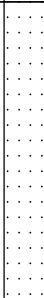

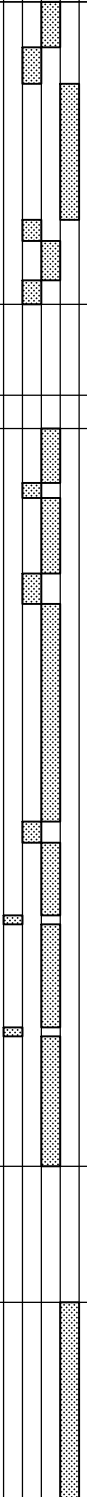

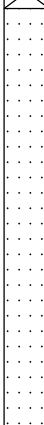

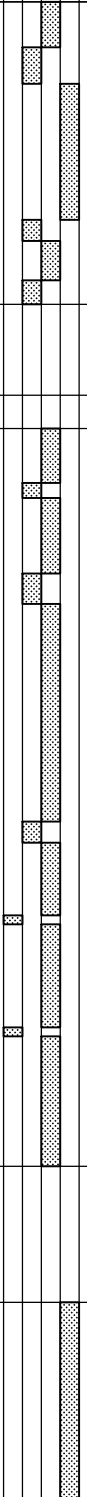

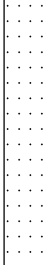

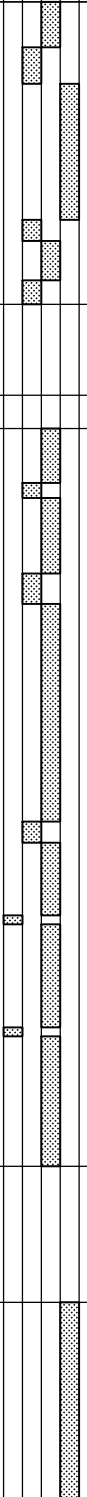



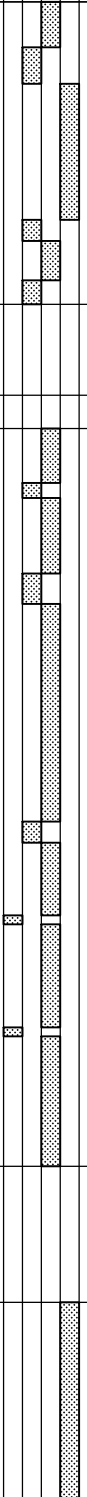



Client : Ausgrid
Project : Scotland Island Energy Reliability Project
Location : Pittwater, Church Point, NSW

SHEET 7 OF 8

Position :	341145.3 E 6275801.8 N MGA94/ 56	Surface RL:	-1.97m AHD	Angle from Horiz. :	90°	Processed :	RCO
Rig Type :	HydraP Trekker	Mounting:	Track	Contractor :	Stratacore	Driller :	TR
Casing Dia. :	HWT	Barrel (m) :	1.5m	Bit :	Surface set	Bit Condition :	New
Date Started :	30/7/2018	Date Completed :	2/8/2018	Logged by :	CT	Date Logged :	01/8/2018
							Note: * indicates signatures on original issue of log or last revision of log.

Note: * indicates signatures on original issue of log or last revision of log

DRILLING						MATERIAL				NATURAL FRACTURES							
Progress			Drill Depth (m)	(Core Loss / Run %)	RQD (%)	Depth / (RL) metres	Graphic Log	Description ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and SOIL TYPE, moisture, colour, consistency, structure, minor components (origin)	Weathering	Estimated Strength Is ₍₅₀₎ MPa ● - Axial ○ - Diametral	Spacing (mm)				Visual	Additional Data (joints, partings, seams, zones and veins) Fracture type, orientation, infilling or coating, shape, roughness, other.	
SCALE (m)	Drilling & Casing	Water									EL 0.03 VL 0.1 L 0.3 M 1 H 3 VH 10 EH	20 40 100 300 1000					
26	HQ Coring+HWT casing			(20) (46)		26.00		SANDSTONE, as previous.	MW				25.15m, BP, 17°, CN, PLN, RF, CI 25.23m, BP, 10°, CLAY, UN, RF, CI 25.27m, BP, 15°, CLAY, PLN, RF, CI 25.72m, SM, 0°, LP CLAY, 10mm 25.79m, SM, 12°, LP CLAY, 3mm 25.92, SM, 0°, SANDY CLAY, 15mm 25.93-26.00m, DB's				
								CORE LOSS 300mm.									
								CORE LOSS 110mm.									
								SANDSTONE, as previous. From 26.41m, bedding at 5-10°.									
27	HQ Coring+HWT casing			(7) (74)		27.80		27.53-27.56m, iron healed partings.	MW				26.59m, BP, 10°, CN, UN, RF, CI 26.64m, BP, 5°, CN, UN, RF, CI 26.89m, SM, 5°, 4mm, EW rock 26.93m, SM, 0°, SANDY CLAY, 8mm 26.99m, SM, 0°, 10mm, EW rock 				
								27.90m, 5mm diameter void, possible removed clast.									
								From 28.30m, becoming coarse grained.									
								CORE LOSS 450mm.									
29	HQ Coring+HWT casing			(30) (60)		28.85		CLAYSTONE, grey/red, indistinctly bedded at 0°, local zones of soil strength material (high plasticity clay).	EW- HW				29.61m, JT, 25°, CLAY VE, PLN, SO, CI				
								CORE LOSS 450mm.									
								CORE LOSS 110mm.									
								CLAYSTONE, grey/red, indistinctly bedded at 0°, local zones of soil strength material (high plasticity clay).									
20	HQ Coring+HWT casing			(0) (100)		29.80		CLAYSTONE, grey/red, indistinctly bedded at 0°, local zones of soil strength material (high plasticity clay).	HW				29.97m, JT, 45°, CLAY VE, UN, SO, CI				
								CORE LOSS 450mm.									
								CORE LOSS 110mm.									
								CLAYSTONE, grey/red, indistinctly bedded at 0°, local zones of soil strength material (high plasticity clay).									



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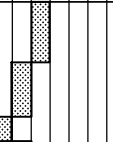
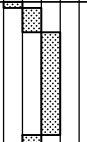



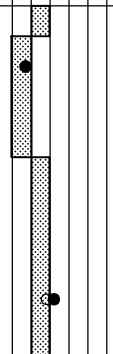
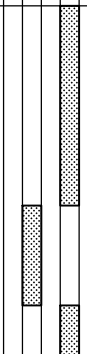


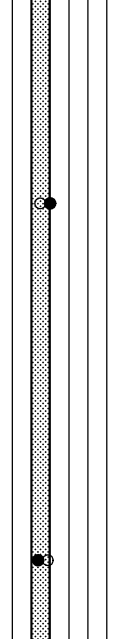
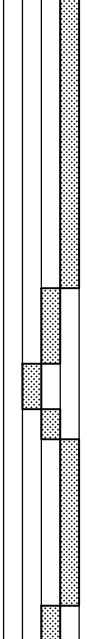

21-27425

CORE LOG SHEET

Client : Ausgrid
Project : Scotland Island Energy Reliability Project
Location : Pittwater, Church Point, NSW

HOLE No. GHD-BH4**SHEET 8 OF 8**

Position : 341145.3 E 6275801.8 N MGA94/ 56 **Surface RL:** -1.97m AHD **Angle from Horiz. :** 90° **Processed :** RCO
Rig Type : HydraP Trekker **Mounting:** Track **Contractor :** Stratacore **Driller :** TR **Checked :** JK
Casing Dia. : HWT **Barrel (m) :** 1.5m **Bit :** Surface set **Bit Condition :** New **Date:** 31/08/2018
Date Started : 30/7/2018 **Date Completed :** 2/8/2018 **Logged by :** CT **Date Logged :** 01/8/2018
Note: * indicates signatures on original issue of log or last revision of log

DRILLING				MATERIAL				NATURAL FRACTURES										
Progress		Drill Depth (m)	(Core Loss / Run %)	RQD (%)	Depth / (RL) metres	Graphic Log	Description ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and SOIL TYPE, moisture, colour, consistency, structure, minor components (origin)	Weathering	Estimated Strength Is ₍₅₀₎ MPa						Spacing (mm)		Visual	Additional Data (joints, partings, seams, zones and veins) Fracture type, orientation, infilling or coating, shape, roughness, other.
SCALE (m)	Drilling & Casing								Water	EL 0.03 VL 0.1 L 0.3 M 1 H 3 VH 10 EH	20 40 100 300 1000							
31	HQ Coring+HWT casing	30.80	(30)	(40)	30.50		CLAYSTONE, as previous.	HW				-30.02m, SM, 20°, HP CLAY, 30mm -30.10m, JT, 60°, FE, PLN, RF, CI -30.18m, JT, 45°, CN, UN, SO, CI -30.30-30.37m, FZ, possible DB						
			30.80		CORE LOSS 300mm.					-30.44m, SM, 0°, HP CLAY, 120mm -30.46m, JT, 30°, CLAY VE, UN, SO, CI -30.55m, JT, 55°, CLAY VE, PLN, SO, CI -30.63m, SM, 10°, LP CLAY, 15mm -30.70m, JT, 45°, CLAY, PLN, SO, CI -30.79m, JT, 25°, CLAY VE, UN, SO, CI								
			32	32.31	(0)	(85)	32.80		CLAYSTONE, as previous.	HW				-32.16m, JT, 20°, CN, UN, SO, CI -32.25m, SM, 25°, LP CLAY, 7mm -32.90m, JT, 85°, CN, UN, SO, DIS, CI -33.15m, SM, 15°, LP CLAY, 15mm -33.19m, SM, 5°, LP CLAY, 10mm -33.30m, JT, 40°, CLAY VE, PLN, SO, CI -33.40m, JT, 37°, CLAY VE, PLN, SO, CI				
34		34.08			34.08		End of Borehole at 34.08 metres. Target Depth					-33.95m, JT, 50°, CN, UN, SO, CI						

See standard sheets for
 details of abbreviations
 & basis of descriptions

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CONSULTING GEOTECHNICAL ENGINEERS AND GEOLOGISTS

Job No.**21-27425**

BOREHOLE LOG SHEET

Client : Ausgrid
Project : Scotland Island Energy Reliability Project
Location : Pittwater, Church Point, NSW

HOLE No. GHD-BH5**SHEET 1 OF 5**

Position : 341540.8 E 6275988.9 N MGA94/ 56 **Surface RL:** -1.29m AHD **Angle from Horiz. :** 90° **Processed :** RCO
Rig Type : HydraP Trekker **Mounting:** Track **Contractor :** Stratacore **Driller :** TR **Checked :** JK
Date Started : 10/7/2018 **Date Completed :** 12/7/2018 **Logged by :** CT **Date:** 31/08/2018

Note: * indicates signatures on original issue of log or last revision of log

DRILLING					MATERIAL					Note: * indicates signatures on original issue of log or last revision of log	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Comments/ Observations
1 											

See standard sheets for
 details of abbreviations
 & basis of descriptions

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Job No.**21-27425**


BOREHOLE LOG SHEET

Client : Ausgrid
Project : Scotland Island Energy Reliability Project
Location : Pittwater, Church Point, NSW

HOLE No. GHD-BH5**SHEET 2 OF 5**

Position : 341540.8 E 6275988.9 N MGA94/ 56 **Surface RL:** -1.29m AHD **Angle from Horiz. :** 90° **Processed :** RCO
Rig Type : HydraP Trekker **Mounting:** Track **Contractor :** Stratacore **Driller :** TR **Checked :** JK
Date Started : 10/7/2018 **Date Completed :** 12/7/2018 **Logged by :** CT **Date:** 31/08/2018

Note: * indicates signatures on original issue of log or last revision of log

DRILLING					MATERIAL					Comments/ Observations
SCALE (m)	Drilling Method	Hole Support \\ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition Consistency / Density Index	
6	RW (m) HWT casing			U75	6.00		CL	Sandy CLAY, as previous.	w>PL St	5.10-5.40m, TR SAMPLE
7				SPT 11/21/20 N=41			CI	CLAY, grey, medium plasticity, trace of silt, iron staining, iron induration (alluvium).	w>PL H	6.00-6.45m, BAG
8				SPT 18/28/ 8 for 50mm * N~52* U75						7.50-7.85m, BAG
9				SPT 11/5 for 10mm HB N=ref	9.20			Start of coring at 9.2 metres. For cored interval, see Core Log Sheet.		8.00m, soil too stiff for U75 (TR Sample)
10										

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 & basis of descriptions

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Job No.**21-27425**

Client : Ausgrid
Project : Scotland Island Energy Reliability Project
Location : Pittwater, Church Point, NSW

SHEET 4 OF 5

Position :	341540.8 E 6275988.9 N MGA94/ 56	Surface RL:	-1.29m AHD	Angle from Horiz. :	90°	Processed :	RCO
Rig Type :	HydraP Trekker	Mounting:	Track	Contractor :	Stratacore	Driller :	TR
Casing Dia. :	HWT	Barrel (m) :	1.5m	Bit :	Surface set	Bit Condition :	New
Date Started :	10/7/2018	Date Completed :	12/7/2018	Logged by :	CT	Date Logged :	11/7/2018
							Note: * indicates signatures on original issue of log or last revision of log

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21-27425

Client :	Ausgrid			HOLE No. GHD-BH5	
Project :	Scotland Island Energy Reliability Project				
Location :	Pittwater, Church Point, NSW				
Position :	341540.8 E 6275988.9 N MGA94/ 56	Surface RL: -1.29m AHD	Angle from Horiz. : 90°	SHEET 5 OF 5	
Rig Type :	HydraP Trekker	Mounting: Track	Contractor : Stratacore	Driller : TR	Processed : RCO
Casing Dia. : HWT	Barrel (m) : 1.5m	Bit : Surface set	Bit Condition : New	Checked : JK	
Date Started : 10/7/2018	Date Completed : 12/7/2018	Logged by : CT	Date Logged : 11/7/2018	Date: 31/08/2018	
Note: * indicates signatures on original issue of log or last revision of log					

DRILLING				MATERIAL				NATURAL FRACTURES						
Progress		Drill Depth (m)	(Core Loss / Run %)	RQD (%)	Depth / (RL) metres	Graphic Log	Description ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and SOIL TYPE, moisture, colour, consistency, structure, minor components (origin)	Weathering	Estimated Strength Is ₍₅₀₎ MPa		Spacing (mm)		Visual	Additional Data (joints, partings, seams, zones and veins) Fracture type, orientation, infilling or coating, shape, roughness, other.
SCALE (m)	Drilling & Casing Water								● - Axial ○ - Diametral	20 40 100 300 1000				
		15.67	(0)	(81)	15.67		SILTSTONE, as previous.	HW	EL 0.03 VL 0.1 L 0.3 M 1 H 3 VH 10 EH					14.96m, BP, 0°, CLAY VE, PLN, SO, CI 15.23m, BP, 0°, CLAY VE, UN, SO, CI 15.48m, BP, 0°, CN, PLN, SO, CI 15.57m, JT, 20°, FE, UN, RF, CI
							End of Borehole at 15.67 metres. Target Depth							
-16														
-17														
-18														
-19														
-20														

Job No. **21-27425**

BOREHOLE LOG SHEET

Client : Ausgrid
Project : Scotland Island Energy Reliability Project
Location : Harold Reserve, Scotland Island, NSW

HOLE No. GHD-BH6**SHEET 1 OF 1**

Position : 341616.5 E 6276042.4 N MGA94/ 56 **Surface RL:** 1.76m AHD **Angle from Horiz. :** 90° **Processed :** CT
Rig Type : Hand auger **Mounting:** Hand auger **Contractor :** - **Driller :** CT/JV **Checked :** JK
Date Started : 27/9/2018 **Date Completed :** 27/9/2018 **Logged by :** CT/JV **Date:** 2/10/2018

Note: * indicates signatures on original issue of log or last revision of log

DRILLING					MATERIAL					Note: * indicates signatures on original issue of log or last revision of log	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Comments/ Observations
1	Hand Auger	Nil	Dry				-	Silty SAND, dark brown, fine to coarse grain, some fine gravels (fill).	w-PL	-	0.00-0.10m, JAR, BAG
					0.50						
2								End of borehole at 0.5 metres. Refusal			Refusal on Sandstone
3											
4											
5											

See standard sheets for
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Job No.**21-27425**

GEO_BOREHOLE_2127425 SCOTLAND ISLAND ERP.GPJ GHD_GEO_TEMPLATE.GDT 2/10/18


BOREHOLE LOG SHEET

Client : Ausgrid
Project : Scotland Island Energy Reliability Project
Location : Harold Reserve, Scotland Island, NSW

HOLE No. GHD-BH7**SHEET 1 OF 1**

Position : 341622.4 E 6276049.8 N MGA94/ 56 **Surface RL:** 3.43m AHD **Angle from Horiz. :** 90° **Processed :** CT
Rig Type : Hand auger **Mounting:** Hand auger **Contractor :** - **Driller :** CT/JV **Checked :** JK
Date Started : 27/9/2018 **Date Completed :** 27/9/2018 **Logged by :** CT/JV **Date:** 2/10/2018

Note: * indicates signatures on original issue of log or last revision of log

DRILLING					MATERIAL					Comments/ Observations
SCALE (m)	Drilling Method	Hole Support \\ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition Consistency / Density Index	
1	Hand Auger	Nil	Dry		0.80		-	CLAY, pale brown, medium plasticity, trace of fine to medium gravels (fill).	w<PL St	0.00 - 0.10m, JAR, BAG
					1.20		-	Gravelly CLAY, pale brown, low plasticity, fine to coarse gravels, gravels are quartz and sandstone, sub-rounded to angular (fill).	w<PL St	0.40-0.50m, JAR, BAG
					1.80		-	CLAY, brown streaked red, high plasticity (fill).	w<PL St	0.90-1.00m, JAR, BAG
					2.00		-	CLAY, pale grey streaked pale orange, high plasticity, trace of fine to medium gravels (fill).	w<PL VSt	1.50-1.60m, JAR, BAG
2								End of borehole at 2 metres. Limit of investigation		1.90-2.00m, JAR, BAG
3										
4										
5										

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CONSULTING GEOTECHNICAL ENGINEERS AND GEOLOGISTS

Job No.**21-27425**

Appendix C – Equipment Calibration Certificates

PID Calibration Certificate

Instrument PhoCheck Tiger
Serial No. T-105859



Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6eV Lamp			
Alarms	Beeper	✓	Low	High	TWA	STEL
	Settings	✓	50ppm	100ppm	N/A	N/A
Software	Version	✓				
Data logger	Operation	✓				
Download	Operation	✓				
Other tests:						

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		98ppm Isobutylene	NATA	SY137		98ppm

Calibrated by: Sarah Lian Sarah Lian

Calibration date: 6/07/2018

Next calibration due: 5/01/2019

Appendix D – Analytical Results Tables

Table D1 – Soil Results Table – Human Health

Table D2 – Soil Results Table – Waste Classification

Table D3 – Groundwater Results Table

Table D4 – Soil Results QAQC RPD Table

Table D5 – Rinsate QAQC Results Table



Appendix D - Table D1
Soil Results Table (Human Health Guidelines)

		Field Parameters	Inorganics			Major Ions		Asbestos	Metals								BTEXN							TRH - NEPM 2			
	Resistivity*	Field Parameters	Electrical conductivity (lab)	Moisture Content (dried @ 103°C)	pH (aqueous extract)	Chloride	Sulfate	Asbestos Reported Result	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Naphthalene (BTEXN)	F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction
	OHM.M	pH Units																									
EQL	0.5	0.1	5	1	0.1	10	10		2	0.4	5	5	5	0.1	5	5	0.1	0.1	0.1	0.1	0.2	0.3	0.5	20	20	50	50
CRC CARE 2011 Soil Direct Contact Intrusive Works																	1100	120000	85000			130000	29000	82000		62000	
CRC CARE 2011 Soil HSL Vap.Int Intrusive Works,0 to <2m,Sand																	77	NL	NL			NL	NL	NL		NL	
CRC CARE 2011 Soil HSL Vap.Int Intrusive Works,2 to <4m,Sand																	160	NL	NL			NL	NL	NL		NL	
NEPM 2013 Table 1A(1) HIL D Comm/Ind									3000	900	3600	240000	1500	730	6000	400000											
NEPM 2013 Table 1A(3) HSL D Comm/Ind Soil for Vapour Intrusion, Sand																											
0-1m																	3	NL	NL			230	NL	260		NL	
1-2m																	3	NL	NL			NL	NL	370		NL	
2-4m																	3	NL	NL			NL	NL	630		NL	
>4m																	3	NL	NL			NL	NL	NL		NL	

Field_ID	Location_Code	Sample_Depth_Range	Sampled_Date_Time	Matrix_Type	Sample_Type																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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Appendix D - Table D1
Soil Results Table (Human Health Guidelines)

	'013			TRH - NEPM 1999						PAHs																									
	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	C6- C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29- C36 Fraction	C10-C36 (Sum of Total)	Acenaphthene	Acenaphthylene	Anthracene	Benz[a]anthracene	Benzo[a] pyrene	Benzo[b+]]fluoranthene	Benzo[k]fluoranthene	Benzo[g,h,i]perylene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene	Fluorene	Indeno[1,2,3-c,d]pyrene	Naphthalene-PAH	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	Total 8 PAHs (as BaP TEQ)(half LOR) - Lab Calc	Total 8 PAHs (as BaP TEQ)(full LOR) - Lab Calc	Organochlorine pesticides EPAVic	Other organochlorine pesticides EPAVic	4,4-DDE	a-BHC			
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
EQL	100	100	100	20	20	50	50	50	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.1	0.1	0.05	0.05			
CRC CARE 2011 Soil Direct Contact Intrusive Works	85000	120000																				29000													
CRC CARE 2011 Soil HSL Vap.Int Intrusive Works,0 to <2m,Sand																						NL													
CRC CARE 2011 Soil HSL Vap.Int Intrusive Works,2 to <4m,Sand																						NL													
NEPM 2013 Table 1A(1) HIL D Comm/Ind																									4000	40	40	40							
NEPM 2013 Table 1A(3) HSL D Comm/Ind Soil for Vapour Intrusion, Sand																																			
0-1m																						NL													
1-2m																						NL													
2-4m																						NL													
>4m																						NL													

Field_ID	Location_Code	Sample_Depth_Range	Sampled_Date_Time	Matrix_Type	Sample_Type	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
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Appendix D - Table D1
Soil Results Table (Human Health Guidelines)

	OC Pesticides																				PCBs								
	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	d-BHC	4,4 DDD	4,4 DDT	DDT+DDE+DDD - Lab Calc	Dieldrin	Endosulfan I (alpha)	Endosulfan II (beta)	Endosulfan Sulfate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Total)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.2	1	0.5	0.1	0.5	0.5	0.5	0.5	0.5	0.5
CRC CARE 2011 Soil Direct Contact Intrusive Works																													
CRC CARE 2011 Soil HSL Vap.Int Intrusive Works,0 to <2m,Sand																													
CRC CARE 2011 Soil HSL Vap.Int Intrusive Works,2 to <4m,Sand																													
NEPM 2013 Table 1A(1) HIL D Comm/Ind		45		530				3600					100				50		80	2500	160								7
NEPM 2013 Table 1A(3) HSL D Comm/Ind Soil for Vapour Intrusion, Sand																													
0-1m																													
1-2m																													
2-4m																													
>4m																													

Field_ID	Location_Code	Sample_Depth_Range	Sampled_Date_Time	Matrix_Type	Sample_Type	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD-BH1_0.5-0.6	GHD-BH1	0.5-0.6	8/08/2018	soil	Normal	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
DUP03	GHD-BH1	0.5-0.6	8/08/2018	soil	Field_D	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD-BH1_2.0-2.1	GHD-BH1	2-2.1	8/08/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD_BH2_1.9-2.35	GHD-BH2	1.9-2.35	23/07/2018	soil	Normal	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
DUP01	GHD-BH2	1.9-2.35	23/07/2018	soil	Field_D	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD_BH2_3.5-3.95	GHD-BH2	3.5-3.95	23/07/2018	soil	Normal	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
DUP02	GHD-BH2	3.5-3.95	23/07/2018	soil	Field_D	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD-BH03_1.5-1.95	GHD-BH3	1.5-1.95	13/07/2018	soil	Normal	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD-BH3_4.5-4.95	GHD-BH3	4.5-4.95	13/07/2018	soil	Normal	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD-BH3_6.0-6.45	GHD-BH3	6-6.45	13/07/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-BH4_1.5_1.95	GHD-BH4	1.5-1.95	30/07/2018	soil	Normal	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD-BH4_15.0_15.45	GHD-BH4	15-15.45	30/07/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-BH4_4.5_4.95	GHD-BH4	4.5-4.95	30/07/2018	soil	Normal	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD-BH5_1.6-2.05	GHD-BH5	1.6-2.05	11/07/2018	soil	Normal	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD-BH5_2.8-3.25	GHD-BH5	2.8-3.25	11/07/2018	soil	Normal	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD-BH5_4.5-4.95	GHD-BH5	4.5-4.95	11/07/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-BH6_0.4-0.5	GHD-BH6	0.4-0.5	27/09/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-BH6_0.0-0.1	GHD-BH6	0-0.1	27/09/2018	soil	Normal	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD-BH7_0.4-0.5	GHD-BH7	0.4-0.5	27/09/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-BH7_0.9-1.0	GHD-BH7	0.9-1	27/09/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-BH7_0.0-0.1	GHD-BH7	0-0.1	27/09/2018	soil	Normal	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD-BH7_1.5-1.6	GHD-BH7	1.5-1.6	27/09/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-BH7_1.9-2.0	GHD-BH7	1.9-2	27/09/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-SI01	GHD-SI01		27/09/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-SI02	GHD-SI02		27/09/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-SI03	GHD-SI03		27/09/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-SI04	GHD-SI04		27/09/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-SI05	GHD-SI05		27/09/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-SI06	GHD-SI06		27/09/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D - Table D2
Soil Waste Classification Table

		Field Parameters	Inorganics		Major Ions		Asbestos	Metals								BTEXN						TRH - NEPM 2013							
	Resistivity*	pH (Field)	Electrical conductivity (lab)	Moisture Content (dried @ 103°C)	pH (aqueous extract)	Chloride	Sulfate	Asbestos Reported Result	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Naphthalene (BTEXN)	F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 >C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 >C16-C34 Fraction)	F4 >C34-C40 Fraction)
	OHM.M																												
EQL	0.5	0.1	5	1	0.1	10	10		2	0.4	5	5	5	0.1	5	5	0.1	0.1	0.1	0.1	0.2	0.3	0.5	20	20	50	50	100	100
NSW EPA (2014) General Solid Waste CT1 (No Leaching)									100	20	100		100	4	40		10	288	600			1000							
NSW EPA (2014) Restricted Solid Waste CT2 (No Leaching)									400	80	400		400	16	160		40	1152	2400			4000							

Field_ID	Location_Code	Sample_Depth_Range	Sampled_Date_Time	Matrix_Type	Sample_Type																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										</
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[illegible][illegible]



Appendix D - Table D2
Soil Waste Classification Table

	OC Pesticides																			PCBs								
	b-BHC	Chlordane	d-BHC	4,4 DDD	4,4 DDT	DDT+DDE+DDD - Lab Calc	Dieldrin	Endosulfan I (alpha)	Endosulfan II (beta)	Endosulfan Sulfate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Total)	
EQL	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NSW EPA (2014) General Solid Waste CT1 (No Leaching)	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.2	1	0.5	0.1	0.5	0.5	0.5	0.5	0.5	0.5	50
NSW EPA (2014) Restricted Solid Waste CT2 (No Leaching)																												50

Field_ID	Location_Code	Sample_Depth_Range	Sampled_Date_Time	Matrix_Type	Sample_Type																								
GHD-BH1_0.5-0.6	GHD-BH1	0.5-0.6	8/08/2018	soil	Normal	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
DUP03	GHD-BH1	0.5-0.6	8/08/2018	soil	Field_D	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD-BH1_2.0-2.1	GHD-BH1	2-2.1	8/08/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD_BH2_1.9-2.35	GHD-BH2	1.9-2.35	23/07/2018	soil	Normal	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
DUP01	GHD-BH2	1.9-2.35	23/07/2018	soil	Field_D	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD_BH2_3.5-3.95	GHD-BH2	3.5-3.95	23/07/2018	soil	Normal	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
DUP02	GHD-BH2	3.5-3.95	23/07/2018	soil	Field_D	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD-BH03_1.5-1.95	GHD-BH3	1.5-1.95	13/07/2018	soil	Normal	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD-BH3_4.5-4.95	GHD-BH3	4.5-4.95	13/07/2018	soil	Normal	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD-BH3_6.0-6.45	GHD-BH3	6-6.45	13/07/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-BH4_1.5_1.95	GHD-BH4	1.5-1.95	30/07/2018	soil	Normal	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD-BH4_15.0_15.45	GHD-BH4	15-15.45	30/07/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-BH4_4.5_4.95	GHD-BH4	4.5-4.95	30/07/2018	soil	Normal	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD-BH5_1.6-2.05	GHD-BH5	1.6-2.05	11/07/2018	soil	Normal	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD-BH5_2.8-3.25	GHD-BH5	2.8-3.25	11/07/2018	soil	Normal	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD-BH5_4.5-4.95	GHD-BH5	4.5-4.95	11/07/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-BH6_0.4-0.5	GHD-BH6	0.4-0.5	27/09/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-BH6_0.0-0.1	GHD-BH6	0-0.1	27/09/2018	soil	Normal	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD-BH7_0.4-0.5	GHD-BH7	0.4-0.5	27/09/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-BH7_0.9-1.0	GHD-BH7	0.9-1	27/09/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-BH7_0.0-0.1	GHD-BH7	0-0.1	27/09/2018	soil	Normal	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GHD-BH7_1.5-1.6	GHD-BH7	1.5-1.6	27/09/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-BH7_1.9-2.0	GHD-BH7	1.9-2	27/09/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-SI01	GHD-SI01		27/09/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-SI02	GHD-SI02		27/09/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-SI03	GHD-SI03		27/09/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-SI04	GHD-SI04		27/09/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-SI05	GHD-SI05		27/09/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GHD-SI06	GHD-SI06		27/09/2018	soil	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D - Table D3
Groundwater Results Table

