Validated

CERTIFICATE OF ANALYSIS

SDG:	191115-83	**Client Reference:**		**Report Number:**	531775
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530906

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
			MW105	0.50	Soil/Solid (S)	13/11/2019	.	15/11/2019	191115-83	21151158	
Naphthalene-d8 % recovery**	%	TM218	86.8								
Acenaphthene-d10 % recovery**	%	TM218	87.8								
Phenanthrene-d10 % recovery**	%	TM218	95.1								
Chrysene-d12 % recovery**	%	TM218	95.7								
Perylene-d12 % recovery**	%	TM218	96.5								
Naphthalene	<9 µg/kg	TM218	<9 M								
Acenaphthylene	<12 µg/kg	TM218	<12 M								
Acenaphthene	<8 µg/kg	TM218	28.4 M								
Fluorene	<10 µg/kg	TM218	25.8 M								
Phenanthrene	<15 µg/kg	TM218	578 M								
Anthracene	<16 µg/kg	TM218	129 M								
Fluoranthene	<17 µg/kg	TM218	1210 M								
Pyrene	<15 µg/kg	TM218	935 M								
Benz(a)anthracene	<14 µg/kg	TM218	526 M								
Chrysene	<10 µg/kg	TM218	389 M								
Benzo(b)fluoranthene	<15 µg/kg	TM218	380 M								
Benzo(k)fluoranthene	<14 µg/kg	TM218	210 M								
Benzo(a)pyrene	<15 µg/kg	TM218	378 M								
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218	191 M								
Dibenzo(a,h)anthracene	<23 µg/kg	TM218	59.3 M								
Benzo(g,h,i)perylene	<24 µg/kg	TM218	246 M								
PAH, Total Detected USEPA 16	<118 µg/kg	TM218	5290								

Validated

CERTIFICATE OF ANALYSIS

SDG:	191115-83	**Client Reference:**		**Report Number:**	531775
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530906

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
			MW105	0.50	Soil/Solid (S)	13/11/2019	.	15/11/2019	191115-83	21151158	
2-Methylnaphthalene	<100 µg/kg	TM157	<100								
Bis(2-chloroisopropyl) ether	<100 µg/kg	TM157	<100								

Validated

CERTIFICATE OF ANALYSIS

SDG:	191115-83	**Client Reference:**		**Report Number:**	531775
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530906

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

		Customer Sample Ref.	MW105
		Depth (m)	0.50
		Sample Type	Soil/Solid (S)
		Date Sampled	13/11/2019
		Sample Time	.
		Date Received	15/11/2019
		SDG Ref	191115-83
		Lab Sample No.(s)	21151158
		AGS Reference	
Component	**LOD/Units**	**Method**	
Toluene-d8**	%	TM116	100
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M
Benzene	<9 µg/kg	TM116	<9 M
Toluene	<7 µg/kg	TM116	<7 M
Ethylbenzene	<4 µg/kg	TM116	<4 M
p/m-Xylene	<10 µg/kg	TM116	<10 #
o-Xylene	<10 µg/kg	TM116	<10 M
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #

Validated

CERTIFICATE OF ANALYSIS

SDG:	191115-83	**Client Reference:**		**Report Number:**	531775
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530906

Asbestos Identification - Solid Samples

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
*	Subcontracted test.
(F)	Trigger breach confirmed
1-5&♦§@	Sample deviation (see appendix)

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref.	MW105	20/11/2019	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.50										
Sample Type	SOLID										
Date Sampled	13/11/2019 00:00:00										
Date Receieved	15/11/2019 05:00:00										
SDG	191115-83										
Original Sample	21151158										
Method Number	TM048										

CERTIFICATE OF ANALYSIS

SDG:	191115-83	**Client Reference:**		**Report Number:**	531775
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530906

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM157	HP 6890 Gas Chromatograph (GC) system and HP 5973 Mass Selective Detector (MSD).	Determination of SVOC in Soils by GC-MS extracted by sonication in DCM/Acetone
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM243		Mixed Anions In Soils By Kone
TM288		Determination of Oxygenates in Soils by Headspace/GC-MS
TM336		
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS

SDG:	191115-83	**Client Reference:**		**Report Number:**	531775
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530906

Test Completion Dates

Lab Sample No(s)	21151158
Customer Sample Ref.	MW105
AGS Ref.	
Depth	0.50
Type	Soil/Solid (S)
Anions by Kone (soil)	22-Nov-2019
Asbestos ID in Solid Samples	20-Nov-2019
EPH CWG GC (S)	19-Nov-2019
GRO by GC-FID (S)	20-Nov-2019
Hexavalent Chromium (s)	22-Nov-2019
Metals in solid samples by OES	21-Nov-2019
n-Hexane in Solids	19-Nov-2019
Oxygenates (S)	19-Nov-2019
PAH by GCMS	21-Nov-2019
PCBs by GCMS	28-Nov-2019
Sample description	16-Nov-2019
Semi Volatile Organic Compounds	20-Nov-2019
VOC MS (S)	19-Nov-2019

Appendix General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. **Sample Deviations**

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**

19. **Asbestos**

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.
Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2107).*

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

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Deeside
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Website: www.alsenvironmental.co.uk

AECOM
Bridgewater House
4th Floor
Whitworth Street,
Manchester
Lancashire
M1 6LT

Attention: Laura McMurtry

CERTIFICATE OF ANALYSIS

Date of report Generation:	28 November 2019
Customer:	AECOM
Sample Delivery Group (SDG):	191113-115
Your Reference:	60608750
Location:	Shell Whitemare Pool
Report No:	531693

This report has been revised and directly supersedes 530662 in its entirety.

We received 4 samples on Wednesday November 13, 2019 and 4 of these samples were scheduled for analysis which was completed on Thursday November 28, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

[redacted]

Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21137336	MW101		1.00	11/11/2019
21137334	MW104		0.50	11/11/2019
21137333	MW107		0.50	12/11/2019
21137335	VP101		0.50	11/11/2019

Maximum Sample/Coolbox Temperature (°C) : **12.2**

ISO5667-3 Water quality - Sampling - Part3 -
During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

Results Legend

X **Test**

N **No Determination Possible**

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			21137336			21137334			21137333			21137335
Customer Sample Reference			MW101			MW104			MW107			VP101
AGS Reference												
Depth (m)			1.00			0.50			0.50			0.50
Container			1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)
Sample Type			S	S	S	S	S	S	S	S	S	S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 1					X						
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 3	X			X					X		
EPH CWG GC (S)	All	NDPs: 0 Tests: 4		X			X		X			X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 4			X			X		X			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 3		X			X		X				
Metals in solid samples by OES	All	NDPs: 0 Tests: 3		X			X		X				
n-Hexane in Solids	All	NDPs: 0 Tests: 4			X			X		X			X
Oxygenates (S)	All	NDPs: 0 Tests: 4			X			X		X			X
PAH by GCMS	All	NDPs: 0 Tests: 4		X			X		X			X	
PCBs by GCMS	All	NDPs: 0 Tests: 1					X						
Sample description	All	NDPs: 0 Tests: 4		X			X		X			X	
Semi Volatile Organic Compounds	All	NDPs: 0 Tests: 4		X			X		X			X	
Total Organic Carbon	All	NDPs: 0 Tests: 2		X					X				
VOC MS (S)	All	NDPs: 0 Tests: 4			X			X		X			X

CERTIFICATE OF ANALYSIS

SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
21137336	MW101	1.00	Dark Brown	Loamy Sand	Stones	Crushed Brick
21137334	MW104	0.50	Dark Brown	Clay Loam	Stones	Vegetation
21137333	MW107	0.50	Dark Brown	Loamy Sand	Stones	Vegetation
21137335	VP101	0.50	Dark Brown	Loamy Sand	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW101	MW104	MW107	VP101		
			Depth (m)	1.00	0.50	0.50	0.50		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	11/11/2019	11/11/2019	12/11/2019	11/11/2019		
			Sampled Time	.	.	.	.		
			Date Received	13/11/2019	13/11/2019	13/11/2019	13/11/2019		
			SDG Ref	191113-115	191113-115	191113-115	191113-115		
			Lab Sample No.(s)	21137336	21137334	21137333	21137335		
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		20	8.2	15	20		
Fraction Organic Carbon Low	<0.0002	TM132		0.0172 #		0.0329 #			
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6 #	<0.6 #	<0.6 #			
PCB congener 28	<3 µg/kg	TM168			<3 M				
PCB congener 52	<3 µg/kg	TM168			<3 M				
PCB congener 101	<3 µg/kg	TM168			<3 M				
PCB congener 118	<3 µg/kg	TM168			<3 M				
PCB congener 138	<3 µg/kg	TM168			<3 M				
PCB congener 153	<3 µg/kg	TM168			<3 M				
PCB congener 180	<3 µg/kg	TM168			<3 M				
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168			<21				
Arsenic	<0.6 mg/kg	TM181		9.37 M	7.51 M	6.87 M			
Boron	<0.7 mg/kg	TM181		7.38 #	4.81 #	8.35 #			
Cadmium	<0.02 mg/kg	TM181		<0.02 M	<0.02 M	0.0866 M			
Chromium	<0.9 mg/kg	TM181		22.6 M	13.9 M	14.1 M			
Cobalt	<0.1 mg/kg	TM181		19.8 M	9 M	8.45 M			
Copper	<1.4 mg/kg	TM181		24.3 M	27 M	26.6 M			
Lead	<0.7 mg/kg	TM181		48.3 M	39.2 M	54.5 M			
Mercury	<0.14 mg/kg	TM181		<0.14 M	<0.14 M	<0.14 M			
Molybdenum	<0.1 mg/kg	TM181		0.709 #	0.869 #	0.652 #			
Nickel	<0.2 mg/kg	TM181		28.4 M	24 M	21 M			
Selenium	<1 mg/kg	TM181		<1 #	<1 #	<1 #			
Tin	<0.24 mg/kg	TM181		1.95 #	2.28 #	3.16 #			
Zinc	<1.9 mg/kg	TM181		77.8 M	82.7 M	84.1 M			
Water Soluble Sulphate as SO4 2:1 Extract	<0.004 g/l	TM243			0.014 M				
Bromofluorobenzene**	%	TM288		100	105	82.4	95.1		
Ethanol	<50 µg/kg	TM288		<50	<50	<50	<50		
tert Butanol	<10 µg/kg	TM288		<10	<10	<10	<10		
Diisopropyl ether	<1 µg/kg	TM288		<1	<1	<1	<1		
tert-butyl ethyl ether	<1 µg/kg	TM288		<1	<1	<1	<1		
n-Hexane	<10 µg/kg	TM336		<10	<10	<10	<10		

CERTIFICATE OF ANALYSIS

SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

EPH CWG GC (S)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	MW101	MW104	MW107	VP101		
Customer Sample Ref.			MW101	MW104	MW107	VP101		
Depth (m)			1.00	0.50	0.50	0.50		
Sample Type			Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
Date Sampled			11/11/2019	11/11/2019	12/11/2019	11/11/2019		
Sampled Time			.	.	.	.		
Date Received			13/11/2019	13/11/2019	13/11/2019	13/11/2019		
SDG Ref			191113-115	191113-115	191113-115	191113-115		
Lab Sample No.(s)			21137336	21137334	21137333	21137335		
AGS Reference								
Aliphatics >C10-C12	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000		
Aliphatics >C12-C16	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000		
Aliphatics >C16-C21	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000		
Aliphatics >C21-C35	<1000 µg/kg	TM414	1280	<1000	1660	3000		
Aliphatics >C35-C44	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000		
Total Aliphatics >C10-C44	<5000 µg/kg	TM414	<5000	<5000	<5000	<5000		
Total Aliphatics & Aromatics >C10-C44	<10000 µg/kg	TM414	<10000	<10000	29100	19200		
Aromatics > EC10-EC12	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000		
Aromatics > EC12-EC16	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000		
Aromatics > EC16-EC21	<1000 µg/kg	TM414	<1000	<1000	4920	3840		
Aromatics > EC21-EC35	<1000 µg/kg	TM414	2080	1500	19300	8750		
Aromatics >EC35-EC44	<1000 µg/kg	TM414	<1000	<1000	2710	<1000		
Total Aromatics > EC10-EC44	<5000 µg/kg	TM414	<5000	<5000	27000	14400		

CERTIFICATE OF ANALYSIS

SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

GRO by GC-FID (S)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	MW101	MW104	MW107	VP101		
Customer Sample Ref.			MW101	MW104	MW107	VP101		
Depth (m)			1.00	0.50	0.50	0.50		
Sample Type			Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
Date Sampled			11/11/2019	11/11/2019	12/11/2019	11/11/2019		
Sampled Time			.	.	.	.		
Date Received			13/11/2019	13/11/2019	13/11/2019	13/11/2019		
SDG Ref			191113-115	191113-115	191113-115	191113-115		
Lab Sample No.(s)			21137336	21137334	21137333	21137335		
AGS Reference								
GRO Surrogate % recovery**	%	TM089	91.8	103	102	72.7		
Aliphatics >C5-C6	<10 µg/kg	TM089	<10	<10	<10	<10		
Aliphatics >C6-C8	<10 µg/kg	TM089	<10	<10	<10	<10		
Aliphatics >C8-C10	<10 µg/kg	TM089	<10	<10	<10	<10		
Aromatics >EC5-EC7	<10 µg/kg	TM089	<10	<10	<10	<10		
Aromatics >EC7-EC8	<10 µg/kg	TM089	<10	<10	<10	<10		
Aromatics >EC8-EC10	<10 µg/kg	TM089	<10	<10	<10	<10		

Validated

CERTIFICATE OF ANALYSIS

SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

PAH by GCMS

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW101	MW104	MW107	VP101		
			Depth (m)	1.00	0.50	0.50	0.50		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	11/11/2019	11/11/2019	12/11/2019	11/11/2019		
			Sampled Time	.	.	.	.		
			Date Received	13/11/2019	13/11/2019	13/11/2019	13/11/2019		
			SDG Ref	191113-115	191113-115	191113-115	191113-115		
			Lab Sample No.(s)	21137336	21137334	21137333	21137335		
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		99	95.7	92.3	91.8		
Acenaphthene-d10 % recovery**	%	TM218		92.7	89.7	89.3	85.8		
Phenanthrene-d10 % recovery**	%	TM218		91.7	88	91.5	84.6		
Chrysene-d12 % recovery**	%	TM218		87	86.6	90.4	83.2		
Perylene-d12 % recovery**	%	TM218		90	90.2	96.3	83.7		
Naphthalene	<9 µg/kg	TM218		<9 M	<9 M	10.9 M	48.5 M		
Acenaphthylene	<12 µg/kg	TM218		<12 M	<12 M	27.6 M	24.1 M		
Acenaphthene	<8 µg/kg	TM218		<8 M	<8 M	22.3 M	13.6 M		
Fluorene	<10 µg/kg	TM218		<10 M	<10 M	24 M	16.1 M		
Phenanthrene	<15 µg/kg	TM218		35 M	43.2 M	342 M	258 M		
Anthracene	<16 µg/kg	TM218		<16 M	<16 M	86.7 M	39.7 M		
Fluoranthene	<17 µg/kg	TM218		50.1 M	104 M	946 M	491 M		
Pyrene	<15 µg/kg	TM218		38.8 M	86.1 M	731 M	389 M		
Benz(a)anthracene	<14 µg/kg	TM218		27.6 M	58.8 M	533 M	268 M		
Chrysene	<10 µg/kg	TM218		32.7 M	68.1 M	515 M	273 M		
Benzo(b)fluoranthene	<15 µg/kg	TM218		50.4 M	103 M	766 M	432 M		
Benzo(k)fluoranthene	<14 µg/kg	TM218		20.1 M	44.4 M	312 M	152 M		
Benzo(a)pyrene	<15 µg/kg	TM218		24.6 M	56.6 M	469 M	238 M		
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218		<18 M	38.1 M	294 M	157 M		
Dibenzo(a,h)anthracene	<23 µg/kg	TM218		<23 M	<23 M	85.6 M	44 M		
Benzo(g,h,i)perylene	<24 µg/kg	TM218		<24 M	50 M	390 M	204 M		
PAH, Total Detected USEPA 16	<118 µg/kg	TM218		279	652	5550	3050		

CERTIFICATE OF ANALYSIS

SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

Semi Volatile Organic Compounds

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW101	MW104	MW107	VP101		
			Depth (m)	1.00	0.50	0.50	0.50		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	11/11/2019	11/11/2019	12/11/2019	11/11/2019		
			Sampled Time	.	.	.	.		
			Date Received	13/11/2019	13/11/2019	13/11/2019	13/11/2019		
			SDG Ref	191113-115	191113-115	191113-115	191113-115		
			Lab Sample No.(s)	21137336	21137334	21137333	21137335		
			AGS Reference						
2-Methylnaphthalene	<100 µg/kg	TM157		<100	<100	<100	<100		
Bis(2-chloroisopropyl) ether	<100 µg/kg	TM157		<100	<100	<100	<100		

Validated

CERTIFICATE OF ANALYSIS

SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW101	MW104	MW107	VP101		
			Depth (m)	1.00	0.50	0.50	0.50		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	11/11/2019	11/11/2019	12/11/2019	11/11/2019		
			Sampled Time	.	.	.	.		
			Date Received	13/11/2019	13/11/2019	13/11/2019	13/11/2019		
			SDG Ref	191113-115	191113-115	191113-115	191113-115		
			Lab Sample No.(s)	21137336	21137334	21137333	21137335		
			AGS Reference						
Toluene-d8**	%	TM116		95.8	97.2	92.5	87.8		
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M		
Benzene	<9 µg/kg	TM116		<9 M	<9 M	<9 M	<9 M		
Toluene	<7 µg/kg	TM116		<7 M	<7 M	<7 M	<7 M		
Ethylbenzene	<4 µg/kg	TM116		<4 M	<4 M	<4 M	<4 M		
p/m-Xylene	<10 µg/kg	TM116		<10 #	<10 #	<10 #	<10 #		
o-Xylene	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M		
Tert-amyl methyl ether	<10 µg/kg	TM116		<10 #	<10 #	<10 #	<10 #		

CERTIFICATE OF ANALYSIS

SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

Asbestos Identification - Solid Samples

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
*	Subcontracted test.
(F)	Trigger breach confirmed
1-5&♦§@	Sample deviation (see appendix)

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	MW101 1.00 SOLID 11/11/2019 00:00:00 13/11/2019 08:30:00 191113-115 21137336 TM048	20/11/2019	Lucy Caroe	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	MW104 0.50 SOLID 11/11/2019 00:00:00 13/11/2019 08:30:00 191113-115 21137334 TM048	19/11/2019	Lucy Caroe	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	VP101 0.50 SOLID 11/11/2019 00:00:00 13/11/2019 08:30:00 191113-115 21137335 TM048	19/11/2019	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

CERTIFICATE OF ANALYSIS

SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM157	HP 6890 Gas Chromatograph (GC) system and HP 5973 Mass Selective Detector (MSD).	Determination of SVOC in Soils by GC-MS extracted by sonication in DCM/Acetone
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM243		Mixed Anions In Soils By Kone
TM288		Determination of Oxygenates in Soils by Headspace/GC-MS
TM336		
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS

SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

Test Completion Dates

Lab Sample No(s)	21137336	21137334	21137333	21137335
Customer Sample Ref.	MW101	MW104	MW107	VP101
AGS Ref.				
Depth	1.00	0.50	0.50	0.50
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (soil)		20-Nov-2019		
Asbestos ID in Solid Samples	20-Nov-2019	19-Nov-2019		19-Nov-2019
EPH CWG GC (S)	18-Nov-2019	18-Nov-2019	18-Nov-2019	19-Nov-2019
GRO by GC-FID (S)	19-Nov-2019	19-Nov-2019	19-Nov-2019	19-Nov-2019
Hexavalent Chromium (s)	20-Nov-2019	20-Nov-2019	20-Nov-2019	
Metals in solid samples by OES	20-Nov-2019	20-Nov-2019	20-Nov-2019	
n-Hexane in Solids	15-Nov-2019	15-Nov-2019	15-Nov-2019	15-Nov-2019
Oxygenates (S)	15-Nov-2019	15-Nov-2019	15-Nov-2019	15-Nov-2019
PAH by GCMS	19-Nov-2019	19-Nov-2019	19-Nov-2019	20-Nov-2019
PCBs by GCMS		28-Nov-2019		
Sample description	14-Nov-2019	14-Nov-2019	14-Nov-2019	14-Nov-2019
Semi Volatile Organic Compounds	20-Nov-2019	20-Nov-2019	20-Nov-2019	20-Nov-2019
Total Organic Carbon	20-Nov-2019		20-Nov-2019	
VOC MS (S)	18-Nov-2019	18-Nov-2019	18-Nov-2019	18-Nov-2019

ASSOCIATED AQC DATA

EPH CWG GC (S)

Component	Method Code	QC 2151	QC 2170
EPH >C8-C40 Raw	TM414	**92.41** 77.66 : 104.66	**116.68** 56.39 : 129.94
Total Aliphatics Raw	TM414	**100.59** 84.39 : 115.61	**122.11** 62.55 : 133.12
Total Aromatics Raw	TM414	**108.7** 81.11 : 118.89	**183.42** 65.95 : 137.39

GRO by GC-FID (S)

Component	Method Code	QC 2148
QC	TM089	**99.74** 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2150	QC 2138
Hexavalent Chromium	TM151	**102.0** 90.20 : 107.00	**102.0** 90.20 : 107.00

Metals in solid samples by OES

Component	Method Code	QC 2178
Aluminium	TM181	**91.15** 77.84 : 119.01
Antimony	TM181	**81.3** 84.28 : 107.67
Arsenic	TM181	**100.58** 87.05 : 109.36
Barium	TM181	**87.71** 82.49 : 109.34
Beryllium	TM181	**100.0** 85.44 : 109.61
Boron	TM181	**85.96** 73.51 : 104.66
Cadmium	TM181	**94.65** 81.46 : 106.43
Chromium	TM181	**88.24** 82.26 : 104.55
Cobalt	TM181	**88.99** 86.54 : 106.87
Copper	TM181	**92.43** 82.40 : 105.45
Iron	TM181	**95.24** 82.95 : 110.58
Lead	TM181	**87.61** 78.24 : 104.05

CERTIFICATE OF ANALYSIS

SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

Metals in solid samples by OES

		QC 2178
Manganese	TM181	**104.17** 94.29 : 119.51
Mercury	TM181	**93.24** 83.74 : 105.34
Molybdenum	TM181	**96.71** 87.11 : 106.87
Nickel	TM181	**91.2** 81.92 : 102.18
Phosphorus	TM181	**112.32** 94.56 : 124.28
Selenium	TM181	**100.39** 86.28 : 110.48
Strontium	TM181	**83.07** 79.13 : 102.79
Thallium	TM181	**92.04** 82.94 : 111.86
Tin	TM181	**98.86** 90.25 : 108.86
Titanium	TM181	**83.97** 66.23 : 102.06
Vanadium	TM181	**89.01** 86.37 : 107.94
Zinc	TM181	**98.36** 84.68 : 113.99

n-Hexane in Solids

Component	Method Code	QC 2149
n_Hexane Raw	TM336	**85.42** 57.88 : 118.80

Oxygenates (S)

