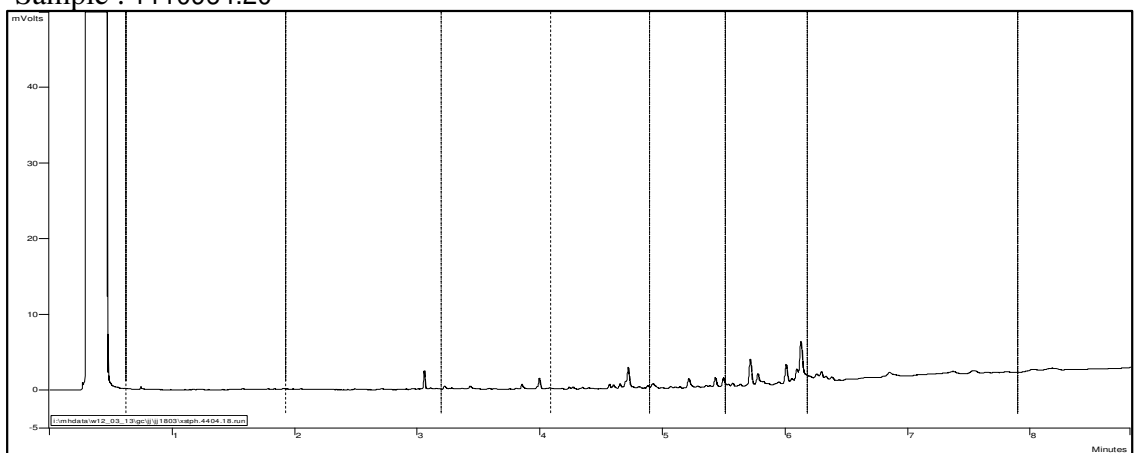
Sample : 1110964.16



Sample : 1110964.18



Sample : 1110964.20



C7 C10 C15 C20 C25 C30 C34 C44

Sample : 1110964.22