	Metals								BTEXN							TRH - NEPM 2013							TRH - NEPM 1999					PAHs									
	Arsenic (Filtered)	Cadmium (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Lead (Filtered)	Mercury (Filtered)	Nickel (Filtered)	Zinc (Filtered)	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Naphthalene (BTEXN)	F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 (Sum of Total)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo[b,j]fluoranthene	Benzo[k]fluoranthene	Benzo[g,h,i]perylene	Chrysene	Dibenz(a,h)anthracene
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.001	0.0002	0.001	0.001	0.001	0.0001	0.001	0.005	1	1	1	1	2	3	10	20	20	50	50	100	100	100	20	50	100	100	100	1	1	1	1	1	1	1	1	1	1
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																					
2-4m									5000	NL	NL			NL	NL	6000		NL																			
4-8m									5000	NL	NL			NL	NL	6000		NL																			
>8m									5000	NL	NL			NL	NL	7000		NL																			
NEPM 2013 Table 1C GILs, Marine Waters		0.0007	0.0044	0.0013	0.0044	0.0001	0.007	0.015	500						50																						
Field_ID	Location_Code	Sampled_Date_Time	Sample_Type	Location_Type																																	
GHD-BH1-GW	GHD-BH1	27/09/2018	Normal	BH	0.002	<0.0002	0.004	0.009	0.003	<0.0001	0.02	0.044	<1	<1	<1	<1	<2	<3	<10	<20	<20	<50	<50	<100	<100	<100	<20	<50	<100	<100	<100	<1	<1	<1	<1	<1	<1



Appendix D - Table D3
Groundwater Results Table

					OC Pesticides																												PCBs													
					Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene-PAH	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Organochlorine pesticides EPAV/c	Other organochlorine pesticides EPAV/c	4,4-DDE	α-BHC	Aldrin	Aldrin + Dieldrin	β-BHC	Chlordane	δ-BHC	4,4 DDD	4,4 DDT	DDT+DDE+DDD - Lab Calc	Dieldrin	Endosulfan I (alpha)	Endosulfan II (beta)	Endosulfan Sulfate	Endrin	Endrin aldehyde	Endrin ketone	γ-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Total)		
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L		
EQL					1	1	1	1	1	1	1	1	1	0.1	0.1	0.1	0.1	0.1	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	10	5	1	5	5	5	5	5	5	1
NEPM 2013 Table 1A(4) HSL D Comm/Ind GW for Vapour Intrusion, Sand																																														
2-4m								NL																																						
4-8m								NL																																						
>8m								NL																																						
NEPM 2013 Table 1C GILs, Marine Waters								50																					0.004																	
Field_ID	Location_Code	Sampled_Date_Time	Sample_Type	Location_Type																																										
GHD-BH1-GW	GHD-BH1	27/09/2018	Normal	BH	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<10	<5	<1	<5	<5	<5	<5	<5	<5	<5	<1		



Appendix D - Table D4
QAQC Soil RPD Table

Ausgrid
Scotland Island Energy Reliability Contamination Investigation

Field Duplicates (soil)
Filter: ALL

Chem_Group	ChemName	Units	EQL	9-Aug-18			25-Jul-18			25-Jul-18			25-Jul-18		
				Field ID	Sample Date/Time	RPD	Field ID	Sample Date/Time	RPD	Field ID	Sample Date/Time	RPD	Field ID	Sample Date/Time	RPD
Inorganics	Moisture Content (dried @ 103°C)	%	1		11	11	0	13	12	8	14	16	13		
Metals	Arsenic	mg/kg	2		7.8	8	3	<2	<2	0	<2	<2	0		
	Cadmium	mg/kg	0.4		<0.4	<0.4	0	<0.4	<0.4	0	<0.4	<0.4	0		
	Chromium (III+VI)	mg/kg	5		9.9	11	11	<5	6.2	21	5.5	6.1	10		
	Copper	mg/kg	5		<5	5.2	4	<5	<5	0	<5	<5	0		
	Lead	mg/kg	5		<5	<5	0	<5	<5	0	<5	<5	0		
	Mercury	mg/kg	0.1		<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0		
	Nickel	mg/kg	5		<5	<5	0	<5	<5	0	<5	<5	0		
	Zinc	mg/kg	5		11	12	9	<5	<5	0	<5	<5	0		
BTEXN	Benzene	mg/kg	0.1		<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0		
	Toluene	mg/kg	0.1		<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0		
	Ethylbenzene	mg/kg	0.1		<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0		
	Xylene (o)	mg/kg	0.1		<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0		
	Xylene (m & p)	mg/kg	0.2		<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0		
	Xylene Total	mg/kg	0.3		<0.3	<0.3	0	<0.3	<0.3	0	<0.3	<0.3	0		
	Naphthalene (BTEXN)	mg/kg	0.5		<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0		
TRH - NEPM 2013	F1 (C6-C10 minus BTEX)	mg/kg	20		<20	<20	0	<20	<20	0	<20	<20	0		
	C6-C10 Fraction	mg/kg	20		<20	<20	0	<20	<20	0	<20	<20	0		
	F2 (>C10-C16 minus Naphthalene)	mg/kg	50		<50	<50	0	<50	<50	0	<50	<50	0		
	>C10-C16 Fraction	mg/kg	50		<50	<50	0	<50	<50	0	<50	<50	0		
	F3 (>C16-C34 Fraction)	mg/kg	100		<100	<100	0	<100	<100	0	<100	<100	0		
	F4 (>C34-C40 Fraction)	mg/kg	100		<100	<100	0	<100	<100	0	<100	<100	0		
	>C10-C40 (Sum of Total)	mg/kg	100		<100	<100	0								
TRH - NEPM 1999	C6-C9 Fraction	mg/kg	20		<20	<20	0	<20	<20	0	<20	<20	0		
	C10-C14 Fraction	mg/kg	20		<20	<20	0	<20	<20	0	<20	<20	0		
	C15-C28 Fraction	mg/kg	50		<50	<50	0	<50	<50	0	<50	<50	0		
	C29-C36 Fraction	mg/kg	50		<50	<50	0	<50	<50	0	<50	<50	0		
	C10-C36 (Sum of Total)	mg/kg	50		<50	<50	0	<50	<50	0	<50	<50	0		
PAHs	Acenaphthene	mg/kg	0.5		<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0		
	Acenaphthylene	mg/kg	0.5		<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0		
	Anthracene	mg/kg	0.5		<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0		
	Benz(a)anthracene	mg/kg	0.5		<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0		
	Benzo(a) pyrene	mg/kg	0.5		<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0		
	Benzo(b+j)fluoranthene	mg/kg	0.5		<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0		
	Benzo(k)fluoranthene	mg/kg	0.5		<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0		
	Benzo(g,h,i)perylene	mg/kg	0.5		<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0		
	Chrysene	mg/kg	0.5		<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0		
	Dibenz(a,h)anthracene	mg/kg	0.5		<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0		
	Fluoranthene	mg/kg	0.5		1	0.8	22	<0.5	<0.5	0	<0.5	<0.5	0		
	Fluorene	mg/kg	0.5		<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0		
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5		<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0		
	Naphthalene-PAH	mg/kg	0.5		<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0		
	Phenanthrene	mg/kg	0.5		<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0		
	Pyrene	mg/kg	0.5		0.9	0.7	25	<0.5	<0.5	0	<0.5	<0.5	0		
	PAHs (Sum of total) - Lab Calc	mg/kg	0.5		1.9	1.5	24	<0.5	<0.5	0	<0.5	<0.5	0		
	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	mg/kg	0.5		<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0		
	Total 8 PAHs (as BaP TEQ)(half LOR) - Lab Calc	mg/kg	0.5		0.6	0.6	0	0.6	0.6	0	0.6	0.6	0		
	Total 8 PAHs (as BaP TEQ)(full LOR) - Lab Calc	mg/kg	0.5		1.2	1.2	0	1.2	1.2	0	1.2	1.2	0		
OC Pesticides	Organochlorine pesticides EPAVic	mg/kg	0.1		<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0		
	Other organochlorine pesticides EPAVic	mg/kg	0.1		<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0		
	4,4-DDE	mg/kg	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0		
	a-BHC	mg/kg	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0		
	Aldrin	mg/kg	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0		
	Aldrin + Dieldrin	mg/kg	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0		
	b-BHC	mg/kg	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0		
	Chlordane	mg/kg	0.1		<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0		
	d-BHC	mg/kg	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0		
	4,4 DDD	mg/kg	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0		
	4,4 DDT	mg/kg	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0		
	DDT+DDE+DDD - Lab Calc	mg/kg	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0		
	Dieldrin	mg/kg	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0		
	Endosulfan I (alpha)	mg/kg	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0		
	Endosulfan II (beta)	mg/kg	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0		
	Endosulfan Sulfate	mg/kg	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0		
	Endrin	mg/kg	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0		
	Endrin aldehyde	mg/kg	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0		
	Endrin ketone	mg/kg	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0		
	g-BHC (Lindane)	mg/kg	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0		
	Heptachlor	mg/kg	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0		
	Heptachlor epoxide	mg/kg	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0		
	Hexachlorobenzene	mg/kg	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0		
	Methoxychlor	mg/kg	0.2		<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0		
	Toxaphene	mg/kg	1		<1	<1	0	<1	<1	0	<1	<1	0		
PCBs	Arochlor 1016	mg/kg	0.5		<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0		
	Arochlor 1221	mg/kg	0.1		<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0		
	Arochlor 1232	mg/kg	0.5		<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0		
	Arochlor 1242	mg/kg	0.5		<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0		
	Arochlor 1248	mg/kg	0.5		<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0		
	Arochlor 1254	mg/kg	0.5		<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0		
	Arochlor 1260	mg/kg	0.5		<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0		
	PCBs (Total)	mg/kg	0.5		<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0		

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 200 (1-10 x EQL); 50 (10-30 x EQL); 50 (> 30 x EQL))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory



Appendix D - Table D5 QAQC Rinsate Results Table

Ausgrid
Scotland Island Energy Reliability Contamination Investigation

Field Blanks (water)
Filter: ALL

SDG	2-Oct-18
Field ID	SI-RIN01
Sampled_Date/Time	27/09/2018
Sample Type	Rinsate

Chem_Group	ChemName	Units	EQL	
PAHs	Acenaphthene	µg/l	1	<1
	Acenaphthylene	µg/l	1	<1
	Anthracene	µg/l	1	<1
	Benz(a)anthracene	µg/l	1	<1
	Benzo(a) pyrene	µg/l	1	<1
	Benzo[b+j]fluoranthene	µg/l	1	<1
	Benzo(k)fluoranthene	µg/l	1	<1
	Benzo(g,h,i)perylene	µg/l	1	<1
	Chrysene	µg/l	1	<1
	Dibenz(a,h)anthracene	µg/l	1	<1
	Fluoranthene	µg/l	1	<1
	Fluorene	µg/l	1	<1
	Indeno(1,2,3-c,d)pyrene	µg/l	1	<1
	Naphthalene-PAH	µg/l	1	<1
	Phenanthrene	µg/l	1	<1
	Pyrene	µg/l	1	<1
	PAHs (Sum of total) - Lab calc	µg/l	1	<1

Filter: ALL

Appendix E – Laboratory Certificates

[illegible]

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Page 1 of 1

Company Name : GHD Pty Ltd	Contact Name : Clifton Thompson	Purchase Order : 2127425	COC Number : 1
Office Address :	Project Manager : Justin Kabat	PROJECT Number : 2127425	Eurofins mgt quote ID : 170808GHDN
Level 15, 133 Castlereagh Street, Sydney NSW 2000	Email for results : clifton.thompson@ghd.com	PROJECT Name : Scotland Island Energy Reliability Project	Data output format: Esdat, PDF

Special Directions & Comments :

Special Directions & Comments :

Zip lock bag samples frozen overnight and been on ice all other times. Please freeze zip lock bags for possible future SPOCAS testing. Thanks

Eurofins | mgt DI water batch number:

Analytes

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

[illegible][illegible]

		Laboratory Staff		Turn around time		Method Of Shipment		Temperature on arrival:	
Relinquished By: Clifton Thompson		Received By: <i>R. Timba</i>		1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/>		<input type="checkbox"/> Courier <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal		Report number:	
Date & Time : 18:00, 13/07/2018		Date & Time : <i>16/7/18 11:06 AM</i>		5 DAY <input checked="" type="checkbox"/> 10 DAY <input type="checkbox"/> Other:		Courier Consignment # :		<i>607671</i>	
Signature:		Signature: <i>Timba</i>							

Sample Receipt Advice

Company name: **GHD Pty Ltd NSW**
Contact name: **Clifton Thompson**
Project name: **SCOTLAND ISLAND ENERGY RELIABILITY PROJECT**
Project ID: **2127425**
COC number: **Not provided**
Turn around time: **5 Day**
Date/Time received: **Jul 13, 2018 8:37 PM**
Eurofins | mgt reference: **607671**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 4.4 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Sample containers for volatile analysis received with zero headspace.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.

Notes N/A Custody Seals intact (if used).

GHD-BH5_9.0-9.15 Sample received extra (sample bag), sample placed on hold.[totals21| met13t]

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Clifton Thompson - Clifton.Thompson@ghd.com.

Certificate of Analysis



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025-Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

GHD Pty Ltd NSW
Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Attention: Clifton Thompson
Report 607671-AID
Project Name SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID 2127425
Received Date Jul 13, 2018
Date Reported Jul 23, 2018

Methodology:

Asbestos Fibre
 Identification

Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques.

NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.

Unknown Mineral
 Fibres

Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity.

NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.

Subsampling Soil
 Samples

The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed.

NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.

Bonded asbestos-
 containing material
 (ACM)

The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 4964 - 2004.

NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.

Limit of Reporting

The performance limitation of the AS4964 method for inhomogeneous samples is around 0.1 g/kg (0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis where required, this is considered to be at the nominal reporting limit of 0.01 % (w / w). The examination of large sample sizes (500 mL is recommended) may improve the likelihood of identifying ACM in the > 2mm fraction. The NEPM screening level of 0.001 % (w / w) asbestos in soil for FA (friable asbestos) and AF (asbestos fines) then applies where they are able to be quantified by gravimetric procedures. This quantitative screening is not generally applicable to FF (free fibres) and results of Trace Analysis are referred.

NOTE: NATA News March 2014, p.7, states in relation to AS4964: "This is a qualitative method with a nominal reporting limit of 0.01%" and that currently in Australia "there is no validated method available for the quantification of asbestos". Accordingly, NATA Accreditation does not cover the performance of this service (indicated with an asterisk). This report is consistent with the analytical procedures and reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended) and the Western Australia Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, 2009, including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil, June 2011.

Project Name SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID 2127425
Date Sampled Jul 11, 2018 to Jul 13, 2018
Report 607671-AID

Client Sample ID	Eurofins mgt Sample No.	Date Sampled	Sample Description	Result
GHD-BH03_1.5-1.95	18-JI16677	Jul 13, 2018	Approximate Sample 69g Sample consisted of: Grey coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD-BH5_1.6-2.05	18-JI16682	Jul 11, 2018	Approximate Sample 73g Sample consisted of: Beige coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jul 16, 2018	Indefinite

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Order No.:
Report #: 607671
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Jul 13, 2018 8:37 PM
Due: Jul 23, 2018
Priority: 5 Day
Contact Name: Clifton Thompson

Project Name: SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID: 2127425

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	HOLD	HOLD	Acid Sulfate Soils Field pH Test	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X		X		X	X	X
Brisbane Laboratory - NATA Site # 20794							X		X			
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID							
1	GHD-BH03_1.5-1.95	Jul 13, 2018		Soil	S18-JI16677	X			X	X	X	X
2	GHD-BH03_2.9-3.35	Jul 13, 2018		Soil	S18-JI16678				X			
3	GHD-BH3_4.5-4.95	Jul 13, 2018		Soil	S18-JI16679				X	X	X	X
4	GHD-BH3_6.0-6.45	Jul 13, 2018		Soil	S18-JI16680				X		X	X
5	GHD-BH3_7.5-7.95	Jul 13, 2018		Soil	S18-JI16681				X			
6	GHD-	Jul 11, 2018		Soil	S18-JI16682	X			X	X	X	X

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID: 2127425

Order No.:
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Phone: 02 9239 7100
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Received: Jul 13, 2018 8:37 PM
Due: Jul 23, 2018
Priority: 5 Day
Contact Name: Clifton Thompson

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	HOLD	HOLD	Acid Sulfate Soils Field pH Test	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X		X		X	X	X
Brisbane Laboratory - NATA Site # 20794							X		X			
Perth Laboratory - NATA Site # 23736												
	BH5_1.6-2.05											
7	GHD-BH5_2.8-3.25	Jul 11, 2018		Soil	S18-JI16683				X	X	X	X
8	GHD-BH5_4.5-4.95	Jul 11, 2018		Soil	S18-JI16684				X		X	X
9	GHD-BH5_6.0-6.45	Jul 11, 2018		Soil	S18-JI16685				X			
10	GHD-BH5_7.5-7.95	Jul 11, 2018		Soil	S18-JI16686				X			
11	RIN1	Jul 13, 2018		Water	S18-JI16687			X				
12	TRIP1	Jul 11, 2018		Soil	S18-JI16688			X				
13	BLANK1	Jul 11, 2018		Soil	S18-JI16689			X				
14	TRIP SPIKE LAB	Jul 11, 2018		Soil	S18-JI16690			X				

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID: 2127425

Order No.:
Report #: 607671
Phone: 02 9239 7100
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Received: Jul 13, 2018 8:37 PM
Due: Jul 23, 2018
Priority: 5 Day
Contact Name: Clifton Thompson

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	HOLD	HOLD	Acid Sulfate Soils Field pH Test	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X		X		X	X	X
Brisbane Laboratory - NATA Site # 20794							X		X			
Perth Laboratory - NATA Site # 23736												
15	GHD-BH5_9.0-9.15	Jul 11, 2018		Soil	S18-Jl16691		X					
Test Counts						2	5	5	10	4	6	6

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Western Australia Department of Health
NOHSC	National Occupational Health and Safety Commission
ACM	Bonded asbestos-containing material means any material containing more than 1% asbestos and comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin. Common examples of ACM include but are not limited to: pipe and boiler insulation, sprayed-on fireproofing, troweled-on acoustical plaster, floor tile and mastic, floor linoleum, transite shingles, roofing materials, wall and ceiling plaster, ceiling tiles, and gasket materials. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected because it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and hence potential for fibre release.
FA	FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).
PACM	Presumed Asbestos-Containing Material means thermal system insulation and surfacing material found in buildings, vessels, and vessel sections constructed no later than 1980 that are assumed to contain greater than one percent asbestos but have not been sampled or analyzed to verify or negate the presence of asbestos.
AF	Asbestos fines (AF) are defined as free fibres, or fibre bundles, smaller than 7mm. It is the free fibres which present the greatest risk to human health, although very small fibres (< 5 microns in length) are not considered to be such a risk. AF also includes small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. (Note that for bonded ACM fragments to pass through a 7 mm x 7 mm sieve implies a substantial degree of damage which increases the potential for fibre release.)
AC	Asbestos cement means a mixture of cement and asbestos fibres (typically 90:10 ratios).

Comments

The samples received were not collected in an approved asbestos bag and was therefore sub-sampled from the 250mL glass jar. Valid sub-sampling procedures were applied so as to ensure that the sub-samples to be analysed accurately represented the samples received.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Sayeed Abu Senior Analyst-Asbestos (NSW)

Authorised by:

Laxman Dias Senior Analyst-Asbestos (NSW)



Glenn Jackson
National Operations Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Certificate of Analysis

GHD Pty Ltd NSW
 Level 15, 133 Castlereagh Street
 Sydney
 NSW 2000



NATA Accredited
 Accreditation Number 1261
 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: Clifton Thompson

Report 607671-S
 Project name SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
 Project ID 2127425
 Received Date Jul 13, 2018

Client Sample ID			GHD-BH03_1.5-1.95	GHD-BH03_2.9-3.35	GHD-BH3_4.5-4.95	GHD-BH3_6.0-6.45
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-JI16677	S18-JI16678	S18-JI16679	S18-JI16680
Date Sampled			Jul 13, 2018	Jul 13, 2018	Jul 13, 2018	Jul 13, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	< 20	< 20
TRH C10-C14	20	mg/kg	24	-	< 20	24
TRH C15-C28	50	mg/kg	< 50	-	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	-	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	-	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	-	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	79	-	67	56
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	-	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	-	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	-	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	-	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	-	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	-	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5

Client Sample ID			GHD-BH03_1.5-1.95 Soil S18-JI16677 Jul 13, 2018	GHD-BH03_2.9-3.35 Soil S18-JI16678 Jul 13, 2018	GHD-BH3_4.5-4.95 Soil S18-JI16679 Jul 13, 2018	GHD-BH3_6.0-6.45 Soil S18-JI16680 Jul 13, 2018
Sample Matrix						
Eurofins mgt Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	99	-	100	100
p-Terphenyl-d14 (surr.)	1	%	104	-	105	105
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	< 0.1	-
Dibutylchlorendate (surr.)	1	%	104	-	90	-
Tetrachloro-m-xylene (surr.)	1	%	114	-	100	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PCB*	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibutylchlorendate (surr.)	1	%	104	-	90	-
Tetrachloro-m-xylene (surr.)	1	%	114	-	100	-

Client Sample ID			GHD-BH03_1.5-1.95	GHD-BH03_2.9-3.35	GHD-BH3_4.5-4.95	GHD-BH3_6.0-6.45
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-JI16677	S18-JI16678	S18-JI16679	S18-JI16680
Date Sampled			Jul 13, 2018	Jul 13, 2018	Jul 13, 2018	Jul 13, 2018
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	< 2	-	20	< 2
Cadmium	0.4	mg/kg	< 0.4	-	< 0.4	< 0.4
Chromium	5	mg/kg	5.3	-	37	27
Copper	5	mg/kg	< 5	-	< 5	6.3
Lead	5	mg/kg	12	-	9.5	15
Mercury	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	-	6.7	< 5
Zinc	5	mg/kg	< 5	-	38	15
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.8	6.8	6.1	6.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.5	6.0	6.0	7.1
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
% Moisture	1	%	12	-	20	21

Client Sample ID			GHD-BH3_7.5-7.95	GHD-BH5_1.6-2.05	GHD-BH5_2.8-3.25	GHD-BH5_4.5-4.95
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-JI16681	S18-JI16682	S18-JI16683	S18-JI16684
Date Sampled			Jul 13, 2018	Jul 11, 2018	Jul 11, 2018	Jul 11, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	-	< 20	28	< 20
TRH C15-C28	50	mg/kg	-	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	-	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	-	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	-	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	79	59	70
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	-	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	-	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	-	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	-	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	-	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	-	< 100	< 100	< 100

Client Sample ID			GHD-BH3_7.5-7.95	GHD-BH5_1.6-2.05	GHD-BH5_2.8-3.25	GHD-BH5_4.5-4.95
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-JI16681	S18-JI16682	S18-JI16683	S18-JI16684
Date Sampled			Jul 13, 2018	Jul 11, 2018	Jul 11, 2018	Jul 11, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	101	99	100
p-Terphenyl-d14 (surr.)	1	%	-	107	103	104
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	< 0.1	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	< 0.05	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	< 0.05	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	< 0.05	-
a-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
Aldrin	0.05	mg/kg	-	< 0.05	< 0.05	-
b-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
d-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
Dieldrin	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan I	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan II	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin ketone	0.05	mg/kg	-	< 0.05	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	< 0.05	-
Methoxychlor	0.2	mg/kg	-	< 0.2	< 0.2	-
Toxaphene	1	mg/kg	-	< 1	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	< 0.1	-
Dibutylchloroendate (surr.)	1	%	-	105	101	-
Tetrachloro-m-xylene (surr.)	1	%	-	108	103	-

Client Sample ID			GHD-BH3_7.5-7.95	GHD-BH5_1.6-2.05	GHD-BH5_2.8-3.25	GHD-BH5_4.5-4.95
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-JI16681	S18-JI16682	S18-JI16683	S18-JI16684
Date Sampled			Jul 13, 2018	Jul 11, 2018	Jul 11, 2018	Jul 11, 2018
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	< 0.1	-
Aroclor-1232	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1242	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1248	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1254	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1260	0.5	mg/kg	-	< 0.5	< 0.5	-
Total PCB*	0.5	mg/kg	-	< 0.5	< 0.5	-
Dibutylchloroendate (surr.)	1	%	-	105	101	-
Tetrachloro-m-xylene (surr.)	1	%	-	108	103	-
Heavy Metals						
Arsenic	2	mg/kg	-	< 2	8.4	5.8
Cadmium	0.4	mg/kg	-	1.0	< 0.4	< 0.4
Chromium	5	mg/kg	-	5.4	32	13
Copper	5	mg/kg	-	< 5	< 5	< 5
Lead	5	mg/kg	-	21	6.6	8.7
Mercury	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	-	< 5	< 5	< 5
Zinc	5	mg/kg	-	77	13	< 5
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.9	8.1	6.4	4.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.2	8.0	4.5	3.6
Reaction Ratings**S05		comment	2.0	4.0	2.0	2.0
% Moisture	1	%	-	18	18	17

Client Sample ID			GHD-BH5_6.0-6.45	GHD-BH5_7.5-7.95
Sample Matrix			Soil	Soil
Eurofins mgt Sample No.			S18-JI16685	S18-JI16686
Date Sampled			Jul 11, 2018	Jul 11, 2018
Test/Reference	LOR	Unit		
Acid Sulfate Soils Field pH Test				
pH-F (Field pH test)*	0.1	pH Units	4.4	4.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.5	3.3
Reaction Ratings**S05		comment	2.0	1.0

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jul 16, 2018	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Jul 16, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jul 16, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jul 16, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	Jul 16, 2018	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Jul 16, 2018	28 Day
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Organochlorine Pesticides	Sydney	Jul 16, 2018	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Sydney	Jul 16, 2018	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Acid Sulfate Soils Field pH Test	Brisbane	Jul 19, 2018	7 Days
- Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests			
% Moisture	Sydney	Jul 16, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID: 2127425

Order No.:
Report #: 607671
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Jul 13, 2018 8:37 PM
Due: Jul 23, 2018
Priority: 5 Day
Contact Name: Clifton Thompson

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	HOLD	HOLD	Acid Sulfate Soils Field pH Test	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X		X		X	X	X
Brisbane Laboratory - NATA Site # 20794							X		X			
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID							
1	GHD-BH03_1.5-1.95	Jul 13, 2018		Soil	S18-JI16677	X			X	X	X	X
2	GHD-BH03_2.9-3.35	Jul 13, 2018		Soil	S18-JI16678				X			
3	GHD-BH3_4.5-4.95	Jul 13, 2018		Soil	S18-JI16679				X	X	X	X
4	GHD-BH3_6.0-6.45	Jul 13, 2018		Soil	S18-JI16680				X		X	X
5	GHD-BH3_7.5-7.95	Jul 13, 2018		Soil	S18-JI16681				X			
6	GHD-	Jul 11, 2018		Soil	S18-JI16682	X			X	X	X	X

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Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X		X		X	X	X
Brisbane Laboratory - NATA Site # 20794							X		X			
Perth Laboratory - NATA Site # 23736												
	BH5_1.6-2.05											
7	GHD-BH5_2.8-3.25	Jul 11, 2018		Soil	S18-JI16683				X	X	X	X
8	GHD-BH5_4.5-4.95	Jul 11, 2018		Soil	S18-JI16684				X		X	X
9	GHD-BH5_6.0-6.45	Jul 11, 2018		Soil	S18-JI16685				X			
10	GHD-BH5_7.5-7.95	Jul 11, 2018		Soil	S18-JI16686				X			
11	RIN1	Jul 13, 2018		Water	S18-JI16687			X				
12	TRIP1	Jul 11, 2018		Soil	S18-JI16688			X				
13	BLANK1	Jul 11, 2018		Soil	S18-JI16689			X				
14	TRIP SPIKE LAB	Jul 11, 2018		Soil	S18-JI16690			X				

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Sample Detail						Asbestos - AS4964	HOLD	HOLD	Acid Sulfate Soils Field pH Test	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X		X		X	X	X
Brisbane Laboratory - NATA Site # 20794							X		X			
Perth Laboratory - NATA Site # 23736												
15	GHD-BH5_9.0-9.15	Jul 11, 2018		Soil	S18-Jl16691		X					
Test Counts						2	5	5	10	4	6	6