Component	Method Code	QC 2131
Diisopropyl ether raw	TM288	**97.0** 81.18 : 116.31
Ethanol raw	TM288	**105.0** 66.44 : 128.38
tert Butanol raw	TM288	**103.5** 84.60 : 113.24
tert-amyl methyl ether raw	TM288	**101.0** 84.97 : 116.53
tert-butyl ethyl ether raw	TM288	**98.0** 84.60 : 113.55
tert-butyl methyl ether raw	TM288	**97.5** 84.11 : 114.26

PAH by GCMS

CERTIFICATE OF ANALYSIS

SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

PAH by GCMS

Component	Method Code	QC 2196
Acenaphthene	TM218	**96.5** 80.97 : 105.99
Acenaphthylene	TM218	**94.5** 80.24 : 105.29
Anthracene	TM218	**94.5** 73.72 : 109.23
Benz(a)anthracene	TM218	**97.5** 79.72 : 116.84
Benzo(a)pyrene	TM218	**99.5** 69.58 : 110.26
Benzo(b)fluoranthene	TM218	**102.0** 77.35 : 112.97
Benzo(ghi)perylene	TM218	**102.0** 77.68 : 107.38
Benzo(k)fluoranthene	TM218	**104.5** 82.61 : 111.93
Chrysene	TM218	**105.0** 80.28 : 111.42
Dibenzo(ah)anthracene	TM218	**99.5** 79.17 : 106.41
Fluoranthene	TM218	**99.5** 79.07 : 112.75
Fluorene	TM218	**95.0** 80.52 : 110.90
Indeno(123cd)pyrene	TM218	**99.5** 76.97 : 113.36
Naphthalene	TM218	**97.0** 83.50 : 110.02
Phenanthrene	TM218	**97.0** 79.34 : 111.91
Pyrene	TM218	**98.0** 74.43 : 114.36

PCBs by GCMS

Component	Method Code	QC 2187
PCB congener 101	TM168	**87.4** 79.46 : 109.70
PCB congener 105	TM168	**75.1** 66.33 : 105.75
PCB congener 114	TM168	**75.2** 66.41 : 106.49
PCB congener 118	TM168	**79.0** 70.33 : 110.29
PCB congener 123	TM168	**70.0** 65.01 : 99.81
PCB congener 126	TM168	**70.8** 59.31 : 109.23
PCB congener 138	TM168	**72.6** 63.95 : 107.63
PCB congener 153	TM168	**75.6** 62.65 : 108.85
PCB congener 156	TM168	**74.1** 61.69 : 112.27

CERTIFICATE OF ANALYSIS

SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

PCBs by GCMS

		QC 2187
PCB congener 157	TM168	**71.9** 67.15 : 109.93
PCB congener 167	TM168	**73.2** 65.58 : 109.14
PCB congener 169	TM168	**70.6** 56.84 : 112.10
PCB congener 180	TM168	**80.0** 66.99 : 111.63
PCB congener 189	TM168	**71.3** 57.75 : 112.59
PCB congener 28	TM168	**81.6** 73.68 : 105.96
PCB congener 52	TM168	**79.0** 67.24 : 107.62
PCB congener 77	TM168	**73.1** 64.87 : 108.49
PCB congener 81	TM168	**75.8** 70.78 : 110.80

Semi Volatile Organic Compounds

Component	Method Code	QC 2179
4-Bromophenylphenylether (Soil)	TM157	**96.5** 66.75 : 125.25
Benzo(a)anthracene (Soil)	TM157	**107.0** 67.40 : 120.50
Hexachlorobutadiene (Soil)	TM157	**91.0** 68.25 : 126.75
Naphthalene (Soil)	TM157	**91.0** 67.55 : 125.45
Nitrobenzene (Soil)	TM157	**86.0** 66.50 : 123.50
Phenol (Soil)	TM157	**94.0** 69.92 : 114.02

Total Organic Carbon

Component	Method Code	QC 2184
Total Organic Carbon	TM132	**93.75** 83.80 : 116.60

VOC MS (S)

Component	Method Code	QC 2146
1,1,1,2-tetrachloroethane	TM116	**92.8** 79.10 : 119.66
1,1,1-Trichloroethane	TM116	**91.4** 87.51 : 115.37
1,1,2-Trichloroethane	TM116	**84.6** 75.16 : 112.70
1,1-Dichloroethane	TM116	**91.8** 89.44 : 121.71

CERTIFICATE OF ANALYSIS

SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

VOC MS (S)

		QC 2146
1,2-Dichloroethane	TM116	**94.2** 86.58 : 129.62
1,4-Dichlorobenzene	TM116	**104.2** 84.04 : 124.40
2-Chlorotoluene	TM116	**96.6** 66.81 : 118.43
4-Chlorotoluene	TM116	**90.0** 65.88 : 114.76
Benzene	TM116	**91.4** 85.63 : 110.10
Carbon Disulphide	TM116	**91.2** 75.11 : 124.81
Carbontetrachloride	TM116	**106.8** 82.35 : 126.46
Chlorobenzene	TM116	**93.8** 82.88 : 122.42
Chloroform	TM116	**92.4** 91.34 : 123.04
Chloromethane	TM116	**94.8** 52.88 : 131.36
Cis-1,2-Dichloroethene	TM116	**89.2** 78.27 : 128.90
Dibromomethane	TM116	**99.0** 71.69 : 119.43
Dichloromethane	TM116	**92.2** 89.49 : 128.89
Ethylbenzene	TM116	**87.8** 70.95 : 113.07
Hexachlorobutadiene	TM116	**83.8** 7.32 : 139.00
Isopropylbenzene	TM116	**85.8** 52.15 : 132.52
Naphthalene	TM116	**102.0** 80.29 : 135.77
o-Xylene	TM116	**87.2** 68.16 : 107.61
p/m-Xylene	TM116	**86.2** 73.52 : 108.71
Sec-Butylbenzene	TM116	**84.4** 49.79 : 125.67
Tetrachloroethene	TM116	**99.8** 81.43 : 126.65
Toluene	TM116	**85.0** 85.50 : 114.89
Trichloroethene	TM116	**88.0** 79.80 : 112.33
Trichlorofluoromethane	TM116	**100.8** 88.86 : 128.82
Vinyl Chloride	TM116	**97.6** 69.66 : 136.55

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.
The figure detailed is the percentage recovery result for the AQC.
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.

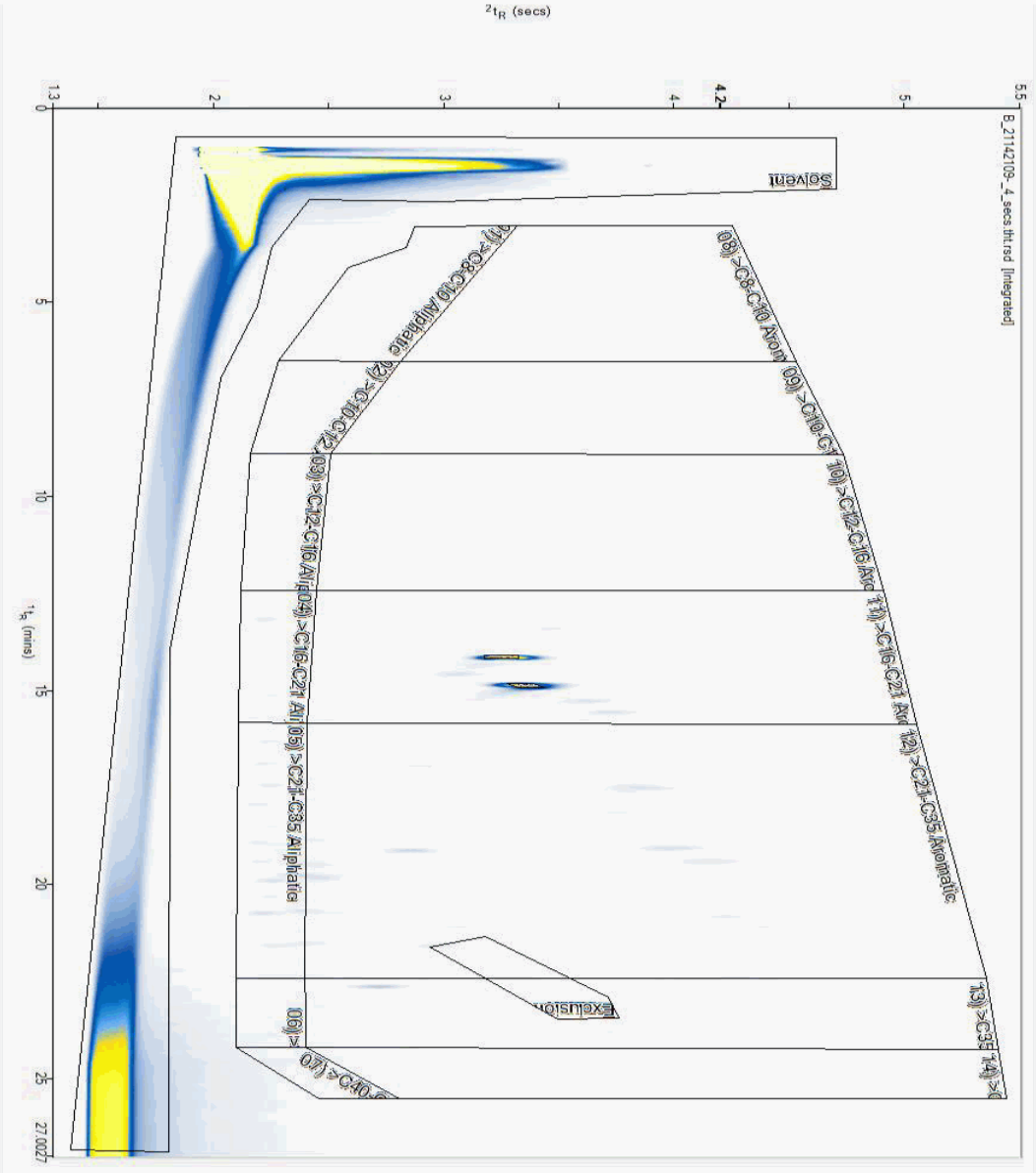
CERTIFICATE OF ANALYSIS

SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 21142109 **Depth :** 0.50
Sample ID : MW104

```
  ChromSpace LIMS export
  Current batch
Sample Identity:  B_21142109-_4_secs.tht
Date Acquired  :  15/11/19 11:36:26
Units          :  ppm
Dilution       :  0
CF             :
Multiplier     :
```



CERTIFICATE OF ANALYSIS

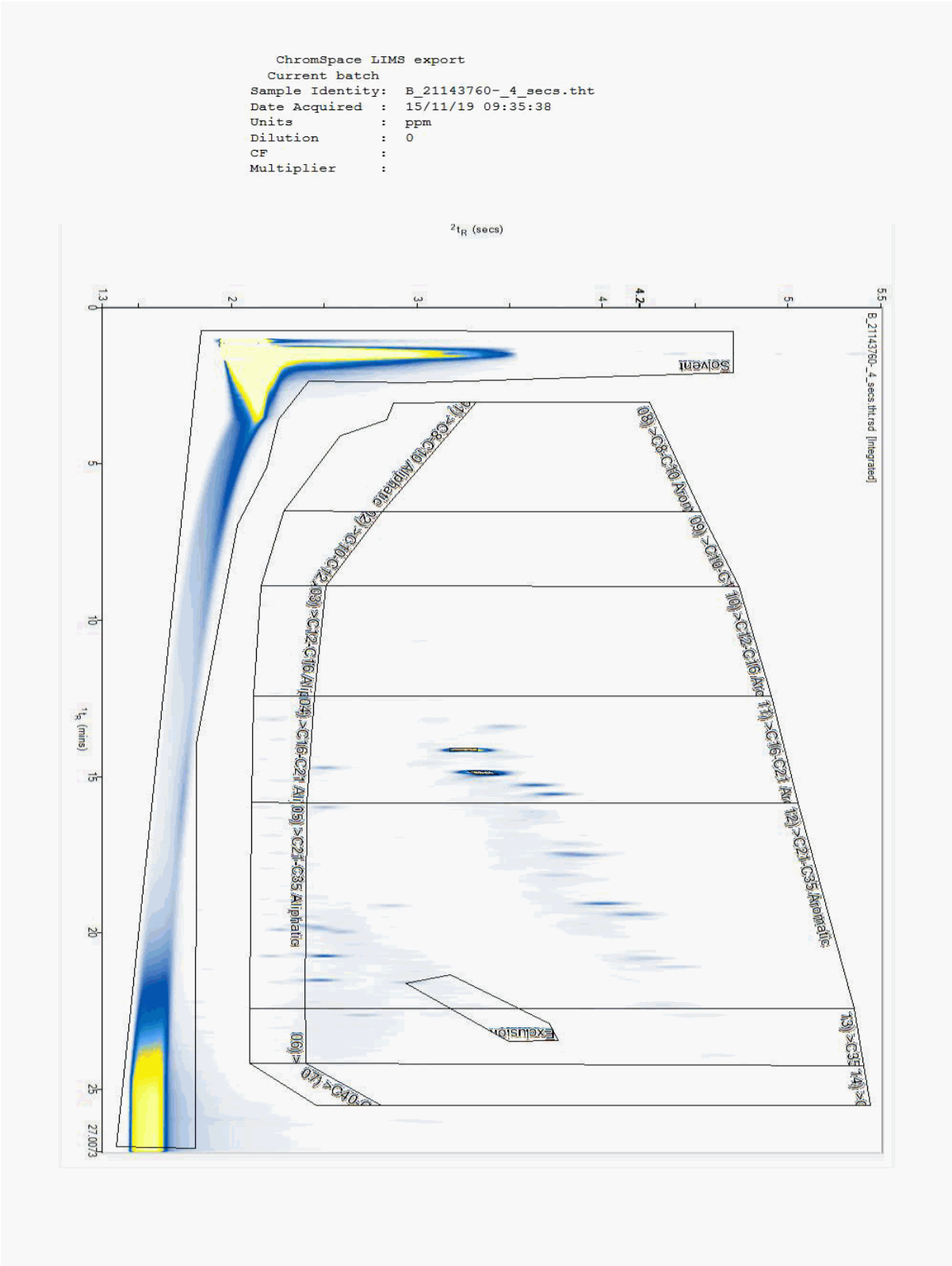
SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 21143760
Sample ID : MW107

Depth : 0.50

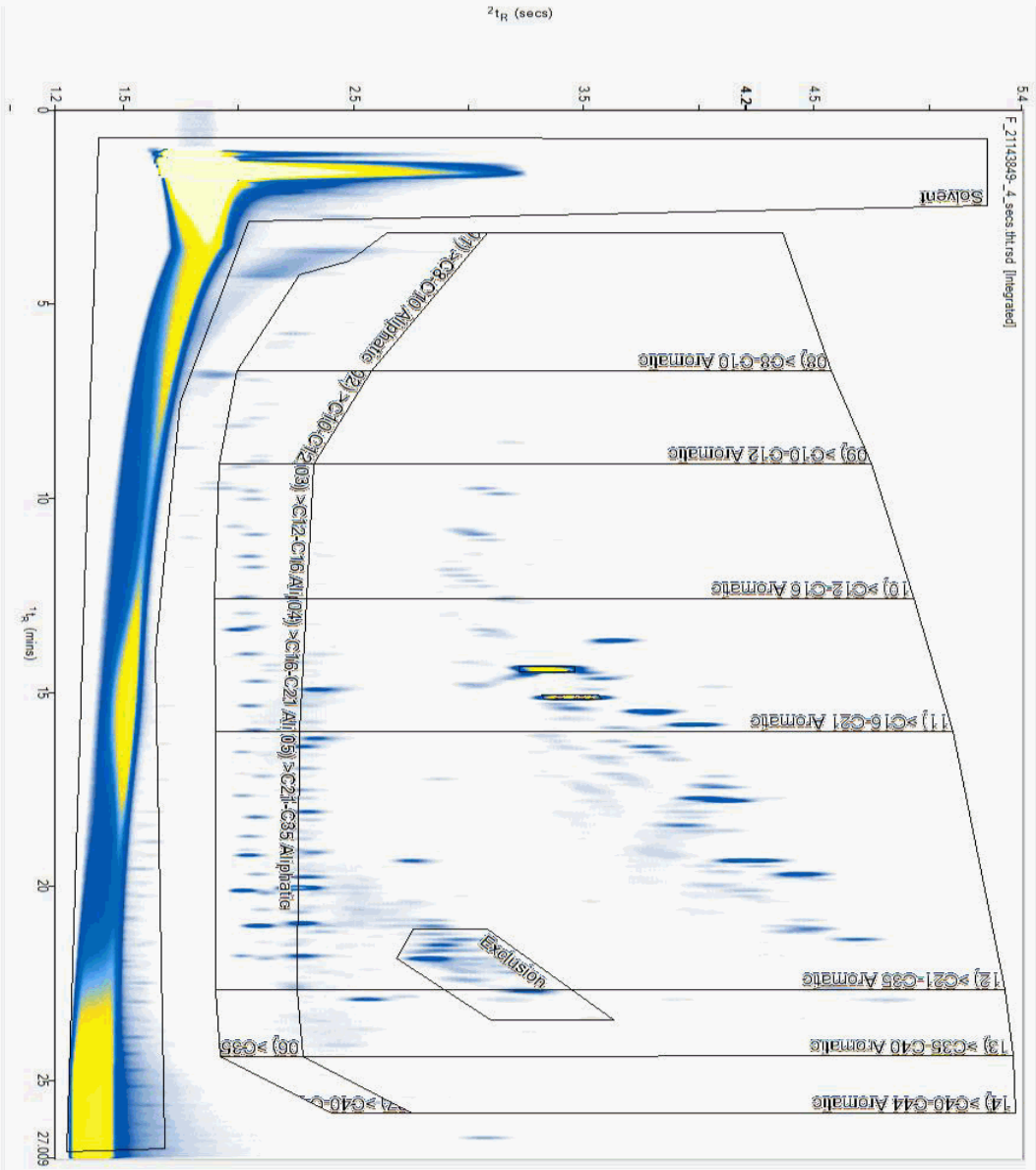


CERTIFICATE OF ANALYSIS

SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 21143849 **Depth :** 0.50
Sample ID : VP101



CERTIFICATE OF ANALYSIS

SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

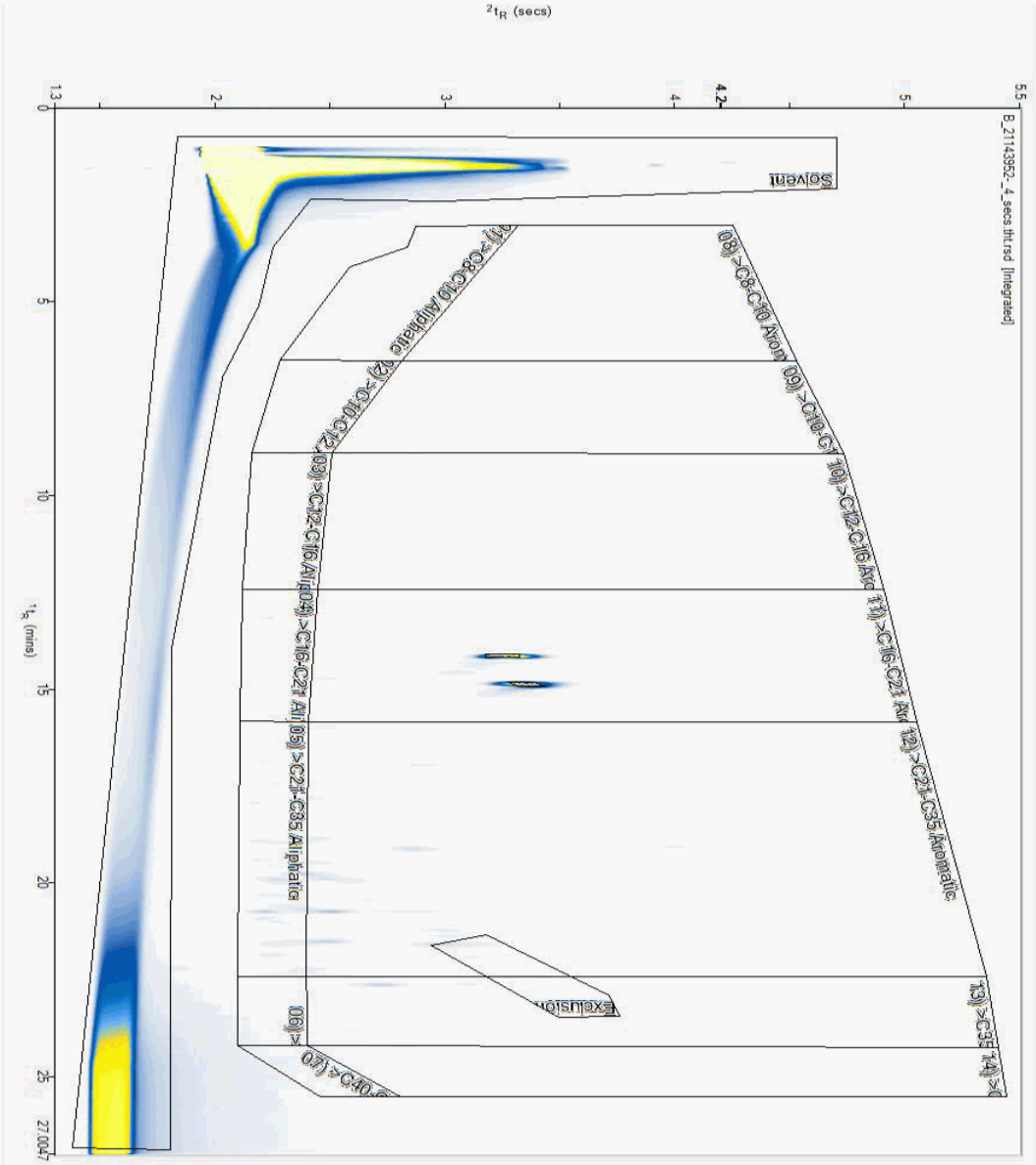
Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 21143952
Sample ID : MW101

Depth : 1.00

```
  ChromSpace LIMS export
  Current batch
Sample Identity:  B_21143952-_4_secs.tht
Date Acquired  :  16/11/19 03:37:57
Units          :  ppm
Dilution       :  0
CF             :
Multiplier     :
```



