Validated

CERTIFICATE OF ANALYSIS

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Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	535166

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.	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						
GRO Surrogate % recovery**	%	TM245		106	99	96	86	94	93
Aliphatics >C5-C6	<10 µg/l	TM245		245	<10	296	<10	<10	10
Aliphatics >C6-C8	<10 µg/l	TM245		430	<10	548	<10	<10	115
Aliphatics >C8-C10	<10 µg/l	TM245		504	<10	619	<10	<10	594
Aliphatics >C10-C12	<10 µg/l	TM245		394	<10	482	<10	<10	591
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174		11	<10	22	<10	<10	11
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174		<10	<10	<10	<10	<10	<10
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174		<10	<10	<10	<10	<10	<10
Aromatics >EC5-EC7	<10 µg/l	TM245		778	<10	688	<10	<10	<10
Aromatics >EC7-EC8	<10 µg/l	TM245		213	<10	89	<10	<10	<10
Aromatics >EC8-EC10	<10 µg/l	TM245		1980	<10	1780	<10	<10	518
Aromatics >EC10-EC12	<10 µg/l	TM245		262	<10	321	<10	<10	394
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174		22	<10	32	<10	<10	51
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174		<10	<10	<10	<10	<10	<10
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174		<10	<10	<10	<10	<10	<10
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM174		4840	<10	4870	<10	<10	2290

Validated

CERTIFICATE OF ANALYSIS

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Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	535166

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.	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
			MW109	.	Ground Water (GW)	12/12/2019	.	13/12/2019	191213-128	21362402	
GRO Surrogate % recovery**	%	TM245	98								
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:	191213-128	**Client Reference:**		**Report Number:**	535986
Location:	Shell Whitemare Pool	**Order Number:**		**Superseded Report:**	535166

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.	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						
Toluene-d8**	%	TM208		97.5	102	101	102	103	103
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		24.2 #	<1 #	25.8 #	8.19 #	3.18 #	1.02 #
Benzene	<1 µg/l	TM208		743 #	<1 #	750 #	<1 #	<1 #	8.25 #
Toluene	<1 µg/l	TM208		63.5 #	<1 #	69.2 #	<1 #	<1 #	<1 #
Ethylbenzene	<1 µg/l	TM208		728 #	<1 #	753 #	<1 #	<1 #	117 #
m,p-Xylene	<1 µg/l	TM208		332 #	<1 #	342 #	<1 #	<1 #	10.8 #
o-Xylene	<1 µg/l	TM208		192 #	<1 #	194 #	<1 #	<1 #	2.89 #
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #

Validated

CERTIFICATE OF ANALYSIS

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

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.	MW109	TRIP 2				
			Depth (m)	.	.				
			Sample Type	Ground Water (GW)	Process Water (PR)				
			Date Sampled	12/12/2019	-				
			Sample Time	.	.				
			Date Received	13/12/2019	13/12/2019				
			SDG Ref	191213-128	191213-128				
			Lab Sample No.(s)	21362402	21362404				
			AGS Reference						
Toluene-d8**	%	TM208		103					
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		1.9 #					
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 #					
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 §				
Sum of detected Xylenes	<2 µg/l	TM208			<2 §				

CERTIFICATE OF ANALYSIS

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

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

Test Completion Dates

Lab Sample No(s)	21362403	21362397	21362398	21362399	21362400	21362401	21362402	21362404	21362395
Customer Sample Ref.	DUP2	MW101	MW102	MW103	MW105	MW106	MW109	TRIP 2	VP102B
AGS Ref.									
Depth									
Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Process Water	Gas (G)
Dissolved Metals by ICP-MS	21-Dec-2019	21-Dec-2019	21-Dec-2019	21-Dec-2019	21-Dec-2019	21-Dec-2019	21-Dec-2019		
EPH CWG (Aliphatic) Aqueous GC (W)	30-Dec-2019	30-Dec-2019	30-Dec-2019	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	30-Dec-2019	30-Dec-2019	30-Dec-2019		
GRO by GC-FID (W)	18-Dec-2019	18-Dec-2019	18-Dec-2019	18-Dec-2019	18-Dec-2019	18-Dec-2019	18-Dec-2019		
Hexavalent Chromium (w)	20-Dec-2019	20-Dec-2019	20-Dec-2019	20-Dec-2019	20-Dec-2019	20-Dec-2019	20-Dec-2019		
Mercury Dissolved	23-Dec-2019	23-Dec-2019	23-Dec-2019	23-Dec-2019	23-Dec-2019	23-Dec-2019	23-Dec-2019		
n-Hexane in Waters	18-Dec-2019	18-Dec-2019	18-Dec-2019	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	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	27-Dec-2019	27-Dec-2019	27-Dec-2019		
SVOC MS (W) - Aqueous	20-Dec-2019	20-Dec-2019	20-Dec-2019	20-Dec-2019	19-Dec-2019	20-Dec-2019	24-Dec-2019		
TPH CWG (W)	30-Dec-2019	30-Dec-2019	30-Dec-2019	30-Dec-2019	30-Dec-2019	30-Dec-2019	30-Dec-2019		
UST Gases									02-Jan-2020
VOC MS (W)	18-Dec-2019	16-Dec-2019	18-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-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.