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4,4'-DDD	mg/kg	< 0.05			0.05	Pass	
4,4'-DDE	mg/kg	< 0.05			0.05	Pass	
4,4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	95			70-130	Pass	
TRH C10-C14	%	79			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	89			70-130	Pass	
Toluene	%	96			70-130	Pass	
Ethylbenzene	%	96			70-130	Pass	
m&p-Xylenes	%	101			70-130	Pass	
o-Xylene	%	100			70-130	Pass	
Xylenes - Total	%	101			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	121			70-130	Pass	
TRH C6-C10	%	96			70-130	Pass	
TRH >C10-C16	%	81			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	93			70-130	Pass	
Acenaphthylene	%	98			70-130	Pass	
Anthracene	%	99			70-130	Pass	
Benz(a)anthracene	%	99			70-130	Pass	
Benzo(a)pyrene	%	93			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(b&j)fluoranthene			%	92			70-130	Pass	
Benzo(g,h,i)perylene			%	112			70-130	Pass	
Benzo(k)fluoranthene			%	89			70-130	Pass	
Chrysene			%	96			70-130	Pass	
Dibenz(a,h)anthracene			%	105			70-130	Pass	
Fluoranthene			%	101			70-130	Pass	
Fluorene			%	96			70-130	Pass	
Indeno(1,2,3-cd)pyrene			%	106			70-130	Pass	
Naphthalene			%	94			70-130	Pass	
Phenanthrene			%	96			70-130	Pass	
Pyrene			%	100			70-130	Pass	
LCS - % Recovery									
Organochlorine Pesticides									
4,4'-DDD			%	102			70-130	Pass	
4,4'-DDE			%	102			70-130	Pass	
4,4'-DDT			%	91			70-130	Pass	
a-BHC			%	107			70-130	Pass	
Aldrin			%	105			70-130	Pass	
b-BHC			%	102			70-130	Pass	
d-BHC			%	102			70-130	Pass	
Dieldrin			%	102			70-130	Pass	
Endosulfan I			%	102			70-130	Pass	
Endosulfan II			%	100			70-130	Pass	
Endosulfan sulphate			%	97			70-130	Pass	
Endrin			%	99			70-130	Pass	
Endrin aldehyde			%	98			70-130	Pass	
Endrin ketone			%	97			70-130	Pass	
g-BHC (Lindane)			%	105			70-130	Pass	
Heptachlor			%	104			70-130	Pass	
Heptachlor epoxide			%	103			70-130	Pass	
Hexachlorobenzene			%	107			70-130	Pass	
Methoxychlor			%	85			70-130	Pass	
LCS - % Recovery									
Polychlorinated Biphenyls									
Aroclor-1260			%	86			70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	108			70-130	Pass	
Cadmium			%	109			70-130	Pass	
Chromium			%	107			70-130	Pass	
Copper			%	110			70-130	Pass	
Lead			%	112			70-130	Pass	
Mercury			%	106			70-130	Pass	
Nickel			%	105			70-130	Pass	
Zinc			%	110			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S18-JI16081	NCP	%	105			70-130	Pass	
TRH C10-C14	S18-JI14018	NCP	%	82			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S18-JI16081	NCP	%	91			70-130	Pass	
Toluene	S18-JI16081	NCP	%	96			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Ethylbenzene	S18-JI16081	NCP	%	95		70-130	Pass	
m&p-Xylenes	S18-JI16081	NCP	%	100		70-130	Pass	
o-Xylene	S18-JI16081	NCP	%	98		70-130	Pass	
Xylenes - Total	S18-JI16081	NCP	%	99		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1				
Naphthalene	S18-JI16081	NCP	%	117		70-130	Pass	
TRH C6-C10	S18-JI16081	NCP	%	112		70-130	Pass	
TRH >C10-C16	S18-JI14018	NCP	%	86		70-130	Pass	
Spike - % Recovery								
Polycyclic Aromatic Hydrocarbons				Result 1				
Acenaphthene	S18-JI14696	NCP	%	95		70-130	Pass	
Acenaphthylene	S18-JI14696	NCP	%	99		70-130	Pass	
Anthracene	S18-JI14696	NCP	%	99		70-130	Pass	
Benz(a)anthracene	S18-JI14696	NCP	%	103		70-130	Pass	
Benzo(a)pyrene	S18-JI14696	NCP	%	87		70-130	Pass	
Benzo(b&j)fluoranthene	S18-JI14696	NCP	%	88		70-130	Pass	
Benzo(g,h,i)perylene	S18-JI14696	NCP	%	106		70-130	Pass	
Benzo(k)fluoranthene	S18-JI14696	NCP	%	85		70-130	Pass	
Chrysene	S18-JI14696	NCP	%	97		70-130	Pass	
Dibenz(a,h)anthracene	S18-JI14696	NCP	%	99		70-130	Pass	
Fluoranthene	S18-JI14696	NCP	%	100		70-130	Pass	
Fluorene	S18-JI14696	NCP	%	97		70-130	Pass	
Indeno(1,2,3-cd)pyrene	S18-JI14696	NCP	%	101		70-130	Pass	
Naphthalene	S18-JI14696	NCP	%	96		70-130	Pass	
Phenanthrene	S18-JI14696	NCP	%	97		70-130	Pass	
Pyrene	S18-JI14696	NCP	%	99		70-130	Pass	
Spike - % Recovery								
Organochlorine Pesticides				Result 1				
4,4'-DDD	S18-JI21625	NCP	%	96		70-130	Pass	
4,4'-DDE	S18-JI21625	NCP	%	87		70-130	Pass	
4,4'-DDT	S18-JI21671	NCP	%	79		70-130	Pass	
a-BHC	S18-JI21625	NCP	%	82		70-130	Pass	
Aldrin	S18-JI21625	NCP	%	88		70-130	Pass	
b-BHC	S18-JI21625	NCP	%	80		70-130	Pass	
d-BHC	S18-JI21625	NCP	%	83		70-130	Pass	
Dieldrin	S18-JI21625	NCP	%	86		70-130	Pass	
Endosulfan I	S18-JI21625	NCP	%	82		70-130	Pass	
Endosulfan II	S18-JI21625	NCP	%	82		70-130	Pass	
Endosulfan sulphate	S18-JI21625	NCP	%	80		70-130	Pass	
Endrin	S18-JI21625	NCP	%	81		70-130	Pass	
Endrin aldehyde	S18-JI21625	NCP	%	74		70-130	Pass	
Endrin ketone	S18-JI21625	NCP	%	79		70-130	Pass	
g-BHC (Lindane)	S18-JI21625	NCP	%	82		70-130	Pass	
Heptachlor	S18-JI21625	NCP	%	88		70-130	Pass	
Heptachlor epoxide	S18-JI21625	NCP	%	86		70-130	Pass	
Hexachlorobenzene	S18-JI20060	NCP	%	102		70-130	Pass	
Methoxychlor	S18-JI21671	NCP	%	80		70-130	Pass	
Toxaphene	S18-JI19047	NCP	%	86		70-130	Pass	
Spike - % Recovery								
Polychlorinated Biphenyls				Result 1				
Aroclor-1260	S18-JI22584	NCP	%	101		70-130	Pass	
Spike - % Recovery								
Heavy Metals				Result 1				

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Arsenic	S18-JI17324	NCP	%	95			70-130	Pass	
Cadmium	S18-JI17324	NCP	%	97			70-130	Pass	
Chromium	S18-JI17324	NCP	%	98			70-130	Pass	
Copper	S18-JI17324	NCP	%	100			70-130	Pass	
Lead	S18-JI17324	NCP	%	100			70-130	Pass	
Mercury	S18-JI17324	NCP	%	97			70-130	Pass	
Nickel	S18-JI17324	NCP	%	96			70-130	Pass	
Zinc	S18-JI17324	NCP	%	100			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S18-JI17314	NCP	mg/kg	25	24	<1	30%	Pass	
TRH C15-C28	S18-JI17314	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S18-JI17314	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S18-JI17314	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S18-JI17314	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S18-JI17314	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S18-JI14694	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S18-JI14694	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S18-JI14694	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S18-JI14694	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S18-JI14694	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&i)fluoranthene	S18-JI14694	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g,h,i)perylene	S18-JI14694	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S18-JI14694	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S18-JI14694	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a,h)anthracene	S18-JI14694	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S18-JI14694	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S18-JI14694	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	S18-JI14694	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S18-JI14694	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S18-JI14694	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S18-JI14694	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S18-JI20057	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4,4'-DDD	S18-JI20057	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4,4'-DDE	S18-JI20057	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4,4'-DDT	S18-JI20057	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S18-JI20057	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S18-JI20057	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S18-JI20057	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S18-JI20057	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S18-JI20057	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S18-JI20057	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S18-JI20057	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S18-JI20057	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S18-JI20057	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S18-JI20057	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S18-JI20057	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
g-BHC (Lindane)	S18-JI20057	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor	S18-JI20057	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor epoxide	S18-JI20057	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Hexachlorobenzene	S18-JI20057	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Methoxychlor	S18-JI20057	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Toxaphene	S18-JI20057	NCP	mg/kg	< 1	< 1	<1	30%	Pass
Duplicate								
Polychlorinated Biphenyls				Result 1	Result 2	RPD		
Aroclor-1016	S18-JI22583	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1221	S18-JI22583	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1232	S18-JI22583	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1242	S18-JI22583	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1248	S18-JI22583	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1254	S18-JI22583	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1260	S18-JI22583	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	S18-JI17323	NCP	mg/kg	< 2	< 2	<1	30%	Pass
Cadmium	S18-JI15899	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	S18-JI17323	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Copper	S18-JI17323	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Lead	S18-JI17323	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Mercury	S18-JI17323	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	S18-JI17323	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Zinc	S18-JI17323	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	S18-JI16680	CP	pH Units	6.9	7.1	pass	30%	Pass
Reaction Ratings*	S18-JI16680	CP	comment	4.0	4.0	pass	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	S18-JI16680	CP	%	21	21	1.0	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD		
TRH C6-C9	S18-JI16682	CP	mg/kg	< 20	< 20	<1	30%	Pass
Duplicate								
BTX				Result 1	Result 2	RPD		
Benzene	S18-JI16682	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Toluene	S18-JI16682	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Ethylbenzene	S18-JI16682	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
m&p-Xylenes	S18-JI16682	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
o-Xylene	S18-JI16682	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Xylenes - Total	S18-JI16682	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	S18-JI16682	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
TRH C6-C10	S18-JI16682	CP	mg/kg	< 20	< 20	<1	30%	Pass

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Nibha Vaidya	Analytical Services Manager
Nibha Vaidya	Senior Analyst-Asbestos (NSW)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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mgt

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☐ **Melbourne**
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Phone: +613 8564 5000 Fax: +613 8564 5090
Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS										Page 1 of 1									
Company Name : GHD Pty Ltd				Contact Name : Clifton Thompson				Purchase Order : 2127425				COC Number : 3							
Office Address : Level 15, 133 Castlereagh Street, Sydney NSW 2000				Project Manager : Justin Kabat				PROJECT Number : 2127425				Eurofins mgt quote ID : 170808GHDN							
Email for results : clifton.thompson@ghd.com				PROJECT Name : Scotland Island Energy Reliability Project				Data output format: Esdat, PDF											
Special Directions & Comments : Special Directions & Comments : Zip lock bag samples frozen overnight and been on ice all other times. Please freeze zip lock bags for possible future SPOCAS testing. Thanks										Some common holding times (with correct preservation). For further information contact the lab									
Eurofins mgt DI water batch number:																			
Analytes										Containers:									
Suite B7 (TRH/PAH/BTEX/N/8 metals)										1LP 250P 125P 1LA 40mL vial 125mL A Jar bag									
Suite B13 OCP / PCB										Sample comments:									
8 metals																			
BTEX																			
BTEX / TPH C6-C9																			
TCLP																			
Suite L2 Aggressivity Suite (pH, EC, Cl, Resistivity, S04)																			
pH - Field Screen (pH and pHox)																			
Asbestos ID (presence/absence)-AS4964-2004																			
Sample ID										Date									
Matrix																			
1 GHD-BH3 16 16.45										17/07/2018 soil									
2 GHD-BH3 17.5 17.77										17/07/2018 soil									
3 GHD-BH3 19 19.45										17/07/2018 soil									
4 GHD-BH3 22 22.45										17/07/2018 soil									
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			
14																			
15																			
16																			
Relinquished By: Clifton Thompson				Received By: <i>Jackie W</i>				Turn around time				Method Of Shipment				Temperature on arrival:			
Date & Time : 18:00, 24/07/2018				Date & Time: <i>24/07/18 7:35PM</i>				1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/>				<input type="checkbox"/> Courier <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal				5-26°C			
Signature:				Signature: <i>Jackie W</i>				5 DAY <input checked="" type="checkbox"/> 10 DAY <input type="checkbox"/> Other:				Courier Consignment # :				Report number: 609184			

Sample Receipt Advice

Company name: **GHD Pty Ltd NSW**
Contact name: **Clifton Thompson**
Project name: **SCOTLAND ISLAND ENERGY RELIABILITY PROJECT**
Project ID: **2127425**
COC number: **Not provided**
Turn around time: **5 Day**
Date/Time received: **Jul 24, 2018 7:35 PM**
Eurofins | mgt reference: **609184**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 5.3 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Clifton Thompson - Clifton.Thompson@ghd.com.

Certificate of Analysis

GHD Pty Ltd NSW
Level 15, 133 Castlereagh Street
Sydney
NSW 2000



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Clifton Thompson

Report 609184-S
Project name SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID 2127425
Received Date Jul 24, 2018

Client Sample ID			GHD-BH3_16-16.45	GHD-BH3_17.5-17.77	GHD-BH3_19-19.45	GHD-BH3_22-22.45
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-JI28182	S18-JI28183	S18-JI28184	S18-JI28185
Date Sampled			Jul 17, 2018	Jul 17, 2018	Jul 17, 2018	Jul 17, 2018
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.9	5.4	5.2	5.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.3	2.6	2.8	1.6
Reaction Ratings* ^{S05}		comment	4.0	1.0	1.0	4.0

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description

Acid Sulfate Soils Field pH Test

Testing Site

Brisbane

Extracted

Jul 26, 2018

Holding Time

7 Days

- Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000
Project Name: SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID: 2127425

Order No.: 2127425
Report #: 609184
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Jul 24, 2018 7:35 PM
Due: Aug 1, 2018
Priority: 5 Day
Contact Name: Clifton Thompson

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						
Brisbane Laboratory - NATA Site # 20794						X
Perth Laboratory - NATA Site # 23736						
External Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
1	GHD-BH3_16-16.45	Jul 17, 2018		Soil	S18-JI28182	X
2	GHD-BH3_17.5-17.77	Jul 17, 2018		Soil	S18-JI28183	X
3	GHD-BH3_19-19.45	Jul 17, 2018		Soil	S18-JI28184	X
4	GHD-BH3_22-22.45	Jul 17, 2018		Soil	S18-JI28185	X
Test Counts						4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	S18-JI28182	CP	pH Units	5.9	5.9	pass	30%	Pass	
Reaction Ratings*	S18-JI28182	CP	comment	4.0	4.0	pass	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Nibha Vaidya Analytical Services Manager



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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**Melbourne**

2 Kingston Town Close, Oakleigh, VIC 3166
 Phone: +613 8564 5000 Fax: +613 8564 5090
 Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORDPage 1 of 1**CLIENT DETAILS**

Company Name : GHD Pty Ltd	Contact Name : Clifton Thompson	Purchase Order : 2127425	COC Number : 1
Office Address :	Project Manager : Justin Kabat	PROJECT Number : 2127425	Eurofins mgt quote ID : 170808GHDN
Level 15, 133 Castlereagh Street, Sydney NSW 2000	Email for results : clifton.thompson@ghd.com	PROJECT Name : Scotland Island Energy Reliability Project	Data output format: Esdat, PDF

Special Directions & Comments :	Analytes															Some common holding times (with correct preservation). For further information contact the lab			
																Waters		Soils	
Special Directions & Comments : Zip lock bag samples frozen overnight and been on ice all other times. Please freeze zip lock bags for possible future SPOCAS testing. Thanks	Asbestos ID (presence/absence)-AS4964-2004	Suite B7 (TRH/PAH/BTEXN/8 metals)	Suite B13 OCP / PCB	8 metals	BTEX	BTEX / TPH C6-C9	TCLP	Suite L2 Aggressivity Suite (pH, EC, Cl, Resistivity, S04)	pH - Field Screen (pH and pHfox)							BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
																TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
																Heavy Metals	6 months	Heavy Metals	6 months
																Mercury, CrVI	28 days	Mercury, CrVI	28 days
																Microbiological testing	24 hours	Microbiological testing	72 hours
																BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
																Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
																Ferrous iron	7 days	ASLP, TCLP	7 days

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	Asbestos ID (presence/absence)-AS4964-2004	Suite B7 (TRH/PAH/BTEXN/8 metals)	Suite B13 OCP / PCB	8 metals	BTEX	BTEX / TPH C6-C9	TCLP	Suite L2 Aggressivity Suite (pH, EC, Cl, Resistivity, S04)	pH - Field Screen (pH and pHfox)							Containers:								Sample comments:
																			1LP	250P	125P	1LA	40mL vial	125mL A	Jar	bag	
1	GHD-BH3 9.0 9.45	17/07/2018	soil									X														1	
2	GHD-BH3 10.5 10.6	17/07/2018	soil									X														1	
3	GHD-BH3 15 15.45	17/07/2018	soil									X														1	
4	GHD-BH3 18 18.2	17/07/2018	soil									X														1	
5	GHD-BH2 1.9 2.35	23/07/2018	soil	X	X	X						X													1	1	
6	GHD-BH2 3.5 3.95	23/07/2018	soil		X	X						X													1	1	
7	GHD-BH2 5 5.45	23/07/2018	soil									X													1	1	
8	GHD-BH2 8 8.45	23/07/2018	soil									X													1	1	
9	GHD-BH2 11.0	23/07/2018	soil		X							X													1	1	
10	GHD-BH2 11 11.23	23/07/2018	soil									X													1	1	
11	GHD-BH2 14 14.45	23/07/2018	soil									X													1	1	
12	Dup01	23/07/2018	soil		X	X																					
13	Dup02	23/07/2018	soil		X	X																					
14																											
15																											
16																											

Laboratory Staff		Turn around time		Method Of Shipment		Temperature on arrival:
Relinquished By: Clifton Thompson	Received By: <i>Uhan G</i>	1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/>		<input type="checkbox"/> Courier <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal		<i>7.43C</i>
Date & Time : 18:00, 23/07/2018 & 18:00 19/07/2018	Date & Time : <i>11:15am 25/7</i>	5 DAY <input checked="" type="checkbox"/> 10 DAY <input type="checkbox"/> Other:		Courier Consignment # :		Report number:
Signature:	Signature: <i>[Signature]</i>					<i>609240</i>

Sample Receipt Advice

Company name: **GHD Pty Ltd NSW**
Contact name: **Clifton Thompson**
Project name: **SCOTLAND ISLAND ENERGY RELIABILITY PROJECT**
Project ID: **2127425**
COC number: **Not provided**
Turn around time: **5 Day**
Date/Time received: **Jul 25, 2018 11:15 AM**
Eurofins | mgt reference: **609240**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 7.4 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☐ Split sample sent to requested external lab.
- ☐ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

GHD_BH2_11.0 not received; analysis cancelled. GHD_BH3_9.0-9.45, GHD_BH3_10.5-10.6, GHD_BH3_15-15.45 & GHD_BH3_18-18.2 not frozen as received in Asbestos bags without prior instructions. Additional sample GHD_BH2_10.60-10.75(Unfrozen Asbestos bag) placed on hold.

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Clifton Thompson - Clifton.Thompson@ghd.com.

Certificate of Analysis



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025-Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

GHD Pty Ltd NSW
Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Attention: Clifton Thompson
Report 609240-AID
Project Name SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID 2127425
Received Date Jul 25, 2018
Date Reported Aug 01, 2018

Methodology:

Asbestos Fibre
Identification

Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques.

NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.

Unknown Mineral
Fibres

Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity.

NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.

Subsampling Soil
Samples

The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed.

NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.

Bonded asbestos-
containing material
(ACM)

The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 4964 - 2004.

NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.

Limit of Reporting

The performance limitation of the AS4964 method for inhomogeneous samples is around 0.1 g/kg (0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis where required, this is considered to be at the nominal reporting limit of 0.01 % (w / w). The examination of large sample sizes (500 mL is recommended) may improve the likelihood of identifying ACM in the > 2mm fraction. The NEPM screening level of 0.001 % (w / w) asbestos in soil for FA (friable asbestos) and AF (asbestos fines) then applies where they are able to be quantified by gravimetric procedures. This quantitative screening is not generally applicable to FF (free fibres) and results of Trace Analysis are referred.

NOTE: NATA News March 2014, p.7, states in relation to AS4964: "This is a qualitative method with a nominal reporting limit of 0.01%" and that currently in Australia "there is no validated method available for the quantification of asbestos". Accordingly, NATA Accreditation does not cover the performance of this service (indicated with an asterisk). This report is consistent with the analytical procedures and reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended) and the Western Australia Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, 2009, including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil, June 2011.

Project Name SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID 2127425
Date Sampled Jul 23, 2018
Report 609240-AID

Client Sample ID	Eurofins mgt Sample No.	Date Sampled	Sample Description	Result
GHD_BH2_1.9-2.35	18-JI28506	Jul 23, 2018	Approximate Sample 45g Sample consisted of: Light grey fine grain soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jul 25, 2018	Indefinite

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Order No.: 2127425
Report #: 609240
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Jul 25, 2018 11:15 AM
Due: Aug 1, 2018
Priority: 5 Day
Contact Name: Clifton Thompson

Project Name: SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID: 2127425

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	CANCELLED	HOLD	Acid Sulfate Soils Field pH Test	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X			X	X	X
Brisbane Laboratory - NATA Site # 20794								X	X			
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID							
1	GHD_BH3_9.0-9.45	Jul 17, 2018		Soil	S18-JI28502				X			
2	GHD_BH3_10.5-10.6	Jul 17, 2018		Soil	S18-JI28503				X			
3	GHD_BH3_15-15.45	Jul 17, 2018		Soil	S18-JI28504				X			
4	GHD_BH3_18-18.2	Jul 17, 2018		Soil	S18-JI28505				X			
5	GHD_BH2_1.9-2.35	Jul 23, 2018		Soil	S18-JI28506	X			X	X	X	X
6	GHD_BH2_3.5	Jul 23, 2018		Soil	S18-JI28507				X	X	X	X

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID: 2127425

Order No.: 2127425
Report #: 609240
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Jul 25, 2018 11:15 AM
Due: Aug 1, 2018
Priority: 5 Day
Contact Name: Clifton Thompson

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	CANCELLED	HOLD	Acid Sulfate Soils Field pH Test	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X			X	X	X
Brisbane Laboratory - NATA Site # 20794								X	X			
Perth Laboratory - NATA Site # 23736												
	-3.95											
7	GHD_BH2_11.0	Jul 23, 2018		Soil	S18-JI28508		X					
8	DUP01	Jul 23, 2018		Soil	S18-JI28509					X	X	X
9	DUP02	Jul 23, 2018		Soil	S18-JI28510					X	X	X
10	GHD_BH2_5-5.45	Jul 23, 2018		Soil	S18-JI28511				X			
11	GHD_BH2_8-8.45	Jul 23, 2018		Soil	S18-JI28512				X			
12	GHD_BH2_11-11.23	Jul 23, 2018		Soil	S18-JI28513				X			
13	GHD_BH2_14-14.45	Jul 23, 2018		Soil	S18-JI28514				X			
14	GHD_BH3_10.	Jul 16, 2018		Soil	S18-JI28546			X				

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Sample Detail						Asbestos - AS4964	CANCELLED	HOLD	Acid Sulfate Soils Field pH Test	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X			X	X	X
Brisbane Laboratory - NATA Site # 20794								X	X			
Perth Laboratory - NATA Site # 23736												
	60-10.75											
Test Counts						1	1	1	10	4	4	4

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Western Australia Department of Health
NOHSC	National Occupational Health and Safety Commission
ACM	Bonded asbestos-containing material means any material containing more than 1% asbestos and comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin. Common examples of ACM include but are not limited to: pipe and boiler insulation, sprayed-on fireproofing, troweled-on acoustical plaster, floor tile and mastic, floor linoleum, transite shingles, roofing materials, wall and ceiling plaster, ceiling tiles, and gasket materials. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected because it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and hence potential for fibre release.
FA	FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).
PACM	Presumed Asbestos-Containing Material means thermal system insulation and surfacing material found in buildings, vessels, and vessel sections constructed no later than 1980 that are assumed to contain greater than one percent asbestos but have not been sampled or analyzed to verify or negate the presence of asbestos.
AF	Asbestos fines (AF) are defined as free fibres, or fibre bundles, smaller than 7mm. It is the free fibres which present the greatest risk to human health, although very small fibres (< 5 microns in length) are not considered to be such a risk. AF also includes small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. (Note that for bonded ACM fragments to pass through a 7 mm x 7 mm sieve implies a substantial degree of damage which increases the potential for fibre release.)
AC	Asbestos cement means a mixture of cement and asbestos fibres (typically 90:10 ratios).

Comments

The sample received was not collected in an approved asbestos bag and was therefore sub-sampled from the 250mL glass jar. Valid sub-sampling procedures were applied so as to ensure that the sub-sample to be analysed accurately represented the sample received.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Sayeed Abu Senior Analyst-Asbestos (NSW)

Authorised by:

Laxman Dias Senior Analyst-Asbestos (NSW)



Glenn Jackson
National Operations Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Certificate of Analysis

GHD Pty Ltd NSW
 Level 15, 133 Castlereagh Street
 Sydney
 NSW 2000



NATA Accredited
 Accreditation Number 1261
 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: Clifton Thompson

Report 609240-S
 Project name SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
 Project ID 2127425
 Received Date Jul 25, 2018

Client Sample ID			GHD_BH3_9.0-9.45	GHD_BH3_10.5-10.6	GHD_BH3_15-15.45	GHD_BH3_18-18.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-JI28502	S18-JI28503	S18-JI28504	S18-JI28505
Date Sampled			Jul 17, 2018	Jul 17, 2018	Jul 17, 2018	Jul 17, 2018
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.8	6.2	7.2	7.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.4	3.1	4.5	2.6
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0

Client Sample ID			GHD_BH2_1.9-2.35	GHD_BH2_3.5-3.95	DUP01	DUP02
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-JI28506	S18-JI28507	S18-JI28509	S18-JI28510
Date Sampled			Jul 23, 2018	Jul 23, 2018	Jul 23, 2018	Jul 23, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	91	79	72	68
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100

Client Sample ID			GHD_BH2_1.9-2.35	GHD_BH2_3.5-3.95	DUP01	DUP02
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-JI28506	S18-JI28507	S18-JI28509	S18-JI28510
Date Sampled			Jul 23, 2018	Jul 23, 2018	Jul 23, 2018	Jul 23, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	133	95	105	83
p-Terphenyl-d14 (surr.)	1	%	123	86	93	83
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchloroendate (surr.)	1	%	83	86	86	80
Tetrachloro-m-xylene (surr.)	1	%	83	90	96	89

Client Sample ID			GHD_BH2_1.9-2.35	GHD_BH2_3.5-3.95	DUP01	DUP02
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-JI28506	S18-JI28507	S18-JI28509	S18-JI28510
Date Sampled			Jul 23, 2018	Jul 23, 2018	Jul 23, 2018	Jul 23, 2018
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibutylchloredate (surr.)	1	%	83	86	86	80
Tetrachloro-m-xylene (surr.)	1	%	83	90	96	89
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	5.5	6.2	6.1
Copper	5	mg/kg	< 5	< 5	< 5	< 5
Lead	5	mg/kg	< 5	< 5	< 5	< 5
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	< 5	< 5	< 5	< 5
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.0	5.1	-	-
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.6	4.4	-	-
Reaction Ratings**S05		comment	1.0	1.0	-	-
% Moisture	1	%	13	14	12	16

Client Sample ID			GHD_BH2_5-5.45	GHD_BH2_8-8.45	GHD_BH2_11-11.23	GHD_BH2_14-14.45
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-JI28511	S18-JI28512	S18-JI28513	S18-JI28514
Date Sampled			Jul 23, 2018	Jul 23, 2018	Jul 23, 2018	Jul 23, 2018
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.1	6.3	5.4	5.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.3	4.8	4.2	1.6
Reaction Ratings**S05		comment	1.0	1.0	1.0	4.0

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: TRH C6-C36 - LTM-ORG-2010	Sydney	Jul 27, 2018	14 Day
BTEX - Method: TRH C6-C40 - LTM-ORG-2010	Sydney	Jul 27, 2018	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Sydney	Jul 27, 2018	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Sydney	Jul 27, 2018	14 Day
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Sydney	Jul 27, 2018	14 Days
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Jul 27, 2018	28 Day
Organochlorine Pesticides - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Sydney	Jul 27, 2018	14 Day
Polychlorinated Biphenyls - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Sydney	Jul 27, 2018	28 Days
Acid Sulfate Soils Field pH Test - Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests	Brisbane	Jul 26, 2018	7 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Sydney	Jul 25, 2018	14 Day

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Received: Jul 25, 2018 11:15 AM
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Contact Name: Clifton Thompson

Project Name: SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
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Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	CANCELLED	HOLD	Acid Sulfate Soils Field pH Test	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X			X	X	X
Brisbane Laboratory - NATA Site # 20794								X	X			
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID							
1	GHD_BH3_9.0-9.45	Jul 17, 2018		Soil	S18-JI28502				X			
2	GHD_BH3_10.5-10.6	Jul 17, 2018		Soil	S18-JI28503				X			
3	GHD_BH3_15-15.45	Jul 17, 2018		Soil	S18-JI28504				X			
4	GHD_BH3_18-18.2	Jul 17, 2018		Soil	S18-JI28505				X			
5	GHD_BH2_1.9-2.35	Jul 23, 2018		Soil	S18-JI28506	X			X	X	X	X
6	GHD_BH2_3.5	Jul 23, 2018		Soil	S18-JI28507				X	X	X	X

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Sample Detail						Asbestos - AS4964	CANCELLED	HOLD	Acid Sulfate Soils Field pH Test	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X			X	X	X
Brisbane Laboratory - NATA Site # 20794								X	X			
Perth Laboratory - NATA Site # 23736												
	-3.95											
7	GHD_BH2_11.0	Jul 23, 2018		Soil	S18-JI28508		X					
8	DUP01	Jul 23, 2018		Soil	S18-JI28509					X	X	X
9	DUP02	Jul 23, 2018		Soil	S18-JI28510					X	X	X
10	GHD_BH2_5-5.45	Jul 23, 2018		Soil	S18-JI28511				X			
11	GHD_BH2_8-8.45	Jul 23, 2018		Soil	S18-JI28512				X			
12	GHD_BH2_11-11.23	Jul 23, 2018		Soil	S18-JI28513				X			
13	GHD_BH2_14-14.45	Jul 23, 2018		Soil	S18-JI28514				X			
14	GHD_BH3_10.	Jul 16, 2018		Soil	S18-JI28546			X				

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Due: Aug 1, 2018
Priority: 5 Day
Contact Name: Clifton Thompson