CERTIFICATE OF ANALYSIS

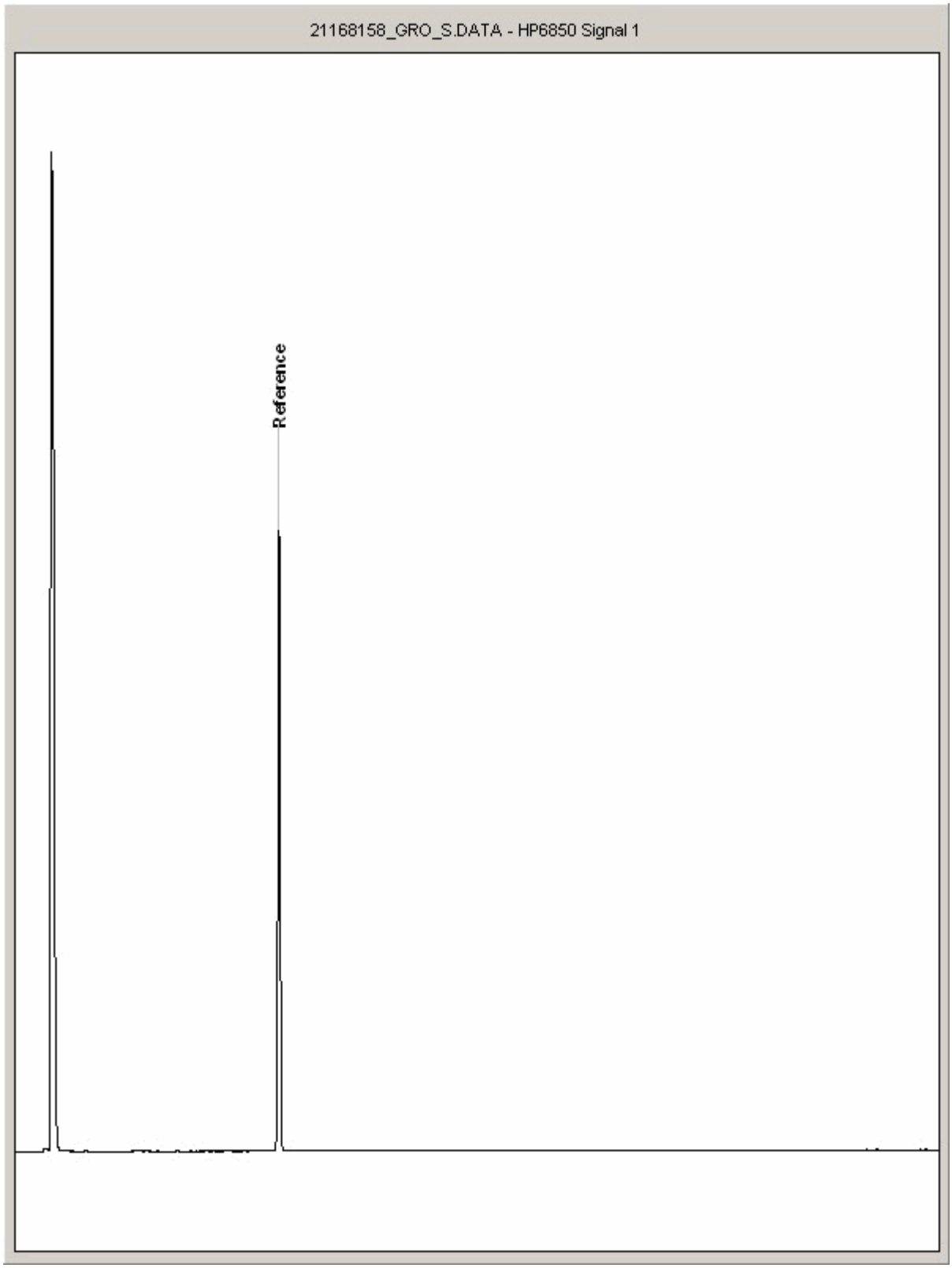
SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21168158
Sample ID : MW101

Depth : 1.00



CERTIFICATE OF ANALYSIS

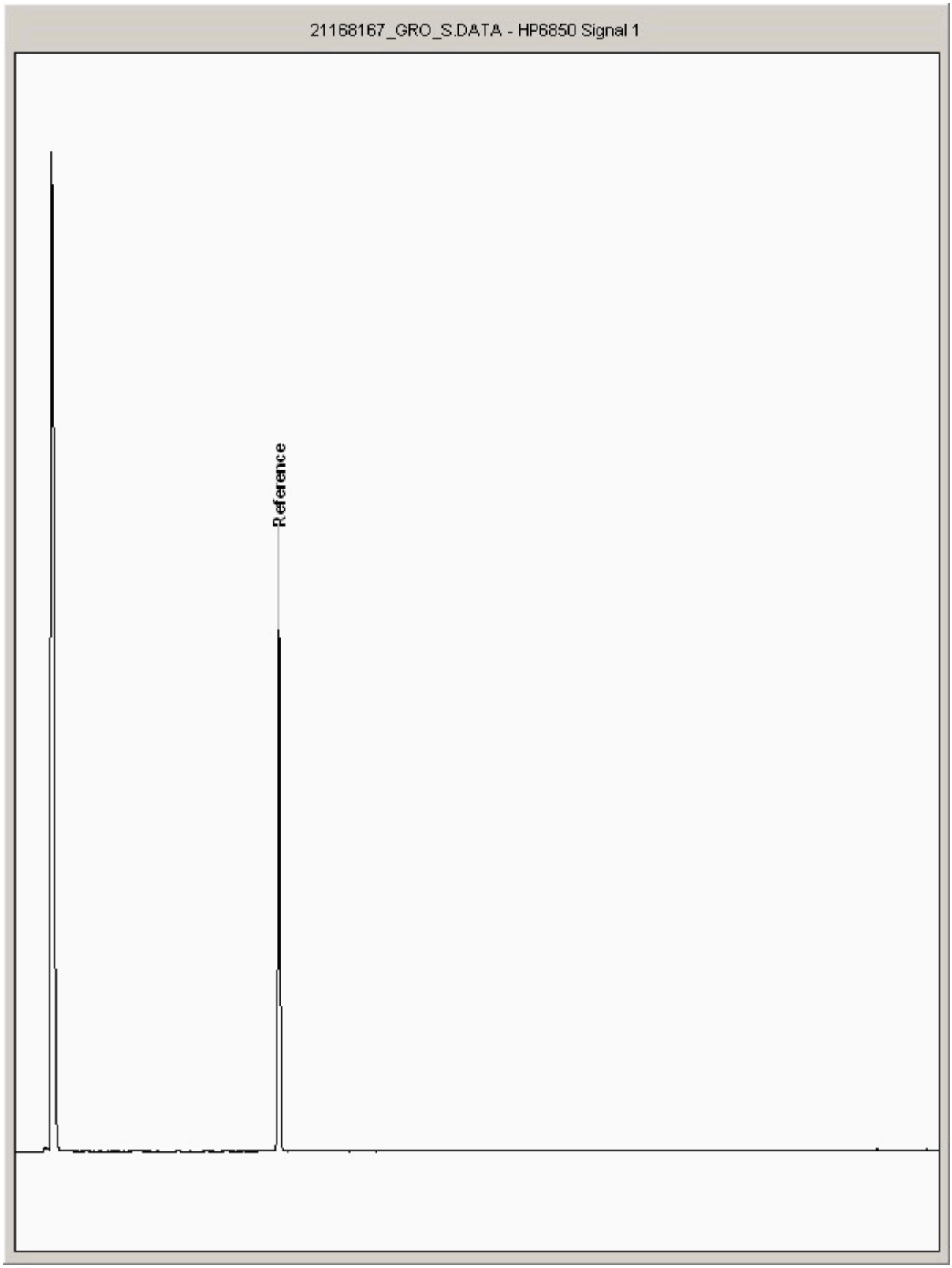
SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21168167
Sample ID : VP101

Depth : 0.50



CERTIFICATE OF ANALYSIS

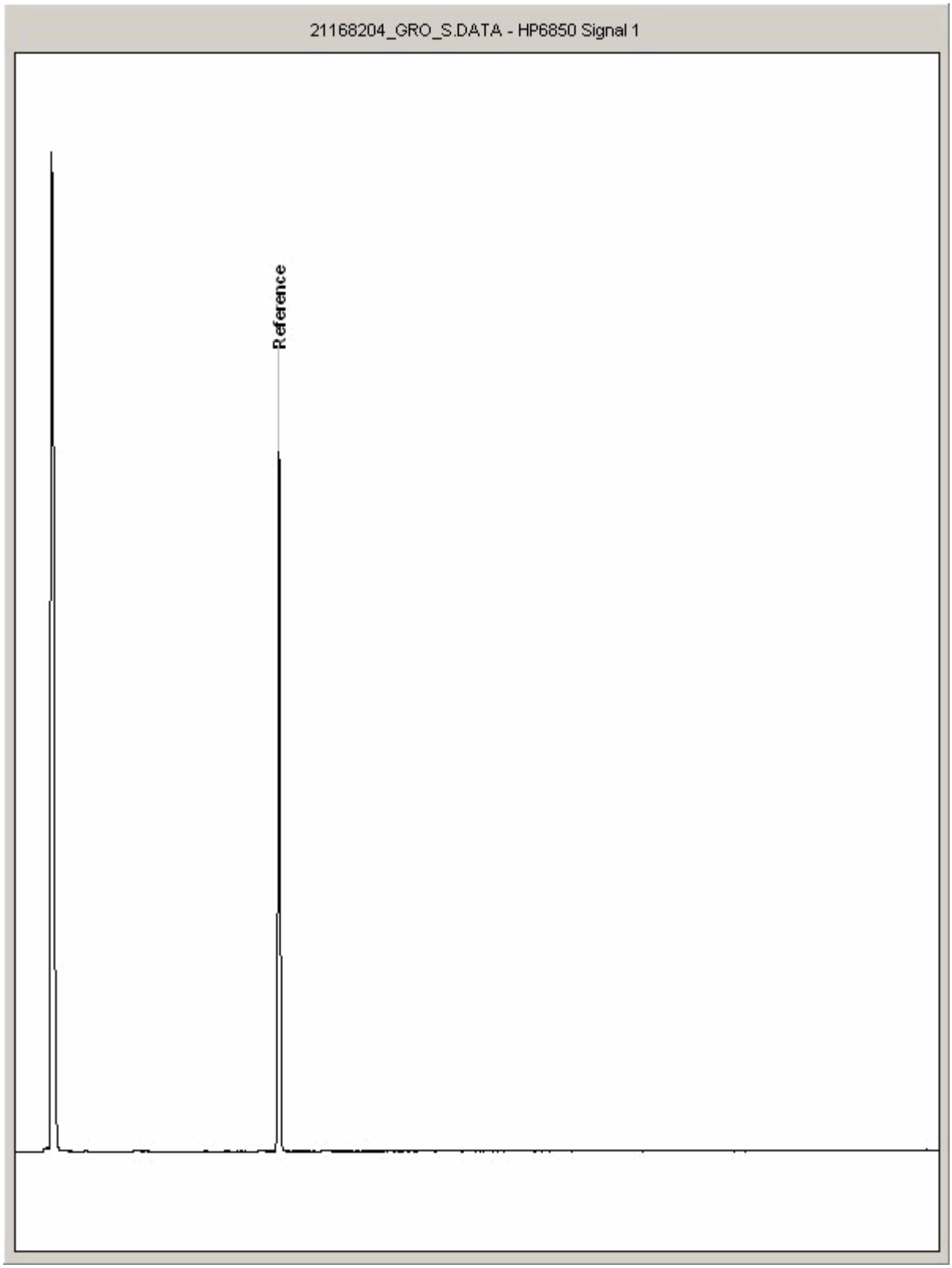
SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21168204
Sample ID : MW104

Depth : 0.50



CERTIFICATE OF ANALYSIS

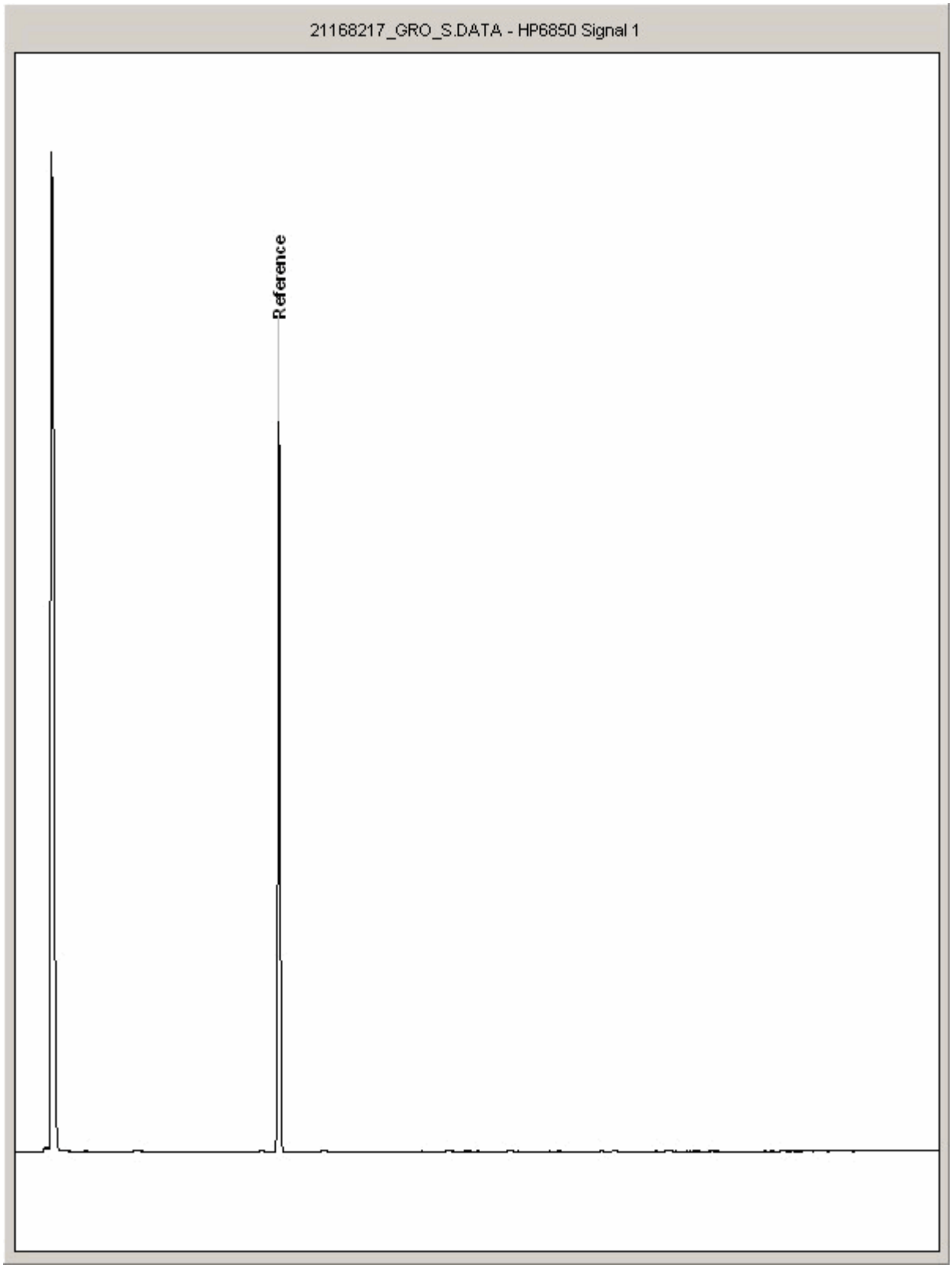
SDG:	191113-115	**Client Reference:**	60608750	**Report Number:**	531693
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	530662

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21168217
Sample ID : MW107

Depth : 0.50



Appendix General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. **Sample Deviations**

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**

19. **Asbestos**

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.
Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2107).*

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

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CH5 3US
Tel: (01244) 528700
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email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

AECOM
Bridgewater House
4th Floor
Whitworth Street,
Manchester
Lancashire
M1 6LT

Attention: Laura McMurtry

CERTIFICATE OF ANALYSIS

Date of report Generation:	03 December 2019
Customer:	AECOM
Sample Delivery Group (SDG):	191123-48
Your Reference:	60608750
Location:	Shell Whitemare Pool
Report No:	532253

We received 3 samples on Saturday November 23, 2019 and 3 of these samples were scheduled for analysis which was completed on Tuesday December 03, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

[redacted]

Sonia McWhan

Operations Manager

ALS Life Sciences Limited. ALS Life Sciences Limited registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

CERTIFICATE OF ANALYSIS

SDG:	191123-48	**Client Reference:**	60608750	**Report Number:**	532253
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21210316	MW103		1.50 - 1.70	19/11/2019
21210319	MW109		2.30 - 2.50	19/11/2019
21210320	MW109		2.90 - 3.10	19/11/2019

Maximum Sample/Coolbox Temperature (°C) : 6.6

ISO5667-3 Water quality - Sampling - Part3 -
During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG:	191123-48	**Client Reference:**	60608750	**Report Number:**	532253
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

Results Legend

X **Test**

N **No Determination Possible**

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)					
			21210316		21210319		21210320	
			Customer Sample Reference					
			MW103		MW109		MW109	
			AGS Reference					
			Depth (m)					
			1.50 - 1.70		2.30 - 2.50		2.90 - 3.10	
			Container					
			250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)
			Sample Type					
			S	S	S	S	S	S
EPH CWG GC (S)	All	NDPs: 0 Tests: 3	X		X		X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 3		X		X		X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 3	X		X		X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 3	X		X		X	
n-Hexane in Solids	All	NDPs: 0 Tests: 3		X		X		X
Oxygenates (S)	All	NDPs: 0 Tests: 3		X		X		X
PAH by GCMS	All	NDPs: 0 Tests: 3	X		X		X	
PCBs by GCMS	All	NDPs: 0 Tests: 1			X			
Sample description	All	NDPs: 0 Tests: 3	X		X		X	
Semi Volatile Organic Compounds	All	NDPs: 0 Tests: 3	X		X		X	
Total Organic Carbon	All	NDPs: 0 Tests: 2	X		X			
VOC MS (S)	All	NDPs: 0 Tests: 3		X		X		X

CERTIFICATE OF ANALYSIS

SDG:	191123-48	**Client Reference:**	60608750	**Report Number:**	532253
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	**fine**	0.063mm - 0.1mm	**medium**	0.1mm - 2mm	**coarse**	2mm - 10mm	**very coarse**	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
21210316	MW103	1.50 - 1.70	Dark Brown	Silt Loam	None	None
21210319	MW109	2.30 - 2.50	Dark Brown	Silt Loam	None	None
21210320	MW109	2.90 - 3.10	Dark Brown	Silt Loam	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Validated

CERTIFICATE OF ANALYSIS

SDG:	191123-48	**Client Reference:**	60608750	**Report Number:**	532253
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW103	MW109	MW109			
			Depth (m)	1.50 - 1.70	2.30 - 2.50	2.90 - 3.10			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	19/11/2019	19/11/2019	19/11/2019			
			Sampled Time	.	.	.			
			Date Received	23/11/2019	23/11/2019	23/11/2019			
			SDG Ref	191123-48	191123-48	191123-48			
			Lab Sample No.(s)	21210316	21210319	21210320			
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		21	17	14			
Fraction Organic Carbon Low	<0.0002	TM132		0.00908 #	0.0126 #				
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6 #	<0.6 #	<0.6 #			
PCB congener 28	<3 µg/kg	TM168			<3 M				
PCB congener 52	<3 µg/kg	TM168			<3 M				
PCB congener 101	<3 µg/kg	TM168			<3 M				
PCB congener 118	<3 µg/kg	TM168			<3 M				
PCB congener 138	<3 µg/kg	TM168			<3 M				
PCB congener 153	<3 µg/kg	TM168			<3 M				
PCB congener 180	<3 µg/kg	TM168			<3 M				
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168			<21				
Arsenic	<0.6 mg/kg	TM181		8.19 M	6.27 M	1.9 M			
Boron	<0.7 mg/kg	TM181		4.79 #	7.92 #	6.58 #			
Cadmium	<0.02 mg/kg	TM181		<0.02 M	0.0712 M	<0.02 M			
Chromium	<0.9 mg/kg	TM181		31.6 M	28.7 M	31.9 M			
Cobalt	<0.1 mg/kg	TM181		10.2 M	13.9 M	22.6 M			
Copper	<1.4 mg/kg	TM181		21 M	24.7 M	32.6 M			
Lead	<0.7 mg/kg	TM181		19.3 M	23.2 M	1.45 M			
Mercury	<0.14 mg/kg	TM181		<0.14 M	<0.14 M	<0.14 M			
Molybdenum	<0.1 mg/kg	TM181		<0.1 #	<0.1 #	<0.1 #			
Nickel	<0.2 mg/kg	TM181		37.7 M	42.8 M	59.8 M			
Selenium	<1 mg/kg	TM181		<1 #	<1 #	<1 #			
Tin	<0.24 mg/kg	TM181		0.764 #	1.43 #	0.6 #			
Zinc	<1.9 mg/kg	TM181		57.1 M	77.8 M	58.9 M			
Bromofluorobenzene**	%	TM288		102	79.6	99.6			
Ethanol	<50 µg/kg	TM288		<50	<50	<50			
tert Butanol	<10 µg/kg	TM288		<10	<10	<10			
Diisopropyl ether	<1 µg/kg	TM288		7.18	<1	<1			
tert-butyl ethyl ether	<1 µg/kg	TM288		<1	<1	<1			
n-Hexane	<10 µg/kg	TM336		<10	<10	<10			

CERTIFICATE OF ANALYSIS

SDG:	191123-48	**Client Reference:**	60608750	**Report Number:**	532253
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

EPH CWG GC (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW103	MW109	MW109			
			Depth (m)	1.50 - 1.70	2.30 - 2.50	2.90 - 3.10			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	19/11/2019	19/11/2019	19/11/2019			
			Sampled Time	.	.	.			
			Date Received	23/11/2019	23/11/2019	23/11/2019			
			SDG Ref	191123-48	191123-48	191123-48			
			Lab Sample No.(s)	21210316	21210319	21210320			
			AGS Reference						
Aliphatics >C10-C12	<1000 µg/kg	TM414		<1000	<1000	<1000			
Aliphatics >C12-C16	<1000 µg/kg	TM414		<1000	<1000	<1000			
Aliphatics >C16-C21	<1000 µg/kg	TM414		<1000	<1000	<1000			
Aliphatics >C21-C35	<1000 µg/kg	TM414		<1000	<1000	<1000			
Aliphatics >C35-C44	<1000 µg/kg	TM414		<1000	<1000	<1000			
Total Aliphatics >C10-C44	<5000 µg/kg	TM414		<5000	<5000	<5000			
Total Aliphatics & Aromatics >C10-C44	<10000 µg/kg	TM414		<10000	<10000	<10000			
Aromatics > EC10-EC12	<1000 µg/kg	TM414		<1000	<1000	<1000			
Aromatics > EC12-EC16	<1000 µg/kg	TM414		<1000	<1000	<1000			
Aromatics > EC16-EC21	<1000 µg/kg	TM414		<1000	<1000	<1000			
Aromatics > EC21-EC35	<1000 µg/kg	TM414		4520	4530	1820			
Aromatics >EC35-EC44	<1000 µg/kg	TM414		<1000	<1000	1290			
Total Aromatics > EC10-EC44	<5000 µg/kg	TM414		5690	5850	<5000			

CERTIFICATE OF ANALYSIS

SDG:	191123-48	**Client Reference:**	60608750	**Report Number:**	532253
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

GRO by GC-FID (S)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW103	MW109	MW109			
			Depth (m)	1.50 - 1.70	2.30 - 2.50	2.90 - 3.10			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	19/11/2019	19/11/2019	19/11/2019			
			Sampled Time	.	.	.			
			Date Received	23/11/2019	23/11/2019	23/11/2019			
			SDG Ref	191123-48	191123-48	191123-48			
			Lab Sample No.(s)	21210316	21210319	21210320			
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		94.5	75.8	98.8			
Aliphatics >C5-C6	<10 µg/kg	TM089		16.4	<10	<10			
Aliphatics >C6-C8	<10 µg/kg	TM089		42.8	<10	<10			
Aliphatics >C8-C10	<10 µg/kg	TM089		86.9	<10	<10			
Aromatics >EC5-EC7	<10 µg/kg	TM089		<10	<10	<10			
Aromatics >EC7-EC8	<10 µg/kg	TM089		<10	<10	<10			
Aromatics >EC8-EC10	<10 µg/kg	TM089		58	<10	<10			