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

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

Attention: Sophie Doyle

CERTIFICATE OF ANALYSIS

Date of report Generation:	18 February 2020
Customer:	AECOM
Sample Delivery Group (SDG):	200210-11
Your Reference:	60608750
Location:	Shell Whitemare Pool
Report No:	541873

This report has been revised and directly supersedes 541679 in its entirety.

We received 5 samples on Monday February 10, 2020 and 5 of these samples were scheduled for analysis which was completed on Tuesday February 18, 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 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:	200210-11	**Client Reference:**	60608750	**Report Number:**	541873
Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21655901	DUP			06/02/2020
21655897	Equip Blank			07/02/2020
21655900	MW101			06/02/2020
21655898	MW102			06/02/2020
21655899	MW103			05/02/2020

Maximum Sample/Coolbox Temperature (°C) : **6.2**

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:	200210-11	**Client Reference:**	60608750	**Report Number:**	541873
Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

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)					21655901				21655897				21655900				21655898				21655899	
Customer Sample Reference					DUP				Equip Blank				MW101				MW102				MW103	
AGS Reference																						
Depth (m)																						
Container					1000ml glass bottle (ALE220)	1plastic (ALE221)	HNO3 Filtered (ALE204)	Vial (ALE297)	1000ml glass bottle (ALE220)	1plastic (ALE221)	Vial (ALE297)	1000ml glass bottle (ALE220)	1plastic (ALE221)	HNO3 Filtered (ALE204)	Vial (ALE297)	1000ml glass bottle (ALE220)	1plastic (ALE221)	HNO3 Filtered (ALE204)	Vial (ALE297)	1000ml glass bottle (ALE220)	1plastic (ALE221)	HNO3 Filtered (ALE204)	Vial (ALE297)
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: 5					X			X				X				X				X	
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 5	X						X			X				X				X			
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 5	X						X			X				X				X			
GRO by GC-FID (W)	All	NDPs: 0 Tests: 5				X				X					X				X				X
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 5		X					X			X				X				X			
Mercury Dissolved	All	NDPs: 0 Tests: 5			X				X					X				X				X	
n-Hexane in Waters	All	NDPs: 0 Tests: 5				X				X					X				X				X
Oxygenates (W)	All	NDPs: 0 Tests: 5				X				X					X				X				X
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 5	X						X			X				X				X			
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 5	X						X			X				X				X			
TPH CWG (W)	All	NDPs: 0 Tests: 5	X						X			X				X				X			
VOC MS (W)	All	NDPs: 0 Tests: 5				X				X					X				X				X

Validated

CERTIFICATE OF ANALYSIS

SDG:	200210-11	**Client Reference:**	60608750	**Report Number:**	541873
Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