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	CANCELLED	HOLD	Acid Sulfate Soils Field pH Test	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X			X	X	X
Brisbane Laboratory - NATA Site # 20794								X	X			
Perth Laboratory - NATA Site # 23736												
	60-10.75											
Test Counts						1	1	1	10	4	4	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4,4'-DDD	mg/kg	< 0.05			0.05	Pass	
4,4'-DDE	mg/kg	< 0.05			0.05	Pass	
4,4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	96			70-130	Pass	
TRH C10-C14	%	79			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	96			70-130	Pass	
Toluene	%	103			70-130	Pass	
Ethylbenzene	%	100			70-130	Pass	
m&p-Xylenes	%	104			70-130	Pass	
o-Xylene	%	102			70-130	Pass	
Xylenes - Total	%	103			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	98			70-130	Pass	
TRH C6-C10	%	94			70-130	Pass	
TRH >C10-C16	%	85			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	89			70-130	Pass	
Acenaphthylene	%	88			70-130	Pass	
Anthracene	%	79			70-130	Pass	
Benz(a)anthracene	%	86			70-130	Pass	
Benzo(a)pyrene	%	86			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(b&j)fluoranthene			%	83			70-130	Pass	
Benzo(g,h,i)perylene			%	86			70-130	Pass	
Benzo(k)fluoranthene			%	84			70-130	Pass	
Chrysene			%	88			70-130	Pass	
Dibenz(a,h)anthracene			%	90			70-130	Pass	
Fluoranthene			%	74			70-130	Pass	
Fluorene			%	88			70-130	Pass	
Indeno(1.2.3-cd)pyrene			%	91			70-130	Pass	
Naphthalene			%	86			70-130	Pass	
Phenanthrene			%	77			70-130	Pass	
Pyrene			%	77			70-130	Pass	
LCS - % Recovery									
Organochlorine Pesticides									
4,4'-DDD			%	91			70-130	Pass	
4,4'-DDE			%	89			70-130	Pass	
4,4'-DDT			%	86			70-130	Pass	
a-BHC			%	91			70-130	Pass	
Aldrin			%	90			70-130	Pass	
b-BHC			%	88			70-130	Pass	
d-BHC			%	90			70-130	Pass	
Dieldrin			%	89			70-130	Pass	
Endosulfan I			%	89			70-130	Pass	
Endosulfan II			%	90			70-130	Pass	
Endosulfan sulphate			%	90			70-130	Pass	
Endrin			%	95			70-130	Pass	
Endrin aldehyde			%	86			70-130	Pass	
Endrin ketone			%	87			70-130	Pass	
g-BHC (Lindane)			%	91			70-130	Pass	
Heptachlor			%	91			70-130	Pass	
Heptachlor epoxide			%	89			70-130	Pass	
Hexachlorobenzene			%	92			70-130	Pass	
Methoxychlor			%	85			70-130	Pass	
LCS - % Recovery									
Polychlorinated Biphenyls									
Aroclor-1260			%	85			70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	115			70-130	Pass	
Cadmium			%	108			70-130	Pass	
Chromium			%	117			70-130	Pass	
Copper			%	115			70-130	Pass	
Lead			%	116			70-130	Pass	
Mercury			%	105			70-130	Pass	
Nickel			%	115			70-130	Pass	
Zinc			%	117			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S18-JI30022	NCP	%	82			70-130	Pass	
TRH C10-C14	S18-JI33205	NCP	%	80			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S18-JI30022	NCP	%	87			70-130	Pass	
Toluene	S18-JI30022	NCP	%	92			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Ethylbenzene	S18-JI30022	NCP	%	90		70-130	Pass	
m&p-Xylenes	S18-JI30022	NCP	%	93		70-130	Pass	
o-Xylene	S18-JI30022	NCP	%	93		70-130	Pass	
Xylenes - Total	S18-JI30022	NCP	%	93		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1				
Naphthalene	S18-JI30022	NCP	%	80		70-130	Pass	
TRH C6-C10	S18-JI30022	NCP	%	80		70-130	Pass	
TRH >C10-C16	S18-JI33205	NCP	%	78		70-130	Pass	
Spike - % Recovery								
Organochlorine Pesticides				Result 1				
4,4'-DDD	S18-JI31124	NCP	%	113		70-130	Pass	
4,4'-DDE	S18-JI31124	NCP	%	108		70-130	Pass	
4,4'-DDT	S18-JI31124	NCP	%	99		70-130	Pass	
a-BHC	S18-JI31124	NCP	%	107		70-130	Pass	
Aldrin	S18-JI31124	NCP	%	107		70-130	Pass	
b-BHC	S18-JI31124	NCP	%	105		70-130	Pass	
d-BHC	S18-JI31124	NCP	%	107		70-130	Pass	
Dieldrin	S18-JI31124	NCP	%	109		70-130	Pass	
Endosulfan I	S18-JI31124	NCP	%	107		70-130	Pass	
Endosulfan II	S18-JI31124	NCP	%	108		70-130	Pass	
Endosulfan sulphate	S18-JI31124	NCP	%	108		70-130	Pass	
Endrin	S18-JI31124	NCP	%	113		70-130	Pass	
Endrin aldehyde	S18-JI31124	NCP	%	99		70-130	Pass	
Endrin ketone	S18-JI31124	NCP	%	106		70-130	Pass	
g-BHC (Lindane)	S18-JI31124	NCP	%	107		70-130	Pass	
Heptachlor	S18-JI31124	NCP	%	106		70-130	Pass	
Heptachlor epoxide	S18-JI31124	NCP	%	107		70-130	Pass	
Hexachlorobenzene	S18-JI31124	NCP	%	109		70-130	Pass	
Methoxychlor	S18-JI31124	NCP	%	97		70-130	Pass	
Spike - % Recovery								
Polychlorinated Biphenyls				Result 1				
Aroclor-1260	S18-JI31124	NCP	%	98		70-130	Pass	
Spike - % Recovery								
Polycyclic Aromatic Hydrocarbons				Result 1				
Acenaphthene	S18-JI28507	CP	%	112		70-130	Pass	
Acenaphthylene	S18-JI28507	CP	%	113		70-130	Pass	
Anthracene	S18-JI28507	CP	%	102		70-130	Pass	
Benz(a)anthracene	S18-JI28507	CP	%	114		70-130	Pass	
Benzo(a)pyrene	S18-JI28507	CP	%	112		70-130	Pass	
Benzo(b&j)fluoranthene	S18-JI28507	CP	%	107		70-130	Pass	
Benzo(g,h,i)perylene	S18-JI28507	CP	%	102		70-130	Pass	
Benzo(k)fluoranthene	S18-JI28507	CP	%	111		70-130	Pass	
Chrysene	S18-JI28507	CP	%	115		70-130	Pass	
Dibenz(a,h)anthracene	S18-JI28507	CP	%	110		70-130	Pass	
Fluoranthene	S18-JI28507	CP	%	99		70-130	Pass	
Fluorene	S18-JI28507	CP	%	114		70-130	Pass	
Indeno(1,2,3-cd)pyrene	S18-JI28507	CP	%	110		70-130	Pass	
Naphthalene	S18-JI28507	CP	%	111		70-130	Pass	
Phenanthrene	S18-JI28507	CP	%	101		70-130	Pass	
Pyrene	S18-JI28507	CP	%	102		70-130	Pass	
Spike - % Recovery								
Heavy Metals				Result 1				
Arsenic	S18-JI28507	CP	%	93		70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Cadmium	S18-JI28507	CP	%	93			70-130	Pass	
Chromium	S18-JI28507	CP	%	96			70-130	Pass	
Copper	S18-JI28507	CP	%	93			70-130	Pass	
Lead	S18-JI28507	CP	%	94			70-130	Pass	
Mercury	S18-JI28507	CP	%	91			70-130	Pass	
Nickel	S18-JI28507	CP	%	95			70-130	Pass	
Zinc	S18-JI28507	CP	%	93			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S18-JI28506	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S18-JI28506	CP	mg/kg	< 20	30	<1	30%	Pass	
TRH C15-C28	S18-JI28506	CP	mg/kg	< 50	70	<1	30%	Pass	
TRH C29-C36	S18-JI28506	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-JI28506	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S18-JI28506	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S18-JI28506	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S18-JI28506	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S18-JI28506	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S18-JI28506	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-JI28506	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S18-JI28506	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S18-JI33147	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S18-JI28506	CP	mg/kg	< 100	110	<1	30%	Pass	
TRH >C34-C40	S18-JI28506	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S18-JI28506	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S18-JI28506	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S18-JI28506	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S18-JI28506	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S18-JI28506	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S18-JI28506	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g,h,i)perylene	S18-JI28506	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S18-JI28506	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S18-JI28506	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a,h)anthracene	S18-JI28506	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S18-JI28506	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S18-JI28506	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	S18-JI28506	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S18-JI28506	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S18-JI28506	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S18-JI28506	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S18-JI31123	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4,4'-DDD	S18-JI31123	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4,4'-DDE	S18-JI31123	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4,4'-DDT	S18-JI31123	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S18-JI31123	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
Aldrin	S18-JI31123	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
b-BHC	S18-JI31123	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
d-BHC	S18-JI31123	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Dieldrin	S18-JI31123	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan I	S18-JI31123	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan II	S18-JI31123	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan sulphate	S18-JI31123	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin	S18-JI31123	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin aldehyde	S18-JI31123	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin ketone	S18-JI31123	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
g-BHC (Lindane)	S18-JI31123	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor	S18-JI31123	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor epoxide	S18-JI31123	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Hexachlorobenzene	S18-JI31123	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Methoxychlor	S18-JI31123	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Toxaphene	S18-JI31123	NCP	mg/kg	< 1	< 1	<1	30%	Pass
Duplicate								
Polychlorinated Biphenyls				Result 1	Result 2	RPD		
Aroclor-1016	S18-JI31123	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1221	S18-JI31123	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1232	S18-JI31123	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1242	S18-JI31123	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1248	S18-JI31123	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1254	S18-JI31123	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1260	S18-JI31123	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	S18-JI30212	NCP	mg/kg	< 2	< 2	<1	30%	Pass
Cadmium	S18-JI30212	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	S18-JI30212	NCP	mg/kg	6.0	6.0	<1	30%	Pass
Copper	S18-JI30212	NCP	mg/kg	5.5	5.6	2.0	30%	Pass
Lead	S18-JI30212	NCP	mg/kg	6.8	7.2	6.0	30%	Pass
Mercury	S18-JI30212	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	S18-JI30212	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Zinc	S18-JI30212	NCP	mg/kg	26	28	8.0	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	S18-JI28506	CP	%	13	14	3.0	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	S18-JI28511	CP	pH Units	5.1	5.2	pass	30%	Pass
Reaction Ratings*	S18-JI28511	CP	comment	1.0	1.0	pass	30%	Pass

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Nibha Vaidya	Analytical Services Manager
Nibha Vaidya	Senior Analyst-Asbestos (NSW)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
Phone: +612 9900 8400
Email: enviro.syd@motlabmark.com.au



Unit 1-21 Smallwood Place, Murrarie
Phone: +617 3902 4600
Email: enviro.bris@mqtlabmark.com.au



2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 8564 5000 Fax: +613 8564 5090
Email: enquiries.melb@mgltabmark.com.au

Page 1 of 1

Company Name : GHD Pty Ltd	Contact Name : Clifton Thompson	Purchase Order : 2127425	COC Number : 4
Office Address :	Project Manager : Justin Kabat	PROJECT Number : 2127425	Eurofins mgt quote ID : 170808GHDN
Level 15, 133 Castlereagh Street, Sydney NSW 2000	Email for results : clifton.thompson@ghd.com	PROJECT Name : Scotland Island Energy Reliability Project	Data output format: Esdat, PDF

Eurofins | mqt DI water batch number:

Soils

BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Sample comments:

[illegible]

QS3009 R0 Issue Date: 25 February 2013 Page 1 of 1

Enviro Sample NSW

From: Alena Bounkeua
Sent: Friday, 3 August 2018 2:32 PM
To: Enviro Sample NSW; COC NSW
Subject: *update* GHD 2127425 COC4
Attachments: Copy of COC4 2127425_Eurofins_Chain Of Custody 1
_contamination_updated3Aug.xls

Follow Up Flag: Follow up
Flag Status: Flagged

Hi All,

Updated COC for report 610390

Cheers!

Warm Regards,

Alena Bounkeua
Eurofins | mgt
Phone: (02) 9900 8414
Email: AlenaBounkeua@eurofins.com

From: Jacqui Hallchurch [<mailto:Jacqui.Hallchurch@ghd.com>]
Sent: Friday, 3 August 2018 2:25 PM
To: Alena Bounkeua; Clifton Thompson
Cc: Nibha Vaidya
Subject: RE: GHD 2127425 COC4

EXTERNAL EMAIL*

Good afternoon

Apologies for the delay. Please find attached updated COC with contamination analyses requested for these samples

Kind regards
jacqui

From: AlenaBounkeua@eurofins.com <AlenaBounkeua@eurofins.com>
Sent: Thursday, 2 August 2018 10:33 AM
To: Clifton Thompson <Clifton.Thompson@ghd.com>
Cc: Jacqui Hallchurch <Jacqui.Hallchurch@ghd.com>; Nibha Vaidya <NibhaVaidya@eurofins.com>
Subject: RE: GHD 2127425 COC4

Hi Clifton,

Thanks for the COC.

No worries, send through the updated COC when ready.

Let me know if there is anything else I can help you with.

Warm Regards,

Alena Bounkeua

Eurofins | mgt

Phone: (02) 9900 8414

Email: AlenaBounkeua@eurofins.com

From: Clifton Thompson [<mailto:Clifton.Thompson@ghd.com>]

Sent: Wednesday, 1 August 2018 10:24 PM

To: Enviro Sample NSW

Cc: Jacqui Hallchurch

Subject: GHD 2127425 COC4

Hi guys,

Please find the attached COC for samples delivered yesterday evening. Jacqui Hallchurch will update the COC for additional testing and send it through.

Regards,

Clifton Thompson
Geotechnical Engineer

GHD

Proudly employee owned

T: +61 2 8898 8812 | M: +61 431 470 139 | E: clifton.thompson@ghd.com
Level 2, 20 Smith Street Parramatta NSW 2150 Australia | www.ghd.com

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mgt

☒ **Sydney**

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☐ **Brisbane**

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☐ **Melbourne**

2 Kingston Town Close, Oakleigh, VIC 3166
 Phone: +613 8564 5000 Fax: +613 8564 5090
 Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS										Page <u>1</u> of <u>1</u>																												
Company Name : GHD Pty Ltd				Contact Name : Clifton Thompson				Purchase Order : 2127425				COC Number : 4																										
Office Address :				Project Manager : Justin Kabat				PROJECT Number : 2127425				Eurofins mgt quote ID : 170808GHDN																										
Level 15, 133 Castlereagh Street, Sydney NSW 2000				Email for results : clifton.thompson@ghd.com				PROJECT Name : Scotland Island Energy Reliability Project				Data output format: Esdat, PDF																										
Special Directions & Comments :				Analytes										Some common holding times (with correct preservation). For further information contact the lab																								
Special Directions & Comments : Zip lock bag samples frozen overnight and been on ice all other times. Please freeze zip lock bags for possible future SPOCAS testing. Thanks				Asbestos ID (presence/absence)-AS4964-2004 Suite B7 (TRH/PAH/BTEX/N8 metals) Suite B13 OCP / PCB 8 metals BTEX BTEX / TPH C6-C9 TCLP Suite L2 Aggressivity Suite (pH, EC, Cl, Resistivity, S04) pH - Field Screen (pHf and pHfox)										Waters					Soils																			
														BTEX, MAH, VOC 14 days TRH, PAH, Phenols, Pesticides 7 days Heavy Metals 6 months Mercury, CrVI 28 days Microbiological testing 24 hours BOD, Nitrate, Nitrite, Total N 2 days Solids - TSS, TDS etc 7 days Ferrous iron 7 days					BTEX, MAH, VOC 14 days TRH, PAH, Phenols, Pesticides 14 days Heavy Metals 6 months Mercury, CrVI 28 days Microbiological testing 72 hours Anions 28 days SPOCAS, pH Field and FOX, CrS 24 hours ASLP, TCLP 7 days																			
Eurofins mgt DI water batch number:																																						
	Sample ID	Date	Matrix											Containers:					Sample comments:																			
														1LP	250P	125P	1LA	40mL vial	125mL A	Jar	bag																	
1	GHD-BH4_1.5_1.95	30/07/2018	soil																			1																
2	GHD-BH4_3.0_3.45	30/07/2018	soil																			1	1															
3	GHD-BH4_4.5_4.95	30/07/2018	soil																			1	1															
4	GHD-BH4_6.0_6.45	30/07/2018	soil																			1	1															
5	GHD-BH4_7.5_7.95	30/07/2018	soil																			1	1															
6	GHD-BH4_9.0_9.45	30/07/2018	soil																			1	1															
7	GHD-BH4_10.5_10.95	30/07/2018	soil																			1	1															
8	GHD-BH4_12.0_12.45	30/07/2018	soil																			1	1															
9	GHD-BH4_13.5_13.81	30/07/2018	soil																			1	1															
10	GHD-BH4_15.0_15.45	30/07/2018	soil																			1	1															
11	GHD-BH4_16.5_16.8	31/07/2018	soil																			1	1															
12	GHD-BH4_18.0_18.45	31/07/2018	soil																			1	1															
13	GHD-BH4_20.4_20.85	31/07/2018	soil																			1	1															
14	GHD-BH4_22.0_22.45	31/07/2018	soil																			1	1															
15																																						
16																																						
				Laboratory Staff										Turn around time										Method Of Shipment										Temperature on arrival:				
Relinquished By: Clifton Thompson				Received By:										1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/> 5 DAY <input checked="" type="checkbox"/> 10 DAY <input type="checkbox"/> Other:										<input type="checkbox"/> Courier <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal Courier Consignment # :										Report number:				
Date & Time : 18:00, 31/07/2018				Date & Time :																																		
Signature:				Signature:																																		

Sample Receipt Advice

Company name: **GHD Pty Ltd NSW**
Contact name: **Clifton Thompson**
Project name: **SCOTLAND ISLAND ENERGY RELIABILITY PROJECT**
Project ID: **2127425**
COC number: **Not provided**
Turn around time: **5 Day**
Date/Time received: **Aug 1, 2018 10:24 PM**
Eurofins | mgt reference: **610390**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 6.1 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☐ Split sample sent to requested external lab.
- ☐ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

No Jar or bag received for sample GHD-BH4_12.0_12.45 analysis cancelled. No bag received for sample GHD-BH4_1.5_1.95 analysis cancelled.

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Clifton Thompson - Clifton.Thompson@ghd.com.

Certificate of Analysis



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025-Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

GHD Pty Ltd NSW
Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Attention: Clifton Thompson
Report 610390-AID
Project Name SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID 2127425
Received Date Aug 01, 2018
Date Reported Aug 09, 2018

Methodology:

Asbestos Fibre
Identification

Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques.

NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.

Unknown Mineral
Fibres

Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity.

NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.

Subsampling Soil
Samples

The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed.

NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.

Bonded asbestos-
containing material
(ACM)

The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 4964 - 2004.

NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.

Limit of Reporting

The performance limitation of the AS4964 method for inhomogeneous samples is around 0.1 g/kg (0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis where required, this is considered to be at the nominal reporting limit of 0.01 % (w / w). The examination of large sample sizes (500 mL is recommended) may improve the likelihood of identifying ACM in the > 2mm fraction. The NEPM screening level of 0.001 % (w / w) asbestos in soil for FA (friable asbestos) and AF (asbestos fines) then applies where they are able to be quantified by gravimetric procedures. This quantitative screening is not generally applicable to FF (free fibres) and results of Trace Analysis are referred.

NOTE: NATA News March 2014, p.7, states in relation to AS4964: "This is a qualitative method with a nominal reporting limit of 0.01%" and that currently in Australia "there is no validated method available for the quantification of asbestos". Accordingly, NATA Accreditation does not cover the performance of this service (indicated with an asterisk). This report is consistent with the analytical procedures and reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended) and the Western Australia Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, 2009, including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil, June 2011.

Project Name SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID 2127425
Date Sampled Jul 30, 2018
Report 610390-AID

Client Sample ID	Eurofins mgt Sample No.	Date Sampled	Sample Description	Result
GHD-BH4_1.5_1.95	18-Au02475	Jul 30, 2018	Approximate Sample 22g Sample consisted of: Dark Grey fine grain soil and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Aug 03, 2018	Indefinite

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Order No.: 2127425
Report #: 610390
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Aug 1, 2018 10:24 PM
Due: Aug 9, 2018
Priority: 5 Day
Contact Name: Clifton Thompson

Project Name: SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID: 2127425

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	CANCELLED	Acid Sulfate Soils Field pH Test	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X			X	X	X
Brisbane Laboratory - NATA Site # 20794							X	X			
Perth Laboratory - NATA Site # 23736											
External Laboratory											
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID						
1	GHD-BH4_1.5_1.95	Jul 30, 2018		Soil	S18-Au02475	X			X	X	X
2	GHD-BH4_3.0_3.45	Jul 30, 2018		Soil	S18-Au02476			X			
3	GHD-BH4_4.5_4.95	Jul 30, 2018		Soil	S18-Au02477			X	X	X	X
4	GHD-BH4_6.0_6.45	Jul 30, 2018		Soil	S18-Au02478			X			
5	GHD-BH4_7.5_7.95	Jul 30, 2018		Soil	S18-Au02479			X			
6	GHD-	Jul 30, 2018		Soil	S18-Au02480			X			

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Order No.: 2127425
Report #: 610390
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Aug 1, 2018 10:24 PM
Due: Aug 9, 2018
Priority: 5 Day
Contact Name: Clifton Thompson

Project Name: SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID: 2127425

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	CANCELLED	Acid Sulfate Soils Field pH Test	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X			X	X	X
Brisbane Laboratory - NATA Site # 20794							X	X			
Perth Laboratory - NATA Site # 23736											
	BH4_9.0_9.45										
7	GHD-BH4_10.5_10.95	Jul 30, 2018		Soil	S18-Au02481			X			
8	GHD-BH4_12.0_12.45	Jul 30, 2018		Soil	S18-Au02482		X				
9	GHD-BH4_13.5_13.81	Jul 30, 2018		Soil	S18-Au02483			X			
10	GHD-BH4_15.0_15.45	Jul 30, 2018		Soil	S18-Au02484			X		X	X
11	GHD-BH4_16.5_16.	Jul 31, 2018		Soil	S18-Au02485			X			

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID: 2127425

Order No.: 2127425
Report #: 610390
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Aug 1, 2018 10:24 PM
Due: Aug 9, 2018
Priority: 5 Day
Contact Name: Clifton Thompson

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	CANCELLED	Acid Sulfate Soils Field pH Test	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X			X	X	X
Brisbane Laboratory - NATA Site # 20794							X	X			
Perth Laboratory - NATA Site # 23736											
	8										
12	GHD-BH4_18.0_18.45	Jul 31, 2018		Soil	S18-Au02486			X			
13	GHD-BH4_20.4_20.85	Jul 31, 2018		Soil	S18-Au02487			X			
14	GHD-BH4_22.0_22.45	Jul 31, 2018		Soil	S18-Au02488			X			
Test Counts						1	1	12	2	3	3

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Western Australia Department of Health
NOHSC	National Occupational Health and Safety Commission
ACM	Bonded asbestos-containing material means any material containing more than 1% asbestos and comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin. Common examples of ACM include but are not limited to: pipe and boiler insulation, sprayed-on fireproofing, troweled-on acoustical plaster, floor tile and mastic, floor linoleum, transite shingles, roofing materials, wall and ceiling plaster, ceiling tiles, and gasket materials. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected because it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and hence potential for fibre release.
FA	FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).
PACM	Presumed Asbestos-Containing Material means thermal system insulation and surfacing material found in buildings, vessels, and vessel sections constructed no later than 1980 that are assumed to contain greater than one percent asbestos but have not been sampled or analyzed to verify or negate the presence of asbestos.
AF	Asbestos fines (AF) are defined as free fibres, or fibre bundles, smaller than 7mm. It is the free fibres which present the greatest risk to human health, although very small fibres (< 5 microns in length) are not considered to be such a risk. AF also includes small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. (Note that for bonded ACM fragments to pass through a 7 mm x 7 mm sieve implies a substantial degree of damage which increases the potential for fibre release.)
AC	Asbestos cement means a mixture of cement and asbestos fibres (typically 90:10 ratios).

Comments

The sample received was not collected in an approved asbestos bag and was therefore sub-sampled from the 250mL glass jar. Valid sub-sampling procedures were applied so as to ensure that the sub-sample to be analysed accurately represented the sample received.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Sayed Abu Senior Analyst-Asbestos (NSW)

Authorised by:

Laxman Dias Senior Analyst-Asbestos (NSW)



Glenn Jackson
National Operations Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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Certificate of Analysis

GHD Pty Ltd NSW
 Level 15, 133 Castlereagh Street
 Sydney
 NSW 2000



NATA Accredited
 Accreditation Number 1261
 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: Clifton Thompson

Report 610390-S
 Project name SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
 Project ID 2127425
 Received Date Aug 01, 2018

Client Sample ID			G01 GHD-BH4_1.5_1.95 Soil S18-Au02475 Jul 30, 2018	GHD-BH4_3.0_3.45 Soil S18-Au02476 Jul 30, 2018	GHD-BH4_4.5_4.95 Soil S18-Au02477 Jul 30, 2018	GHD-BH4_6.0_6.45 Soil S18-Au02478 Jul 30, 2018
Sample Matrix						
Eurofins mgt Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 40	-	< 20	-
TRH C10-C14	20	mg/kg	< 40	-	< 20	-
TRH C15-C28	50	mg/kg	< 100	-	< 50	-
TRH C29-C36	50	mg/kg	< 100	-	< 50	-
TRH C10-36 (Total)	50	mg/kg	< 100	-	< 50	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	-
Xylenes - Total	0.3	mg/kg	< 0.3	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	72	-	77	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 1	-	< 0.5	-
TRH C6-C10	20	mg/kg	< 40	-	< 20	-
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 40	-	< 20	-
TRH >C10-C16	50	mg/kg	< 100	-	< 50	-
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 100	-	< 50	-
TRH >C16-C34	100	mg/kg	< 200	-	< 100	-
TRH >C34-C40	100	mg/kg	< 200	-	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	-	< 100	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	1.2	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	2.4	-	1.2	-
Acenaphthene	0.5	mg/kg	< 1	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 1	-	< 0.5	-
Anthracene	0.5	mg/kg	< 1	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 1	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 1	-	< 0.5	-
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 1	-	< 0.5	-
Benzo(g,h,i)perylene	0.5	mg/kg	< 1	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 1	-	< 0.5	-
Chrysene	0.5	mg/kg	< 1	-	< 0.5	-

Client Sample ID			G01 GHD-BH4_1.5_1.95 Soil S18-Au02475 Jul 30, 2018	GHD-BH4_3.0_3.45 Soil S18-Au02476 Jul 30, 2018	GHD-BH4_4.5_4.95 Soil S18-Au02477 Jul 30, 2018	GHD-BH4_6.0_6.45 Soil S18-Au02478 Jul 30, 2018
Sample Matrix						
Eurofins mgt Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a,h)anthracene	0.5	mg/kg	< 1	-	< 0.5	-
Fluoranthene	0.5	mg/kg	< 1	-	< 0.5	-
Fluorene	0.5	mg/kg	< 1	-	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 1	-	< 0.5	-
Naphthalene	0.5	mg/kg	< 1	-	< 0.5	-
Phenanthrene	0.5	mg/kg	< 1	-	< 0.5	-
Pyrene	0.5	mg/kg	< 1	-	< 0.5	-
Total PAH*	0.5	mg/kg	< 1	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	104	-	105	-
p-Terphenyl-d14 (surr.)	1	%	112	-	111	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	< 0.1	-
Dibutylchloroendate (surr.)	1	%	99	-	96	-
Tetrachloro-m-xylene (surr.)	1	%	102	-	97	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PCB*	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibutylchloroendate (surr.)	1	%	99	-	96	-
Tetrachloro-m-xylene (surr.)	1	%	102	-	97	-

Client Sample ID			G01 GHD-BH4_1.5_1.95	GHD-BH4_3.0_3.45	GHD-BH4_4.5_4.95	GHD-BH4_6.0_6.45
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Au02475	S18-Au02476	S18-Au02477	S18-Au02478
Date Sampled			Jul 30, 2018	Jul 30, 2018	Jul 30, 2018	Jul 30, 2018
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	18	-	< 2	-
Cadmium	0.4	mg/kg	< 0.4	-	< 0.4	-
Chromium	5	mg/kg	18	-	6.7	-
Copper	5	mg/kg	< 5	-	< 5	-
Lead	5	mg/kg	5.7	-	< 5	-
Mercury	0.1	mg/kg	< 0.1	-	< 0.1	-
Nickel	5	mg/kg	7.6	-	< 5	-
Zinc	5	mg/kg	16	-	< 5	-
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	-	5.0	4.7	5.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	-	3.6	3.9	3.7
Reaction Ratings* ^{S05}		comment	-	4.0	2.0	2.0
% Moisture	1	%	43	-	10	-

Client Sample ID			GHD-BH4_7.5_7.95	GHD-BH4_9.0_9.45	GHD-BH4_10.5_10.9	GHD-BH4_13.5_13.8
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Au02479	S18-Au02480	S18-Au02481	S18-Au02483
Date Sampled			Jul 30, 2018	Jul 30, 2018	Jul 30, 2018	Jul 30, 2018
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.4	4.4	4.8	5.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.4	3.5	3.7	4.1
Reaction Ratings* ^{S05}		comment	2.0	1.0	2.0	2.0

Client Sample ID			GHD-BH4_15.0_15.4	GHD-BH4_16.5_16.8	GHD-BH4_18.0_18.4	GHD-BH4_20.4_20.8
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Au02484	S18-Au02485	S18-Au02486	S18-Au02487
Date Sampled			Jul 30, 2018	Jul 31, 2018	Jul 31, 2018	Jul 31, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	-	-
TRH C10-C14	20	mg/kg	130	-	-	-
TRH C15-C28	50	mg/kg	120	-	-	-
TRH C29-C36	50	mg/kg	130	-	-	-
TRH C10-36 (Total)	50	mg/kg	380	-	-	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	-	-
Toluene	0.1	mg/kg	< 0.1	-	-	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	-	-
m&p-Xylenes	0.2	mg/kg	0.2	-	-	-
o-Xylene	0.1	mg/kg	< 0.1	-	-	-
Xylenes - Total	0.3	mg/kg	< 0.3	-	-	-
4-Bromofluorobenzene (surr.)	1	%	82	-	-	-