CERTIFICATE OF ANALYSIS

SDG:	191123-48	**Client Reference:**	60608750	**Report Number:**	532253
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

PAH by GCMS

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW103	MW109	MW109			
			Depth (m)	1.50 - 1.70	2.30 - 2.50	2.90 - 3.10			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	19/11/2019	19/11/2019	19/11/2019			
			Sampled Time	.	.	.			
			Date Received	23/11/2019	23/11/2019	23/11/2019			
			SDG Ref	191123-48	191123-48	191123-48			
			Lab Sample No.(s)	21210316	21210319	21210320			
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		79.1	73.8	79.4			
Acenaphthene-d10 % recovery**	%	TM218		87.2	72.2	82.3			
Phenanthrene-d10 % recovery**	%	TM218		89.6	71.3	84.8			
Chrysene-d12 % recovery**	%	TM218		91.1	63.3	82.1			
Perylene-d12 % recovery**	%	TM218		84.4	63.7	83.8			
Naphthalene	<9 µg/kg	TM218		<9 M	<9 M	<9 M			
Acenaphthylene	<12 µg/kg	TM218		<12 M	<12 M	<12 M			
Acenaphthene	<8 µg/kg	TM218		<8 M	<8 M	<8 M			
Fluorene	<10 µg/kg	TM218		<10 M	<10 M	<10 M			
Phenanthrene	<15 µg/kg	TM218		<15 M	<15 M	<15 M			
Anthracene	<16 µg/kg	TM218		<16 M	<16 M	<16 M			
Fluoranthene	<17 µg/kg	TM218		<17 M	<17 M	<17 M			
Pyrene	<15 µg/kg	TM218		<15 M	<15 M	<15 M			
Benz(a)anthracene	<14 µg/kg	TM218		<14 M	<14 M	<14 M			
Chrysene	<10 µg/kg	TM218		<10 M	<10 M	<10 M			
Benzo(b)fluoranthene	<15 µg/kg	TM218		<15 M	19.8 M	<15 M			
Benzo(k)fluoranthene	<14 µg/kg	TM218		<14 M	<14 M	<14 M			
Benzo(a)pyrene	<15 µg/kg	TM218		<15 M	<15 M	<15 M			
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218		<18 M	<18 M	<18 M			
Dibenzo(a,h)anthracene	<23 µg/kg	TM218		<23 M	<23 M	<23 M			
Benzo(g,h,i)perylene	<24 µg/kg	TM218		<24 M	<24 M	<24 M			
PAH, Total Detected USEPA 16	<118 µg/kg	TM218		<118	<118	<118			

CERTIFICATE OF ANALYSIS

SDG:	191123-48	**Client Reference:**	60608750	**Report Number:**	532253
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

Semi Volatile Organic Compounds

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW103	MW109	MW109			
			Depth (m)	1.50 - 1.70	2.30 - 2.50	2.90 - 3.10			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	19/11/2019	19/11/2019	19/11/2019			
			Sampled Time	.	.	.			
			Date Received	23/11/2019	23/11/2019	23/11/2019			
			SDG Ref	191123-48	191123-48	191123-48			
			Lab Sample No.(s)	21210316	21210319	21210320			
			AGS Reference						
2-Methylnaphthalene	<100 µg/kg	TM157		<100	<100	<100			
Bis(2-chloroisopropyl) ether	<100 µg/kg	TM157		<100	<100	<100			

Validated

CERTIFICATE OF ANALYSIS

SDG:	191123-48	**Client Reference:**	60608750	**Report Number:**	532253
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW103	MW109	MW109			
			Depth (m)	1.50 - 1.70	2.30 - 2.50	2.90 - 3.10			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	19/11/2019	19/11/2019	19/11/2019			
			Sampled Time	.	.	.			
			Date Received	23/11/2019	23/11/2019	23/11/2019			
			SDG Ref	191123-48	191123-48	191123-48			
			Lab Sample No.(s)	21210316	21210319	21210320			
			AGS Reference						
Toluene-d8**	%	TM116		95	78.9	95.2			
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116		17.9 M	<10 M	<10 M			
Benzene	<9 µg/kg	TM116		22.9 M	<9 M	<9 M			
Toluene	<7 µg/kg	TM116		<7 M	<7 M	<7 M			
Ethylbenzene	<4 µg/kg	TM116		25.9 M	<4 M	<4 M			
p/m-Xylene	<10 µg/kg	TM116		78.1 #	<10 #	<10 #			
o-Xylene	<10 µg/kg	TM116		15.7 M	<10 M	<10 M			
Tert-amyl methyl ether	<10 µg/kg	TM116		<10 #	<10 #	<10 #			

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM157	HP 6890 Gas Chromatograph (GC) system and HP 5973 Mass Selective Detector (MSD).	Determination of SVOC in Soils by GC-MS extracted by sonication in DCM/Acetone
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM288		Determination of Oxygenates in Soils by Headspace/GC-MS
TM336		
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS

SDG:	191123-48	**Client Reference:**	60608750	**Report Number:**	532253
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	21210316	21210319	21210320
Customer Sample Ref.	MW103	MW109	MW109
AGS Ref.			
Depth	1.50 - 1.70	2.30 - 2.50	2.90 - 3.10
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
EPH CWG GC (S)	27-Nov-2019	27-Nov-2019	27-Nov-2019
GRO by GC-FID (S)	27-Nov-2019	27-Nov-2019	27-Nov-2019
Hexavalent Chromium (s)	28-Nov-2019	28-Nov-2019	28-Nov-2019
Metals in solid samples by OES	29-Nov-2019	29-Nov-2019	28-Nov-2019
n-Hexane in Solids	25-Nov-2019	25-Nov-2019	25-Nov-2019
Oxygenates (S)	26-Nov-2019	26-Nov-2019	26-Nov-2019
PAH by GCMS	27-Nov-2019	03-Dec-2019	27-Nov-2019
PCBs by GCMS		02-Dec-2019	
Sample description	24-Nov-2019	24-Nov-2019	24-Nov-2019
Semi Volatile Organic Compounds	27-Nov-2019	27-Nov-2019	27-Nov-2019
Total Organic Carbon	29-Nov-2019	29-Nov-2019	
VOC MS (S)	27-Nov-2019	27-Nov-2019	27-Nov-2019

ASSOCIATED AQC DATA

EPH CWG GC (S)

Component	Method Code	QC 2185
EPH >C8-C40 Raw	TM414	**100.12** 77.66 : 104.66
Total Aliphatics Raw	TM414	**108.96** 84.39 : 115.61
Total Aromatics Raw	TM414	**117.91** 81.11 : 118.89

GRO by GC-FID (S)

Component	Method Code	QC 2109
QC	TM089	**95.17** 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2145
Hexavalent Chromium	TM151	**100.0** 90.20 : 107.00

Metals in solid samples by OES

Component	Method Code	QC 2172	QC 2137
Aluminium	TM181	**97.35** 77.84 : 119.01	**89.38** 77.84 : 119.01
Antimony	TM181	**97.56** 84.28 : 107.67	**98.37** 84.28 : 107.67
Arsenic	TM181	**102.91** 87.05 : 109.36	**98.84** 87.05 : 109.36
Barium	TM181	**96.33** 82.49 : 109.34	**90.73** 82.49 : 109.34
Beryllium	TM181	**103.73** 85.44 : 109.61	**96.64** 85.44 : 109.61
Boron	TM181	**89.11** 73.51 : 104.66	**79.08** 73.51 : 104.66
Cadmium	TM181	**93.0** 81.46 : 106.43	**86.01** 81.46 : 106.43
Chromium	TM181	**94.73** 82.26 : 104.55	**94.73** 82.26 : 104.55
Cobalt	TM181	**93.71** 86.54 : 106.87	**88.68** 86.54 : 106.87
Copper	TM181	**95.77** 82.40 : 105.45	**91.9** 82.40 : 105.45
Iron	TM181	**98.41** 82.95 : 110.58	**92.86** 82.95 : 110.58
Lead	TM181	**93.02** 78.24 : 104.05	**88.96** 78.24 : 104.05

CERTIFICATE OF ANALYSIS

SDG:	191123-48	**Client Reference:**	60608750	**Report Number:**	532253
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

Metals in solid samples by OES

		QC 2172	QC 2137
Manganese	TM181	**109.44** 94.29 : 119.51	**105.0** 94.29 : 119.51
Mercury	TM181	**99.76** 83.74 : 105.34	**95.41** 83.74 : 105.34
Molybdenum	TM181	**96.71** 87.11 : 106.87	**94.65** 87.11 : 106.87
Nickel	TM181	**95.35** 81.92 : 102.18	**89.0** 81.92 : 102.18
Phosphorus	TM181	**112.12** 94.56 : 124.28	**105.05** 94.56 : 124.28
Selenium	TM181	**100.0** 86.28 : 110.48	**98.82** 86.28 : 110.48
Strontium	TM181	**92.65** 79.13 : 102.79	**85.97** 79.13 : 102.79
Thallium	TM181	**64.6** 82.94 : 111.86	**94.25** 82.94 : 111.86
Tin	TM181	**104.18** 90.25 : 108.86	**96.96** 90.25 : 108.86
Titanium	TM181	**77.1** 66.23 : 102.06	**65.8** 66.23 : 102.06
Vanadium	TM181	**96.34** 86.37 : 107.94	**90.48** 86.37 : 107.94
Zinc	TM181	**100.62** 84.68 : 113.99	**95.48** 84.68 : 113.99

n-Hexane in Solids

Component	Method Code	QC 2128
n_Hexane Raw	TM336	**89.4** 57.88 : 118.80

Oxygenates (S)

Component	Method Code	QC 2102
Diisopropyl ether raw	TM288	**101.75** 81.18 : 116.31
Ethanol raw	TM288	**97.5** 66.44 : 128.38
tert Butanol raw	TM288	**104.5** 84.60 : 113.24
tert-amyl methyl ether raw	TM288	**103.25** 84.97 : 116.53
tert-butyl ethyl ether raw	TM288	**104.5** 84.60 : 113.55
tert-butyl methyl ether raw	TM288	**102.5** 84.11 : 114.26

PAH by GCMS

CERTIFICATE OF ANALYSIS

SDG:	191123-48	**Client Reference:**	60608750	**Report Number:**	532253
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

PAH by GCMS

Component	Method Code	QC 2121	QC 2173
Acenaphthene	TM218	**92.0** 70.00 : 130.00	**99.0** 76.79 : 103.90
Acenaphthylene	TM218	**92.5** 70.00 : 130.00	**98.0** 78.40 : 108.66
Anthracene	TM218	**97.0** 70.00 : 130.00	**96.0** 76.15 : 110.07
Benz(a)anthracene	TM218	**91.0** 68.12 : 118.39	**96.0** 73.77 : 119.26
Benzo(a)pyrene	TM218	**77.5** 71.72 : 115.31	**92.5** 73.20 : 114.18
Benzo(b)fluoranthene	TM218	**74.5** 66.89 : 120.40	**88.5** 75.36 : 117.58
Benzo(ghi)perylene	TM218	**72.5** 67.82 : 118.49	**96.0** 70.73 : 116.12
Benzo(k)fluoranthene	TM218	**83.0** 73.10 : 117.03	**98.0** 75.98 : 116.59
Chrysene	TM218	**84.0** 69.58 : 115.47	**94.0** 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	**72.0** 67.32 : 121.35	**88.5** 69.17 : 115.30
Fluoranthene	TM218	**94.5** 75.16 : 117.28	**90.5** 75.88 : 112.84
Fluorene	TM218	**93.0** 70.00 : 130.00	**97.5** 78.50 : 114.02
Indeno(123cd)pyrene	TM218	**77.0** 68.91 : 117.62	**84.0** 70.26 : 117.95
Naphthalene	TM218	**82.5** 70.00 : 130.00	**98.5** 75.24 : 111.26
Phenanthrene	TM218	**93.0** 70.00 : 130.00	**93.0** 77.07 : 107.43
Pyrene	TM218	**92.5** 75.68 : 119.23	**91.5** 78.74 : 112.56

PCBs by GCMS

Component	Method Code	QC 2113
PCB congener 101	TM168	**81.4** 79.46 : 109.70
PCB congener 105	TM168	**69.2** 66.33 : 105.75
PCB congener 114	TM168	**67.6** 66.41 : 106.49
PCB congener 118	TM168	**74.4** 70.33 : 110.29
PCB congener 123	TM168	**70.8** 65.01 : 99.81
PCB congener 126	TM168	**65.9** 59.31 : 109.23
PCB congener 138	TM168	**68.6** 63.95 : 107.63
PCB congener 153	TM168	**68.3** 62.65 : 108.85
PCB congener 156	TM168	**66.9** 61.69 : 112.27

PCBs by GCMS

		QC 2113
PCB congener 157	TM168	**67.5** 67.15 : 109.93
PCB congener 167	TM168	**67.0** 65.58 : 109.14
PCB congener 169	TM168	**65.1** 56.84 : 112.10
PCB congener 180	TM168	**68.0** 66.99 : 111.63
PCB congener 189	TM168	**67.2** 57.75 : 112.59
PCB congener 28	TM168	**82.7** 73.68 : 105.96
PCB congener 52	TM168	**75.7** 67.24 : 107.62
PCB congener 77	TM168	**69.8** 64.87 : 108.49
PCB congener 81	TM168	**76.5** 70.78 : 110.80

Semi Volatile Organic Compounds

Component	Method Code	QC 2195
4-Bromophenylphenylether (Soil)	TM157	**98.5** 66.75 : 125.25
Benzo(a)anthracene (Soil)	TM157	**101.0** 67.40 : 120.50
Hexachlorobutadiene (Soil)	TM157	**104.5** 68.25 : 126.75
Naphthalene (Soil)	TM157	**101.0** 67.55 : 125.45
Nitrobenzene (Soil)	TM157	**96.5** 66.50 : 123.50
Phenol (Soil)	TM157	**102.0** 69.92 : 114.02

Total Organic Carbon

Component	Method Code	QC 2121
Total Organic Carbon	TM132	**97.27** 84.82 : 117.61

VOC MS (S)

Component	Method Code	QC 2127
1,1,1,2-tetrachloroethane	TM116	**99.6** 77.47 : 121.29
1,1,1-Trichloroethane	TM116	**107.4** 86.26 : 117.53
1,1,2-Trichloroethane	TM116	**100.6** 75.16 : 112.70
1,1-Dichloroethane	TM116	**105.2** 83.27 : 122.16

CERTIFICATE OF ANALYSIS

SDG:	191123-48	**Client Reference:**	60608750	**Report Number:**	532253
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

VOC MS (S)

		QC 2127
1,2-Dichloroethane	TM116	**115.0** 86.58 : 129.62
1,4-Dichlorobenzene	TM116	**96.8** 82.59 : 123.23
2-Chlorotoluene	TM116	**92.0** 66.81 : 118.43
4-Chlorotoluene	TM116	**92.6** 65.88 : 114.76
Benzene	TM116	**103.6** 93.16 : 123.63
Carbon Disulphide	TM116	**95.8** 75.11 : 124.81
Carbontetrachloride	TM116	**112.4** 82.35 : 126.46
Chlorobenzene	TM116	**99.8** 82.88 : 122.42
Chloroform	TM116	**108.6** 88.13 : 122.71
Chloromethane	TM116	**91.6** 55.37 : 133.35
Cis-1,2-Dichloroethene	TM116	**104.8** 78.27 : 128.90
Dibromomethane	TM116	**104.0** 77.47 : 121.29
Dichloromethane	TM116	**106.4** 81.68 : 125.21
Ethylbenzene	TM116	**93.2** 83.56 : 122.99
Hexachlorobutadiene	TM116	**87.4** 7.32 : 139.00
Isopropylbenzene	TM116	**89.0** 69.92 : 116.39
Naphthalene	TM116	**94.2** 79.29 : 125.59
o-Xylene	TM116	**92.8** 74.57 : 112.73
p/m-Xylene	TM116	**92.3** 77.41 : 112.71
Sec-Butylbenzene	TM116	**85.8** 44.71 : 117.87
Tetrachloroethene	TM116	**104.2** 81.43 : 126.65
Toluene	TM116	**96.4** 87.82 : 116.21
Trichloroethene	TM116	**101.2** 79.80 : 112.33
Trichlorofluoromethane	TM116	**116.6** 80.52 : 132.12
Vinyl Chloride	TM116	**104.6** 58.08 : 128.58

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.
The figure detailed is the percentage recovery result for the AQC.
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.

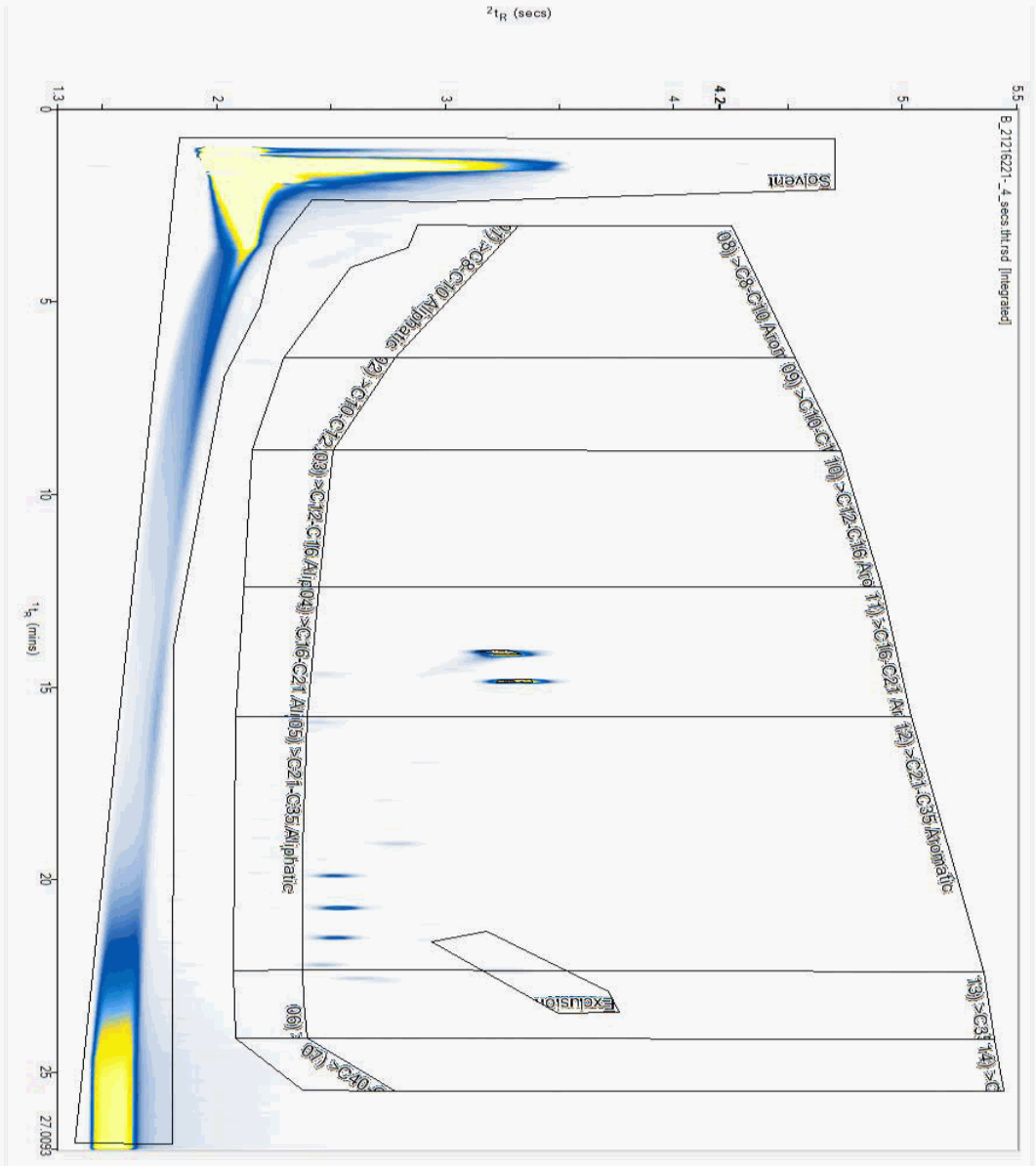
CERTIFICATE OF ANALYSIS

SDG:	191123-48	**Client Reference:**	60608750	**Report Number:**	532253
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 21216221 **Sample ID :** MW103 **Depth :** 1.50 - 1.70

```
   ChromSpace LIMS export
  Current batch
Sample Identity:  B_21216221-_4_secs.tht
Date Acquired   :  27/11/19 03:51:47
Units           :  ppm
Dilution        :  0
CF              :
Multiplier      :
```

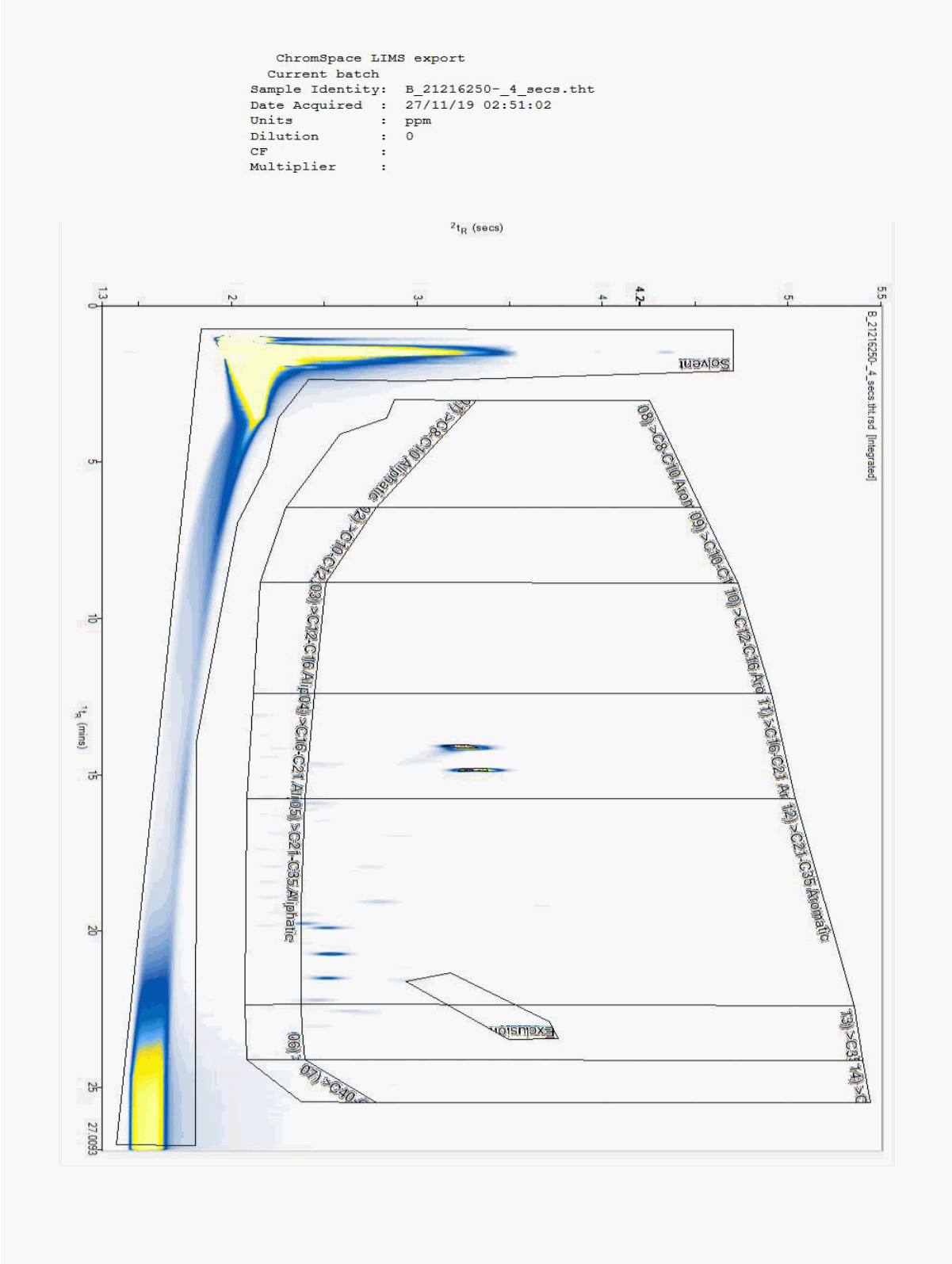


CERTIFICATE OF ANALYSIS

SDG:	191123-48	**Client Reference:**	60608750	**Report Number:**	532253
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 21216250 **Sample ID :** MW109 **Depth :** 2.30 - 2.50