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.	DUP	Equip Blank	MW101	MW102	MW103
			Depth (m)	.	.	.	.	.
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	06/02/2020	07/02/2020	06/02/2020	06/02/2020	05/02/2020
			Sampled Time	.	.	.	.	.
			Date Received	10/02/2020	10/02/2020	10/02/2020	10/02/2020	10/02/2020
			SDG Ref	200210-11	200210-11	200210-11	200210-11	200210-11
			Lab Sample No.(s)	21655901	21655897	21655900	21655898	21655899
			AGS Reference					
Arsenic (diss.filt)	<0.5 µg/l	TM152		0.952 #	<0.5 2 #	0.986 #	6.64 #	1.38 #
Boron (diss.filt)	<10 µg/l	TM152		86.6 #	<10 2 #	86.6 #	93.6 #	49.4 #
Cadmium (diss.filt)	<0.08 µg/l	TM152		<0.08 #	<0.08 2 #	<0.08 #	<0.08 #	<0.08 #
Chromium (diss.filt)	<1 µg/l	TM152		<1 #	5.76 2 #	<1 #	<1 #	2.02 #
Cobalt (diss.filt)	<0.5 µg/l	TM152		<0.5 #	<0.5 2 #	<0.5 #	2.79 #	1.62 #
Copper (diss.filt)	<0.3 µg/l	TM152		1.85 #	0.77 2 #	5.77 #	1.11 #	2.37 #
Lead (diss.filt)	<0.2 µg/l	TM152		<0.2 #	<0.2 2 #	0.287 #	0.679 #	<0.2 #
Molybdenum (diss.filt)	<3 µg/l	TM152		<3 #	<3 2 #	<3 #	11.3 #	3.36 #
Nickel (diss.filt)	<0.4 µg/l	TM152		2.41 #	<0.4 2 #	2.21 #	3.55 #	2 #
Selenium (diss.filt)	<1 µg/l	TM152		<1 #	<1 2 #	<1 #	<1 #	1.05 #
Zinc (diss.filt)	<1 µg/l	TM152		2.13 #	3.69 2 #	4.34 #	5.1 #	4.31 #
Tin (Diss.Filt)	<1 µg/l	TM152		<1 #	<1 2 #	<1 #	3.51 #	<1 #
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 #	<0.01 2 #	<0.01 #	<0.01 #	<0.01 #
Chromium, Hexavalent	<0.03 mg/l	TM241		<0.03 #	<0.03 #	<0.03 #	<0.03 #	<0.03 #
Isopropanol-d8**	%	TM289		103	102	103	99.4	101
Bromofluorobenzene**	%	TM289		105	106	105	118	105
Ethanol	<50 µg/l	TM289		<50	<50	<50	<50	<50
tert Butanol	<10 µg/l	TM289		<10	<10	<10	<10	<10
Diisopropyl ether	<1 µg/l	TM289		<1	<1	<1	7.47	1.55
tert-butyl ethyl ether	<1 µg/l	TM289		<1	<1	<1	<1	<1
n-Hexane	<2 µg/l	TM336		<2	<2	<2	9.1	<2

CERTIFICATE OF ANALYSIS

SDG:	200210-11	**Client Reference:**	60608750	**Report Number:**	541873
Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

PAH Spec MS - Aqueous (W)

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.	DUP	Equip Blank	MW101	MW102	MW103
			Depth (m)	.	.	.	.	.
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	06/02/2020	07/02/2020	06/02/2020	06/02/2020	05/02/2020
			Sampled Time	.	.	.	.	.
			Date Received	10/02/2020	10/02/2020	10/02/2020	10/02/2020	10/02/2020
			SDG Ref	200210-11	200210-11	200210-11	200210-11	200210-11
			Lab Sample No.(s)	21655901	21655897	21655900	21655898	21655899
			AGS Reference					
Naphthalene (aq)	<0.01 µg/l	TM178		<0.01 #	<0.01 #	<0.01 #	80.3 #	<0.01 @ #
Acenaphthene (aq)	<0.005 µg/l	TM178		<0.005 #	<0.005 #	<0.005 #	0.145 #	<0.005 @ #
Acenaphthylene (aq)	<0.005 µg/l	TM178		<0.005 #	<0.005 #	<0.005 #	0.0102 #	<0.005 @ #
Fluoranthene (aq)	<0.005 µg/l	TM178		<0.005 #	<0.005 #	<0.005 #	0.0139 #	0.00909 @ #
Anthracene (aq)	<0.005 µg/l	TM178		<0.005 #	<0.005 #	<0.005 #	0.021 #	<0.005 @ #
Phenanthrene (aq)	<0.005 µg/l	TM178		<0.005 #	<0.005 #	<0.005 #	0.0841 #	<0.005 @ #
Fluorene (aq)	<0.005 µg/l	TM178		<0.005 #	<0.005 #	<0.005 #	0.213 #	<0.005 @ #
Chrysene (aq)	<0.005 µg/l	TM178		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 @ #
Pyrene (aq)	<0.005 µg/l	TM178		<0.005 #	<0.005 #	<0.005 #	0.0119 #	0.0142 @ #
Benzo(a)anthracene (aq)	<0.005 µg/l	TM178		<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 #	0.00812 @ #
Benzo(k)fluoranthene (aq)	<0.005 µg/l	TM178		<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 #	0.00549 @ #
Dibenzo(a,h)anthracene (aq)	<0.005 µg/l	TM178		<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 @ #
Indeno(1,2,3-cd)pyrene (aq)	<0.005 µg/l	TM178		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 @ #
PAH, Total Detected USEPA 16 (aq)	<0.082 µg/l	TM178		<0.082 #	<0.082 #	<0.082 #	80.8 #	<0.082 @ #