Client Sample ID			GHD-BH4_15.0_15.4 5	GHD-BH4_16.5_16.8 5	GHD-BH4_18.0_18.4 5	GHD-BH4_20.4_20.8 5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Au02484	S18-Au02485	S18-Au02486	S18-Au02487
Date Sampled			Jul 30, 2018	Jul 31, 2018	Jul 31, 2018	Jul 31, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	-	-	-
TRH C6-C10	20	mg/kg	29	-	-	-
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	29	-	-	-
TRH >C10-C16	50	mg/kg	110	-	-	-
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	110	-	-	-
TRH >C16-C34	100	mg/kg	200	-	-	-
TRH >C34-C40	100	mg/kg	< 100	-	-	-
TRH >C10-C40 (total)*	100	mg/kg	310	-	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	-	-
Acenaphthene	0.5	mg/kg	< 0.5	-	-	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	-	-
Anthracene	0.5	mg/kg	< 0.5	-	-	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	-	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	-	-
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	-	-	-
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	-	-	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	-	-
Chrysene	0.5	mg/kg	< 0.5	-	-	-
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	-	-	-
Fluoranthene	0.5	mg/kg	< 0.5	-	-	-
Fluorene	0.5	mg/kg	< 0.5	-	-	-
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	< 0.5	-	-	-
Naphthalene	0.5	mg/kg	< 0.5	-	-	-
Phenanthrene	0.5	mg/kg	< 0.5	-	-	-
Pyrene	0.5	mg/kg	< 0.5	-	-	-
Total PAH*	0.5	mg/kg	< 0.5	-	-	-
2-Fluorobiphenyl (surr.)	1	%	102	-	-	-
p-Terphenyl-d14 (surr.)	1	%	103	-	-	-
Heavy Metals						
Arsenic	2	mg/kg	3.8	-	-	-
Cadmium	0.4	mg/kg	< 0.4	-	-	-
Chromium	5	mg/kg	30	-	-	-
Copper	5	mg/kg	11	-	-	-
Lead	5	mg/kg	12	-	-	-
Mercury	0.1	mg/kg	< 0.1	-	-	-
Nickel	5	mg/kg	5.2	-	-	-
Zinc	5	mg/kg	10	-	-	-
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.9	4.7	4.7	4.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.6	3.6	3.8	4.0
Reaction Ratings ^{*S05}		comment	4.0	2.0	2.0	2.0
% Moisture	1	%	16	-	-	-

Client Sample ID			GHD-BH4_22.0_22.4
Sample Matrix			Soil
Eurofins mgt Sample No.			S18-Au02488
Date Sampled			Jul 31, 2018
Test/Reference	LOR	Unit	
Acid Sulfate Soils Field pH Test			
pH-F (Field pH test)*	0.1	pH Units	4.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.5
Reaction Ratings* ^{S05}		comment	2.0

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: TRH C6-C36 - LTM-ORG-2010	Sydney	Aug 08, 2018	14 Day
BTEX - Method: TRH C6-C40 - LTM-ORG-2010	Sydney	Aug 08, 2018	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Sydney	Aug 08, 2018	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Sydney	Aug 08, 2018	14 Day
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Sydney	Aug 08, 2018	14 Days
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Aug 08, 2018	28 Day
Organochlorine Pesticides - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Sydney	Aug 08, 2018	14 Day
Polychlorinated Biphenyls - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Sydney	Aug 08, 2018	28 Days
Acid Sulfate Soils Field pH Test - Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests	Brisbane	Aug 06, 2018	7 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Sydney	Aug 08, 2018	14 Day

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Order No.: 2127425
Report #: 610390
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Aug 1, 2018 10:24 PM
Due: Aug 9, 2018
Priority: 5 Day
Contact Name: Clifton Thompson

Project Name: SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID: 2127425

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	CANCELLED	Acid Sulfate Soils Field pH Test	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X			X	X	X
Brisbane Laboratory - NATA Site # 20794							X	X			
Perth Laboratory - NATA Site # 23736											
External Laboratory											
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID						
1	GHD-BH4_1.5_1.95	Jul 30, 2018		Soil	S18-Au02475	X			X	X	X
2	GHD-BH4_3.0_3.45	Jul 30, 2018		Soil	S18-Au02476			X			
3	GHD-BH4_4.5_4.95	Jul 30, 2018		Soil	S18-Au02477			X	X	X	X
4	GHD-BH4_6.0_6.45	Jul 30, 2018		Soil	S18-Au02478			X			
5	GHD-BH4_7.5_7.95	Jul 30, 2018		Soil	S18-Au02479			X			
6	GHD-	Jul 30, 2018		Soil	S18-Au02480			X			

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

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Received: Aug 1, 2018 10:24 PM
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Contact Name: Clifton Thompson

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	CANCELLED	Acid Sulfate Soils Field pH Test	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X			X	X	X
Brisbane Laboratory - NATA Site # 20794							X	X			
Perth Laboratory - NATA Site # 23736											
	BH4_9.0_9.45										
7	GHD-BH4_10.5_10.95	Jul 30, 2018		Soil	S18-Au02481			X			
8	GHD-BH4_12.0_12.45	Jul 30, 2018		Soil	S18-Au02482		X				
9	GHD-BH4_13.5_13.81	Jul 30, 2018		Soil	S18-Au02483			X			
10	GHD-BH4_15.0_15.45	Jul 30, 2018		Soil	S18-Au02484			X		X	X
11	GHD-BH4_16.5_16.	Jul 31, 2018		Soil	S18-Au02485			X			

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID: 2127425

Order No.: 2127425
Report #: 610390
Phone: 02 9239 7100
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Received: Aug 1, 2018 10:24 PM
Due: Aug 9, 2018
Priority: 5 Day
Contact Name: Clifton Thompson

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	CANCELLED	Acid Sulfate Soils Field pH Test	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X			X	X	X
Brisbane Laboratory - NATA Site # 20794							X	X			
Perth Laboratory - NATA Site # 23736											
	8										
12	GHD-BH4_18.0_18.45	Jul 31, 2018		Soil	S18-Au02486			X			
13	GHD-BH4_20.4_20.85	Jul 31, 2018		Soil	S18-Au02487			X			
14	GHD-BH4_22.0_22.45	Jul 31, 2018		Soil	S18-Au02488			X			
Test Counts						1	1	12	2	3	3

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4,4'-DDD	mg/kg	< 0.05			0.05	Pass	
4,4'-DDE	mg/kg	< 0.05			0.05	Pass	
4,4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	78			70-130	Pass	
TRH C10-C14	%	73			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	81			70-130	Pass	
Toluene	%	81			70-130	Pass	
Ethylbenzene	%	79			70-130	Pass	
m&p-Xylenes	%	83			70-130	Pass	
o-Xylene	%	83			70-130	Pass	
Xylenes - Total	%	83			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	110			70-130	Pass	
TRH C6-C10	%	73			70-130	Pass	
TRH >C10-C16	%	70			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	89			70-130	Pass	
Acenaphthylene	%	92			70-130	Pass	
Anthracene	%	89			70-130	Pass	
Benz(a)anthracene	%	92			70-130	Pass	
Benzo(a)pyrene	%	93			70-130	Pass	

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(b&j)fluoranthene				%	89			70-130	Pass	
Benzo(g,h,i)perylene				%	99			70-130	Pass	
Benzo(k)fluoranthene				%	95			70-130	Pass	
Chrysene				%	95			70-130	Pass	
Dibenz(a,h)anthracene				%	105			70-130	Pass	
Fluoranthene				%	94			70-130	Pass	
Fluorene				%	90			70-130	Pass	
Indeno(1,2,3-cd)pyrene				%	93			70-130	Pass	
Naphthalene				%	93			70-130	Pass	
Phenanthrene				%	88			70-130	Pass	
Pyrene				%	96			70-130	Pass	
LCS - % Recovery										
Organochlorine Pesticides										
4,4'-DDD				%	106			70-130	Pass	
4,4'-DDE				%	96			70-130	Pass	
4,4'-DDT				%	86			70-130	Pass	
a-BHC				%	96			70-130	Pass	
Aldrin				%	100			70-130	Pass	
b-BHC				%	93			70-130	Pass	
d-BHC				%	95			70-130	Pass	
Dieldrin				%	95			70-130	Pass	
Endosulfan I				%	96			70-130	Pass	
Endosulfan II				%	95			70-130	Pass	
Endosulfan sulphate				%	94			70-130	Pass	
Endrin				%	82			70-130	Pass	
Endrin aldehyde				%	100			70-130	Pass	
Endrin ketone				%	95			70-130	Pass	
g-BHC (Lindane)				%	96			70-130	Pass	
Heptachlor				%	96			70-130	Pass	
Heptachlor epoxide				%	96			70-130	Pass	
Hexachlorobenzene				%	98			70-130	Pass	
Methoxychlor				%	75			70-130	Pass	
LCS - % Recovery										
Polychlorinated Biphenyls										
Aroclor-1260				%	96			70-130	Pass	
LCS - % Recovery										
Heavy Metals										
Arsenic				%	100			70-130	Pass	
Cadmium				%	99			70-130	Pass	
Chromium				%	100			70-130	Pass	
Copper				%	101			70-130	Pass	
Lead				%	101			70-130	Pass	
Mercury				%	97			70-130	Pass	
Nickel				%	101			70-130	Pass	
Zinc				%	102			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code	
Spike - % Recovery										
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					Result 1					
TRH C6-C9	S18-Au06818	NCP	%	73			70-130	Pass		
TRH C10-C14	S18-Au06808	NCP	%	74			70-130	Pass		
Spike - % Recovery										
BTEX					Result 1					
Benzene	S18-Au06864	NCP	%	79			70-130	Pass		
Toluene	S18-Au06864	NCP	%	79			70-130	Pass		

Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Ethylbenzene	S18-Au06864	NCP	%	76		70-130	Pass	
m&p-Xylenes	S18-Au06864	NCP	%	79		70-130	Pass	
o-Xylene	S18-Au06864	NCP	%	81		70-130	Pass	
Xylenes - Total	S18-Au06864	NCP	%	80		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1				
Naphthalene	S18-Au06864	NCP	%	95		70-130	Pass	
TRH C6-C10	S18-Au06818	NCP	%	71		70-130	Pass	
TRH >C10-C16	S18-Au06808	NCP	%	70		70-130	Pass	
Spike - % Recovery								
Polycyclic Aromatic Hydrocarbons				Result 1				
Acenaphthene	S18-Au06159	NCP	%	89		70-130	Pass	
Acenaphthylene	S18-Au06159	NCP	%	94		70-130	Pass	
Anthracene	S18-Au06159	NCP	%	86		70-130	Pass	
Benz(a)anthracene	S18-Au06159	NCP	%	97		70-130	Pass	
Benzo(a)pyrene	S18-Au06159	NCP	%	93		70-130	Pass	
Benzo(b&j)fluoranthene	S18-Au06159	NCP	%	88		70-130	Pass	
Benzo(g,h,i)perylene	S18-Au06159	NCP	%	96		70-130	Pass	
Benzo(k)fluoranthene	S18-Au06159	NCP	%	91		70-130	Pass	
Chrysene	S18-Au06159	NCP	%	95		70-130	Pass	
Dibenz(a,h)anthracene	S18-Au06159	NCP	%	105		70-130	Pass	
Fluoranthene	S18-Au06159	NCP	%	97		70-130	Pass	
Fluorene	S18-Au06159	NCP	%	89		70-130	Pass	
Indeno(1,2,3-cd)pyrene	S18-Au06159	NCP	%	101		70-130	Pass	
Naphthalene	S18-Au06159	NCP	%	95		70-130	Pass	
Phenanthrene	S18-Au06159	NCP	%	83		70-130	Pass	
Pyrene	S18-Au06159	NCP	%	97		70-130	Pass	
Spike - % Recovery								
Organochlorine Pesticides				Result 1				
4,4'-DDD	S18-Au08245	NCP	%	127		70-130	Pass	
4,4'-DDE	S18-Au08245	NCP	%	99		70-130	Pass	
4,4'-DDT	S18-Au06773	NCP	%	83		70-130	Pass	
a-BHC	S18-Au08245	NCP	%	97		70-130	Pass	
Aldrin	S18-Au08245	NCP	%	109		70-130	Pass	
b-BHC	S18-Au08245	NCP	%	91		70-130	Pass	
d-BHC	S18-Au08245	NCP	%	101		70-130	Pass	
Dieldrin	S18-Au08245	NCP	%	98		70-130	Pass	
Endosulfan I	S18-Au08245	NCP	%	98		70-130	Pass	
Endosulfan II	S18-Au08245	NCP	%	97		70-130	Pass	
Endosulfan sulphate	S18-Au08245	NCP	%	93		70-130	Pass	
Endrin	S18-Au08245	NCP	%	87		70-130	Pass	
Endrin aldehyde	S18-Au08245	NCP	%	83		70-130	Pass	
Endrin ketone	S18-Au08245	NCP	%	71		70-130	Pass	
g-BHC (Lindane)	S18-Au08245	NCP	%	90		70-130	Pass	
Heptachlor	S18-Au08245	NCP	%	72		70-130	Pass	
Heptachlor epoxide	S18-Au08245	NCP	%	101		70-130	Pass	
Hexachlorobenzene	S18-Au08245	NCP	%	99		70-130	Pass	
Methoxychlor	S18-Au06773	NCP	%	97		70-130	Pass	
Toxaphene	S18-JI33208	NCP	%	95		70-130	Pass	
Spike - % Recovery								
Polychlorinated Biphenyls				Result 1				
Aroclor-1260	S18-Au08245	NCP	%	93		70-130	Pass	
Spike - % Recovery								
Heavy Metals				Result 1				

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Arsenic	S18-Au06151	NCP	%	103			70-130	Pass	
Cadmium	S18-Au06151	NCP	%	103			70-130	Pass	
Chromium	S18-Au06151	NCP	%	100			70-130	Pass	
Copper	S18-Au06151	NCP	%	101			70-130	Pass	
Lead	S18-Au08243	NCP	%	81			70-130	Pass	
Mercury	S18-Au06151	NCP	%	100			70-130	Pass	
Nickel	S18-Au06151	NCP	%	103			70-130	Pass	
Zinc	S18-Au06151	NCP	%	111			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S18-Au06863	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S18-Au06158	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S18-Au06158	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S18-Au06158	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-Au06863	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S18-Au06863	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S18-Au06863	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S18-Au06863	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S18-Au06863	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S18-Au06863	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-Au06863	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S18-Au06863	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S18-Au06158	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S18-Au06158	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S18-Au06158	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S18-Au07709	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S18-Au07709	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S18-Au07709	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S18-Au07709	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S18-Au07709	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S18-Au07709	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g,h,i)perylene	S18-Au07709	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S18-Au07709	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S18-Au07709	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a,h)anthracene	S18-Au07709	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S18-Au07709	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S18-Au07709	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	S18-Au07709	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S18-Au07709	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S18-Au07709	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S18-Au07709	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S18-Au06871	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4,4'-DDD	S18-Au06871	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4,4'-DDE	S18-Au06871	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4,4'-DDT	S18-Au06871	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
a-BHC	S18-Au06871	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Aldrin	S18-Au06871	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
b-BHC	S18-Au06871	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
d-BHC	S18-Au06871	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Dieldrin	S18-Au06871	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan I	S18-Au06871	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan II	S18-Au06871	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan sulphate	S18-Au06871	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin	S18-Au06871	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin aldehyde	S18-Au06871	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin ketone	S18-Au06871	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
g-BHC (Lindane)	S18-Au06871	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor	S18-Au06871	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor epoxide	S18-Au06871	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Hexachlorobenzene	S18-Au06871	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Methoxychlor	S18-Au06871	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Toxaphene	S18-Au06871	NCP	mg/kg	< 1	< 1	<1	30%	Pass
Duplicate								
Polychlorinated Biphenyls				Result 1	Result 2	RPD		
Aroclor-1016	S18-Au06871	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1221	S18-Au06871	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1232	S18-Au06871	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1242	S18-Au06871	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1248	S18-Au06871	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1254	S18-Au06871	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1260	S18-Au06871	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	S18-Au06096	NCP	mg/kg	4.5	4.9	10	30%	Pass
Cadmium	S18-Au06096	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	S18-Au06096	NCP	mg/kg	9.1	9.8	7.0	30%	Pass
Copper	S18-Au06096	NCP	mg/kg	8.1	9.0	11	30%	Pass
Lead	S18-Au06096	NCP	mg/kg	63	76	20	30%	Pass
Mercury	S18-Au01486	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	S18-Au06096	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Zinc	S18-Au06096	NCP	mg/kg	38	47	20	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	S18-Au00415	NCP	%	3.2	2.8	13	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	S18-Au02476	CP	pH Units	5.0	5.1	pass	30%	Pass
Reaction Ratings*	S18-Au02476	CP	comment	4.0	4.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	S18-Au02487	CP	pH Units	4.9	4.9	pass	30%	Pass
Reaction Ratings*	S18-Au02487	CP	comment	2.0	2.0	pass	30%	Pass

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
G01	The LORs have been raised due to matrix interference
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Nibha Vaidya	Analytical Services Manager
Nibha Vaidya	Senior Analyst-Asbestos (NSW)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Enviro Sample Bris

From: Enviro Sample NSW
Sent: Wednesday, 8 August 2018 4:02 PM
To: Enviro Sample Bris
Subject: FW: Eurofins | mgt Sample Receipt Advice - Report 609184 : Site SCOTLAND ISLAND ENERGY RELIABILITY PROJECT (2127425)
Attachments: COC1 2127425_Eurofins_Chain Of Custody 5_SPOCAS.xls
Follow Up Flag: Follow up
Flag Status: Flagged


Hi Team,

Following additional for samples sent to Brisbane under report No: 609184.

Kind Regards,
Elvis D
Enviro Sample NSW
Sample Receipt NSW

Eurofins | mgt
Unit F3, Parkview Building
16 Mars Road
LANE COVE WEST NSW 2066
AUSTRALIA
Phone : +61 2 9900 8492

Email : EnviroSampleNSW@Eurofins.com
Website: www.eurofins.com.au/environmental-testing



From: Justin Kabat [<mailto:Justin.Kabat@ghd.com>]
Sent: Wednesday, 8 August 2018 3:40 PM
To: Enviro Sample NSW; Clifton Thompson
Cc: Jacqui Hallchurch
Subject: RE: Eurofins | mgt Sample Receipt Advice - Report 609184 : Site SCOTLAND ISLAND ENERGY RELIABILITY PROJECT (2127425)

Hi Elvis

Further to the testing undertaken on samples, we wish to schedule the attached additional testing on remaining sample material (sPOCAS and SCr suites).

Cheers,
Justin Kabat MIEAust CPEng NER
Senior Geotechnical Engineer

GHD
T: 61 2 9462 4831 | F: 61 2 8898 8810 | V: 214831 | M: 61 413 244 331 | E: justin.kabat@ghd.com
Level 6, 20 Smith Street Parramatta NSW 2150 Australia | <http://www.ghd.com/>
[Water](#) | [Energy & Resources](#) | [Environment](#) | [Property & Buildings](#) | [Transportation](#)

From: EnviroSampleNSW@eurofins.com <EnviroSampleNSW@eurofins.com>
Sent: Wednesday, 25 July 2018 2:39 PM
To: Clifton Thompson <Clifton.Thompson@ghd.com>
Cc: Jacqui Hallchurch <Jacqui.Hallchurch@ghd.com>; Justin Kabat <Justin.Kabat@ghd.com>

Subject: Eurofins | mgt Sample Receipt Advice - Report 609184 : Site SCOTLAND ISLAND ENERGY RELIABILITY PROJECT (2127425)

Dear Valued Client,

Please find attached a Sample Receipt Advice (SRA), a Summary Sheet and a scanned copy of your Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers as well as the requested analysis. If there are any irregularities then please contact your Eurofins | mgt Analytical Services Manager as soon as possible to make certain that they get changed.

Regards

Elvis Dsouza

Sample Receipt

Eurofins | mgt

Unit F3, Parkview Building

16 Mars Road

LANE COVE WEST NSW 2066

AUSTRALIA

Phone: +61 29900 8492

Email: EnviroSampleNSW@eurofins.com

Website: environment.eurofins.com.au

EnviroNote 1076 - PFAS Biota

EnviroNote 1077 - Soil Vapour Sampling – NATA Accreditation

This e-mail has been scanned for viruses

CONFIDENTIALITY NOTICE: This email, including any attachments, is confidential and may be privileged. If you are not the intended recipient please notify the sender immediately, and please delete it; you should not copy it or use it for any purpose or disclose its contents to any other person. GHD and its affiliates reserve the right to monitor and modify all email communications through their networks.

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Page 1 of 1

Company Name : GHD Pty Ltd	Contact Name : Clifton Thompson	Purchase Order : 2127425	COC Number : 3
Office Address :	Project Manager : Justin Kabat	PROJECT Number : 2127425	Eurofins mgt quote ID : 170808GHDN
Level 15, 133 Castlereagh Street, Sydney NSW 2000	Email for results : clifton.thompson@ghd.com	PROJECT Name : Scotland Island Energy Reliability Project	Data output format: Esdat, PDF

Eurofins I mgt DI water batch number:

Some common holding times (with correct preservation).
For further information contact the lab

[illegible]

Laboratory Staff		Turn around time		Method Of Shipment		Temperature on arrival:
Relinquished By: Clifton Thompson	Received By: <i>Jade W</i>	1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/>		<input type="checkbox"/> Courier <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal		5.26°C
Date & Time : 18:00, 24/07/2018	Date & Time: <i>24/07/18 7:35PM</i>	5 DAY <input checked="" type="checkbox"/> 10 DAY <input type="checkbox"/> Other:		Courier Consignment # :		Report number:
Signature:	Signature: <i>[Signature]</i>					609184

Sample Receipt Advice

Company name: **GHD Pty Ltd NSW**
Contact name: **Clifton Thompson**
Project name: **SCOTLAND ISLAND ENERGY RELIABILITY PROJECT**
Project ID: **2127425**
COC number: **Not provided**
Turn around time: **5 Day**
Date/Time received: **Aug 8, 2018 4:02 PM**
Eurofins | mgt reference: **611405**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 5.3 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Clifton Thompson - Clifton.Thompson@ghd.com.

Certificate of Analysis

GHD Pty Ltd NSW
Level 15, 133 Castlereagh Street
Sydney
NSW 2000



NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Clifton Thompson

Report 611405-S-V2
Project name SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID 2127425
Received Date Aug 08, 2018

Client Sample ID			GHD-BH2_16-16.45	GHD-BH2_17.5-17.77	GHD-BH2_19-19.45	GHD-BH2_22-22.45
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B18-Au10547	B18-Au10548	B18-Au10549	B18-Au10550
Date Sampled			Jul 17, 2018	Jul 17, 2018	Jul 17, 2018	Jul 17, 2018
Test/Reference	LOR	Unit				
SPOCAS Suite						
pH-KCL	0.1	pH Units	5.3	5.3	5.6	4.1
pH-OX	0.1	pH Units	2.6	3.4	3.8	1.6
Acid trail - Titratable Actual Acidity	2	mol H+/t	8.5	9.2	3.7	150
Acid trail - Titratable Peroxide Acidity	2	mol H+/t	150	69	22	2500
Acid trail - Titratable Sulfidic Acidity	2	mol H+/t	140	62	22	2400
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02	< 0.02	0.24
sulfidic - TPA equiv. S% pyrite	0.02	% pyrite S	0.23	0.11	0.04	4.0
sulfidic - TSA equiv. S% pyrite	0.02	% pyrite S	0.22	0.10	0.04	3.8
Sulfur - KCl Extractable	0.02	% S	< 0.02	< 0.02	< 0.02	0.21
Sulfur - Peroxide	0.02	% S	0.24	0.09	0.03	3.6
Sulfur - Peroxide Oxidisable Sulfur	0.02	% S	0.24	0.09	0.03	3.3
acidity - Peroxide Oxidisable Sulfur	10	mol H+/t	150	58	17	2100
HCl Extractable Sulfur	0.02	% S	n/a	n/a	n/a	0.21
Net Acid soluble sulfur	0.02	% S	n/a	n/a	n/a	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	n/a	n/a	< 10
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	n/a	n/a	< 0.02
Calcium - KCl Extractable	0.02	% Ca	0.03	0.04	0.02	0.10
Calcium - Peroxide	0.02	% Ca	0.03	0.05	0.02	0.09
Acid Reacted Calcium	0.02	% Ca	< 0.02	< 0.02	< 0.02	-0.01
acidity - Acid Reacted Calcium	10	mol H+/t	< 10	< 10	< 10	-7
sulfidic - Acid Reacted Ca equiv. S% pyrite	0.02	% S	< 0.02	< 0.02	< 0.02	-0.01
Magnesium - KCl Extractable	0.02	% Mg	0.04	0.05	0.03	0.10
Magnesium - Peroxide	0.02	% Mg	0.04	0.05	0.03	0.10
Acid Reacted Magnesium	0.02	% Mg	< 0.02	< 0.02	< 0.02	< 0.02
acidity - Acid Reacted Magnesium	10	mol H+/t	< 10	< 10	< 10	< 10
sulfidic - Acid Reacted Mg equiv. S% pyrite	0.02	% S	< 0.02	< 0.02	< 0.02	< 0.02
Acid Neutralising Capacity (ANCE)	0.02	%CaCO3	n/a	n/a	n/a	n/a
Acid Neutralising Capacity - Acidity units (a-ANCE)	10	mol H+/t	n/a	n/a	n/a	n/a
Acid Neutralising Capacity - equivalent S% pyrite(s-ANCE)	0.02	% S	n/a	n/a	n/a	n/a
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5
SPOCAS - Net Acidity (Sulfur Units)	0.02	% S	0.25	0.10	0.03	3.6
SPOCAS - Net Acidity (Acidity Units)	10	mol H+/t	160	65	17	2200
SPOCAS - Liming rate	1	kg CaCO3/t	12	5.0	1.0	170

Client Sample ID			GHD-BH2_16-16.45	GHD-BH2_17.5-17.77	GHD-BH2_19-19.45	GHD-BH2_22-22.45
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B18-Au10547	B18-Au10548	B18-Au10549	B18-Au10550
Date Sampled			Jul 17, 2018	Jul 17, 2018	Jul 17, 2018	Jul 17, 2018
Test/Reference	LOR	Unit				
Chromium Suite						
pH-KCL	0.1	pH Units	5.3	5.3	5.6	4.1
Acid trail - Titratable Actual Acidity	2	mol H+/t	8.5	9.2	3.7	150
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02	< 0.02	0.24
Chromium Reducible Sulfur ^{S04}	0.005	% S	0.20	0.066	0.017	2.9
Chromium Reducible Sulfur -acidity units	3	mol H+/t	120	41	11	1800
Sulfur - KCl Extractable	0.02	% S	< 0.02	< 0.02	< 0.02	0.21
HCl Extractable Sulfur	0.02	% S	n/a	n/a	n/a	0.21
Net Acid soluble sulfur	0.02	% S	n/a	n/a	n/a	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	n/a	n/a	< 10
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	n/a	n/a	< 0.02
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	n/a	n/a	n/a
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	n/a	n/a	n/a	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	n/a	n/a	n/a
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	0.19	0.07	0.02	3.2
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	130	50	14	2000
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	9.8	3.8	1.1	150
Extraneous Material						
<2mm Fraction	0.005	g	52	42	34	59
>2mm Fraction	0.005	g	< 0.005	< 0.005	< 0.005	< 0.005
Analysed Material	0.1	%	100	100	100	100
Extraneous Material	0.1	%	< 0.1	< 0.1	< 0.1	< 0.1
% Moisture	1	%	24	19	17	27

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
SPOCAS Suite			
SPOCAS Suite	Brisbane	Aug 09, 2018	6 Week
- Method: LTM-GEN-7050			
Chromium Reducible Sulfur Suite			
Chromium Suite	Brisbane	Aug 13, 2018	6 Week
- Method: LTM-GEN-7070			
Extraneous Material	Brisbane	Aug 09, 2018	6 Week
- Method: LTM-GEN-7050/7070			
% Moisture	Brisbane	Aug 09, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID: 2127425

Order No.: 2127425
Report #: 611405
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Aug 8, 2018 4:02 PM
Due: Aug 15, 2018
Priority: 5 Day
Contact Name: Clifton Thompson