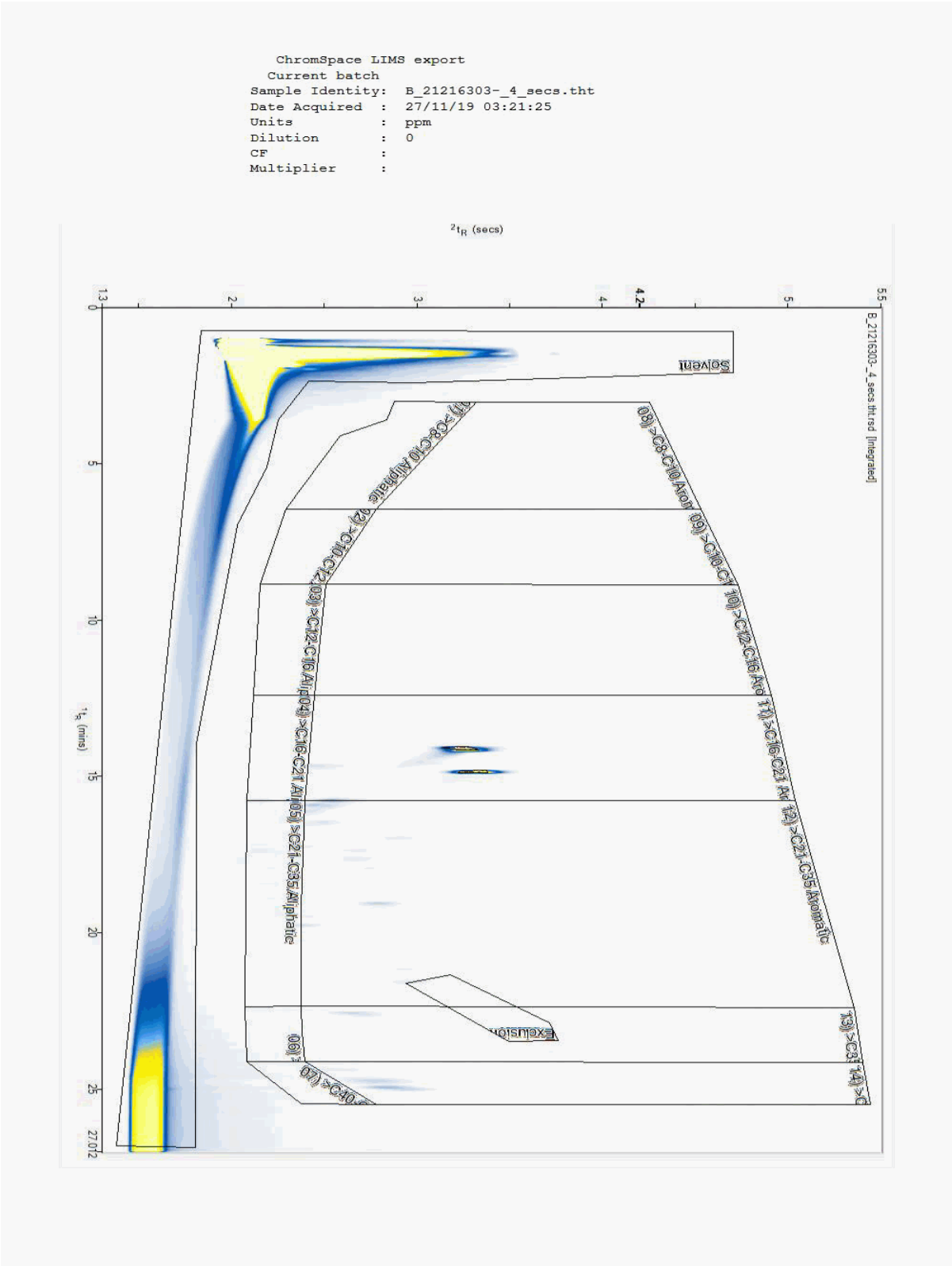


CERTIFICATE OF ANALYSIS

SDG:	191123-48	**Client Reference:**	60608750	**Report Number:**	532253
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 21216303 **Sample ID :** MW109 **Depth :** 2.90 - 3.10



CERTIFICATE OF ANALYSIS

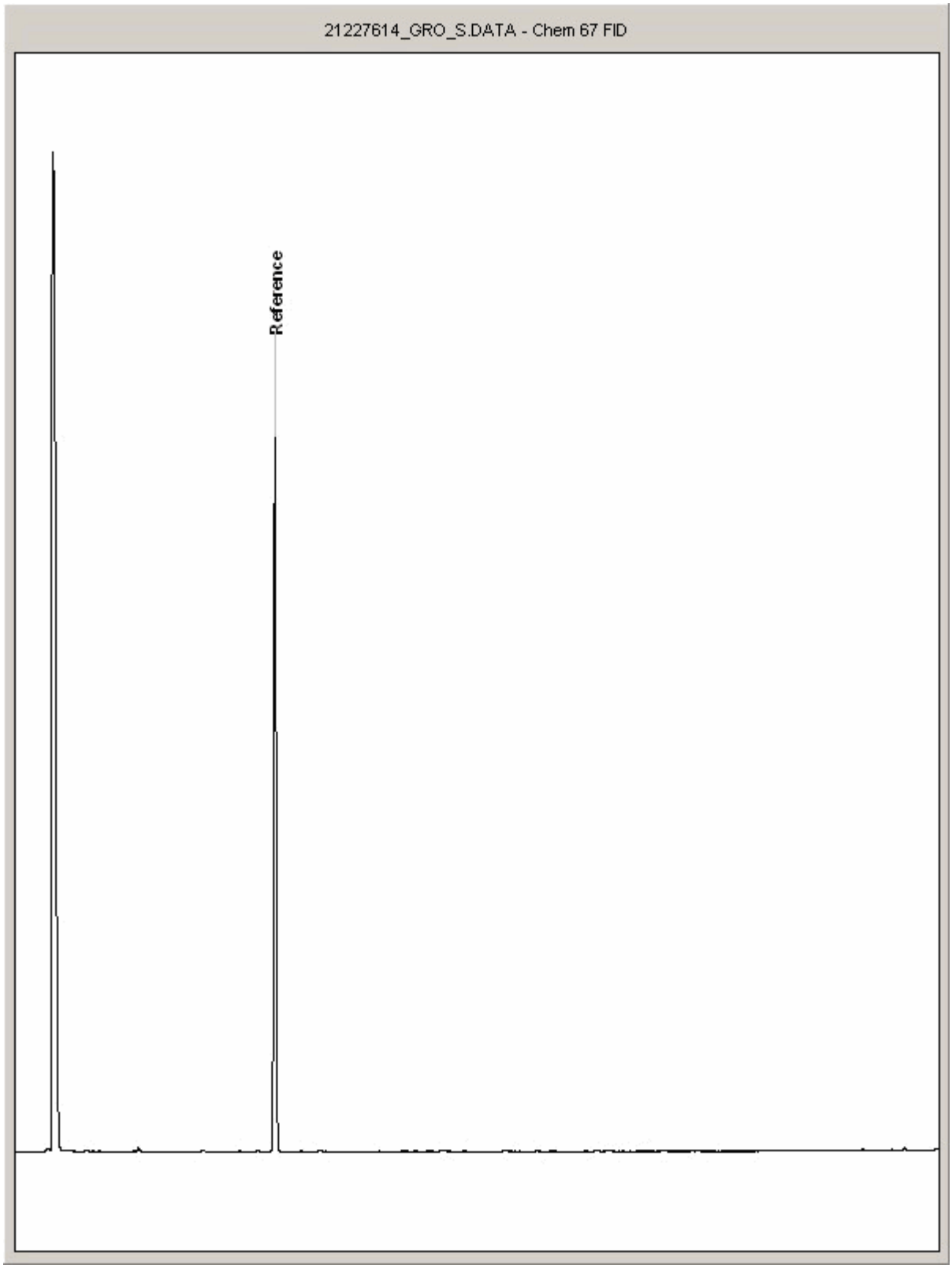
SDG:	191123-48	**Client Reference:**	60608750	**Report Number:**	532253
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21227614
Sample ID : MW109

Depth : 2.90 - 3.10



CERTIFICATE OF ANALYSIS

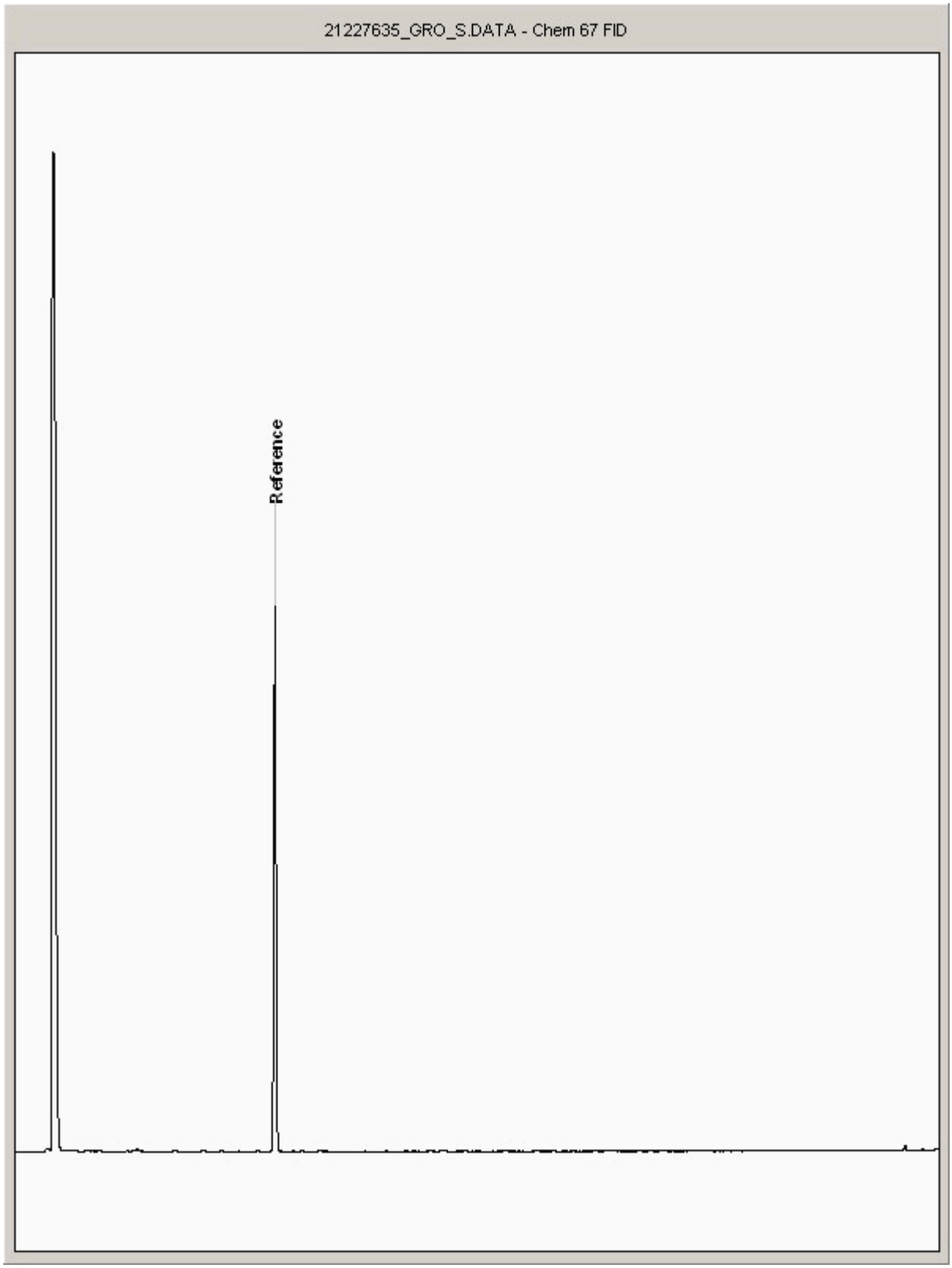
SDG:	191123-48	**Client Reference:**	60608750	**Report Number:**	532253
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21227635
Sample ID : MW109

Depth : 2.30 - 2.50



CERTIFICATE OF ANALYSIS

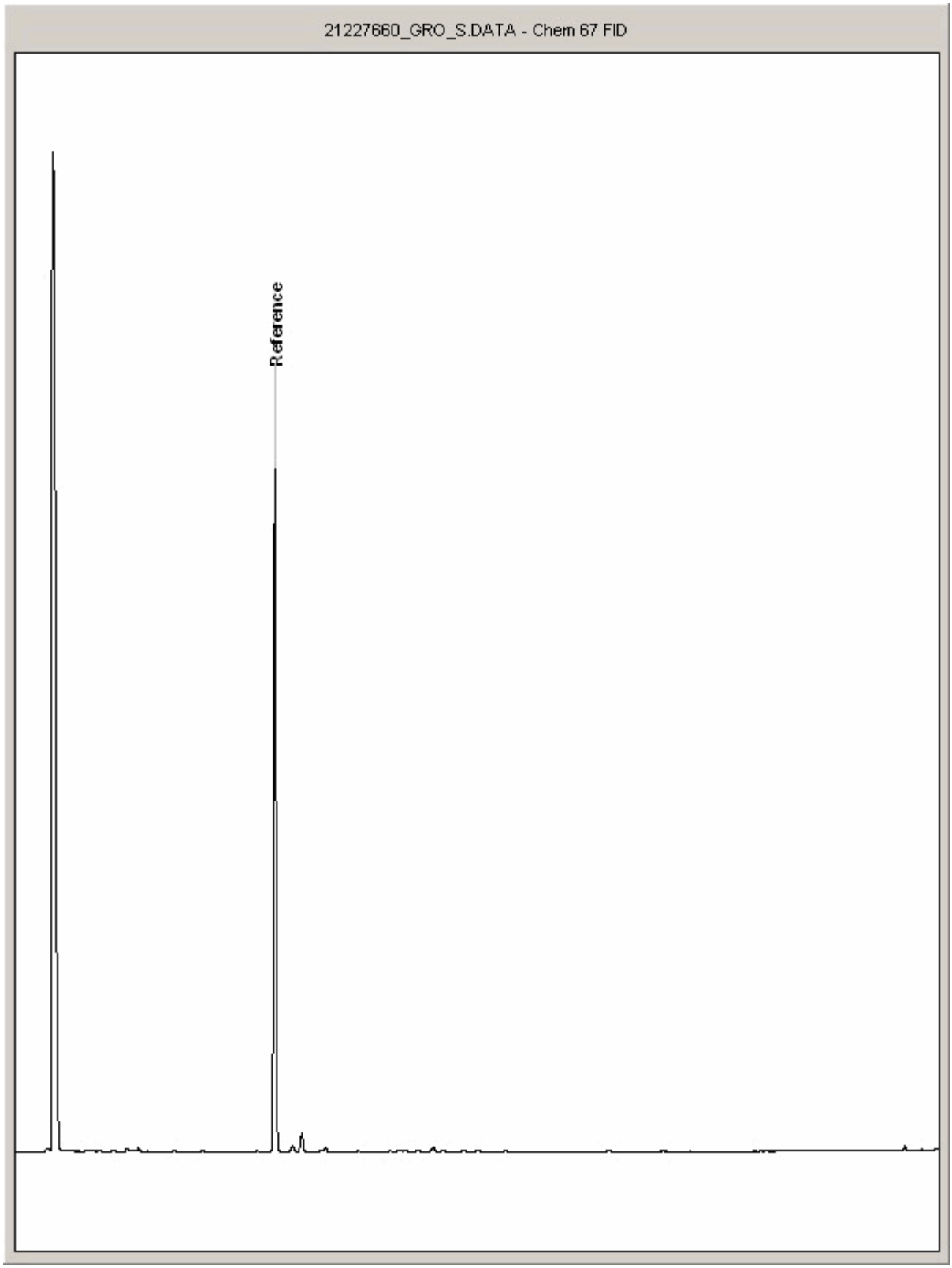
SDG:	191123-48	**Client Reference:**	60608750	**Report Number:**	532253
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21227660
Sample ID : MW103

Depth : 1.50 - 1.70



Appendix General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. **Sample Deviations**

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**

19. **Asbestos**

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.
Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2107).*

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

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Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

AECOM
36 Storey's Way
Cambridge
CB3 0DT

Attention: Laura McMurtry

CERTIFICATE OF ANALYSIS

Date of report Generation:	06 December 2019
Customer:	AECOM
Sample Delivery Group (SDG):	191127-76
Your Reference:	
Location:	Shell Whitemare Pool
Report No:	532862

We received 3 samples on Wednesday November 27, 2019 and 3 of these samples were scheduled for analysis which was completed on Friday December 06, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

[redacted]

Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	191127-76	**Client Reference:**		**Report Number:**	532862
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21235901	MW101		2.20 - 2.40	22/11/2019
21235904	MW106		1.30 - 1.50	26/11/2019
21235905	MW106		2.00 - 2.20	26/11/2019

Maximum Sample/Coolbox Temperature (°C) : **7.4**

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG:	191127-76	**Client Reference:**		**Report Number:**	532862
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	

Results Legend

X **Test**

N **No Determination Possible**

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			21235901		21235904		21235905	
Customer Sample Reference			MW101		MW106		MW106	
AGS Reference								
Depth (m)			2.20 - 2.40		1.30 - 1.50		2.00 - 2.20	
Container			250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)
Sample Type			S	S	S	S	S	S
EPH CWG GC (S)	All	NDPs: 0 Tests: 3	X		X		X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 3		X		X		X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 3	X		X		X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 3	X		X		X	
n-Hexane in Solids	All	NDPs: 0 Tests: 3		X		X		X
Oxygenates (S)	All	NDPs: 0 Tests: 3		X		X		X
PAH by GCMS	All	NDPs: 0 Tests: 3	X		X		X	
Sample description	All	NDPs: 0 Tests: 3	X		X		X	
Semi Volatile Organic Compounds	All	NDPs: 0 Tests: 3	X		X		X	
Total Organic Carbon	All	NDPs: 0 Tests: 2	X				X	
VOC MS (S)	All	NDPs: 0 Tests: 3		X		X		X

CERTIFICATE OF ANALYSIS

SDG:	191127-76	**Client Reference:**		**Report Number:**	532862
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
21235901	MW101	2.20 - 2.40	Light Brown	Loamy Sand	Stones	Vegetation
21235904	MW106	1.30 - 1.50	Light Brown	Sandy Silt Loam	N/A	N/A
21235905	MW106	2.00 - 2.20	Dark Brown	Loamy Sand	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Validated

CERTIFICATE OF ANALYSIS

SDG:	191127-76	**Client Reference:**		**Report Number:**	532862
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW101	MW106	MW106			
			Depth (m)	2.20 - 2.40	1.30 - 1.50	2.00 - 2.20			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	22/11/2019	26/11/2019	26/11/2019			
			Sample Time	.	.	.			
			Date Received	27/11/2019	27/11/2019	27/11/2019			
			SDG Ref	191127-76	191127-76	191127-76			
			Lab Sample No.(s)	21235901	21235904	21235905			
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		15	17	14			
Fraction Organic Carbon Low	<0.0002	TM132		0.0117 #		0.00825 #			
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6 #	<0.6 #	<0.6 #			
Arsenic	<0.6 mg/kg	TM181		6.73 M	6.73 M	6.41 M			
Boron	<0.7 mg/kg	TM181		6.1 #	5.03 #	6.36 #			
Cadmium	<0.02 mg/kg	TM181		<0.02 M	<0.02 M	0.052 M			
Chromium	<0.9 mg/kg	TM181		20.6 M	26.1 M	23.8 M			
Cobalt	<0.1 mg/kg	TM181		13.3 M	47.5 M	15.4 M			
Copper	<1.4 mg/kg	TM181		20 M	20.3 M	19.8 M			
Lead	<0.7 mg/kg	TM181		19.2 M	25 M	16.7 M			
Mercury	<0.14 mg/kg	TM181		<0.14 M	<0.14 M	<0.14 M			
Molybdenum	<0.1 mg/kg	TM181		0.177 #	0.129 #	0.168 #			
Nickel	<0.2 mg/kg	TM181		36 M	36 M	41 M			
Selenium	<1 mg/kg	TM181		<1 #	<1 #	<1 #			
Tin	<0.24 mg/kg	TM181		0.562 #	0.644 #	0.617 #			
Zinc	<1.9 mg/kg	TM181		59.1 M	71.7 M	58.6 M			
Bromofluorobenzene**	%	TM288		83.8	110	81.5			
Ethanol	<50 µg/kg	TM288		<50	<50	<50			
tert Butanol	<10 µg/kg	TM288		<10	<10	<10			
Diisopropyl ether	<1 µg/kg	TM288		<1	<1	<1			
tert-butyl ethyl ether	<1 µg/kg	TM288		<1	<1	<1			
n-Hexane	<10 µg/kg	TM336		<10	<10	<10			

Validated

CERTIFICATE OF ANALYSIS

SDG:	191127-76	**Client Reference:**		**Report Number:**	532862
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	

EPH CWG GC (S)

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW101	MW106	MW106			
			Depth (m)	2.20 - 2.40	1.30 - 1.50	2.00 - 2.20			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	22/11/2019	26/11/2019	26/11/2019			
			Sample Time	.	.	.			
			Date Received	27/11/2019	27/11/2019	27/11/2019			
			SDG Ref	191127-76	191127-76	191127-76			
			Lab Sample No.(s)	21235901	21235904	21235905			
			AGS Reference						
Aliphatics >C10-C12	<1000 µg/kg	TM414		<1000	<1000	<1000			
Aliphatics >C12-C16	<1000 µg/kg	TM414		<1000	<1000	<1000			
Aliphatics >C16-C21	<1000 µg/kg	TM414		<1000	<1000	<1000			
Aliphatics >C21-C35	<1000 µg/kg	TM414		<1000	<1000	<1000			
Aliphatics >C35-C44	<1000 µg/kg	TM414		<1000	<1000	<1000			
Total Aliphatics >C10-C44	<5000 µg/kg	TM414		<5000	<5000	<5000			
Total Aliphatics & Aromatics >C10-C44	<10000 µg/kg	TM414		<10000	<10000	<10000			
Aromatics > EC10-EC12	<1000 µg/kg	TM414		<1000	<1000	<1000			
Aromatics > EC12-EC16	<1000 µg/kg	TM414		<1000	<1000	<1000			
Aromatics > EC16-EC21	<1000 µg/kg	TM414		<1000	<1000	<1000			
Aromatics > EC21-EC35	<1000 µg/kg	TM414		<1000	<1000	1050			
Aromatics >EC35-EC44	<1000 µg/kg	TM414		<1000	<1000	<1000			
Total Aromatics > EC10-EC44	<5000 µg/kg	TM414		<5000	<5000	<5000			

Validated

CERTIFICATE OF ANALYSIS

SDG:	191127-76	**Client Reference:**		**Report Number:**	532862
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	

GRO by GC-FID (S)

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW101	MW106	MW106			
			Depth (m)	2.20 - 2.40	1.30 - 1.50	2.00 - 2.20			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	22/11/2019	26/11/2019	26/11/2019			
			Sample Time	.	.	.			
			Date Received	27/11/2019	27/11/2019	27/11/2019			
			SDG Ref	191127-76	191127-76	191127-76			
			Lab Sample No.(s)	21235901	21235904	21235905			
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		95	113	98			
Aliphatics >C5-C6	<10 µg/kg	TM089		<10	<10	<10			
Aliphatics >C6-C8	<10 µg/kg	TM089		<10	<10	<10			
Aliphatics >C8-C10	<10 µg/kg	TM089		<10	<10	<10			
Aromatics >EC5-EC7	<10 µg/kg	TM089		<10	<10	<10			
Aromatics >EC7-EC8	<10 µg/kg	TM089		<10	<10	<10			
Aromatics >EC8-EC10	<10 µg/kg	TM089		<10	<10	<10			

Validated

CERTIFICATE OF ANALYSIS

SDG:	191127-76	**Client Reference:**		**Report Number:**	532862
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW101	MW106	MW106			
			Depth (m)	2.20 - 2.40	1.30 - 1.50	2.00 - 2.20			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	22/11/2019	26/11/2019	26/11/2019			
			Sample Time	.	.	.			
			Date Received	27/11/2019	27/11/2019	27/11/2019			
			SDG Ref	191127-76	191127-76	191127-76			
			Lab Sample No.(s)	21235901	21235904	21235905			
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		90.8	91.9	86.7			
Acenaphthene-d10 % recovery**	%	TM218		84.9	90.2	82.7			
Phenanthrene-d10 % recovery**	%	TM218		84.2	85.8	78.8			
Chrysene-d12 % recovery**	%	TM218		79.5	82.5	71.8			
Perylene-d12 % recovery**	%	TM218		76.6	81.9	70.1			
Naphthalene	<9 µg/kg	TM218		<9 M	<9 M	<9 M			
Acenaphthylene	<12 µg/kg	TM218		<12 M	<12 M	<12 M			
Acenaphthene	<8 µg/kg	TM218		<8 M	<8 M	<8 M			
Fluorene	<10 µg/kg	TM218		<10 M	<10 M	<10 M			
Phenanthrene	<15 µg/kg	TM218		<15 M	<15 M	<15 M			
Anthracene	<16 µg/kg	TM218		<16 M	<16 M	<16 M			
Fluoranthene	<17 µg/kg	TM218		<17 M	<17 M	<17 M			
Pyrene	<15 µg/kg	TM218		<15 M	<15 M	<15 M			
Benz(a)anthracene	<14 µg/kg	TM218		<14 M	<14 M	<14 M			
Chrysene	<10 µg/kg	TM218		13.9 M	<10 M	<10 M			
Benzo(b)fluoranthene	<15 µg/kg	TM218		26.4 M	<15 M	<15 M			
Benzo(k)fluoranthene	<14 µg/kg	TM218		<14 M	<14 M	<14 M			
Benzo(a)pyrene	<15 µg/kg	TM218		<15 M	<15 M	<15 M			
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218		<18 M	<18 M	<18 M			
Dibenzo(a,h)anthracene	<23 µg/kg	TM218		<23 M	<23 M	<23 M			
Benzo(g,h,i)perylene	<24 µg/kg	TM218		<24 M	<24 M	<24 M			
PAH, Total Detected USEPA 16	<118 µg/kg	TM218		<118	<118	<118			

Validated

CERTIFICATE OF ANALYSIS

SDG:	191127-76	**Client Reference:**		**Report Number:**	532862
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW101	MW106	MW106			
			Depth (m)	2.20 - 2.40	1.30 - 1.50	2.00 - 2.20			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	22/11/2019	26/11/2019	26/11/2019			
			Sample Time	.	.	.			
			Date Received	27/11/2019	27/11/2019	27/11/2019			
			SDG Ref	191127-76	191127-76	191127-76			
			Lab Sample No.(s)	21235901	21235904	21235905			
			AGS Reference						
2-Methylnaphthalene	<100 µg/kg	TM157		<100	<100	<100			
Bis(2-chloroisopropyl) ether	<100 µg/kg	TM157		<100	<100	<100			

CERTIFICATE OF ANALYSIS

SDG:	191127-76	**Client Reference:**		**Report Number:**	532862
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW101	MW106	MW106			
			Depth (m)	2.20 - 2.40	1.30 - 1.50	2.00 - 2.20			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	22/11/2019	26/11/2019	26/11/2019			
			Sample Time	.	.	.			
			Date Received	27/11/2019	27/11/2019	27/11/2019			
			SDG Ref	191127-76	191127-76	191127-76			
			Lab Sample No.(s)	21235901	21235904	21235905			
			AGS Reference						
Toluene-d8**	%	TM116		90.7	93.1	90.7			
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116		<10 M	<10 M	<10 M			
Benzene	<9 µg/kg	TM116		<9 M	<9 M	<9 M			
Toluene	<7 µg/kg	TM116		<7 M	<7 M	<7 M			
Ethylbenzene	<4 µg/kg	TM116		<4 M	<4 M	<4 M			
p/m-Xylene	<10 µg/kg	TM116		<10 #	<10 #	<10 #			
o-Xylene	<10 µg/kg	TM116		<10 M	<10 M	<10 M			
Tert-amyl methyl ether	<10 µg/kg	TM116		<10 #	<10 #	<10 #			

CERTIFICATE OF ANALYSIS

SDG:	191127-76	**Client Reference:**		**Report Number:**	532862
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM157	HP 6890 Gas Chromatograph (GC) system and HP 5973 Mass Selective Detector (MSD).	Determination of SVOC in Soils by GC-MS extracted by sonication in DCM/Acetone
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM288		Determination of Oxygenates in Soils by Headspace/GC-MS
TM336		
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS

SDG:	191127-76	**Client Reference:**		**Report Number:**	532862
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	21235901	21235904	21235905
Customer Sample Ref.	MW101	MW106	MW106
AGS Ref.			
Depth	2.20 - 2.40	1.30 - 1.50	2.00 - 2.20
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
EPH CWG GC (S)	02-Dec-2019	02-Dec-2019	02-Dec-2019
GRO by GC-FID (S)	03-Dec-2019	03-Dec-2019	03-Dec-2019
Hexavalent Chromium (s)	04-Dec-2019	04-Dec-2019	04-Dec-2019
Metals in solid samples by OES	05-Dec-2019	05-Dec-2019	05-Dec-2019
n-Hexane in Solids	04-Dec-2019	04-Dec-2019	04-Dec-2019
Oxygenates (S)	05-Dec-2019	05-Dec-2019	05-Dec-2019
PAH by GCMS	06-Dec-2019	06-Dec-2019	06-Dec-2019
Sample description	29-Nov-2019	29-Nov-2019	29-Nov-2019
Semi Volatile Organic Compounds	04-Dec-2019	04-Dec-2019	04-Dec-2019
Total Organic Carbon	05-Dec-2019		05-Dec-2019
VOC MS (S)	03-Dec-2019	03-Dec-2019	03-Dec-2019

Appendix General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. **Sample Deviations**

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**

19. **Asbestos**

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.
Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2107).*

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

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1 New York Street
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M1 4HD

Attention: Sophie Doyle

CERTIFICATE OF ANALYSIS

Date of report Generation:	11 December 2019
Customer:	Aecom
Sample Delivery Group (SDG):	191202-26
Your Reference:	
Location:	Shell Whitemare Pool
Report No:	533642

This report has been revised and directly supersedes 533512 in its entirety.

We received 4 samples on Monday December 02, 2019 and 4 of these samples were scheduled for analysis which was completed on Wednesday December 11, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

[redacted]

Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	191202-26	**Client Reference:**		**Report Number:**	533642
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	533512

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21273189	MW102		2.30 - 2.50	28/11/2019
21273187	MW105		1.50 - 1.70	27/11/2019
21273188	MW105		2.70 - 2.90	27/11/2019
21273190	SKIP			29/11/2019

Maximum Sample/Coolbox Temperature (°C) : **2.8**

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

Validated

CERTIFICATE OF ANALYSIS

SDG:	191202-26	**Client Reference:**		**Report Number:**	533642
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	533512

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			21273189		21273187		21273188			21273190
Customer Sample Reference			MW102		MW105		MW105			SKIP
AGS Reference										
Depth (m)			2.30 - 2.50		1.50 - 1.70		2.70 - 2.90			
Container			250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)
Sample Type			S	S	S	S	S	S	S	S	S
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 1								X	
Anions by Kone (w)	All	NDPs: 0 Tests: 1							X		
CEN Readings	All	NDPs: 0 Tests: 1							X		
Coronene	All	NDPs: 0 Tests: 1								X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1							X		
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1							X		
EPH CWG GC (S)	All	NDPs: 0 Tests: 4	X		X		X			X	
Fluoride	All	NDPs: 0 Tests: 1							X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 4		X		X		X			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 4	X		X		X			X	
Loss on Ignition in soils	All	NDPs: 0 Tests: 1								X	
Mercury Dissolved	All	NDPs: 0 Tests: 1							X		
Metals in solid samples by OES	All	NDPs: 0 Tests: 4	X		X		X			X	
Mineral Oil	All	NDPs: 0 Tests: 1								X	
n-Hexane in Solids	All	NDPs: 0 Tests: 3		X		X		X			

Validated

CERTIFICATE OF ANALYSIS

SDG:	191202-26	**Client Reference:**		**Report Number:**	533642
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	533512

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			21273189		21273187		21273188			21273190
Customer Sample Reference			MW102		MW105		MW105			SKIP
AGS Reference										
Depth (m)			2.30 - 2.50		1.50 - 1.70		2.70 - 2.90			
Container			250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)
Sample Type			S	S	S	S	S	S	S	S	S
Oxygenates (S)	All	NDPs: 0 Tests: 4		X		X		X			X
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 1								X	
PAH by GCMS	All	NDPs: 0 Tests: 4	X		X		X			X	
PCBs by GCMS	All	NDPs: 0 Tests: 1								X	
pH	All	NDPs: 0 Tests: 1								X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1							X		
Sample description	All	NDPs: 0 Tests: 4	X		X		X			X	
Semi Volatile Organic Compounds	All	NDPs: 0 Tests: 3	X		X		X				
Total Dissolved Solids	All	NDPs: 0 Tests: 1							X		
Total Organic Carbon	All	NDPs: 0 Tests: 2					X			X	
VOC MS (S)	All	NDPs: 0 Tests: 4		X		X		X			X

CERTIFICATE OF ANALYSIS

SDG:	191202-26	**Client Reference:**		**Report Number:**	533642
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	533512

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
21273189	MW102	2.30 - 2.50	Dark Brown	Clay Loam	Stones	None
21273187	MW105	1.50 - 1.70	Dark Brown	Clay	Stones	None
21273188	MW105	2.70 - 2.90	Light Brown	Clay Loam	Stones	None
21273190	SKIP		Dark Brown	Clay Loam	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Validated

CERTIFICATE OF ANALYSIS

SDG:	191202-26	**Client Reference:**		**Report Number:**	533642
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	533512

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW102	MW105	MW105	SKIP		
			Depth (m)	2.30 - 2.50	1.50 - 1.70	2.70 - 2.90	.		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	28/11/2019	27/11/2019	27/11/2019	29/11/2019		
			Sample Time	.	.	.	.		
			Date Received	02/12/2019	02/12/2019	02/12/2019	02/12/2019		
			SDG Ref	191202-26	191202-26	191202-26	191202-26		
			Lab Sample No.(s)	21273189	21273187	21273188	21273190		
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		15	15	13	17		
Loss on ignition	<0.7 %	TM018					4.88 M		
Mineral Oil Surrogate % recovery**	%	TM061					80.2		
Mineral oil >C10-C40	<1 mg/kg	TM061					<1		
Organic Carbon, Total	<0.2 %	TM132					0.896 M		
Fraction Organic Carbon Low	<0.0002	TM132				0.00296 #			
pH	1 pH Units	TM133					8.59 M		
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6 #	<0.6 #	<0.6 #	<0.6 #		
PCB congener 28	<3 µg/kg	TM168					<3 M		
PCB congener 52	<3 µg/kg	TM168					<3 M		
PCB congener 101	<3 µg/kg	TM168					<3 M		
PCB congener 118	<3 µg/kg	TM168					<3 M		
PCB congener 138	<3 µg/kg	TM168					<3 M		
PCB congener 153	<3 µg/kg	TM168					<3 M		
PCB congener 180	<3 µg/kg	TM168					<3 M		
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168					<21		
Arsenic	<0.6 mg/kg	TM181		5.67 M	7 M	3.12 M	5.52 M		
Boron	<0.7 mg/kg	TM181		7.71 #	8.85 #	6.33 #	7.93 #		
Cadmium	<0.02 mg/kg	TM181		0.1 M	0.0446 M	<0.02 M	0.103 M		
Chromium	<0.9 mg/kg	TM181		17.9 M	28.6 M	23.8 M	20.7 M		
Cobalt	<0.1 mg/kg	TM181		13.9 M	16.5 M	21.9 M	16.1 M		
Copper	<1.4 mg/kg	TM181		18.2 M	20.6 M	23.2 M	22.1 M		
Lead	<0.7 mg/kg	TM181		20.2 M	18.8 M	3.59 M	15.9 M		
Mercury	<0.14 mg/kg	TM181		<0.14 M	<0.14 M	<0.14 M	<0.14 M		
Molybdenum	<0.1 mg/kg	TM181		0.15 #	0.177 #	<0.1 #	0.271 #		
Nickel	<0.2 mg/kg	TM181		31.9 M	49.2 M	51.6 M	36.4 M		
Selenium	<1 mg/kg	TM181		<1 #	<1 #	<1 #	<1 #		
Tin	<0.24 mg/kg	TM181		0.837 #	0.61 #	0.547 #	0.655 #		
Zinc	<1.9 mg/kg	TM181		57.5 M	59.2 M	32.3 M	58.4 M		
ANC @ pH 4	<0.03 mol/kg	TM182					0.442		
ANC @ pH 6	<0.03 mol/kg	TM182					0.181		
Bromofluorobenzene**	%	TM288		102	93	104	98.6		
Ethanol	<50 µg/kg	TM288		<50	<50	<50	197		

Validated

CERTIFICATE OF ANALYSIS

SDG:	191202-26	**Client Reference:**		**Report Number:**	533642
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	533512

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW102	MW105	MW105	SKIP		
			Depth (m)	2.30 - 2.50	1.50 - 1.70	2.70 - 2.90	.		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	28/11/2019	27/11/2019	27/11/2019	29/11/2019		
			Sample Time	.	.	.	.		
			Date Received	02/12/2019	02/12/2019	02/12/2019	02/12/2019		
			SDG Ref	191202-26	191202-26	191202-26	191202-26		
			Lab Sample No.(s)	21273189	21273187	21273188	21273190		
			AGS Reference						
tert Butanol	<10 µg/kg	TM288		<10	<10	<10	<10		
Diisopropyl ether	<1 µg/kg	TM288		<1	<1	<1	<1		
tert-butyl ethyl ether	<1 µg/kg	TM288		<1	<1	<1	<1		
n-Hexane	<10 µg/kg	TM336		<10	<10	<10			
PAH Total 17 (inc Coronene) Moisture Corrected	<10 mg/kg	TM410					<10		
Coronene	<200 µg/kg	TM410					<200		

Validated

CERTIFICATE OF ANALYSIS

SDG:	191202-26	**Client Reference:**		**Report Number:**	533642
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	533512

EPH CWG GC (S)

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW102	MW105	MW105	SKIP		
			Depth (m)	2.30 - 2.50	1.50 - 1.70	2.70 - 2.90	.		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	28/11/2019	27/11/2019	27/11/2019	29/11/2019		
			Sample Time	.	.	.	.		
			Date Received	02/12/2019	02/12/2019	02/12/2019	02/12/2019		
			SDG Ref	191202-26	191202-26	191202-26	191202-26		
			Lab Sample No.(s)	21273189	21273187	21273188	21273190		
			AGS Reference						
Aliphatics >C10-C12	<1000 µg/kg	TM414		<1000	<1000	<1000	<1000		
Aliphatics >C12-C16	<1000 µg/kg	TM414		<1000	<1000	<1000	<1000		
Aliphatics >C16-C21	<1000 µg/kg	TM414		<1000	<1000	<1000	<1000		
Aliphatics >C21-C35	<1000 µg/kg	TM414		<1000	<1000	<1000	<1000		
Aliphatics >C35-C44	<1000 µg/kg	TM414		<1000	<1000	<1000	1800		
Total Aliphatics >C10-C44	<5000 µg/kg	TM414		<5000	<5000	<5000	<5000		
Total Aliphatics & Aromatics >C10-C44	<10000 µg/kg	TM414		<10000	<10000	<10000	<10000		
Aromatics > EC10-EC12	<1000 µg/kg	TM414		<1000	<1000	<1000	<1000		
Aromatics > EC12-EC16	<1000 µg/kg	TM414		<1000	<1000	<1000	<1000		
Aromatics > EC16-EC21	<1000 µg/kg	TM414		<1000	<1000	<1000	<1000		
Aromatics > EC21-EC35	<1000 µg/kg	TM414		<1000	<1000	1190	<1000		
Aromatics >EC35-EC44	<1000 µg/kg	TM414		<1000	<1000	<1000	<1000		
Total Aromatics > EC10-EC44	<5000 µg/kg	TM414		<5000	<5000	<5000	<5000		

Validated

CERTIFICATE OF ANALYSIS

SDG:	191202-26	**Client Reference:**		**Report Number:**	533642
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	533512

GRO by GC-FID (S)

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW102	MW105	MW105	SKIP		
			Depth (m)	2.30 - 2.50	1.50 - 1.70	2.70 - 2.90	.		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	28/11/2019	27/11/2019	27/11/2019	29/11/2019		
			Sample Time	.	.	.	.		
			Date Received	02/12/2019	02/12/2019	02/12/2019	02/12/2019		
			SDG Ref	191202-26	191202-26	191202-26	191202-26		
			Lab Sample No.(s)	21273189	21273187	21273188	21273190		
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		90.1	90.7	95.9	94.2		
Aliphatics >C5-C6	<10 µg/kg	TM089		<10	<10	<10	<10		
Aliphatics >C6-C8	<10 µg/kg	TM089		<10	<10	<10	<10		
Aliphatics >C8-C10	<10 µg/kg	TM089		<10	<10	<10	<10		
Aromatics >EC5-EC7	<10 µg/kg	TM089		<10	<10	<10	<10		
Aromatics >EC7-EC8	<10 µg/kg	TM089		<10	<10	<10	<10		
Aromatics >EC8-EC10	<10 µg/kg	TM089		<10	<10	<10	<10		

Validated

CERTIFICATE OF ANALYSIS

SDG:	191202-26	**Client Reference:**		**Report Number:**	533642
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	533512

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW102	MW105	MW105	SKIP		
			Depth (m)	2.30 - 2.50	1.50 - 1.70	2.70 - 2.90	.		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	28/11/2019	27/11/2019	27/11/2019	29/11/2019		
			Sample Time	.	.	.	.		
			Date Received	02/12/2019	02/12/2019	02/12/2019	02/12/2019		
			SDG Ref	191202-26	191202-26	191202-26	191202-26		
			Lab Sample No.(s)	21273189	21273187	21273188	21273190		
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		92.2	93.4	96.4	94.6		
Acenaphthene-d10 % recovery**	%	TM218		92.6	90.8	92.3	94.9		
Phenanthrene-d10 % recovery**	%	TM218		95.6	91.9	93.8	93.9		
Chrysene-d12 % recovery**	%	TM218		79.9	79.2	79.3	90.1		
Perylene-d12 % recovery**	%	TM218		83.9	87.9	86.4	92.9		
Naphthalene	<9 µg/kg	TM218		<9 M	<9 M	<9 M	33.9 M		
Acenaphthylene	<12 µg/kg	TM218		<12 M	<12 M	<12 M	<12 M		
Acenaphthene	<8 µg/kg	TM218		<8 M	<8 M	<8 M	<8 M		
Fluorene	<10 µg/kg	TM218		<10 M	<10 M	<10 M	<10 M		
Phenanthrene	<15 µg/kg	TM218		<15 M	<15 M	<15 M	19.2 M		
Anthracene	<16 µg/kg	TM218		<16 M	<16 M	<16 M	<16 M		
Fluoranthene	<17 µg/kg	TM218		<17 M	<17 M	<17 M	28.8 M		
Pyrene	<15 µg/kg	TM218		<15 M	<15 M	<15 M	23.5 M		
Benz(a)anthracene	<14 µg/kg	TM218		<14 M	<14 M	<14 M	<14 M		
Chrysene	<10 µg/kg	TM218		<10 M	<10 M	<10 M	15.1 M		
Benzo(b)fluoranthene	<15 µg/kg	TM218		<15 M	<15 M	<15 M	19.3 M		
Benzo(k)fluoranthene	<14 µg/kg	TM218		<14 M	<14 M	<14 M	<14 M		
Benzo(a)pyrene	<15 µg/kg	TM218		<15 M	<15 M	<15 M	<15 M		
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218		<18 M	<18 M	<18 M	<18 M		
Dibenzo(a,h)anthracene	<23 µg/kg	TM218		<23 M	<23 M	<23 M	<23 M		
Benzo(g,h,i)perylene	<24 µg/kg	TM218		<24 M	<24 M	<24 M	<24 M		
PAH, Total Detected USEPA 16	<118 µg/kg	TM218		<118	<118	<118	140		

Validated

CERTIFICATE OF ANALYSIS

SDG:	191202-26	**Client Reference:**		**Report Number:**	533642
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	533512

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW102	MW105	MW105			
			Depth (m)	2.30 - 2.50	1.50 - 1.70	2.70 - 2.90			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	28/11/2019	27/11/2019	27/11/2019			
			Sample Time	.	.	.			
			Date Received	02/12/2019	02/12/2019	02/12/2019			
			SDG Ref	191202-26	191202-26	191202-26			
			Lab Sample No.(s)	21273189	21273187	21273188			
			AGS Reference						
2-Methylnaphthalene	<100 µg/kg	TM157		<100	<100	<100			
Bis(2-chloroisopropyl) ether	<100 µg/kg	TM157		<100	<100	<100			