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						SPOCAS Suite	Chromium Reducible Sulfur Suite	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	GHD-BH2_16-16.45	Jul 17, 2018		Soil	B18-Au10547	X	X	X
2	GHD-BH2_17.5-17.77	Jul 17, 2018		Soil	B18-Au10548	X	X	X
3	GHD-BH2_19-19.45	Jul 17, 2018		Soil	B18-Au10549	X	X	X
4	GHD-BH2_22-22.45	Jul 17, 2018		Soil	B18-Au10550	X	X	X
Test Counts						4	4	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPa, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery									
Chromium Suite									
Chromium Reducible Sulfur			%	99			70-130	Pass	
Acid Neutralising Capacity (ANCbt)			%	106			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
SPOCAS Suite				Result 1	Result 2	RPD			
pH-KCL	M18-Au09044	NCP	pH Units	4.9	5.0	<1	30%	Pass	
pH-OX	B18-Au13733	NCP	pH Units	3.0	3.0	1.0	30%	Pass	
Acid trail - Titratable Actual Acidity	M18-Au09044	NCP	mol H+/t	27	26	1.7	30%	Pass	
Acid trail - Titratable Peroxide Acidity	B18-Au13733	NCP	mol H+/t	160	160	1.0	30%	Pass	
Acid trail - Titratable Sulfidic Acidity	B18-Au13733	NCP	mol H+/t	120	120	1.0	30%	Pass	
sulfidic - TAA equiv. S% pyrite	M18-Au09044	NCP	% pyrite S	0.04	0.04	2.0	30%	Pass	
sulfidic - TPA equiv. S% pyrite	B18-Au13733	NCP	% pyrite S	0.26	0.26	1.0	30%	Pass	
sulfidic - TSA equiv. S% pyrite	B18-Au13733	NCP	% pyrite S	0.19	0.19	1.0	30%	Pass	
Sulfur - KCl Extractable	B18-Au13733	NCP	% S	0.09	0.09	1.0	30%	Pass	
Sulfur - Peroxide	B18-Au13733	NCP	% S	0.19	0.20	4.0	30%	Pass	
Sulfur - Peroxide Oxidisable Sulfur	B18-Au13733	NCP	% S	0.10	0.11	9.0	30%	Pass	
acidity - Peroxide Oxidisable Sulfur	B18-Au13733	NCP	mol H+/t	62	68	9.0	30%	Pass	
HCl Extractable Sulfur	B18-Au13733	NCP	% S	0.28	0.27	2.0	30%	Pass	
Net Acid soluble sulfur	B18-Au13733	NCP	% S	0.19	0.19	3.0	30%	Pass	
Net Acid soluble sulfur - acidity units	B18-Au13733	NCP	mol H+/t	89	87	3.0	30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	B18-Au13733	NCP	% S	0.14	0.14	3.0	30%	Pass	
Calcium - KCl Extractable	B18-Au13733	NCP	% Ca	0.16	0.16	3.0	30%	Pass	
Calcium - Peroxide	B18-Au13733	NCP	% Ca	0.15	0.17	8.0	30%	Pass	
Acid Reacted Calcium	B18-Au13733	NCP	% Ca	< 0.02	< 0.02	<1	30%	Pass	
sulfidic - Acid Reacted Ca equiv. S% pyrite	B18-Au13733	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - KCl Extractable	B18-Au13733	NCP	% Mg	0.06	0.06	1.0	30%	Pass	
Magnesium - Peroxide	B18-Au13733	NCP	% Mg	0.06	0.06	7.0	30%	Pass	
Acid Reacted Magnesium	B18-Au13733	NCP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
sulfidic - Acid Reacted Mg equiv. S% pyrite	B18-Au13733	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Acid Neutralising Capacity (ANCE)	B18-Au13733	NCP	%CaCO3	n/a	n/a	n/a	30%	Pass	
Acid Neutralising Capacity - Acidity units (a-ANCE)	B18-Au13733	NCP	mol H+/t	n/a	n/a	n/a	30%	Pass	
ANC Fineness Factor	M18-Au09044	NCP	factor	1.5	1.5	<1	30%	Pass	
SPOCAS - Liming rate	B18-Au13733	NCP	kg CaCO3/t	15	15	2.0	30%	Pass	
Duplicate									
Chromium Suite				Result 1	Result 2	RPD			
Chromium Reducible Sulfur	M18-Au09044	NCP	% S	0.029	0.027	6.0	30%	Pass	
Chromium Reducible Sulfur -acidity units	M18-Au09044	NCP	mol H+/t	18	17	6.0	30%	Pass	
Acid Neutralising Capacity (ANCbt)	M18-Au09044	NCP	%CaCO3	n/a	n/a	n/a	30%	Pass	
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	M18-Au09044	NCP	% S	n/a	n/a	n/a	30%	Pass	
CRS Suite - Net Acidity (Sulfur Units)	M18-Au09044	NCP	% S	0.07	0.07	n/a	30%	Pass	
CRS Suite - Net Acidity (Acidity Units)	M18-Au09044	NCP	mol H+/t	45	43	n/a	30%	Pass	
CRS Suite - Liming Rate	M18-Au09044	NCP	kg CaCO3/t	3.4	3.2	4.0	30%	Pass	

Duplicate									
				Result 1	Result 2	RPD			
% Moisture	P18-JI04806	NCP	%	25	25	1.0	30%	Pass	

Comments

New version to amend IDs.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
S01	Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO ₃) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from 'kg/t dry weight' to 'kg/m ³ in-situ soil' multiply 'reported results' x 'wet bulk density of soil in t/m ³ '
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5
S03	Acid Neutralising Capacity is only required if the pHKCl is greater than or equal to pH 6.5
S04	Acid Sulfate Soil Samples have a 24 hour holding time unless frozen or dried within that period

Authorised By

Nibha Vaidya	Analytical Services Manager
Steven Trout	Senior Analyst-Metal (QLD)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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☐ **Brisbane**
Unit 1-21 Smallwood Place, Murrarie
Phone: +617 3902 4600
Email: enviro.bris@mgtlabmark.com.au

☐ **Melbourne**
2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 8564 5000 Fax: +613 8564 5090
Email: enquiries.melb@mgflabmark.com.au

CLIENT DETAILS

Page 1 of 1

CLIENT DETAILS

Page 1 of 1

Company Name : GHD Pty Ltd	Contact Name : Clifton Thompson	Purchase Order : 2127425	COC Number : 5
Office Address :	Project Manager : Justin Kabat	PROJECT Number : 2127425	Eurofins mgt quote ID : 170808GHDN
Level 15, 133 Castlereagh Street, Sydney NSW 2000	Email for results : clifton.thompson@ghd.com	PROJECT Name : Scotland Island Energy Reliability Project	Data output format: Esdat, PDF

	<p>Analytes</p>	<p>Some common holding times (with correct preservation). For further information contact the lab</p>
--	------------------------	--

[illegible][illegible]

		Laboratory Staff		Turn around time		Method Of Shipment		Temperature on arrival:	
Relinquished By: Clifton Thompson		Received By: <i>R P Williams</i>		1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/>		<input type="checkbox"/> Courier <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal		-2.9	
Date & Time : 07:00 9/8/18		Date & Time : <i>9:40 am 9/8/18</i>		5 DAY <input checked="" type="checkbox"/> 10 DAY <input type="checkbox"/> Other:		Courier Consignment # :		Report number:	
Signature:		Signature: <i>W</i>							

Sample Receipt Advice

Company name: **GHD Pty Ltd NSW**
Contact name: **Clifton Thompson**
Project name: **SCOTLAND ISLAND ENERGY RELIABILITY PROJECT**
Project ID: **2127425**
COC number: **Not provided**
Turn around time: **5 Day**
Date/Time received: **Aug 9, 2018 9:40 AM**
Eurofins | mgt reference: **611464**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 0.00 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Sample containers for volatile analysis received with zero headspace.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Clifton Thompson - Clifton.Thompson@ghd.com.

Certificate of Analysis



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025-Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

GHD Pty Ltd NSW
Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Attention: Clifton Thompson
Report 611464-AID
Project Name SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID 2127425
Received Date Aug 09, 2018
Date Reported Aug 16, 2018

Methodology:

Asbestos Fibre
Identification

Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques.

NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.

Unknown Mineral
Fibres

Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity.

NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.

Subsampling Soil
Samples

The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed.

NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.

Bonded asbestos-
containing material
(ACM)

The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 4964 - 2004.

NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.

Limit of Reporting

The performance limitation of the AS4964 method for inhomogeneous samples is around 0.1 g/kg (0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis where required, this is considered to be at the nominal reporting limit of 0.01 % (w / w). The examination of large sample sizes (500 mL is recommended) may improve the likelihood of identifying ACM in the > 2mm fraction. The NEPM screening level of 0.001 % (w / w) asbestos in soil for FA (friable asbestos) and AF (asbestos fines) then applies where they are able to be quantified by gravimetric procedures. This quantitative screening is not generally applicable to FF (free fibres) and results of Trace Analysis are referred.

NOTE: NATA News March 2014, p.7, states in relation to AS4964: "This is a qualitative method with a nominal reporting limit of 0.01%" and that currently in Australia "there is no validated method available for the quantification of asbestos". Accordingly, NATA Accreditation does not cover the performance of this service (indicated with an asterisk). This report is consistent with the analytical procedures and reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended) and the Western Australia Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, 2009, including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil, June 2011.

Project Name SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID 2127425
Date Sampled Aug 08, 2018
Report 611464-AID

Client Sample ID	Eurofins mgt Sample No.	Date Sampled	Sample Description	Result
GHD-BH1_0.5-0.6	18-Au11035	Aug 08, 2018	Approximate Sample 48g Sample consisted of: Brown fine grain sandy soil	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Aug 09, 2018	Indefinite

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Order No.: 2127425
Report #: 611464
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Aug 9, 2018 9:40 AM
Due: Aug 16, 2018
Priority: 5 Day
Contact Name: Clifton Thompson

Project Name: SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID: 2127425

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	HOLD	Acid Sulfate Soils Field pH Test	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X		X	X	X
Brisbane Laboratory - NATA Site # 20794								X			
Perth Laboratory - NATA Site # 23736											
External Laboratory											
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID						
1	GHD-BH1_0-0.1	Aug 08, 2018		Soil	S18-Au11034			X			
2	GHD-BH1_0.5-0.6	Aug 08, 2018		Soil	S18-Au11035	X		X	X	X	X
3	GHD-BH1_1.0-1.45	Aug 08, 2018		Soil	S18-Au11036			X			
4	GHD-BH1_2.0-2.1	Aug 08, 2018		Soil	S18-Au11037			X		X	X
5	GHD-BH1_3.0-3.1	Aug 08, 2018		Soil	S18-Au11038			X			
6	GHD-	Aug 08, 2018		Soil	S18-Au11039			X			

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID: 2127425

Order No.: 2127425
Report #: 611464
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Aug 9, 2018 9:40 AM
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Priority: 5 Day
Contact Name: Clifton Thompson

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	HOLD	Acid Sulfate Soils Field pH Test	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X		X	X	X
Brisbane Laboratory - NATA Site # 20794								X			
Perth Laboratory - NATA Site # 23736											
	BH1_3.9-4.0										
7	GHD-BH1_4.9-5.0	Aug 08, 2018		Soil	S18-Au11040			X			
8	DUP03	Aug 08, 2018		Soil	S18-Au11041				X	X	X
9	RIN2	Aug 08, 2018		Water	S18-Au11042		X				
10	DUP04	Aug 08, 2018		Soil	S18-Au11043		X				
Test Counts						1	2	7	2	3	3

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Western Australia Department of Health
NOHSC	National Occupational Health and Safety Commission
ACM	Bonded asbestos-containing material means any material containing more than 1% asbestos and comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin. Common examples of ACM include but are not limited to: pipe and boiler insulation, sprayed-on fireproofing, troweled-on acoustical plaster, floor tile and mastic, floor linoleum, transite shingles, roofing materials, wall and ceiling plaster, ceiling tiles, and gasket materials. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected because it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and hence potential for fibre release.
FA	FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).
PACM	Presumed Asbestos-Containing Material means thermal system insulation and surfacing material found in buildings, vessels, and vessel sections constructed no later than 1980 that are assumed to contain greater than one percent asbestos but have not been sampled or analyzed to verify or negate the presence of asbestos.
AF	Asbestos fines (AF) are defined as free fibres, or fibre bundles, smaller than 7mm. It is the free fibres which present the greatest risk to human health, although very small fibres (< 5 microns in length) are not considered to be such a risk. AF also includes small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. (Note that for bonded ACM fragments to pass through a 7 mm x 7 mm sieve implies a substantial degree of damage which increases the potential for fibre release.)
AC	Asbestos cement means a mixture of cement and asbestos fibres (typically 90:10 ratios).

Comments

The sample received was not collected in an approved asbestos bag and was therefore sub-sampled from the 250mL glass jar. Valid sub-sampling procedures were applied so as to ensure that the sub-sample to be analysed accurately represented the sample received.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Sayeed Abu Senior Analyst-Asbestos (NSW)

Authorised by:

Laxman Dias Senior Analyst-Asbestos (NSW)



Glenn Jackson
National Operations Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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Certificate of Analysis

GHD Pty Ltd NSW
 Level 15, 133 Castlereagh Street
 Sydney
 NSW 2000



NATA Accredited
 Accreditation Number 1261
 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: Clifton Thompson

Report 611464-S
 Project name SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
 Project ID 2127425
 Received Date Aug 09, 2018

Client Sample ID			GHD-BH1_0-0.1	GHD-BH1_0.5-0.6	GHD-BH1_1.0-1.45	GHD-BH1_2.0-2.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Au11034	S18-Au11035	S18-Au11036	S18-Au11037
Date Sampled			Aug 08, 2018	Aug 08, 2018	Aug 08, 2018	Aug 08, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	-	< 20
TRH C10-C14	20	mg/kg	-	< 20	-	< 20
TRH C15-C28	50	mg/kg	-	< 50	-	< 50
TRH C29-C36	50	mg/kg	-	< 50	-	< 50
TRH C10-36 (Total)	50	mg/kg	-	< 50	-	< 50
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1	-	< 0.1
Xylenes - Total	0.3	mg/kg	-	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	66	-	54
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	-	< 0.5	-	< 0.5
TRH C6-C10	20	mg/kg	-	< 20	-	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	-	< 20	-	< 20
TRH >C10-C16	50	mg/kg	-	< 50	-	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	-	< 50	-	< 50
TRH >C16-C34	100	mg/kg	-	< 100	-	< 100
TRH >C34-C40	100	mg/kg	-	< 100	-	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	< 100	-	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	-	1.2
Acenaphthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Chrysene	0.5	mg/kg	-	< 0.5	-	< 0.5

Client Sample ID			GHD-BH1_0-0.1	GHD-BH1_0.5-0.6	GHD-BH1_1.0-1.45	GHD-BH1_2.0-2.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Au11034	S18-Au11035	S18-Au11036	S18-Au11037
Date Sampled			Aug 08, 2018	Aug 08, 2018	Aug 08, 2018	Aug 08, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a,h)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Fluoranthene	0.5	mg/kg	-	1.0	-	< 0.5
Fluorene	0.5	mg/kg	-	< 0.5	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Naphthalene	0.5	mg/kg	-	< 0.5	-	< 0.5
Phenanthrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Pyrene	0.5	mg/kg	-	0.9	-	< 0.5
Total PAH*	0.5	mg/kg	-	1.9	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	120	-	113
p-Terphenyl-d14 (surr.)	1	%	-	129	-	119
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	-
a-BHC	0.05	mg/kg	-	< 0.05	-	-
Aldrin	0.05	mg/kg	-	< 0.05	-	-
b-BHC	0.05	mg/kg	-	< 0.05	-	-
d-BHC	0.05	mg/kg	-	< 0.05	-	-
Dieldrin	0.05	mg/kg	-	< 0.05	-	-
Endosulfan I	0.05	mg/kg	-	< 0.05	-	-
Endosulfan II	0.05	mg/kg	-	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	-
Endrin	0.05	mg/kg	-	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	-
Endrin ketone	0.05	mg/kg	-	< 0.05	-	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	-	-
Heptachlor	0.05	mg/kg	-	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	-
Methoxychlor	0.2	mg/kg	-	< 0.2	-	-
Toxaphene	1	mg/kg	-	< 1	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	-	-
Dibutylchloroendate (surr.)	1	%	-	86	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	87	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1232	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1242	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1248	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1254	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1260	0.5	mg/kg	-	< 0.5	-	-
Total PCB*	0.5	mg/kg	-	< 0.5	-	-
Dibutylchloroendate (surr.)	1	%	-	86	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	87	-	-

Client Sample ID			GHD-BH1_0-0.1	GHD-BH1_0.5-0.6	GHD-BH1_1.0-1.45	GHD-BH1_2.0-2.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Au11034	S18-Au11035	S18-Au11036	S18-Au11037
Date Sampled			Aug 08, 2018	Aug 08, 2018	Aug 08, 2018	Aug 08, 2018
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	-	7.8	-	5.8
Cadmium	0.4	mg/kg	-	< 0.4	-	< 0.4
Chromium	5	mg/kg	-	9.9	-	5.4
Copper	5	mg/kg	-	< 5	-	< 5
Lead	5	mg/kg	-	< 5	-	8.1
Mercury	0.1	mg/kg	-	< 0.1	-	< 0.1
Nickel	5	mg/kg	-	< 5	-	< 5
Zinc	5	mg/kg	-	11	-	10
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.2	8.6	9.0	8.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.8	9.3	9.5	7.5
Reaction Ratings* ^{S05}		comment	3.0	4.0	4.0	4.0
% Moisture	1	%	-	11	-	21

Client Sample ID			GHD-BH1_3.0-3.1	GHD-BH1_3.9-4.0	GHD-BH1_4.9-5.0	DUP03
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Au11038	S18-Au11039	S18-Au11040	S18-Au11041
Date Sampled			Aug 08, 2018	Aug 08, 2018	Aug 08, 2018	Aug 08, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	-	-	< 20
TRH C10-C14	20	mg/kg	-	-	-	< 20
TRH C15-C28	50	mg/kg	-	-	-	< 50
TRH C29-C36	50	mg/kg	-	-	-	< 50
TRH C10-36 (Total)	50	mg/kg	-	-	-	< 50
BTEX						
Benzene	0.1	mg/kg	-	-	-	< 0.1
Toluene	0.1	mg/kg	-	-	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	-	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	-	-	< 0.2
o-Xylene	0.1	mg/kg	-	-	-	< 0.1
Xylenes - Total	0.3	mg/kg	-	-	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	-	-	61
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	-	-	-	< 0.5
TRH C6-C10	20	mg/kg	-	-	-	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	-	-	-	< 20
TRH >C10-C16	50	mg/kg	-	-	-	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	-	-	-	< 50
TRH >C16-C34	100	mg/kg	-	-	-	< 100
TRH >C34-C40	100	mg/kg	-	-	-	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	-	-	< 100

Client Sample ID			GHD-BH1_3.0-3.1	GHD-BH1_3.9-4.0	GHD-BH1_4.9-5.0	DUP03
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Au11038	S18-Au11039	S18-Au11040	S18-Au11041
Date Sampled			Aug 08, 2018	Aug 08, 2018	Aug 08, 2018	Aug 08, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	-	1.2
Acenaphthene	0.5	mg/kg	-	-	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	-	-	< 0.5
Anthracene	0.5	mg/kg	-	-	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	-	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	-	-	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	-	-	-	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	-	-	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	-	-	< 0.5
Chrysene	0.5	mg/kg	-	-	-	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	-	-	-	< 0.5
Fluoranthene	0.5	mg/kg	-	-	-	0.8
Fluorene	0.5	mg/kg	-	-	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	-	-	< 0.5
Naphthalene	0.5	mg/kg	-	-	-	< 0.5
Phenanthrene	0.5	mg/kg	-	-	-	< 0.5
Pyrene	0.5	mg/kg	-	-	-	0.7
Total PAH*	0.5	mg/kg	-	-	-	1.5
2-Fluorobiphenyl (surr.)	1	%	-	-	-	113
p-Terphenyl-d14 (surr.)	1	%	-	-	-	121
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4,4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4,4'-DDE	0.05	mg/kg	-	-	-	< 0.05
4,4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-BHC	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-BHC	0.05	mg/kg	-	-	-	< 0.05
d-BHC	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.2	mg/kg	-	-	-	< 0.2
Toxaphene	1	mg/kg	-	-	-	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchloroendate (surr.)	1	%	-	-	-	97
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	99

Client Sample ID			GHD-BH1_3.0-3.1	GHD-BH1_3.9-4.0	GHD-BH1_4.9-5.0	DUP03
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Au11038	S18-Au11039	S18-Au11040	S18-Au11041
Date Sampled			Aug 08, 2018	Aug 08, 2018	Aug 08, 2018	Aug 08, 2018
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1221	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1232	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1242	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1248	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1254	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1260	0.5	mg/kg	-	-	-	< 0.5
Total PCB*	0.5	mg/kg	-	-	-	< 0.5
Dibutylchloroendate (surr.)	1	%	-	-	-	97
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	99
Heavy Metals						
Arsenic	2	mg/kg	-	-	-	8.0
Cadmium	0.4	mg/kg	-	-	-	< 0.4
Chromium	5	mg/kg	-	-	-	11
Copper	5	mg/kg	-	-	-	5.2
Lead	5	mg/kg	-	-	-	< 5
Mercury	0.1	mg/kg	-	-	-	< 0.1
Nickel	5	mg/kg	-	-	-	< 5
Zinc	5	mg/kg	-	-	-	12
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.7	6.0	7.9	-
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.4	7.2	8.9	-
Reaction Ratings* ^{S05}		comment	4.0	2.0	4.0	-
% Moisture	1	%	-	-	-	11

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Aug 13, 2018	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Aug 13, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Aug 13, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Aug 13, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	Aug 13, 2018	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Aug 13, 2018	28 Day
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Organochlorine Pesticides	Sydney	Aug 13, 2018	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Sydney	Aug 13, 2018	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Acid Sulfate Soils Field pH Test	Brisbane	Aug 10, 2018	7 Days
- Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests			
% Moisture	Sydney	Aug 09, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Order No.: 2127425
Report #: 611464
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Aug 9, 2018 9:40 AM
Due: Aug 16, 2018
Priority: 5 Day
Contact Name: Clifton Thompson

Project Name: SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID: 2127425

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	HOLD	Acid Sulfate Soils Field pH Test	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X		X	X	X
Brisbane Laboratory - NATA Site # 20794								X			
Perth Laboratory - NATA Site # 23736											
External Laboratory											
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID						
1	GHD-BH1_0-0.1	Aug 08, 2018		Soil	S18-Au11034			X			
2	GHD-BH1_0.5-0.6	Aug 08, 2018		Soil	S18-Au11035	X		X	X	X	X
3	GHD-BH1_1.0-1.45	Aug 08, 2018		Soil	S18-Au11036			X			
4	GHD-BH1_2.0-2.1	Aug 08, 2018		Soil	S18-Au11037			X		X	X
5	GHD-BH1_3.0-3.1	Aug 08, 2018		Soil	S18-Au11038			X			
6	GHD-	Aug 08, 2018		Soil	S18-Au11039			X			

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
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NSW 2000

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Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	HOLD	Acid Sulfate Soils Field pH Test	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X		X	X	X
Brisbane Laboratory - NATA Site # 20794								X			
Perth Laboratory - NATA Site # 23736											
	BH1_3.9-4.0										
7	GHD-BH1_4.9-5.0	Aug 08, 2018		Soil	S18-Au11040			X			
8	DUP03	Aug 08, 2018		Soil	S18-Au11041				X	X	X
9	RIN2	Aug 08, 2018		Water	S18-Au11042		X				
10	DUP04	Aug 08, 2018		Soil	S18-Au11043		X				
Test Counts						1	2	7	2	3	3

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPa, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4,4'-DDD	mg/kg	< 0.05			0.05	Pass	
4,4'-DDE	mg/kg	< 0.05			0.05	Pass	
4,4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4,4'-DDD	%	85			70-130	Pass	
4,4'-DDE	%	85			70-130	Pass	
4,4'-DDT	%	85			70-130	Pass	
a-BHC	%	91			70-130	Pass	
Aldrin	%	85			70-130	Pass	
b-BHC	%	85			70-130	Pass	
d-BHC	%	84			70-130	Pass	
Dieldrin	%	86			70-130	Pass	
Endosulfan I	%	85			70-130	Pass	
Endosulfan II	%	83			70-130	Pass	
Endosulfan sulphate	%	84			70-130	Pass	
Endrin	%	89			70-130	Pass	
Endrin aldehyde	%	80			70-130	Pass	
Endrin ketone	%	86			70-130	Pass	
g-BHC (Lindane)	%	90			70-130	Pass	
Heptachlor	%	91			70-130	Pass	
Heptachlor epoxide	%	88			70-130	Pass	

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Hexachlorobenzene				%	95			70-130	Pass	
Methoxychlor				%	89			70-130	Pass	
LCS - % Recovery										
Polychlorinated Biphenyls										
Aroclor-1260				%	87			70-130	Pass	
Test	Lab Sample ID	QA Source		Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery										
Organochlorine Pesticides					Result 1					
4,4'-DDE	S18-Au11041	CP	%		96			70-130	Pass	
a-BHC	S18-Au11041	CP	%		93			70-130	Pass	
Aldrin	S18-Au11041	CP	%		94			70-130	Pass	
b-BHC	S18-Au11041	CP	%		88			70-130	Pass	
d-BHC	S18-Au11041	CP	%		91			70-130	Pass	
Dieldrin	S18-Au11041	CP	%		96			70-130	Pass	
Endosulfan I	S18-Au11041	CP	%		94			70-130	Pass	
Endosulfan II	S18-Au11041	CP	%		95			70-130	Pass	
Endosulfan sulphate	S18-Au11041	CP	%		86			70-130	Pass	
Endrin	S18-Au11041	CP	%		92			70-130	Pass	
Endrin aldehyde	S18-Au11041	CP	%		86			70-130	Pass	
g-BHC (Lindane)	S18-Au11041	CP	%		86			70-130	Pass	
Heptachlor epoxide	S18-Au11041	CP	%		94			70-130	Pass	
Hexachlorobenzene	S18-Au11041	CP	%		96			70-130	Pass	
Spike - % Recovery										
Polychlorinated Biphenyls					Result 1					
Aroclor-1260	S18-Au11041	CP	%		89			70-130	Pass	
Test	Lab Sample ID	QA Source		Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate										
Acid Sulfate Soils Field pH Test					Result 1	Result 2	RPD			
pH-F (Field pH test)*	M18-Au10016	NCP	pH Units		8.1	8.2	pass	30%	Pass	
Reaction Ratings*	M18-Au10016	NCP	comment		4.0	4.0	pass	30%	Pass	
Duplicate										
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					Result 1	Result 2	RPD			
TRH C6-C9	S18-Au15303	NCP	mg/kg		< 20	< 20	<1	30%	Pass	
TRH C10-C14	S18-Au14513	NCP	mg/kg		25	27	5.0	30%	Pass	
TRH C15-C28	S18-Au14513	NCP	mg/kg		130	150	14	30%	Pass	
TRH C29-C36	S18-Au14513	NCP	mg/kg		260	230	13	30%	Pass	
Duplicate										
Polycyclic Aromatic Hydrocarbons					Result 1	Result 2	RPD			
Benz(a)anthracene	S18-Au10960	NCP	mg/kg		< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S18-Au10960	NCP	mg/kg		< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S18-Au10960	NCP	mg/kg		< 0.5	< 0.5	<1	30%	Pass	
Benzo(g,h,i)perylene	S18-Au10960	NCP	mg/kg		< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S18-Au10960	NCP	mg/kg		< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a,h)anthracene	S18-Au10960	NCP	mg/kg		< 0.5	< 0.5	<1	30%	Pass	
Duplicate										
Organochlorine Pesticides					Result 1	Result 2	RPD			
Chlordanes - Total	S18-Au11035	CP	mg/kg		< 0.1	< 0.1	<1	30%	Pass	
4,4'-DDD	S18-Au11035	CP	mg/kg		< 0.05	< 0.05	<1	30%	Pass	
4,4'-DDE	S18-Au11035	CP	mg/kg		< 0.05	< 0.05	<1	30%	Pass	
4,4'-DDT	S18-Au11035	CP	mg/kg		< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S18-Au11035	CP	mg/kg		< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S18-Au11035	CP	mg/kg		< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S18-Au11035	CP	mg/kg		< 0.05	< 0.05	<1	30%	Pass	

Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
d-BHC	S18-Au11035	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Dieldrin	S18-Au11035	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan I	S18-Au11035	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan II	S18-Au11035	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan sulphate	S18-Au11035	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin	S18-Au11035	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin aldehyde	S18-Au11035	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin ketone	S18-Au11035	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
g-BHC (Lindane)	S18-Au11035	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor	S18-Au11035	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor epoxide	S18-Au11035	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Hexachlorobenzene	S18-Au11035	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Methoxychlor	S18-Au11035	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Toxaphene	S18-Au11035	CP	mg/kg	< 1	< 1	<1	30%	Pass
Duplicate								
Polychlorinated Biphenyls				Result 1	Result 2	RPD		
Aroclor-1016	S18-Au11035	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1221	S18-Au11035	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1232	S18-Au11035	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1242	S18-Au11035	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1248	S18-Au11035	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1254	S18-Au11035	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1260	S18-Au11035	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M18-Au12942	NCP	mg/kg	**	**	19	30%	Pass
Cadmium	M18-Au12942	NCP	mg/kg	**	**	<1	30%	Pass
Chromium	M18-Au10739	NCP	mg/kg	**	**	1.0	30%	Pass
Copper	M18-Au12942	NCP	mg/kg	**	**	<1	30%	Pass
Lead	M18-Au12942	NCP	mg/kg	**	**	<1	30%	Pass
Mercury	M18-Au12942	NCP	mg/kg	**	**	<1	30%	Pass
Nickel	M18-Au10739	NCP	mg/kg	**	**	3.0	30%	Pass
Zinc	M18-Au10739	NCP	mg/kg	**	**	2.0	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	S18-JI26285	NCP	%	5.7	5.5	2.0	30%	Pass

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Nibha Vaidya	Analytical Services Manager
Nibha Vaidya	Senior Analyst-Asbestos (NSW)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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CHAIN OF CUSTODY RECORD**CLIENT DETAILS**Page 1 of 1

Company Name : GHD Pty Ltd	Contact Name : Clifton Thompson	Purchase Order : 2127425	COC Number : 6
Office Address :	Project Manager : Justin Kabat	PROJECT Number : 2127425	Eurofins mgt quote ID : 170808GHDN
Level 15, 133 Castlereagh Street, Sydney NSW 2000	Email for results : clifton.thompson@ghd.com	PROJECT Name : Scotland Island Energy Reliability Project	Data output format: Esdat, PDF

Special Directions & Comments :	Analytes																Some common holding times (with correct preservation). For further information contact the lab			
	Asbestos ID (presence/absence)-AS4964-2004	Suite B7 (TRH/PAH/BTEXN/8 metals)	Suite B13 OCP / PCB	8 metals	BTEX	BTEX / TPH C6-C9	TCLP	Suite L2 Aggressivity Suite (pH, EC, Cl, Resistivity, S04)	pH - Field Screen (pH and pHfox)	SPOCAS and SCr							Waters		Soils	
Special Directions & Comments : Please carry out these tests on the remaining samples already in Eurofins custody																	BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
																	TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
																	Heavy Metals	6 months	Heavy Metals	6 months
																	Mercury, CrVI	28 days	Mercury, CrVI	28 days
																	Microbiological testing	24 hours	Microbiological testing	72 hours
																	BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
																	Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
																	Ferrous iron	7 days	ASLP, TCLP	7 days

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	Asbestos	Suite B	Suite B		8 meta	BTEX	BTEX /	TCLP		Suite L	Cl, Res	pH - Fil	SPOC/										Containers:								Sample comments:
																										1LP	250P	125P	1LA	40mL vial	125mL A	Jar	bag	
1	GHD-BH02_22_22.45		soil													X														1				
2	GHD-BH04_15_15.45		soil													X														1				
3																																		
4																																		
5																																		
6																																		
7																																		
8																																		
9																																		
10																																		
11																																		
12																																		
13																																		
14																																		
15																																		
16																																		

		Laboratory Staff		Turn around time		Method Of Shipment		Temperature on arrival:
Relinquished By: Clifton Thompson		Received By: <i>VLONG</i>		1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/>		<input type="checkbox"/> Courier <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal		Report number: <i>612636</i>
Date & Time :		Date & Time : <i>14/8 1:06pm</i>		5 DAY <input checked="" type="checkbox"/> 10 DAY <input type="checkbox"/> Other:		Courier Consignment # :		
Signature:		Signature: <i>[Signature]</i>						

Sample Receipt Advice

Company name: **GHD Pty Ltd NSW**
Contact name: **Clifton Thompson**
Project name: **ADDITIONAL - SCOTLAND ISLAND ENERGY RELIABILITY PROJECT**
Project ID: **2127425**
COC number: **Not provided**
Turn around time: **5 Day**
Date/Time received: **Aug 14, 2018 1:06 PM**
Eurofins | mgt reference: **612636**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 5.3 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Clifton Thompson - Clifton.Thompson@ghd.com.

Certificate of Analysis

GHD Pty Ltd NSW
Level 15, 133 Castlereagh Street
Sydney
NSW 2000



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Clifton Thompson

Report **612636-S**
Project name ADDITIONAL - SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID 2127425
Received Date Aug 14, 2018

Client Sample ID			GHD-BH2_22-22.45	GHD-BH4_15.0_15.45
Sample Matrix			Soil	Soil
Eurofins mgt Sample No.			S18-Au20520	S18-Au20521
Date Sampled			Jul 17, 2018	Jul 17, 2018
Test/Reference	LOR	Unit		
SPOCAS Suite				
pH-KCL	0.1	pH Units	4.1	4.7
pH-OX	0.1	pH Units	1.6	3.6
Acid trail - Titratable Actual Acidity	2	mol H+/t	150	73
Acid trail - Titratable Peroxide Acidity	2	mol H+/t	2500	170
Acid trail - Titratable Sulfidic Acidity	2	mol H+/t	2400	92
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.24	0.12
sulfidic - TPA equiv. S% pyrite	0.02	% pyrite S	4.0	0.27
sulfidic - TSA equiv. S% pyrite	0.02	% pyrite S	3.8	0.15
Sulfur - KCl Extractable	0.02	% S	0.21	0.03
Sulfur - Peroxide	0.02	% S	3.6	0.04
Sulfur - Peroxide Oxidisable Sulfur	0.02	% S	3.3	< 0.02
acidity - Peroxide Oxidisable Sulfur	10	mol H+/t	2100	< 10
HCl Extractable Sulfur	0.02	% S	0.21	n/a
Net Acid soluble sulfur	0.02	% S	< 0.02	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	< 10	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	< 0.02	n/a
Calcium - KCl Extractable	0.02	% Ca	0.10	0.04
Calcium - Peroxide	0.02	% Ca	0.09	0.04
Acid Reacted Calcium	0.02	% Ca	< 0.02	< 0.02
acidity - Acid Reacted Calcium	10	mol H+/t	< 10	< 10
sulfidic - Acid Reacted Ca equiv. S% pyrite	0.02	% S	< 0.02	< 0.02
Magnesium - KCl Extractable	0.02	% Mg	0.10	0.08
Magnesium - Peroxide	0.02	% Mg	0.10	0.07
Acid Reacted Magnesium	0.02	% Mg	< 0.02	< 0.02
acidity - Acid Reacted Magnesium	10	mol H+/t	< 10	< 10
sulfidic - Acid Reacted Mg equiv. S% pyrite	0.02	% S	< 0.02	< 0.02
Acid Neutralising Capacity (ANCE)	0.02	%CaCO3	n/a	n/a
Acid Neutralising Capacity - Acidity units (a-ANCE)	10	mol H+/t	n/a	n/a
Acid Neutralising Capacity - equivalent S% pyrite(s-ANCE)	0.02	% S	n/a	n/a
ANC Fineness Factor		factor	1.5	1.5
SPOCAS - Net Acidity (Sulfur Units)	0.02	% S	3.6	0.13
SPOCAS - Net Acidity (Acidity Units)	10	mol H+/t	2200	79
SPOCAS - Liming rate	1	kg CaCO3/t	170	6.0

Client Sample ID			GHD-BH2_22-22.45	GHD-BH4_15.0_15.45
Sample Matrix			Soil	Soil
Eurofins mgt Sample No.			S18-Au20520	S18-Au20521
Date Sampled			Jul 17, 2018	Jul 17, 2018
Test/Reference	LOR	Unit		
Chromium Suite				
pH-KCL	0.1	pH Units	4.1	4.7
Acid trail - Titratable Actual Acidity	2	mol H+/t	150	73
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.24	0.12
Chromium Reducible Sulfur ^{S04}	0.005	% S	2.9	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	1800	< 3
Sulfur - KCl Extractable	0.02	% S	0.21	0.03
HCl Extractable Sulfur	0.02	% S	0.21	n/a
Net Acid soluble sulfur	0.02	% S	< 0.02	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	< 10	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	< 0.02	n/a
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	n/a
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	n/a	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	n/a
ANC Fineness Factor		factor	1.5	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	3.2	0.12
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	2000	73
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	150	5.5
Extraneous Material				
<2mm Fraction	0.005	g	59	30
>2mm Fraction	0.005	g	< 0.005	< 0.005
Analysed Material	0.1	%	100	100
Extraneous Material	0.1	%	< 0.1	< 0.1
% Moisture	1	%	27	16

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
SPOCAS Suite			
SPOCAS Suite	Brisbane	Aug 16, 2018	6 Week
- Method: LTM-GEN-7050			
Chromium Reducible Sulfur Suite			
Chromium Suite	Brisbane	Aug 16, 2018	6 Week
- Method: LTM-GEN-7070			
Extraneous Material	Brisbane	Aug 16, 2018	6 Week
- Method: LTM-GEN-7050/7070			
% Moisture	Brisbane	Aug 16, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Order No.:
Report #: 612636
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Aug 14, 2018 1:06 PM
Due: Aug 21, 2018
Priority: 5 Day
Contact Name: Clifton Thompson

Project Name: ADDITIONAL - SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID: 2127425

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						SPOCAS Suite	Chromium Reducible Sulfur Suite	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	GHD-BH2_22-22.45	Jul 17, 2018		Soil	S18-Au20520	X	X	X
2	GHD-BH4_15.0_15.45	Jul 17, 2018		Soil	S18-Au20521	X	X	X
Test Counts						2	2	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPa, PFHx, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
SPOCAS Suite				Result 1	Result 2	RPD			
pH-KCL	B18-Au13733	NCP	pH Units	4.5	4.5	<1	30%	Pass	
pH-OX	B18-Au13733	NCP	pH Units	3.0	3.0	1.0	30%	Pass	
Acid trail - Titratable Actual Acidity	B18-Au13733	NCP	mol H+/t	44	44	<1	30%	Pass	
Acid trail - Titratable Peroxide Acidity	B18-Au13733	NCP	mol H+/t	160	160	1.0	30%	Pass	
Acid trail - Titratable Sulfidic Acidity	B18-Au13733	NCP	mol H+/t	120	120	1.0	30%	Pass	
sulfidic - TAA equiv. S% pyrite	B18-Au13733	NCP	% pyrite S	0.07	0.07	<1	30%	Pass	
sulfidic - TPA equiv. S% pyrite	B18-Au13733	NCP	% pyrite S	0.26	0.26	1.0	30%	Pass	
sulfidic - TSA equiv. S% pyrite	B18-Au13733	NCP	% pyrite S	0.19	0.19	1.0	30%	Pass	
Sulfur - KCl Extractable	B18-Au13733	NCP	% S	0.09	0.09	1.0	30%	Pass	
Sulfur - Peroxide	B18-Au13733	NCP	% S	0.19	0.20	4.0	30%	Pass	
Sulfur - Peroxide Oxidisable Sulfur	B18-Au13733	NCP	% S	0.10	0.11	9.0	30%	Pass	
acidity - Peroxide Oxidisable Sulfur	B18-Au13733	NCP	mol H+/t	62	68	9.0	30%	Pass	
HCl Extractable Sulfur	B18-Au13733	NCP	% S	0.28	0.27	2.0	30%	Pass	
Net Acid soluble sulfur	B18-Au13733	NCP	% S	0.19	0.19	3.0	30%	Pass	
Net Acid soluble sulfur - acidity units	B18-Au13733	NCP	mol H+/t	89	87	3.0	30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	B18-Au13733	NCP	% S	0.14	0.14	3.0	30%	Pass	
Calcium - KCl Extractable	B18-Au13733	NCP	% Ca	0.16	0.16	3.0	30%	Pass	
Calcium - Peroxide	B18-Au13733	NCP	% Ca	0.15	0.17	8.0	30%	Pass	
Acid Reacted Calcium	B18-Au13733	NCP	% Ca	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Calcium	B18-Au13733	NCP	mol H+/t	-2	< 10	1200	30%	Fail	
sulfidic - Acid Reacted Ca equiv. S% pyrite	B18-Au13733	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - KCl Extractable	B18-Au13733	NCP	% Mg	0.06	0.06	1.0	30%	Pass	
Magnesium - Peroxide	B18-Au13733	NCP	% Mg	0.06	0.06	7.0	30%	Pass	
Acid Reacted Magnesium	B18-Au13733	NCP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Magnesium	B18-Au13733	NCP	mol H+/t	-1	< 10	590	30%	Fail	
sulfidic - Acid Reacted Mg equiv. S% pyrite	B18-Au13733	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Acid Neutralising Capacity (ANCE)	B18-Au13733	NCP	%CaCO3	n/a	n/a	n/a	30%	Pass	
Acid Neutralising Capacity - Acidity units (a-ANCE)	B18-Au13733	NCP	mol H+/t	n/a	n/a	n/a	30%	Pass	
ANC Fineness Factor	B18-Au13733	NCP	factor	1.5	1.5	<1	30%	Pass	
SPOCAS - Liming rate	B18-Au13733	NCP	kg CaCO3/t	15	15	2.0	30%	Pass	
Duplicate									
Chromium Suite				Result 1	Result 2	RPD			
Chromium Reducible Sulfur	M18-Au09044	NCP	% S	0.029	0.027	6.0	30%	Pass	
Chromium Reducible Sulfur -acidity units	M18-Au09044	NCP	mol H+/t	18	17	6.0	30%	Pass	
Acid Neutralising Capacity (ANCbt)	M18-Au09044	NCP	%CaCO3	n/a	n/a	n/a	30%	Pass	
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	M18-Au09044	NCP	% S	n/a	n/a	n/a	30%	Pass	
CRS Suite - Net Acidity (Sulfur Units)	M18-Au09044	NCP	% S	0.07	0.07	n/a	30%	Pass	
CRS Suite - Net Acidity (Acidity Units)	M18-Au09044	NCP	mol H+/t	45	43	n/a	30%	Pass	
CRS Suite - Liming Rate	M18-Au09044	NCP	kg CaCO3/t	3.4	3.2	4.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
S01	Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO ₃) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from 'kg/t dry weight' to 'kg/m ³ in-situ soil' multiply 'reported results' x 'wet bulk density of soil in t/m ³ '
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5
S03	Acid Neutralising Capacity is only required if the pHKCl is greater than or equal to pH 6.5
S04	Acid Sulfate Soil Samples have a 24 hour holding time unless frozen or dried within that period

Authorised By

Nibha Vaidya	Analytical Services Manager
Steven Trout	Senior Analyst-Metal (QLD)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Page 1 of 1

Company Name : GHD Pty Ltd	Contact Name : Clifton Thompson	Purchase Order : 2127425	COC Number : 7
Office Address :	Project Manager : Justin Kabat	PROJECT Number : 2127425	Eurofins mgt quote ID : 170808GHDN
Level 15, 133 Castlereagh Street, Sydney NSW 2000	Email for results : clifton.thompson@ghd.com	PROJECT Name : Scotland Island Energy Reliability Project	Data output format: Esdat, PDF

[illegible]

Eurofins | mqt DI water batch number:

[illegible]

	Laboratory Staff	Turn around time	Method Of Shipment	Temperature on arrival:
Relinquished By: Clifton Thompson	Received By: <i>Elms D</i>	1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/>	<input checked="" type="checkbox"/> Courier	<i>5.43C</i>
Date & Time : 02/10/2018 15:00	Date & Time : <i>21/01/18 5:07PM</i>		<input type="checkbox"/> Hand Delivered	Report number:
Signature:	Signature: <i>[Signature]</i>	5 DAY <input checked="" type="checkbox"/> 10 DAY <input type="checkbox"/> Other:	<input type="checkbox"/> Postal	<i>620547</i>
			Courier Consignment # :	

From: Alena Bounkeua
Sent: Tuesday, 2 October 2018 5:07 PM
To: Enviro Sample NSW; COC NSW
Subject: FW: GHD 2127425
Attachments: COC7 2127425_Eurofins_Chain Of Custody 1_SCOTLAND ISLAND.xls

Follow Up Flag: Follow up
Flag Status: Flagged

COC for samples arrived on Friday.

Please note that for the last water sample -- it is for B7FILT - metals needs to be subbed from the unpreserved and filtered. If sending unlogged to Melbourne --- please let Melbourne team know.

[illegible]

Alena Bounkeua
Eurofins Ingt
Phone: (02) 9900 9414
Email: AlenaBounkeua@eurofins.com

From: Clifton Thompson [mailto:Clifton.Thompson@ghd.com]
Sent: Tuesday, 2 October 2018 4:32 PM
To: Alena Bounkeua
Cc: Nibha Vaidya; Henry Luo
Subject: GHD 2127425

EXTERNAL EMAIL *

Hi Aiena,

Please find the attached COC for the samples received on Friday.

Regards,

Clifton Thompson
Geotechnical Director

GHD
Proudly employee owned
T: +61 2 9598 3812 | M: +61 431 470 139 | E: clifton.thomson@ghd.com
Level 2, 20 Smith Street Parramatta NSW 2150 Australia | www.ghd.com

Sample Receipt Advice

Company name: **GHD Pty Ltd NSW**
Contact name: **Clifton Thompson**
Project name: **SCOTLAND ISLAND ENERGY RELIABILITY PROJECT**
Project ID: **2127425**
COC number: **Not provided**
Turn around time: **5 Day**
Date/Time received: **Oct 2, 2018 5:07 PM**
Eurofins | mgt reference: **620547**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 5.4 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Sample containers for volatile analysis received with zero headspace.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Clifton Thompson - Clifton.Thompson@ghd.com.

Certificate of Analysis



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025-Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

GHD Pty Ltd NSW
Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Attention: Clifton Thompson
Report 620547-AID
Project Name SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID 2127425
Received Date Oct 02, 2018
Date Reported Oct 09, 2018

Methodology:

Asbestos Fibre
 Identification

Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques.

NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.

Unknown Mineral
 Fibres

Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity.

NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.

Subsampling Soil
 Samples

The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed.

NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.

Bonded asbestos-
 containing material
 (ACM)

The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 4964 - 2004.

NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.

Limit of Reporting

The performance limitation of the AS4964 method for inhomogeneous samples is around 0.1 g/kg (0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis where required, this is considered to be at the nominal reporting limit of 0.01 % (w / w). The examination of large sample sizes (500 mL is recommended) may improve the likelihood of identifying ACM in the > 2mm fraction. The NEPM screening level of 0.001 % (w / w) asbestos in soil for FA (friable asbestos) and AF (asbestos fines) then applies where they are able to be quantified by gravimetric procedures. This quantitative screening is not generally applicable to FF (free fibres) and results of Trace Analysis are referred.

NOTE: NATA News March 2014, p.7, states in relation to AS4964: "This is a qualitative method with a nominal reporting limit of 0.01%" and that currently in Australia "there is no validated method available for the quantification of asbestos". Accordingly, NATA Accreditation does not cover the performance of this service (indicated with an asterisk). This report is consistent with the analytical procedures and reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended) and the Western Australia Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, 2009, including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil, June 2011.

Project Name SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID 2127425
Date Sampled Sep 27, 2018
Report 620547-AID

Client Sample ID	Eurofins mgt Sample No.	Date Sampled	Sample Description	Result
GHD-BH6_0.0-0.1	18-Oc02399	Sep 27, 2018	Approximate Sample 192g Sample consisted of: Brown fine-grained soil, rocks and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD-BH7_0.0-0.1	18-Oc02401	Sep 27, 2018	Approximate Sample 289g Sample consisted of: Brown fine-grained soil, rocks and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD-BH7_0.9-1.0	18-Oc02403	Sep 27, 2018	Approximate Sample 229g Sample consisted of: Light brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD-SI01	18-Oc02406	Sep 27, 2018	Approximate Sample 420g Sample consisted of: Brown fine-grained soil, rocks and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD-SI02	18-Oc02407	Sep 27, 2018	Approximate Sample 343g Sample consisted of: Brown fine-grained soil, rocks and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD-SI03	18-Oc02408	Sep 27, 2018	Approximate Sample 262g Sample consisted of: Brown fine-grained soil, rocks and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD-SI04	18-Oc02409	Sep 27, 2018	Approximate Sample 267g Sample consisted of: Brown fine-grained soil, rocks and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD-SI05	18-Oc02410	Sep 27, 2018	Approximate Sample 245g Sample consisted of: Brown fine-grained soil, rocks and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
GHD-SI06	18-Oc02411	Sep 27, 2018	Approximate Sample 255g Sample consisted of: Brown fine-grained soil, rocks and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Oct 02, 2018	Indefinite

Certificate of Analysis

GHD Pty Ltd NSW
 Level 15, 133 Castlereagh Street
 Sydney
 NSW 2000



NATA Accredited
 Accreditation Number 1261
 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: Clifton Thompson

Report 620547-S
 Project name SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
 Project ID 2127425
 Received Date Oct 02, 2018

Client Sample ID			GHD-BH6_0.0-0.1	GHD-BH6_0.4-0.5	GHD-BH7_0.0-0.1	GHD-BH7_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Oc02399	S18-Oc02400	S18-Oc02401	S18-Oc02402
Date Sampled			Sep 27, 2018	Sep 27, 2018	Sep 27, 2018	Sep 27, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	-	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	-	< 20
TRH C15-C28	50	mg/kg	82	65	-	< 50
TRH C29-C36	50	mg/kg	110	73	-	< 50
TRH C10-36 (Total)	50	mg/kg	192	138	-	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	67	63	-	62
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	-	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	-	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	-	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	-	< 50
TRH >C16-C34	100	mg/kg	150	110	-	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	-	< 100
TRH >C10-C40 (total)*	100	mg/kg	150	110	-	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	-	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5

Client Sample ID			GHD-BH6_0.0-0.1	GHD-BH6_0.4-0.5	GHD-BH7_0.0-0.1	GHD-BH7_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Oc02399	S18-Oc02400	S18-Oc02401	S18-Oc02402
Date Sampled			Sep 27, 2018	Sep 27, 2018	Sep 27, 2018	Sep 27, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	182	114	-	107
p-Terphenyl-d14 (surr.)	1	%	221	126	-	120
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	< 0.1	-
Dibutylchlorodate (surr.)	1	%	135	-	112	-
Tetrachloro-m-xylene (surr.)	1	%	115	-	101	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PCB*	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibutylchlorodate (surr.)	1	%	135	-	112	-
Tetrachloro-m-xylene (surr.)	1	%	115	-	101	-

Client Sample ID			GHD-BH6_0.0-0.1	GHD-BH6_0.4-0.5	GHD-BH7_0.0-0.1	GHD-BH7_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Oc02399	S18-Oc02400	S18-Oc02401	S18-Oc02402
Date Sampled			Sep 27, 2018	Sep 27, 2018	Sep 27, 2018	Sep 27, 2018
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	57	-	77	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	5	uS/cm	77	-	94	-
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	5.9	-	5.4	-
Resistivity*	0.5	ohm.m	650	-	530	-
Sulphate (as SO4)	10	mg/kg	14	-	13	-
% Moisture	1	%	14	11	11	11
Heavy Metals						
Arsenic	2	mg/kg	4.1	4.7	-	4.0
Cadmium	0.4	mg/kg	< 0.4	< 0.4	-	< 0.4
Chromium	5	mg/kg	8.3	10	-	9.8
Copper	5	mg/kg	< 5	< 5	-	< 5
Lead	5	mg/kg	23	18	-	13
Mercury	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Nickel	5	mg/kg	< 5	< 5	-	< 5
Zinc	5	mg/kg	39	32	-	22

Client Sample ID			GHD-BH7_0.9-1.0	GHD-BH7_1.5-1.6	GHD-BH7_1.9-2.0
Sample Matrix			Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Oc02403	S18-Oc02404	S18-Oc02405
Date Sampled			Sep 27, 2018	Sep 27, 2018	Sep 27, 2018
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	-	< 20	-
TRH C10-C14	20	mg/kg	-	< 20	-
TRH C15-C28	50	mg/kg	-	< 50	-
TRH C29-C36	50	mg/kg	-	< 50	-
TRH C10-36 (Total)	50	mg/kg	-	< 50	-
BTEX					
Benzene	0.1	mg/kg	-	< 0.1	-
Toluene	0.1	mg/kg	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-
o-Xylene	0.1	mg/kg	-	< 0.1	-
Xylenes - Total	0.3	mg/kg	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	-	75	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene ^{N02}	0.5	mg/kg	-	< 0.5	-
TRH C6-C10	20	mg/kg	-	< 20	-
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	-	< 20	-
TRH >C10-C16	50	mg/kg	-	< 50	-
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	-	< 50	-
TRH >C16-C34	100	mg/kg	-	< 100	-
TRH >C34-C40	100	mg/kg	-	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	-	< 100	-

Client Sample ID			GHD-BH7_0.9-1.0	GHD-BH7_1.5-1.6	GHD-BH7_1.9-2.0
Sample Matrix			Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Oc02403	S18-Oc02404	S18-Oc02405
Date Sampled			Sep 27, 2018	Sep 27, 2018	Sep 27, 2018
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	-
Acenaphthene	0.5	mg/kg	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	-	< 0.5	-
Anthracene	0.5	mg/kg	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	-	< 0.5	-
Benzo(g,h,i)perylene	0.5	mg/kg	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-
Chrysene	0.5	mg/kg	-	< 0.5	-
Dibenz(a,h)anthracene	0.5	mg/kg	-	< 0.5	-
Fluoranthene	0.5	mg/kg	-	< 0.5	-
Fluorene	0.5	mg/kg	-	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	-
Naphthalene	0.5	mg/kg	-	< 0.5	-
Phenanthrene	0.5	mg/kg	-	< 0.5	-
Pyrene	0.5	mg/kg	-	< 0.5	-
Total PAH*	0.5	mg/kg	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	-	110	-
p-Terphenyl-d14 (surr.)	1	%	-	123	-
Chloride	10	mg/kg	27	-	42
Conductivity (1:5 aqueous extract at 25°C as rec.)	5	uS/cm	53	-	1100
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	5.4	-	4.8
Resistivity*	0.5	ohm.m	940	-	47
Sulphate (as SO4)	10	mg/kg	36	-	140
% Moisture	1	%	11	16	18
Heavy Metals					
Arsenic	2	mg/kg	-	12	-
Cadmium	0.4	mg/kg	-	< 0.4	-
Chromium	5	mg/kg	-	25	-
Copper	5	mg/kg	-	< 5	-
Lead	5	mg/kg	-	16	-
Mercury	0.1	mg/kg	-	< 0.1	-
Nickel	5	mg/kg	-	< 5	-
Zinc	5	mg/kg	-	5.8	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Oct 03, 2018	14 Day
BTEX - Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices	Sydney	Oct 03, 2018	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Oct 03, 2018	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Oct 03, 2018	14 Day
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Sydney	Oct 03, 2018	14 Days
Organochlorine Pesticides - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Sydney	Oct 03, 2018	14 Day
Polychlorinated Biphenyls - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Sydney	Oct 03, 2018	28 Days
Chloride - Method: E045 /E047 Chloride	Sydney	Oct 03, 2018	28 Day
Conductivity (1:5 aqueous extract at 25°C as rec.) - Method: LTM-INO-4030 Conductivity	Sydney	Oct 03, 2018	7 Day
pH (1:5 Aqueous extract at 25°C as rec.) - Method: LTM-GEN-7090 pH in soil by ISE	Sydney	Oct 03, 2018	7 Day
Sulphate (as SO ₄) - Method: E045 Anions by Ion Chromatography	Sydney	Oct 03, 2018	28 Day
% Moisture - Method: LTM-GEN-7080 Moisture	Sydney	Oct 02, 2018	14 Day
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Oct 03, 2018	28 Day

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Order No.: 2127425
Report #: 620547
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Oct 2, 2018 5:07 PM
Due: Oct 9, 2018
Priority: 5 Day
Contact Name: Clifton Thompson

Project Name: SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID: 2127425

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	Polycyclic Aromatic Hydrocarbons	Eurofins mgt Suite B13	Aggressivity Soil Set	Moisture Set	Eurofins mgt Suite B7	Eurofins mgt Suite B7 (filtered metals)
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID							
1	GHD-BH6_0.0-0.1	Sep 27, 2018		Soil	S18-Oc02399	X		X	X	X	X	
2	GHD-BH6_0.4-0.5	Sep 27, 2018		Soil	S18-Oc02400					X	X	
3	GHD-BH7_0.0-0.1	Sep 27, 2018		Soil	S18-Oc02401	X		X	X	X		
4	GHD-BH7_0.4-0.5	Sep 27, 2018		Soil	S18-Oc02402					X	X	
5	GHD-BH7_0.9-1.0	Sep 27, 2018		Soil	S18-Oc02403	X			X	X		
6	GHD-	Sep 27, 2018		Soil	S18-Oc02404					X	X	