Validated

CERTIFICATE OF ANALYSIS

SDG:	191202-26	**Client Reference:**		**Report Number:**	533642
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	533512

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW102	MW105	MW105	SKIP		
			Depth (m)	2.30 - 2.50	1.50 - 1.70	2.70 - 2.90	.		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	28/11/2019	27/11/2019	27/11/2019	29/11/2019		
			Sample Time	.	.	.	.		
			Date Received	02/12/2019	02/12/2019	02/12/2019	02/12/2019		
			SDG Ref	191202-26	191202-26	191202-26	191202-26		
			Lab Sample No.(s)	21273189	21273187	21273188	21273190		
			AGS Reference						
Dibromofluoromethane**	%	TM116					106		
Toluene-d8**	%	TM116		95.5	87.3	91.3	92.1		
4-Bromofluorobenzene**	%	TM116					72		
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M		
Benzene	<9 µg/kg	TM116		<9 M	<9 M	<9 M	<9 M		
Toluene	<7 µg/kg	TM116		<7 M	<7 M	<7 M	<7 M		
Ethylbenzene	<4 µg/kg	TM116		<4 M	<4 M	<4 M	<4 M		
p/m-Xylene	<10 µg/kg	TM116		<10 #	<10 #	<10 #	<10 #		
o-Xylene	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M		
Tert-amyl methyl ether	<10 µg/kg	TM116		<10 #	<10 #	<10 #	<10 #		

Validated

CERTIFICATE OF ANALYSIS

SDG:	191202-26	**Client Reference:**		**Report Number:**	533642
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	533512

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Shell Whitemare Pool
Mass Sample taken (kg)	0.108	**Natural Moisture Content (%)**	20.5
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	83
Particle Size <4mm	>95%		

Case	
SDG	191202-26
Lab Sample Number(s)	21273190
Sampled Date	29-Nov-2019
Customer Sample Ref.	SKIP
Depth (m)	

Solid Waste Analysis	**Result**	**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	0.896	3	5	6
Loss on Ignition (%)	4.88	-	-	10
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg)	<1	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	8.59	-	>6	-
ANC to pH 6 (mol/kg)	0.181	-	-	-
ANC to pH 4 (mol/kg)	0.442	-	-	-

Eluate Analysis	**C_2 Conc^n in 10:1 eluate (mg/l)**		**A_2 10:1 conc^n leached (mg/kg)**		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.24	<0.0002	2.4	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	0.00108	<0.001	0.0108	<0.01	0.5	10	70
Copper	0.00157	<0.0003	0.0157	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.00969	<0.003	0.0969	<0.03	0.5	10	30
Nickel	0.000774	<0.0004	0.00774	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00278	<0.001	0.0278	<0.01	4	50	200
Chloride	9.4	<2	94	<20	800	15000	25000
Fluoride	1.83	<0.5	18.3	<5	10	150	500
Sulphate (soluble)	13	<2	130	<20	1000	20000	50000
Total Dissolved Solids	138	<5	1380	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	4.25	<3	42.5	<30	500	800	1000

Leach Test Information

Date Prepared	04-Dec-2019
pH (pH Units)	8.78
Conductivity (µS/cm)	184.00
Temperature (°C)	20.10
Volume Leachant (Litres)	0.882

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
11/12/2019 15:41:46

15:41:31 11/12/2019

CERTIFICATE OF ANALYSIS

SDG:	191202-26	**Client Reference:**		**Report Number:**	533642
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	533512

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM157	HP 6890 Gas Chromatograph (GC) system and HP 5973 Mass Selective Detector (MSD).	Determination of SVOC in Soils by GC-MS extracted by sonication in DCM/Acetone
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM182	CEN/TC 292 - WI 292046-chacterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM288		Determination of Oxygenates in Soils by Headspace/GC-MS
TM336		
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS

SDG:	191202-26	**Client Reference:**		**Report Number:**	533642
Location:	Shell Whitemare Pool	**Order Number:**	1382284	**Superseded Report:**	533512

Test Completion Dates

Lab Sample No(s)	21273189	21273187	21273188	21273190
Customer Sample Ref.	MW102	MW105	MW105	SKIP
AGS Ref.				
Depth	2.30 - 2.50	1.50 - 1.70	2.70 - 2.90	
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
ANC at pH4 and ANC at pH 6				09-Dec-2019
Anions by Kone (w)				09-Dec-2019
CEN 10:1 Leachate (1 Stage)				04-Dec-2019
CEN Readings				07-Dec-2019
Coronene				05-Dec-2019
Dissolved Metals by ICP-MS				10-Dec-2019
Dissolved Organic/Inorganic Carbon				07-Dec-2019
EPH CWG GC (S)	06-Dec-2019	06-Dec-2019	05-Dec-2019	06-Dec-2019
Fluoride				09-Dec-2019
GRO by GC-FID (S)	05-Dec-2019	05-Dec-2019	05-Dec-2019	05-Dec-2019
Hexavalent Chromium (s)	09-Dec-2019	09-Dec-2019	09-Dec-2019	09-Dec-2019
Loss on Ignition in soils				09-Dec-2019
Mercury Dissolved				09-Dec-2019
Metals in solid samples by OES	10-Dec-2019	10-Dec-2019	10-Dec-2019	10-Dec-2019
Mineral Oil				06-Dec-2019
n-Hexane in Solids	04-Dec-2019	04-Dec-2019	04-Dec-2019	
Oxygenates (S)	05-Dec-2019	05-Dec-2019	05-Dec-2019	05-Dec-2019
PAH 16 & 17 Calc				06-Dec-2019
PAH by GCMS	05-Dec-2019	05-Dec-2019	05-Dec-2019	06-Dec-2019
PCBs by GCMS				11-Dec-2019
pH				08-Dec-2019
Phenols by HPLC (W)				07-Dec-2019
Sample description	03-Dec-2019	03-Dec-2019	03-Dec-2019	03-Dec-2019
Semi Volatile Organic Compounds	09-Dec-2019	09-Dec-2019	09-Dec-2019	
Total Dissolved Solids				09-Dec-2019
Total Organic Carbon			09-Dec-2019	09-Dec-2019
VOC MS (S)	04-Dec-2019	04-Dec-2019	04-Dec-2019	04-Dec-2019

Appendix General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. **Sample Deviations**

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**

19. **Asbestos**

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.
Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2107).*

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

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Attention: Sophie Doyle

CERTIFICATE OF ANALYSIS

Date of report Generation:	30 December 2019
Customer:	Aecom
Sample Delivery Group (SDG):	191212-165
Your Reference:	
Location:	Shell Whitemare Pool
Report No:	535622

We received 8 samples on Thursday December 12, 2019 and 7 of these samples were scheduled for analysis which was completed on Monday December 30, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

[redacted]

Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	191212-165	**Client Reference:**		**Report Number:**	535622
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21351800	Active			10/12/2019
21351802	DUP1			10/12/2019
21351803	Equipment Blank			10/12/2019
21351801	Static			10/12/2019
21351805	Trip 1			
21351798	VP101			10/12/2019
21351804	VP102			11/12/2019
21351799	VP103			10/12/2019

Maximum Sample/Coolbox Temperature (°C) : **5.8**

ISO5667-3 Water quality - Sampling - Part3 -
During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

Validated

CERTIFICATE OF ANALYSIS

SDG:	191212-165	**Client Reference:**	**Report Number:** 535622
Location:	Shell Whitemare Pool	**Order Number:**	**Superseded Report:**

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			21351800				21351802				21351803				21351801				21351798	21351804	21351799
Customer Sample Reference			Active				DUP1				Equipment Blank				Static				VP101	VP102	VP103
AGS Reference																					
Depth (m)																					
Container			1000ml glass bottle (ALE220)	500ml Plastic (ALE208)	HNO3 Filtered (ALE204)	Vial (ALE297)	1000ml glass bottle (ALE220)	500ml Plastic (ALE208)	HNO3 Filtered (ALE204)	Vial (ALE297)	1000ml glass bottle (ALE220)	500ml Plastic (ALE208)	HNO3 Filtered (ALE204)	Vial (ALE297)	1000ml glass bottle (ALE220)	500ml Plastic (ALE208)	HNO3 Filtered (ALE204)	Vial (ALE297)	TD tube	TD tube	TD tube
Sample Type			DW	DW	DW	DW	DW	DW	DW	DW	PW	PW	PW	PW	DW	DW	DW	DW	G	G	G
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 4			X				X				X				X				
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 4	X				X				X				X						
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 4	X				X				X				X						
GRO by GC-FID (W)	All	NDPs: 0 Tests: 4				X				X				X				X			
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 4		X				X				X				X					
Mercury Dissolved	All	NDPs: 0 Tests: 4			X				X				X				X				
n-Hexane in Waters	All	NDPs: 0 Tests: 4				X				X				X				X			
Oxygenates (W)	All	NDPs: 0 Tests: 4				X				X				X				X			
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 4	X				X				X				X						
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 4	X				X				X				X						
TPH CWG (W)	All	NDPs: 0 Tests: 4	X				X				X				X						
UST Gases	All	NDPs: 0 Tests: 3																	X	X	X
VOC MS (W)	All	NDPs: 0 Tests: 4				X				X				X				X			

Validated

CERTIFICATE OF ANALYSIS

SDG:	191212-165	**Client Reference:**		**Report Number:**	535622
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	Active	DUP1	Equipment Blank	Static	VP101	VP102
			Depth (m)	.	.	.	.	.	.
			Sample Type	Drinking Water	Drinking Water	Process Water (PR)	Drinking Water	Gas (G)	Gas (G)
			Date Sampled	Non-regulatory (DW)	Non-regulatory (DW)	10/12/2019	Non-regulatory (DW)	10/12/2019	11/12/2019
			Sample Time	10/12/2019	10/12/2019	.	10/12/2019	.	.
			Date Received	.	.	12/12/2019	.	12/12/2019	12/12/2019
			SDG Ref	12/12/2019	12/12/2019	191212-165	12/12/2019	191212-165	191212-165
			Lab Sample No.(s)	191212-165	191212-165	21351803	191212-165	21351798	21351804
			AGS Reference	21351800	21351802		21351801		
MTBE	ug/m³	TM278						<13.3	<13.3
Hexane	ug/m³	TM278						38.2	17.9
DIPE	ug/m³	TM278						<13.3	<13.3
ETBE	ug/m³	TM278						<13.3	<13.3
Benzene	ug/m³	TM278						10	11.6
TAME	ug/m³	TM278						<13.3	<13.3
Toluene	ug/m³	TM278						33.7	40.8
Octane	ug/m³	TM278						18.5	7.13
Ethylbenzene	ug/m³	TM278						37.2	13.7
p/m-Xylene	ug/m³	TM278						128	48.7
o-Xylene	ug/m³	TM278						49.3	17.9
Decane	ug/m³	TM278						220	81.8
1,2,3-Trimethylbenzene	ug/m³	TM278						12.3	<8
Dodecane	ug/m³	TM278						<8	<8
Naphthalene	ug/m³	TM278						<5.33	<5.33
1-Methylnaphthalene	ug/m³	TM278						<10.7	<10.7
GRO C6-C12	ug/m³	TM278						12800	5700
Arsenic (diss.filt)	<0.5 µg/l	TM152		<0.5	<0.5		<0.5		
Boron (diss.filt)	<10 µg/l	TM152		<10	<10		<10		
Cadmium (diss.filt)	<0.08 µg/l	TM152		<0.08	<0.08		<0.08		
Chromium (diss.filt)	<1 µg/l	TM152		<1	<1		<1		
Cobalt (diss.filt)	<0.5 µg/l	TM152		<0.5	<0.5		<0.5		
Copper (diss.filt)	<0.3 µg/l	TM152		8.36	8.66		15.7		
Lead (diss.filt)	<0.2 µg/l	TM152		<0.2	<0.2		<0.2		
Molybdenum (diss.filt)	<3 µg/l	TM152		<3	<3		<3		
Nickel (diss.filt)	<0.4 µg/l	TM152		1.53	1.23		1.45		
Selenium (diss.filt)	<1 µg/l	TM152		<1	<1		<1		
Zinc (diss.filt)	<1 µg/l	TM152		7.57	7.3		14.2		
Tin (Diss.Filt)	<1 µg/l	TM152		<1	<1		<1		
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01	<0.01		<0.01		
Chromium, Hexavalent	<0.03 mg/l	TM241		<0.03 #	<0.03 #		<0.03 #		
Isopropanol-d8**	%	TM289		102	101		101		
Bromofluorobenzene**	%	TM289		98.8	97		98		

10:21:21 30/12/2019

Validated

CERTIFICATE OF ANALYSIS

SDG:	191212-165	**Client Reference:**		**Report Number:**	535622
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	Active	DUP1	Equipment Blank	Static	VP101	VP102
			Depth (m)	.	.	.	.	.	.
			Sample Type	Drinking Water	Drinking Water	Process Water (PR)	Drinking Water	Gas (G)	Gas (G)
			Date Sampled	Non-regulatory (DW)	Non-regulatory (DW)	10/12/2019	Non-regulatory (DW)	10/12/2019	11/12/2019
			Sample Time	10/12/2019	10/12/2019	.	10/12/2019	.	.
			Date Received	.	.	12/12/2019	.	12/12/2019	12/12/2019
			SDG Ref	12/12/2019	12/12/2019	191212-165	12/12/2019	191212-165	191212-165
			Lab Sample No.(s)	191212-165	191212-165	21351803	191212-165	21351798	21351804
			AGS Reference	21351800	21351802		21351801		
Ethanol	<50 µg/l	TM289		<50	<50		<50		
tert Butanol	<10 µg/l	TM289		<10	<10		<10		
Diisopropyl ether	<1 µg/l	TM289		<1	<1		<1		
tert-butyl ethyl ether	<1 µg/l	TM289		<1	<1		<1		
n-Hexane	<2 µg/l	TM336		<2	<2		<2		
Arsenic (diss.filt)	<0.5 µg/l	TM152				<0.5			
Boron (diss.filt)	<10 µg/l	TM152				<10			
Cadmium (diss.filt)	<0.08 µg/l	TM152				<0.08			
Chromium (diss.filt)	<1 µg/l	TM152				7.72			
Cobalt (diss.filt)	<0.5 µg/l	TM152				<0.5			
Copper (diss.filt)	<0.3 µg/l	TM152				1.48			
Lead (diss.filt)	<0.2 µg/l	TM152				<0.2			
Molybdenum (diss.filt)	<3 µg/l	TM152				<3			
Nickel (diss.filt)	<0.4 µg/l	TM152				<0.4			
Selenium (diss.filt)	<1 µg/l	TM152				<1			
Zinc (diss.filt)	<1 µg/l	TM152				1.42			
Tin (Diss.Filt)	<1 µg/l	TM152				<1			
Mercury (diss.filt)	<0.01 µg/l	TM183				<0.01			
Chromium, Hexavalent	<0.03 mg/l	TM241				<0.03			
Isopropanol-d8**	%	TM289				103			
Bromofluorobenzene**	%	TM289				99.4			
Ethanol	<50 µg/l	TM289				<50			
tert Butanol	<10 µg/l	TM289				<10			
Diisopropyl ether	<1 µg/l	TM289				<1			
tert-butyl ethyl ether	<1 µg/l	TM289				<1			
n-Hexane	<2 µg/l	TM336				<2			

Validated

CERTIFICATE OF ANALYSIS

SDG:	191212-165	**Client Reference:**		**Report Number:**	535622
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
			VP103	.	Gas (G)	10/12/2019	.	12/12/2019	191212-165	21351799	
MTBE	ug/m³	TM278	17.3								
Hexane	ug/m³	TM278	185								
DIPE	ug/m³	TM278	<13.3								
ETBE	ug/m³	TM278	<13.3								
Benzene	ug/m³	TM278	<6.67								
TAME	ug/m³	TM278	<13.3								
Toluene	ug/m³	TM278	223								
Octane	ug/m³	TM278	12.8								
Ethylbenzene	ug/m³	TM278	23.2								
p/m-Xylene	ug/m³	TM278	81.5								
o-Xylene	ug/m³	TM278	31.9								
Decane	ug/m³	TM278	131								
1,2,3-Trimethylbenzene	ug/m³	TM278	8.83								
Dodecane	ug/m³	TM278	<8								
Naphthalene	ug/m³	TM278	<5.33								
1-Methylnaphthalene	ug/m³	TM278	<10.7								
GRO C6-C12	ug/m³	TM278	8550								

Validated

CERTIFICATE OF ANALYSIS

SDG:	191212-165	**Client Reference:**		**Report Number:**	535622
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	

PAH Spec MS - Aqueous (W)

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	Active	DUP1	Equipment Blank	Static		
			Depth (m)	.	.	.	.		
			Sample Type	Drinking Water	Drinking Water	Process Water (PR)	Drinking Water		
			Date Sampled	Non-regulatory (DW)	Non-regulatory (DW)	10/12/2019	Non-regulatory (DW)		
			Sample Time	10/12/2019	10/12/2019	.	10/12/2019		
			Date Received	.	.	12/12/2019	.		
			SDG Ref	12/12/2019	12/12/2019	191212-165	12/12/2019		
			Lab Sample No.(s)	191212-165	191212-165	21351803	191212-165		
			AGS Reference	21351800	21351802		21351801		
Naphthalene (aq)	<0.01 µg/l	TM178		<0.01	<0.01		<0.01		
Acenaphthene (aq)	<0.005 µg/l	TM178		<0.005	<0.005		<0.005		
Acenaphthylene (aq)	<0.005 µg/l	TM178		<0.005	<0.005		<0.005		
Fluoranthene (aq)	<0.005 µg/l	TM178		<0.005	<0.005		0.00654		
Anthracene (aq)	<0.005 µg/l	TM178		<0.005	<0.005		<0.005		
Phenanthrene (aq)	<0.005 µg/l	TM178		<0.005	0.0089		0.0105		
Fluorene (aq)	<0.005 µg/l	TM178		<0.005	<0.005		<0.005		
Chrysene (aq)	<0.005 µg/l	TM178		<0.005	<0.005		<0.005		
Pyrene (aq)	<0.005 µg/l	TM178		<0.005	<0.005		<0.005		
Benzo(a)anthracene (aq)	<0.005 µg/l	TM178		<0.005	<0.005		<0.005		
Benzo(b)fluoranthene (aq)	<0.005 µg/l	TM178		<0.005	<0.005		<0.005		
Benzo(k)fluoranthene (aq)	<0.005 µg/l	TM178		<0.005	<0.005		<0.005		
Benzo(a)pyrene (aq)	<0.002 µg/l	TM178		<0.002	<0.002		<0.002		
Dibenzo(a,h)anthracene (aq)	<0.005 µg/l	TM178		<0.005	<0.005		<0.005		
Benzo(g,h,i)perylene (aq)	<0.005 µg/l	TM178		<0.005	<0.005		<0.005		
Indeno(1,2,3-cd)pyrene (aq)	<0.005 µg/l	TM178		<0.005	<0.005		<0.005		
PAH, Total Detected USEPA 16 (aq)	<0.082 µg/l	TM178		<0.082	<0.082		<0.082		
Naphthalene (aq)	<0.01 µg/l	TM178				<0.01			
Acenaphthene (aq)	<0.005 µg/l	TM178				<0.005			
Acenaphthylene (aq)	<0.005 µg/l	TM178				<0.005			
Fluoranthene (aq)	<0.005 µg/l	TM178				<0.005			
Anthracene (aq)	<0.005 µg/l	TM178				<0.005			
Phenanthrene (aq)	<0.005 µg/l	TM178				<0.005			
Fluorene (aq)	<0.005 µg/l	TM178				<0.005			
Chrysene (aq)	<0.005 µg/l	TM178				<0.005			
Pyrene (aq)	<0.005 µg/l	TM178				<0.005			
Benzo(a)anthracene (aq)	<0.005 µg/l	TM178				<0.005			
Benzo(b)fluoranthene (aq)	<0.005 µg/l	TM178				<0.005			
Benzo(k)fluoranthene (aq)	<0.005 µg/l	TM178				<0.005			
Benzo(a)pyrene (aq)	<0.002 µg/l	TM178				<0.002			
Dibenzo(a,h)anthracene (aq)	<0.005 µg/l	TM178				<0.005			
Benzo(g,h,i)perylene (aq)	<0.005 µg/l	TM178				<0.005			
Indeno(1,2,3-cd)pyrene (aq)	<0.005 µg/l	TM178				<0.005			

Validated

CERTIFICATE OF ANALYSIS

SDG:	191212-165	**Client Reference:**		**Report Number:**	535622
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	

PAH Spec MS - Aqueous (W)

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
			Active	.	Drinking Water	Non-regulatory (DW)	10/12/2019	.	12/12/2019	191212-165	21351800
			DUP1	.	Drinking Water	Non-regulatory (DW)	10/12/2019	.	12/12/2019	191212-165	21351802
			Equipment Blank	.	Process Water (PR)	10/12/2019	.	12/12/2019	191212-165	21351803	
			Static	.	Drinking Water	Non-regulatory (DW)	10/12/2019	.	12/12/2019	191212-165	21351801
PAH, Total Detected USEPA 16 (aq)	<0.082 µg/l	TM178							<0.082		

Validated

CERTIFICATE OF ANALYSIS

SDG:	191212-165	**Client Reference:**		**Report Number:**	535622
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	Active	DUP1	Equipment Blank	Static		
			Depth (m)	.	.	.	.		
			Sample Type	Drinking Water	Drinking Water	Process Water (PR)	Drinking Water		
			Date Sampled	Non-regulatory (DW)	Non-regulatory (DW)	10/12/2019	Non-regulatory (DW)		
			Sample Time	10/12/2019	10/12/2019	.	10/12/2019		
			Date Received	.	.	12/12/2019	.		
			SDG Ref	12/12/2019	12/12/2019	191212-165	12/12/2019		
			Lab Sample No.(s)	191212-165	191212-165	21351803	191212-165		
			AGS Reference	21351800	21351802		21351801		
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1 @	<1 @		<1		
2-Methylnaphthalene (aq)	<1 µg/l	TM176				<1			

Validated

CERTIFICATE OF ANALYSIS

SDG:	191212-165	**Client Reference:**		**Report Number:**	535622
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	

TPH CWG (W)