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Sample Detail						Asbestos - AS4964	Polycyclic Aromatic Hydrocarbons	Eurofins mgt Suite B13	Aggressivity Soil Set	Moisture Set	Eurofins mgt Suite B7	Eurofins mgt Suite B7 (filtered metals)
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
	BH7_1.5-1.6											
7	GHD-BH7_1.9-2.0	Sep 27, 2018		Soil	S18-Oc02405				X	X		
8	GHD-SI01	Sep 27, 2018		Soil	S18-Oc02406	X						
9	GHD-SI02	Sep 27, 2018		Soil	S18-Oc02407	X						
10	GHD-SI03	Sep 27, 2018		Soil	S18-Oc02408	X						
11	GHD-SI04	Sep 27, 2018		Soil	S18-Oc02409	X						
12	GHD-SI05	Sep 27, 2018		Soil	S18-Oc02410	X						
13	GHD-SI06	Sep 27, 2018		Soil	S18-Oc02411	X						
14	GHD-BH1-GW	Sep 27, 2018		Water	S18-Oc02412			X				X
15	SI-RIN01	Sep 27, 2018		Water	S18-Oc02413		X					
Test Counts						9	1	3	4	7	4	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPa, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4,4'-DDD	mg/kg	< 0.05			0.05	Pass	
4,4'-DDE	mg/kg	< 0.05			0.05	Pass	
4,4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Chloride	mg/kg	< 10			10	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	< 5			5	Pass	
Sulphate (as SO4)	mg/kg	< 10			10	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	109			70-130	Pass	
TRH C10-C14	%	114			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	117			70-130	Pass	
Toluene	%	116			70-130	Pass	
Ethylbenzene	%	116			70-130	Pass	
m&p-Xylenes	%	119			70-130	Pass	
o-Xylene	%	118			70-130	Pass	
Xylenes - Total	%	119			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	127			70-130	Pass	
TRH C6-C10	%	105			70-130	Pass	
TRH >C10-C16	%	128			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	82			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Acenaphthylene	%	91			70-130	Pass	
Anthracene	%	90			70-130	Pass	
Benz(a)anthracene	%	89			70-130	Pass	
Benzo(a)pyrene	%	87			70-130	Pass	
Benzo(b&j)fluoranthene	%	80			70-130	Pass	
Benzo(g,h,i)perylene	%	91			70-130	Pass	
Benzo(k)fluoranthene	%	85			70-130	Pass	
Chrysene	%	90			70-130	Pass	
Dibenz(a,h)anthracene	%	92			70-130	Pass	
Fluoranthene	%	91			70-130	Pass	
Fluorene	%	89			70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	96			70-130	Pass	
Naphthalene	%	87			70-130	Pass	
Phenanthrene	%	90			70-130	Pass	
Pyrene	%	93			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4,4'-DDD	%	110			70-130	Pass	
4,4'-DDE	%	127			70-130	Pass	
4,4'-DDT	%	93			70-130	Pass	
a-BHC	%	119			70-130	Pass	
Aldrin	%	122			70-130	Pass	
b-BHC	%	106			70-130	Pass	
d-BHC	%	112			70-130	Pass	
Dieldrin	%	127			70-130	Pass	
Endosulfan I	%	124			70-130	Pass	
Endosulfan II	%	122			70-130	Pass	
Endosulfan sulphate	%	121			70-130	Pass	
Endrin	%	124			70-130	Pass	
Endrin aldehyde	%	111			70-130	Pass	
Endrin ketone	%	111			70-130	Pass	
g-BHC (Lindane)	%	113			70-130	Pass	
Heptachlor	%	114			70-130	Pass	
Heptachlor epoxide	%	121			70-130	Pass	
Hexachlorobenzene	%	105			70-130	Pass	
Methoxychlor	%	107			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	110			70-130	Pass	
LCS - % Recovery							
Chloride	%	103			70-130	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	%	97			70-130	Pass	
Resistivity*	%	97			70-130	Pass	
Sulphate (as SO4)	%	108			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	118			70-130	Pass	
Cadmium	%	104			70-130	Pass	
Chromium	%	104			70-130	Pass	
Copper	%	102			70-130	Pass	
Lead	%	106			70-130	Pass	
Mercury	%	103			70-130	Pass	
Nickel	%	101			70-130	Pass	
Zinc	%	102			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1				
TRH C6-C9	S18-Oc02040	NCP	%	101		70-130	Pass	
Spike - % Recovery								
BTEX				Result 1				
Benzene	S18-Oc02040	NCP	%	103		70-130	Pass	
Toluene	S18-Oc02040	NCP	%	102		70-130	Pass	
Ethylbenzene	S18-Oc02040	NCP	%	99		70-130	Pass	
m&p-Xylenes	S18-Oc02040	NCP	%	104		70-130	Pass	
o-Xylene	S18-Oc02040	NCP	%	102		70-130	Pass	
Xylenes - Total	S18-Oc02040	NCP	%	103		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1				
Naphthalene	S18-Oc02040	NCP	%	82		70-130	Pass	
TRH C6-C10	S18-Oc02040	NCP	%	99		70-130	Pass	
Spike - % Recovery								
Organochlorine Pesticides				Result 1				
4,4'-DDD	S18-Oc03390	NCP	%	123		70-130	Pass	
4,4'-DDT	S18-Oc03390	NCP	%	121		70-130	Pass	
Methoxychlor	S18-Oc03390	NCP	%	117		70-130	Pass	
Spike - % Recovery								
Polychlorinated Biphenyls				Result 1				
Aroclor-1260	S18-Oc03390	NCP	%	97		70-130	Pass	
Spike - % Recovery								
				Result 1				
Chloride	S18-Oc02399	CP	%	96		70-130	Pass	
Sulphate (as SO4)	S18-Oc02399	CP	%	101		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1				
TRH C10-C14	S18-Oc02400	CP	%	86		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1				
TRH >C10-C16	S18-Oc02400	CP	%	91		70-130	Pass	
Spike - % Recovery								
Polycyclic Aromatic Hydrocarbons				Result 1				
Acenaphthene	S18-Oc02400	CP	%	77		70-130	Pass	
Acenaphthylene	S18-Oc02400	CP	%	87		70-130	Pass	
Anthracene	S18-Oc02400	CP	%	86		70-130	Pass	
Benz(a)anthracene	S18-Oc02400	CP	%	83		70-130	Pass	
Benzo(a)pyrene	S18-Oc02400	CP	%	79		70-130	Pass	
Benzo(b&j)fluoranthene	S18-Oc02400	CP	%	75		70-130	Pass	
Benzo(g,h,i)perylene	S18-Oc02400	CP	%	88		70-130	Pass	
Benzo(k)fluoranthene	S18-Oc02400	CP	%	79		70-130	Pass	
Chrysene	S18-Oc02400	CP	%	87		70-130	Pass	
Dibenz(a,h)anthracene	S18-Oc02400	CP	%	90		70-130	Pass	
Fluoranthene	S18-Oc02400	CP	%	89		70-130	Pass	
Fluorene	S18-Oc02400	CP	%	85		70-130	Pass	
Indeno(1,2,3-cd)pyrene	S18-Oc02400	CP	%	92		70-130	Pass	
Naphthalene	S18-Oc02400	CP	%	87		70-130	Pass	
Phenanthrene	S18-Oc02400	CP	%	86		70-130	Pass	
Pyrene	S18-Oc02400	CP	%	89		70-130	Pass	
Spike - % Recovery								
Heavy Metals				Result 1				
Arsenic	S18-Oc02400	CP	%	109		70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Cadmium	S18-Oc02400	CP	%	99			70-130	Pass	
Chromium	S18-Oc02400	CP	%	95			70-130	Pass	
Copper	S18-Oc02400	CP	%	92			70-130	Pass	
Lead	S18-Oc02400	CP	%	96			70-130	Pass	
Mercury	S18-Oc02400	CP	%	101			70-130	Pass	
Nickel	S18-Oc02400	CP	%	95			70-130	Pass	
Zinc	S18-Oc02400	CP	%	86			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4,4'-DDE	S18-Oc02401	CP	%	124			70-130	Pass	
a-BHC	S18-Oc02401	CP	%	109			70-130	Pass	
Aldrin	S18-Oc02401	CP	%	109			70-130	Pass	
b-BHC	S18-Oc02401	CP	%	97			70-130	Pass	
d-BHC	S18-Oc02401	CP	%	102			70-130	Pass	
Dieldrin	S18-Oc02401	CP	%	124			70-130	Pass	
Endosulfan I	S18-Oc02401	CP	%	114			70-130	Pass	
Endosulfan II	S18-Oc02401	CP	%	118			70-130	Pass	
Endosulfan sulphate	S18-Oc02401	CP	%	124			70-130	Pass	
Endrin	S18-Oc02401	CP	%	126			70-130	Pass	
Endrin aldehyde	S18-Oc02401	CP	%	110			70-130	Pass	
Endrin ketone	S18-Oc02401	CP	%	97			70-130	Pass	
g-BHC (Lindane)	S18-Oc02401	CP	%	101			70-130	Pass	
Heptachlor	S18-Oc02401	CP	%	96			70-130	Pass	
Heptachlor epoxide	S18-Oc02401	CP	%	110			70-130	Pass	
Hexachlorobenzene	S18-Oc02401	CP	%	95			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S18-Oc02399	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S18-Oc02399	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S18-Oc02399	CP	mg/kg	82	< 50	<1	30%	Pass	
TRH C29-C36	S18-Oc02399	CP	mg/kg	110	61	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-Oc02399	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S18-Oc02399	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S18-Oc02399	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S18-Oc02399	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S18-Oc02399	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S18-Oc02399	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-Oc02399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S18-Oc02399	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S18-Oc02399	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S18-Oc02399	CP	mg/kg	150	< 100	<1	30%	Pass	
TRH >C34-C40	S18-Oc02399	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S18-Oc02399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S18-Oc02399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S18-Oc02399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S18-Oc02399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S18-Oc02399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Benzo(b&j)fluoranthene	S18-Oc02399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(g,h,i)perylene	S18-Oc02399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(k)fluoranthene	S18-Oc02399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chrysene	S18-Oc02399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibenz(a,h)anthracene	S18-Oc02399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	S18-Oc02399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluorene	S18-Oc02399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	S18-Oc02399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Naphthalene	S18-Oc02399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phenanthrene	S18-Oc02399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pyrene	S18-Oc02399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
Chlordanes - Total	S18-Oc02399	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
4,4'-DDD	S18-Oc02399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDE	S18-Oc02399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDT	S18-Oc02399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
a-BHC	S18-Oc02399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Aldrin	S18-Oc02399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
b-BHC	S18-Oc02399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
d-BHC	S18-Oc02399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Dieldrin	S18-Oc02399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan I	S18-Oc02399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan II	S18-Oc02399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan sulphate	S18-Oc02399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin	S18-Oc02399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin aldehyde	S18-Oc02399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin ketone	S18-Oc02399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
g-BHC (Lindane)	S18-Oc02399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor	S18-Oc02399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor epoxide	S18-Oc02399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Hexachlorobenzene	S18-Oc02399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Methoxychlor	S18-Oc02399	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Toxaphene	S18-Oc02399	CP	mg/kg	< 1	< 1	<1	30%	Pass
Duplicate								
Polychlorinated Biphenyls				Result 1	Result 2	RPD		
Aroclor-1016	S18-Oc02399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1221	S18-Oc02399	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1232	S18-Oc02399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1242	S18-Oc02399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1248	S18-Oc02399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1254	S18-Oc02399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1260	S18-Oc02399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Chloride	S18-Oc02399	CP	mg/kg	57	57	<1	30%	Pass
Conductivity (1:5 aqueous extract at 25°C as rec.)	S18-Oc02236	NCP	uS/cm	84	79	6.0	30%	Pass
pH (1:5 Aqueous extract at 25°C as rec.)	S18-Oc02399	CP	pH Units	5.9	5.9	pass	30%	Pass
Resistivity*	S18-Oc02399	CP	ohm.m	650	630	3.0	30%	Pass
Sulphate (as SO4)	S18-Oc02399	CP	mg/kg	14	13	3.0	30%	Pass
% Moisture	S18-Oc02399	CP	%	14	14	1.0	30%	Pass

Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	S18-Oc03239	NCP	mg/kg	80	86	7.0	30%	Pass
Cadmium	S18-Oc03094	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	S18-Oc03094	NCP	mg/kg	5.5	5.0	9.0	30%	Pass
Copper	S18-Oc03094	NCP	mg/kg	5.2	5.3	3.0	30%	Pass
Lead	S18-Oc03094	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Mercury	S18-Oc03094	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	S18-Oc03094	NCP	mg/kg	5.9	5.6	5.0	30%	Pass
Zinc	S18-Oc03094	NCP	mg/kg	54	53	2.0	30%	Pass

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Nibha Vaidya	Analytical Services Manager
Nibha Vaidya	Senior Analyst-Asbestos (NSW)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Order No.: 2127425
Report #: 620547
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Oct 2, 2018 5:07 PM
Due: Oct 9, 2018
Priority: 5 Day
Contact Name: Clifton Thompson

Project Name: SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID: 2127425

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	Polycyclic Aromatic Hydrocarbons	Eurofins mgt Suite B13	Aggressivity Soil Set	Moisture Set	Eurofins mgt Suite B7	Eurofins mgt Suite B7 (filtered metals)
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID							
1	GHD-BH6_0.0-0.1	Sep 27, 2018		Soil	S18-Oc02399	X		X	X	X	X	
2	GHD-BH6_0.4-0.5	Sep 27, 2018		Soil	S18-Oc02400					X	X	
3	GHD-BH7_0.0-0.1	Sep 27, 2018		Soil	S18-Oc02401	X		X	X	X		
4	GHD-BH7_0.4-0.5	Sep 27, 2018		Soil	S18-Oc02402					X	X	
5	GHD-BH7_0.9-1.0	Sep 27, 2018		Soil	S18-Oc02403	X			X	X		
6	GHD-	Sep 27, 2018		Soil	S18-Oc02404					X	X	

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Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
	BH7_1.5-1.6											
7	GHD-BH7_1.9-2.0	Sep 27, 2018		Soil	S18-Oc02405				X	X		
8	GHD-SI01	Sep 27, 2018		Soil	S18-Oc02406	X						
9	GHD-SI02	Sep 27, 2018		Soil	S18-Oc02407	X						
10	GHD-SI03	Sep 27, 2018		Soil	S18-Oc02408	X						
11	GHD-SI04	Sep 27, 2018		Soil	S18-Oc02409	X						
12	GHD-SI05	Sep 27, 2018		Soil	S18-Oc02410	X						
13	GHD-SI06	Sep 27, 2018		Soil	S18-Oc02411	X						
14	GHD-BH1-GW	Sep 27, 2018		Water	S18-Oc02412			X				X
15	SI-RIN01	Sep 27, 2018		Water	S18-Oc02413		X					
Test Counts						9	1	3	4	7	4	1

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Western Australia Department of Health
NOHSC	National Occupational Health and Safety Commission
ACM	Bonded asbestos-containing material means any material containing more than 1% asbestos and comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin. Common examples of ACM include but are not limited to: pipe and boiler insulation, sprayed-on fireproofing, troweled-on acoustical plaster, floor tile and mastic, floor linoleum, transite shingles, roofing materials, wall and ceiling plaster, ceiling tiles, and gasket materials. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected because it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and hence potential for fibre release.
FA	FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).
PACM	Presumed Asbestos-Containing Material means thermal system insulation and surfacing material found in buildings, vessels, and vessel sections constructed no later than 1980 that are assumed to contain greater than one percent asbestos but have not been sampled or analyzed to verify or negate the presence of asbestos.
AF	Asbestos fines (AF) are defined as free fibres, or fibre bundles, smaller than 7mm. It is the free fibres which present the greatest risk to human health, although very small fibres (< 5 microns in length) are not considered to be such a risk. AF also includes small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. (Note that for bonded ACM fragments to pass through a 7 mm x 7 mm sieve implies a substantial degree of damage which increases the potential for fibre release.)
AC	Asbestos cement means a mixture of cement and asbestos fibres (typically 90:10 ratios).

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Sayeed Abu Senior Analyst-Asbestos (NSW)

Authorised by:

Nibha Vaidya Senior Analyst-Asbestos (NSW)



Glenn Jackson
National Operations Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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Certificate of Analysis

GHD Pty Ltd NSW
Level 15, 133 Castlereagh Street
Sydney
NSW 2000



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Clifton Thompson

Report 620547-W
Project name SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID 2127425
Received Date Oct 02, 2018

Client Sample ID			GHD-BH1-GW	SI-RIN01
Sample Matrix			Water	Water
Eurofins mgt Sample No.			S18-Oc02412	S18-Oc02413
Date Sampled			Sep 27, 2018	Sep 27, 2018
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	0.02	mg/L	< 0.02	-
TRH C10-C14	0.05	mg/L	< 0.05	-
TRH C15-C28	0.1	mg/L	< 0.1	-
TRH C29-C36	0.1	mg/L	< 0.1	-
TRH C10-36 (Total)	0.1	mg/L	< 0.1	-
BTEX				
Benzene	0.001	mg/L	< 0.001	-
Toluene	0.001	mg/L	< 0.001	-
Ethylbenzene	0.001	mg/L	< 0.001	-
m&p-Xylenes	0.002	mg/L	< 0.002	-
o-Xylene	0.001	mg/L	< 0.001	-
Xylenes - Total	0.003	mg/L	< 0.003	-
4-Bromofluorobenzene (surr.)	1	%	82	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene ^{N02}	0.01	mg/L	< 0.01	-
TRH C6-C10	0.02	mg/L	< 0.02	-
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	-
TRH >C10-C16	0.05	mg/L	< 0.05	-
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	-
TRH >C16-C34	0.1	mg/L	< 0.1	-
TRH >C34-C40	0.1	mg/L	< 0.1	-
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	-
Polycyclic Aromatic Hydrocarbons				
Acenaphthene	0.001	mg/L	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001

Client Sample ID			GHD-BH1-GW	SI-RIN01
Sample Matrix			Water	Water
Eurofins mgt Sample No.			S18-Oc02412	S18-Oc02413
Date Sampled			Sep 27, 2018	Sep 27, 2018
Test/Reference	LOR	Unit		
Polycyclic Aromatic Hydrocarbons				
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	100	67
p-Terphenyl-d14 (surr.)	1	%	124	72
Organochlorine Pesticides				
Chlordanes - Total	0.001	mg/L	< 0.001	-
4.4'-DDD	0.0001	mg/L	< 0.0001	-
4.4'-DDE	0.0001	mg/L	< 0.0001	-
4.4'-DDT	0.0001	mg/L	< 0.0001	-
a-BHC	0.0001	mg/L	< 0.0001	-
Aldrin	0.0001	mg/L	< 0.0001	-
b-BHC	0.0001	mg/L	< 0.0001	-
d-BHC	0.0001	mg/L	< 0.0001	-
Dieldrin	0.0001	mg/L	< 0.0001	-
Endosulfan I	0.0001	mg/L	< 0.0001	-
Endosulfan II	0.0001	mg/L	< 0.0001	-
Endosulfan sulphate	0.0001	mg/L	< 0.0001	-
Endrin	0.0001	mg/L	< 0.0001	-
Endrin aldehyde	0.0001	mg/L	< 0.0001	-
Endrin ketone	0.0001	mg/L	< 0.0001	-
g-BHC (Lindane)	0.0001	mg/L	< 0.0001	-
Heptachlor	0.0001	mg/L	< 0.0001	-
Heptachlor epoxide	0.0001	mg/L	< 0.0001	-
Hexachlorobenzene	0.0001	mg/L	< 0.0001	-
Methoxychlor	0.0001	mg/L	< 0.0001	-
Toxaphene	0.01	mg/L	< 0.01	-
Aldrin and Dieldrin (Total)*	0.0001	mg/L	< 0.0001	-
DDT + DDE + DDD (Total)*	0.0001	mg/L	< 0.0001	-
Vic EPA IWRG 621 OCP (Total)*	0.001	mg/L	< 0.001	-
Vic EPA IWRG 621 Other OCP (Total)*	0.001	mg/L	< 0.001	-
Dibutylchloroendate (surr.)	1	%	70	-
Tetrachloro-m-xylene (surr.)	1	%	63	-
Polychlorinated Biphenyls				
Aroclor-1016	0.005	mg/L	< 0.005	-
Aroclor-1221	0.001	mg/L	< 0.001	-
Aroclor-1232	0.005	mg/L	< 0.005	-
Aroclor-1242	0.005	mg/L	< 0.005	-
Aroclor-1248	0.005	mg/L	< 0.005	-
Aroclor-1254	0.005	mg/L	< 0.005	-
Aroclor-1260	0.005	mg/L	< 0.005	-
Total PCB*	0.001	mg/L	< 0.001	-
Dibutylchloroendate (surr.)	1	%	70	-
Tetrachloro-m-xylene (surr.)	1	%	63	-

Client Sample ID			GHD-BH1-GW	SI-RIN01
Sample Matrix			Water	Water
Eurofins mgt Sample No.			S18-Oc02412	S18-Oc02413
Date Sampled			Sep 27, 2018	Sep 27, 2018
Test/Reference	LOR	Unit		
Heavy Metals				
Arsenic (filtered)	0.001	mg/L	0.002	-
Cadmium (filtered)	0.0002	mg/L	< 0.0002	-
Chromium (filtered)	0.001	mg/L	0.004	-
Copper (filtered)	0.001	mg/L	0.009	-
Lead (filtered)	0.001	mg/L	0.003	-
Mercury (filtered)	0.0001	mg/L	< 0.0001	-
Nickel (filtered)	0.001	mg/L	0.020	-
Zinc (filtered)	0.005	mg/L	0.044	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Oct 02, 2018	7 Day
BTEX - Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices	Sydney	Oct 02, 2018	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Oct 02, 2018	7 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Oct 02, 2018	7 Day
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Sydney	Oct 02, 2018	7 Days
Metals M8 filtered - Method:	Sydney	Oct 02, 2018	28 Day
Organochlorine Pesticides - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Sydney	Oct 02, 2018	7 Day
Polychlorinated Biphenyls - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Sydney	Oct 02, 2018	7 Days

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Order No.: 2127425
Report #: 620547
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Oct 2, 2018 5:07 PM
Due: Oct 9, 2018
Priority: 5 Day
Contact Name: Clifton Thompson

Project Name: SCOTLAND ISLAND ENERGY RELIABILITY PROJECT
Project ID: 2127425

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	Polycyclic Aromatic Hydrocarbons	Eurofins mgt Suite B13	Aggressivity Soil Set	Moisture Set	Eurofins mgt Suite B7	Eurofins mgt Suite B7 (filtered metals)
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID							
1	GHD-BH6_0.0-0.1	Sep 27, 2018		Soil	S18-Oc02399	X		X	X	X	X	
2	GHD-BH6_0.4-0.5	Sep 27, 2018		Soil	S18-Oc02400					X	X	
3	GHD-BH7_0.0-0.1	Sep 27, 2018		Soil	S18-Oc02401	X		X	X	X		
4	GHD-BH7_0.4-0.5	Sep 27, 2018		Soil	S18-Oc02402					X	X	
5	GHD-BH7_0.9-1.0	Sep 27, 2018		Soil	S18-Oc02403	X			X	X		
6	GHD-	Sep 27, 2018		Soil	S18-Oc02404					X	X	

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Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
	BH7_1.5-1.6											
7	GHD-BH7_1.9-2.0	Sep 27, 2018		Soil	S18-Oc02405				X	X		
8	GHD-SI01	Sep 27, 2018		Soil	S18-Oc02406	X						
9	GHD-SI02	Sep 27, 2018		Soil	S18-Oc02407	X						
10	GHD-SI03	Sep 27, 2018		Soil	S18-Oc02408	X						
11	GHD-SI04	Sep 27, 2018		Soil	S18-Oc02409	X						
12	GHD-SI05	Sep 27, 2018		Soil	S18-Oc02410	X						
13	GHD-SI06	Sep 27, 2018		Soil	S18-Oc02411	X						
14	GHD-BH1-GW	Sep 27, 2018		Water	S18-Oc02412			X				X
15	SI-RIN01	Sep 27, 2018		Water	S18-Oc02413		X					
Test Counts						9	1	3	4	7	4	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPa, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g,h,i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a,h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1,2,3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/L	< 0.001			0.001	Pass	
4,4'-DDD	mg/L	< 0.0001			0.0001	Pass	
4,4'-DDE	mg/L	< 0.0001			0.0001	Pass	
4,4'-DDT	mg/L	< 0.0001			0.0001	Pass	
a-BHC	mg/L	< 0.0001			0.0001	Pass	
Aldrin	mg/L	< 0.0001			0.0001	Pass	
b-BHC	mg/L	< 0.0001			0.0001	Pass	
d-BHC	mg/L	< 0.0001			0.0001	Pass	
Dieldrin	mg/L	< 0.0001			0.0001	Pass	
Endosulfan I	mg/L	< 0.0001			0.0001	Pass	
Endosulfan II	mg/L	< 0.0001			0.0001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/L	< 0.0001			0.0001	Pass	
Endrin	mg/L	< 0.0001			0.0001	Pass	
Endrin aldehyde	mg/L	< 0.0001			0.0001	Pass	
Endrin ketone	mg/L	< 0.0001			0.0001	Pass	
g-BHC (Lindane)	mg/L	< 0.0001			0.0001	Pass	
Heptachlor	mg/L	< 0.0001			0.0001	Pass	
Heptachlor epoxide	mg/L	< 0.0001			0.0001	Pass	
Hexachlorobenzene	mg/L	< 0.0001			0.0001	Pass	
Methoxychlor	mg/L	< 0.0001			0.0001	Pass	
Toxaphene	mg/L	< 0.01			0.01	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/L	< 0.005			0.005	Pass	
Aroclor-1221	mg/L	< 0.001			0.001	Pass	
Aroclor-1232	mg/L	< 0.005			0.005	Pass	
Aroclor-1242	mg/L	< 0.005			0.005	Pass	
Aroclor-1248	mg/L	< 0.005			0.005	Pass	
Aroclor-1254	mg/L	< 0.005			0.005	Pass	
Aroclor-1260	mg/L	< 0.005			0.005	Pass	
Total PCB*	mg/L	< 0.001			0.001	Pass	
Method Blank							
Heavy Metals							
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	74			70-130	Pass	
TRH C10-C14	%	83			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	77			70-130	Pass	
Toluene	%	83			70-130	Pass	
Ethylbenzene	%	78			70-130	Pass	
m&p-Xylenes	%	79			70-130	Pass	
o-Xylene	%	82			70-130	Pass	
Xylenes - Total	%	80			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	121			70-130	Pass	
TRH C6-C10	%	71			70-130	Pass	
TRH >C10-C16	%	83			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	87			70-130	Pass	
Acenaphthylene	%	84			70-130	Pass	
Anthracene	%	84			70-130	Pass	
Benz(a)anthracene	%	91			70-130	Pass	
Benzo(a)pyrene	%	92			70-130	Pass	

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(b&j)fluoranthene				%	91			70-130	Pass	
Benzo(g,h,i)perylene				%	97			70-130	Pass	
Benzo(k)fluoranthene				%	94			70-130	Pass	
Chrysene				%	92			70-130	Pass	
Dibenz(a,h)anthracene				%	92			70-130	Pass	
Fluoranthene				%	88			70-130	Pass	
Fluorene				%	87			70-130	Pass	
Indeno(1,2,3-cd)pyrene				%	91			70-130	Pass	
Naphthalene				%	81			70-130	Pass	
Phenanthrene				%	83			70-130	Pass	
Pyrene				%	90			70-130	Pass	
LCS - % Recovery										
Organochlorine Pesticides										
4,4'-DDD				%	104			70-130	Pass	
4,4'-DDE				%	106			70-130	Pass	
4,4'-DDT				%	96			70-130	Pass	
a-BHC				%	102			70-130	Pass	
Aldrin				%	94			70-130	Pass	
b-BHC				%	94			70-130	Pass	
d-BHC				%	92			70-130	Pass	
Dieldrin				%	104			70-130	Pass	
Endosulfan I				%	102			70-130	Pass	
Endosulfan II				%	82			70-130	Pass	
Endosulfan sulphate				%	70			70-130	Pass	
Endrin				%	120			70-130	Pass	
Endrin aldehyde				%	70			70-130	Pass	
Endrin ketone				%	80			70-130	Pass	
g-BHC (Lindane)				%	102			70-130	Pass	
Heptachlor				%	98			70-130	Pass	
Heptachlor epoxide				%	102			70-130	Pass	
Hexachlorobenzene				%	82			70-130	Pass	
Methoxychlor				%	82			70-130	Pass	
Toxaphene				%	92			70-130	Pass	
LCS - % Recovery										
Polychlorinated Biphenyls										
Aroclor-1260				%	83			70-130	Pass	
LCS - % Recovery										
Heavy Metals										
Arsenic (filtered)				%	102			70-130	Pass	
Cadmium (filtered)				%	99			70-130	Pass	
Chromium (filtered)				%	99			70-130	Pass	
Copper (filtered)				%	98			70-130	Pass	
Lead (filtered)				%	99			70-130	Pass	
Mercury (filtered)				%	97			70-130	Pass	
Nickel (filtered)				%	97			70-130	Pass	
Zinc (filtered)				%	96			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1				Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery										
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1						
TRH C6-C9	S18-Se37127	NCP	%	87				70-130	Pass	
Spike - % Recovery										
BTEX				Result 1						
Benzene	S18-Se37127	NCP	%	90				70-130	Pass	
Toluene	S18-Se37127	NCP	%	90				70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Ethylbenzene	S18-Se37127	NCP	%	90			70-130	Pass	
m&p-Xylenes	S18-Se37127	NCP	%	92			70-130	Pass	
o-Xylene	S18-Se37127	NCP	%	94			70-130	Pass	
Xylenes - Total	S18-Se37127	NCP	%	93			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S18-Se37127	NCP	%	86			70-130	Pass	
TRH C6-C10	S18-Se37127	NCP	%	82			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4,4'-DDD	M18-Se01593	NCP	%	127			70-130	Pass	
4,4'-DDE	M18-Se01593	NCP	%	126			70-130	Pass	
4,4'-DDT	M18-Se01593	NCP	%	121			70-130	Pass	
a-BHC	M18-Se01593	NCP	%	121			70-130	Pass	
Aldrin	M18-Se01593	NCP	%	121			70-130	Pass	
b-BHC	M18-Se01593	NCP	%	110			70-130	Pass	
d-BHC	M18-Se01593	NCP	%	116			70-130	Pass	
Dieldrin	M18-Se01593	NCP	%	126			70-130	Pass	
Endosulfan I	M18-Se01593	NCP	%	122			70-130	Pass	
Endosulfan II	M18-Se01593	NCP	%	120			70-130	Pass	
Endosulfan sulphate	M18-Se01593	NCP	%	122			70-130	Pass	
Endrin aldehyde	M18-Se01593	NCP	%	110			70-130	Pass	
Endrin ketone	M18-Se01593	NCP	%	111			70-130	Pass	
g-BHC (Lindane)	M18-Se01593	NCP	%	122			70-130	Pass	
Heptachlor	M18-Se01593	NCP	%	124			70-130	Pass	
Heptachlor epoxide	M18-Se01593	NCP	%	119			70-130	Pass	
Hexachlorobenzene	M18-Se01593	NCP	%	106			70-130	Pass	
Methoxychlor	M18-Se01593	NCP	%	115			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	S18-Se37124	NCP	%	121			70-130	Pass	
Cadmium (filtered)	S18-Se37124	NCP	%	99			70-130	Pass	
Chromium (filtered)	S18-Se37124	NCP	%	92			70-130	Pass	
Copper (filtered)	S18-Se37124	NCP	%	82			70-130	Pass	
Lead (filtered)	S18-Se37124	NCP	%	85			70-130	Pass	
Mercury (filtered)	S18-Se37124	NCP	%	87			70-130	Pass	
Nickel (filtered)	S18-Se37124	NCP	%	85			70-130	Pass	
Zinc (filtered)	S18-Se37124	NCP	%	84			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S18-Se37126	NCP	mg/L	72	0.41	1.0	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-Se37126	NCP	mg/L	100	0.051	<1	30%	Pass	
Toluene	S18-Se37126	NCP	mg/L	96	0.048	<1	30%	Pass	
Ethylbenzene	S18-Se37126	NCP	mg/L	87	0.045	3.0	30%	Pass	
m&p-Xylenes	S18-Se37126	NCP	mg/L	84	0.086	3.0	30%	Pass	
o-Xylene	S18-Se37126	NCP	mg/L	94	0.048	2.0	30%	Pass	
Xylenes - Total	S18-Se37126	NCP	mg/L	87	0.13	2.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-Se37126	NCP	mg/L	86	0.05	14	30%	Pass	
TRH C6-C10	S18-Se37126	NCP	mg/L	71	0.47	1.0	30%	Pass	

Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic (filtered)	S18-Oc03631	NCP	mg/L	0.002	0.002	6.0	30%	Pass
Cadmium (filtered)	S18-Oc03631	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium (filtered)	S18-Oc03631	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Copper (filtered)	S18-Oc03631	NCP	mg/L	0.018	0.018	1.0	30%	Pass
Lead (filtered)	S18-Oc03631	NCP	mg/L	0.002	0.002	3.0	30%	Pass
Mercury (filtered)	S18-Oc07400	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Nickel (filtered)	S18-Oc03631	NCP	mg/L	0.003	0.003	5.0	30%	Pass
Zinc (filtered)	S18-Oc03631	NCP	mg/L	0.027	0.026	5.0	30%	Pass

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Nibha Vaidya Analytical Services Manager



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
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