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	Active	DUP1	Equipment Blank	Static		
			Depth (m)	.	.	.	.		
			Sample Type	Drinking Water	Drinking Water	Process Water (PR)	Drinking Water		
			Date Sampled	Non-regulatory (DW)	Non-regulatory (DW)	10/12/2019	Non-regulatory (DW)		
			Sample Time	10/12/2019	10/12/2019	.	10/12/2019		
			Date Received	.	.	12/12/2019	.		
			SDG Ref	12/12/2019	12/12/2019	191212-165	12/12/2019		
			Lab Sample No.(s)	191212-165	191212-165	21351803	191212-165		
			AGS Reference	21351800	21351802		21351801		
GRO Surrogate % recovery**	%	TM245		83	85		105		
Aliphatics >C5-C6	<10 µg/l	TM245		<10	<10		<10		
Aliphatics >C6-C8	<10 µg/l	TM245		<10	<10		<10		
Aliphatics >C8-C10	<10 µg/l	TM245		<10	<10		<10		
Aliphatics >C10-C12	<10 µg/l	TM245		<10	<10		<10		
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174		<10	<10		<10		
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174		<10	<10		<10		
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174		<10	<10		<10		
Aromatics >EC5-EC7	<10 µg/l	TM245		<10	<10		<10		
Aromatics >EC7-EC8	<10 µg/l	TM245		<10	<10		<10		
Aromatics >EC8-EC10	<10 µg/l	TM245		<10	<10		<10		
Aromatics >EC10-EC12	<10 µg/l	TM245		<10	<10		<10		
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174		<10	<10		<10		
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174		<10	<10		<10		
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174		<10	<10		<10		
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM174		<10	<10		<10		
GRO Surrogate % recovery**	%	TM245				94			
Aliphatics >C5-C6	<10 µg/l	TM245				<10			
Aliphatics >C6-C8	<10 µg/l	TM245				<10			
Aliphatics >C8-C10	<10 µg/l	TM245				<10			
Aliphatics >C10-C12	<10 µg/l	TM245				<10			
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174				<10			
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174				<10			
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174				<10			
Aromatics >EC5-EC7	<10 µg/l	TM245				<10			
Aromatics >EC7-EC8	<10 µg/l	TM245				<10			
Aromatics >EC8-EC10	<10 µg/l	TM245				<10			
Aromatics >EC10-EC12	<10 µg/l	TM245				<10			
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174				<10			
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174				<10			
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174				<10			
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM174				<10			

Validated

CERTIFICATE OF ANALYSIS

SDG:	191212-165	**Client Reference:**		**Report Number:**	535622
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	

VOC MS (W)

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	Active	DUP1	Equipment Blank	Static		
			Depth (m)	.	.	.	.		
			Sample Type	Drinking Water	Drinking Water	Process Water (PR)	Drinking Water		
			Date Sampled	Non-regulatory (DW)	Non-regulatory (DW)	10/12/2019	Non-regulatory (DW)		
			Sample Time	10/12/2019	10/12/2019	.	10/12/2019		
			Date Received	.	.	12/12/2019	.		
			SDG Ref	12/12/2019	12/12/2019	191212-165	12/12/2019		
			Lab Sample No.(s)	191212-165	191212-165	21351803	191212-165		
			AGS Reference	21351800	21351802		21351801		
Toluene-d8**	%	TM208		99.6	101		100		
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		<1	<1		<1		
Benzene	<1 µg/l	TM208		<1	<1		<1		
Toluene	<1 µg/l	TM208		<1	<1		<1		
Ethylbenzene	<1 µg/l	TM208		<1	<1		<1		
m,p-Xylene	<1 µg/l	TM208		<1	<1		<1		
o-Xylene	<1 µg/l	TM208		<1	<1		<1		
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208		<1	<1		<1		
Toluene-d8**	%	TM208				101			
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208				<1			
Benzene	<1 µg/l	TM208				<1			
Toluene	<1 µg/l	TM208				<1			
Ethylbenzene	<1 µg/l	TM208				<1			
m,p-Xylene	<1 µg/l	TM208				<1			
o-Xylene	<1 µg/l	TM208				<1			
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208				<1			

Table of Results - Appendix

Method No	Reference	Description
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1980.	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM278		Determination of Selective VOCs by TD-GC-MS
TM289		Determination of Oxygenates in Waters by Headspace/GC-MS
TM336		

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS

SDG:	191212-165	**Client Reference:**		**Report Number:**	535622
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	21351800	21351802	21351803	21351801	21351798	21351804	21351799
Customer Sample Ref.	Active	DUP1	Equipment Blank	Static	VP101	VP102	VP103
AGS Ref.							
Depth							
Type	Drinking Water	Drinking Water	Process Water	Drinking Water	Gas (G)	Gas (G)	Gas (G)
Dissolved Metals by ICP-MS	20-Dec-2019	20-Dec-2019	20-Dec-2019	20-Dec-2019			
EPH CWG (Aliphatic) Aqueous GC (W)	30-Dec-2019	30-Dec-2019	30-Dec-2019	30-Dec-2019			
EPH CWG (Aromatic) Aqueous GC (W)	30-Dec-2019	30-Dec-2019	30-Dec-2019	30-Dec-2019			
GRO by GC-FID (W)	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019			
Hexavalent Chromium (w)	19-Dec-2019	19-Dec-2019	19-Dec-2019	19-Dec-2019			
Mercury Dissolved	20-Dec-2019	20-Dec-2019	20-Dec-2019	20-Dec-2019			
n-Hexane in Waters	18-Dec-2019	18-Dec-2019	18-Dec-2019	18-Dec-2019			
Oxygenates (W)	18-Dec-2019	18-Dec-2019	18-Dec-2019	18-Dec-2019			
PAH Spec MS - Aqueous (W)	27-Dec-2019	27-Dec-2019	27-Dec-2019	27-Dec-2019			
SVOC MS (W) - Aqueous	23-Dec-2019	24-Dec-2019	20-Dec-2019	20-Dec-2019			
TPH CWG (W)	30-Dec-2019	30-Dec-2019	30-Dec-2019	30-Dec-2019			
UST Gases					19-Dec-2019	19-Dec-2019	19-Dec-2019
VOC MS (W)	17-Dec-2019	17-Dec-2019	17-Dec-2019	17-Dec-2019			

Appendix General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. **Sample Deviations**

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**

19. **Asbestos**

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.
Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2107).*

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

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Aecom
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M1 4HD

Attention: Sophie Doyle

CERTIFICATE OF ANALYSIS

Date of report Generation:	02 January 2020
Customer:	Aecom
Sample Delivery Group (SDG):	191213-128
Your Reference:	
Location:	Shell Whitemare Pool
Report No:	535986

This report has been revised and directly supersedes 535166 in its entirety.

We received 9 samples on Friday December 13, 2019 and 9 of these samples were scheduled for analysis which was completed on Thursday January 02, 2020. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

[redacted]

Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	191213-128	**Client Reference:**		**Report Number:**	535986
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	535166

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21362403	DUP2			11/12/2019
21362397	MW101			11/12/2019
21362398	MW102			11/12/2019
21362399	MW103			11/12/2019
21362400	MW105			12/12/2019
21362401	MW106			11/12/2019
21362402	MW109			12/12/2019
21362404	TRIP 2			
21362395	VP102B			12/12/2019

Maximum Sample/Coolbox Temperature (°C) : **5.8**

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

Validated

CERTIFICATE OF ANALYSIS

SDG:	191213-128	**Client Reference:**		**Report Number:**	535986
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	535166

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)					21362403				21362397				21362398				21362399				21362400
Customer Sample Reference					DUP2				MW101				MW102				MW103				MW105
AGS Reference																					
Depth (m)																					
Container					1000ml glass bottle (ALE220)	500ml Plastic (ALE208)	HNO3 Filtered (ALE204)	Vial (ALE297)	1000ml glass bottle (ALE220)	500ml Plastic (ALE208)	HNO3 Filtered (ALE204)	Vial (ALE297)	1000ml glass bottle (ALE220)	500ml Plastic (ALE208)	HNO3 Filtered (ALE204)	Vial (ALE297)	1000ml glass bottle (ALE220)	500ml Plastic (ALE208)	HNO3 Filtered (ALE204)	Vial (ALE297)	1000ml glass bottle (ALE220)	500ml Plastic (ALE208)	HNO3 Filtered (ALE204)
Sample Type					GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 7					X				X				X				X				X
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 7			X				X				X				X				X		
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 7			X				X				X				X				X		
GRO by GC-FID (W)	All	NDPs: 0 Tests: 7			X				X				X				X				X		
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 7		X				X				X				X				X			
Mercury Dissolved	All	NDPs: 0 Tests: 7					X				X				X				X				X
n-Hexane in Waters	All	NDPs: 0 Tests: 7						X				X				X				X			
Oxygenates (W)	All	NDPs: 0 Tests: 7						X				X				X				X			
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 7			X				X				X				X				X		
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 7			X				X				X				X				X		
TPH CWG (W)	All	NDPs: 0 Tests: 7			X				X				X				X				X		
UST Gases	All	NDPs: 0 Tests: 1																					
VOC MS (W)	All	NDPs: 0 Tests: 8						X				X				X				X			

21362395	VP102B			Gas Bag	G																X		
21362404	TRIP 2			Vial (ALE297)	PW																		X
21362402	MW109			Vial (ALE297)	GW									X		X							X
				HNO3 Filtered (ALE204)	GW	X						X											
				500ml Plastic (ALE208)	GW						X												
				1000ml glass bottle (ALE220)	GW		X		X		X						X		X		X		
21362401	MW106			Vial (ALE297)	GW									X		X							X
				HNO3 Filtered (ALE204)	GW	X						X											
				500ml Plastic (ALE208)	GW						X												
				1000ml glass bottle (ALE220)	GW		X		X		X						X		X		X		
21362400	MW105			Vial (ALE297)	GW									X		X							X

Validated

CERTIFICATE OF ANALYSIS

SDG:	191213-128	**Client Reference:**		**Report Number:**	535986
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	535166

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	DUP2	MW101	MW102	MW103	MW105	MW106
			Depth (m)	.	.	.	.	.	.
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	11/12/2019	11/12/2019	11/12/2019	11/12/2019	12/12/2019	11/12/2019
			Sample Time	.	.	.	.	.	.
			Date Received	13/12/2019	13/12/2019	13/12/2019	13/12/2019	13/12/2019	13/12/2019
			SDG Ref	191213-128	191213-128	191213-128	191213-128	191213-128	191213-128
			Lab Sample No.(s)	21362403	21362397	21362398	21362399	21362400	21362401
			AGS Reference						
Arsenic (diss.filt)	<0.5 µg/l	TM152		2.66 #	0.557 #	2.61 #	0.654 #	<0.5 #	17.4 #
Boron (diss.filt)	<10 µg/l	TM152		86.5 #	92 #	92.6 #	52.2 #	60.3 #	86 #
Cadmium (diss.filt)	<0.08 µg/l	TM152		<0.08 #	<0.08 #	<0.08 #	<0.08 #	<0.08 #	<0.08 #
Chromium (diss.filt)	<1 µg/l	TM152		<1 #	<1 #	<1 #	2.94 #	<1 #	<1 #
Cobalt (diss.filt)	<0.5 µg/l	TM152		1.48 #	0.622 #	1.36 #	<0.5 #	0.683 #	6.13 #
Copper (diss.filt)	<0.3 µg/l	TM152		1.66 #	1.55 #	<0.3 #	3.03 #	1.04 #	<0.3 #
Lead (diss.filt)	<0.2 µg/l	TM152		0.623 #	<0.2 #	<0.2 #	<0.2 #	<0.2 #	<0.2 #
Molybdenum (diss.filt)	<3 µg/l	TM152		<3 #	<3 #	<3 #	4.06 #	<3 #	<3 #
Nickel (diss.filt)	<0.4 µg/l	TM152		2.84 #	2.93 #	2.79 #	1.79 #	3.18 #	5.82 #
Selenium (diss.filt)	<1 µg/l	TM152		<1 #	1.28 #	<1 #	1.19 #	<1 #	<1 #
Zinc (diss.filt)	<1 µg/l	TM152		3.1 #	2.87 #	1.95 #	4.83 #	2.93 #	3.62 #
Tin (Diss.Filt)	<1 µg/l	TM152		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #
Chromium, Hexavalent	<0.03 mg/l	TM241		<0.03 #	<0.03 #	<0.03 #	<0.03 #	<0.03 #	<0.03 #
Isopropanol-d8**	%	TM289		97.9	102	99.2	102	98.3	100
Bromofluorobenzene**	%	TM289		98.4	97.8	101	99.4	97.7	98.3
Ethanol	<50 µg/l	TM289		<50	<50	<50	<50	<50	<50
tert Butanol	<10 µg/l	TM289		<10	<10	<10	<10	<10	<10
Diisopropyl ether	<1 µg/l	TM289		4.55	<1	4.81	<1	<1	<1
tert-butyl ethyl ether	<1 µg/l	TM289		<1	<1	<1	<1	<1	<1
n-Hexane	<2 µg/l	TM336		4.93	<2	5.75	<2	<2	<2

Validated

CERTIFICATE OF ANALYSIS

SDG:	191213-128	**Client Reference:**		**Report Number:**	535986
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	535166

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW109	VP102B			
			Depth (m)	.	.			
			Sample Type	Ground Water (GW)	Gas (G)			
			Date Sampled	12/12/2019	12/12/2019			
			Sample Time	.	.			
			Date Received	13/12/2019	13/12/2019			
			SDG Ref	191213-128	191213-128			
			Lab Sample No.(s)	21362402	21362395			
			AGS Reference					
MTBE	ug/m³	TM278			<100 3			
Hexane	ug/m³	TM278			<40 3			
DIPE	ug/m³	TM278			<100 3			
ETBE	ug/m³	TM278			<100 3			
Benzene	ug/m³	TM278			<50 3			
TAME	ug/m³	TM278			<100 3			
Toluene	ug/m³	TM278			<20 3			
Octane	ug/m³	TM278			<50 3			
Ethylbenzene	ug/m³	TM278			<20 3			
p/m-Xylene	ug/m³	TM278			<30 3			
o-Xylene	ug/m³	TM278			<20 3			
Decane	ug/m³	TM278			<16 3			
1,2,3-Trimethylbenzene	ug/m³	TM278			<60 3			
Dodecane	ug/m³	TM278			<60 3			
Naphthalene	ug/m³	TM278			<40 3			
1-Methylnaphthalene	ug/m³	TM278			<80 3			
GRO C6-C12	ug/m³	TM278			<670 3			
Arsenic (diss.filt)	<0.5 µg/l	TM152		0.52 #				
Boron (diss.filt)	<10 µg/l	TM152		62 #				
Cadmium (diss.filt)	<0.08 µg/l	TM152		<0.08 #				
Chromium (diss.filt)	<1 µg/l	TM152		<1 #				
Cobalt (diss.filt)	<0.5 µg/l	TM152		3.25 #				
Copper (diss.filt)	<0.3 µg/l	TM152		1.28 #				
Lead (diss.filt)	<0.2 µg/l	TM152		0.401 #				
Molybdenum (diss.filt)	<3 µg/l	TM152		<3 #				
Nickel (diss.filt)	<0.4 µg/l	TM152		6.28 #				
Selenium (diss.filt)	<1 µg/l	TM152		<1 #				
Zinc (diss.filt)	<1 µg/l	TM152		5.6 #				
Tin (Diss.Filt)	<1 µg/l	TM152		<1 #				
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 #				
Chromium, Hexavalent	<0.03 mg/l	TM241		<0.03 #				
Isopropanol-d8**	%	TM289		98.4				
Bromofluorobenzene**	%	TM289		98.9				

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Validated

CERTIFICATE OF ANALYSIS

SDG:	191213-128	**Client Reference:**		**Report Number:**	535986
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	535166

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	MW109	VP102B
			Depth (m)	.	.
			Sample Type	Ground Water (GW)	Gas (G)
			Date Sampled	12/12/2019	12/12/2019
			Sample Time	.	.
			Date Received	13/12/2019	13/12/2019
			SDG Ref	191213-128	191213-128
			Lab Sample No.(s)	21362402	21362395
			AGS Reference		
Ethanol	<50 µg/l	TM289		<50	
tert Butanol	<10 µg/l	TM289		<10	
Diisopropyl ether	<1 µg/l	TM289		<1	
tert-butyl ethyl ether	<1 µg/l	TM289		<1	
n-Hexane	<2 µg/l	TM336		<2	

Validated

CERTIFICATE OF ANALYSIS

SDG:	191213-128	**Client Reference:**		**Report Number:**	535986
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	535166

PAH Spec MS - Aqueous (W)

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	DUP2	MW101	MW102	MW103	MW105	MW106
			Depth (m)	.	.	.	.	.	.
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	11/12/2019	11/12/2019	11/12/2019	11/12/2019	12/12/2019	11/12/2019
			Sample Time	.	.	.	.	.	.
			Date Received	13/12/2019	13/12/2019	13/12/2019	13/12/2019	13/12/2019	13/12/2019
			SDG Ref	191213-128	191213-128	191213-128	191213-128	191213-128	191213-128
			Lab Sample No.(s)	21362403	21362397	21362398	21362399	21362400	21362401
			AGS Reference						
Naphthalene (aq)	<0.01 µg/l	TM178		30.9 ♦ #	<0.01 ♦ #	48.8 ♦ #	<0.01 ♦ #	<0.01 #	0.569 ♦ #
Acenaphthene (aq)	<0.005 µg/l	TM178		0.104 ♦ #	<0.005 ♦ #	0.145 ♦ #	<0.005 ♦ #	<0.005 #	0.0218 ♦ #
Acenaphthylene (aq)	<0.005 µg/l	TM178		<0.005 ♦ #	<0.005 ♦ #	<0.005 ♦ #	<0.005 ♦ #	<0.005 #	<0.005 ♦ #
Fluoranthene (aq)	<0.005 µg/l	TM178		<0.005 ♦ #	<0.005 ♦ #	<0.005 ♦ #	<0.005 ♦ #	<0.005 #	<0.005 ♦ #
Anthracene (aq)	<0.005 µg/l	TM178		0.0143 ♦ #	<0.005 ♦ #	0.0219 ♦ #	<0.005 ♦ #	<0.005 #	<0.005 ♦ #
Phenanthrene (aq)	<0.005 µg/l	TM178		0.0388 ♦ #	<0.005 ♦ #	0.0725 ♦ #	<0.005 ♦ #	<0.005 #	<0.005 ♦ #
Fluorene (aq)	<0.005 µg/l	TM178		0.124 ♦ #	<0.005 ♦ #	0.2 ♦ #	<0.005 ♦ #	<0.005 #	0.00937 ♦ #
Chrysene (aq)	<0.005 µg/l	TM178		<0.005 ♦ #	<0.005 ♦ #	<0.005 ♦ #	<0.005 ♦ #	<0.005 #	<0.005 ♦ #
Pyrene (aq)	<0.005 µg/l	TM178		<0.005 ♦ #	<0.005 ♦ #	<0.005 ♦ #	<0.005 ♦ #	<0.005 #	0.00598 ♦ #
Benzo(a)anthracene (aq)	<0.005 µg/l	TM178		<0.005 ♦ #	<0.005 ♦ #	<0.005 ♦ #	<0.005 ♦ #	<0.005 #	<0.005 ♦ #
Benzo(b)fluoranthene (aq)	<0.005 µg/l	TM178		<0.005 ♦ #	<0.005 ♦ #	<0.005 ♦ #	<0.005 ♦ #	<0.005 #	<0.005 ♦ #
Benzo(k)fluoranthene (aq)	<0.005 µg/l	TM178		<0.005 ♦ #	<0.005 ♦ #	<0.005 ♦ #	<0.005 ♦ #	<0.005 #	<0.005 ♦ #
Benzo(a)pyrene (aq)	<0.002 µg/l	TM178		<0.002 ♦ #	<0.002 ♦ #	<0.002 ♦ #	<0.002 ♦ #	<0.002 #	<0.002 ♦ #
Dibenzo(a,h)anthracene (aq)	<0.005 µg/l	TM178		<0.005 ♦ #	<0.005 ♦ #	<0.005 ♦ #	<0.005 ♦ #	<0.005 #	<0.005 ♦ #
Benzo(g,h,i)perylene (aq)	<0.005 µg/l	TM178		<0.005 ♦ #	<0.005 ♦ #	<0.005 ♦ #	<0.005 ♦ #	<0.005 #	<0.005 ♦ #
Indeno(1,2,3-cd)pyrene (aq)	<0.005 µg/l	TM178		<0.005 ♦ #	<0.005 ♦ #	<0.005 ♦ #	<0.005 ♦ #	<0.005 #	<0.005 ♦ #
PAH, Total Detected USEPA 16 (aq)	<0.082 µg/l	TM178		31.2 ♦ #	<0.082 ♦ #	49.3 ♦ #	<0.082 ♦ #	<0.082 #	0.606 ♦ #

Validated

CERTIFICATE OF ANALYSIS

SDG:	191213-128	**Client Reference:**		**Report Number:**	535986
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	535166

PAH Spec MS - Aqueous (W)

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

		Customer Sample Ref.	MW109
		Depth (m)	.
		Sample Type	Ground Water (GW)
		Date Sampled	12/12/2019
		Sample Time	.
		Date Received	13/12/2019
		SDG Ref	191213-128
		Lab Sample No.(s)	21362402
		AGS Reference	
Component	**LOD/Units**	**Method**	
Naphthalene (aq)	<0.01 µg/l	TM178	<0.01 #
Acenaphthene (aq)	<0.005 µg/l	TM178	<0.005 #
Acenaphthylene (aq)	<0.005 µg/l	TM178	<0.005 #
Fluoranthene (aq)	<0.005 µg/l	TM178	0.0109 #
Anthracene (aq)	<0.005 µg/l	TM178	<0.005 #
Phenanthrene (aq)	<0.005 µg/l	TM178	0.0136 #
Fluorene (aq)	<0.005 µg/l	TM178	<0.005 #
Chrysene (aq)	<0.005 µg/l	TM178	<0.005 #
Pyrene (aq)	<0.005 µg/l	TM178	0.011 #
Benzo(a)anthracene (aq)	<0.005 µg/l	TM178	<0.005 #
Benzo(b)fluoranthene (aq)	<0.005 µg/l	TM178	0.013 #
Benzo(k)fluoranthene (aq)	<0.005 µg/l	TM178	0.00634 #
Benzo(a)pyrene (aq)	<0.002 µg/l	TM178	0.00796 #
Dibenzo(a,h)anthracene (aq)	<0.005 µg/l	TM178	<0.005 #
Benzo(g,h,i)perylene (aq)	<0.005 µg/l	TM178	<0.005 #
Indeno(1,2,3-cd)pyrene (aq)	<0.005 µg/l	TM178	<0.005 #
PAH, Total Detected USEPA 16 (aq)	<0.082 µg/l	TM178	<0.082 #

Validated

CERTIFICATE OF ANALYSIS

SDG:	191213-128	**Client Reference:**		**Report Number:**	535986
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	535166

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	DUP2	MW101	MW102	MW103	MW105	MW106
			Depth (m)	.	.	.	.	.	.
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	11/12/2019	11/12/2019	11/12/2019	11/12/2019	12/12/2019	11/12/2019
			Sample Time	.	.	.	.	.	.
			Date Received	13/12/2019	13/12/2019	13/12/2019	13/12/2019	13/12/2019	13/12/2019
			SDG Ref	191213-128	191213-128	191213-128	191213-128	191213-128	191213-128
			Lab Sample No.(s)	21362403	21362397	21362398	21362399	21362400	21362401
			AGS Reference						
2-Methylnaphthalene (aq)	<1 µg/l	TM176		5.96 #	<1 #	8.84 #	<1 #	<1 #	<2 #

Validated

CERTIFICATE OF ANALYSIS

SDG:	191213-128	**Client Reference:**		**Report Number:**	535986
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	535166

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

		Customer Sample Ref.	MW109
		Depth (m)	.
		Sample Type	Ground Water (GW)
		Date Sampled	12/12/2019
		Sample Time	.
		Date Received	13/12/2019
		SDG Ref	191213-128
		Lab Sample No.(s)	21362402
		AGS Reference	
Component	**LOD/Units**	**Method**	
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<4 #