Validated

CERTIFICATE OF ANALYSIS

SDG:	200210-11	**Client Reference:**	60608750	**Report Number:**	541873
Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

SVOC MS (W) - Aqueous

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.	Depth (m)	Sample Type	Date Sampled	Sampled Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
			DUP	.	Ground Water (GW)	06/02/2020	.	10/02/2020	200210-11	21655901	
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<1 @ #								
			Equip Blank	.	Ground Water (GW)	07/02/2020	.	10/02/2020	200210-11	21655897	
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<1 #								
			MW101	.	Ground Water (GW)	06/02/2020	.	10/02/2020	200210-11	21655900	
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<1 #								
			MW102	.	Ground Water (GW)	06/02/2020	.	10/02/2020	200210-11	21655898	
2-Methylnaphthalene (aq)	<1 µg/l	TM176	8.09 #								
			MW103	.	Ground Water (GW)	05/02/2020	.	10/02/2020	200210-11	21655899	
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<10 @ #								

Validated

CERTIFICATE OF ANALYSIS

SDG:	200210-11	**Client Reference:**	60608750	**Report Number:**	541873
Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

TPH CWG (W)

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.	DUP	Equip Blank	MW101	MW102	MW103
			Depth (m)	.	.	.	.	.
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	06/02/2020	07/02/2020	06/02/2020	06/02/2020	05/02/2020
			Sampled Time	.	.	.	.	.
			Date Received	10/02/2020	10/02/2020	10/02/2020	10/02/2020	10/02/2020
			SDG Ref	200210-11	200210-11	200210-11	200210-11	200210-11
			Lab Sample No.(s)	21655901	21655897	21655900	21655898	21655899
			AGS Reference					
GRO Surrogate % recovery**	%	TM245		79	85	91	89	84
Aliphatics >C5-C6	<10 µg/l	TM245		<10	<10	<10	305	<10
Aliphatics >C6-C8	<10 µg/l	TM245		<10	<10	<10	634	<10
Aliphatics >C8-C10	<10 µg/l	TM245		<10	<10	<10	808	<10
Aliphatics >C10-C12	<10 µg/l	TM245		<10	<10	<10	572	<10
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174		<10	<10	<10	<10	<10
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174		<10	<10	<10	<10	<10
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174		<10	<10	<10	<10	<10
Aromatics >EC5-EC7	<10 µg/l	TM245		<10	<10	<10	904	<10
Aromatics >EC7-EC8	<10 µg/l	TM245		<10	<10	<10	224	<10
Aromatics >EC8-EC10	<10 µg/l	TM245		<10	<10	<10	2280	<10
Aromatics >EC10-EC12	<10 µg/l	TM245		<10	<10	<10	381	<10
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174		<10	<10	<10	53	<10
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174		<10	<10	<10	<10	<10
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174		<10	<10	<10	<10	<10
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM174		<10	<10	<10	6160	<10

Validated

CERTIFICATE OF ANALYSIS

SDG:	200210-11	**Client Reference:**	60608750	**Report Number:**	541873
Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

VOC MS (W)

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.	DUP	Equip Blank	MW101	MW102	MW103
			Depth (m)	.	.	.	.	.
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	06/02/2020	07/02/2020	06/02/2020	06/02/2020	05/02/2020
			Sampled Time	.	.	.	.	.
			Date Received	10/02/2020	10/02/2020	10/02/2020	10/02/2020	10/02/2020
			SDG Ref	200210-11	200210-11	200210-11	200210-11	200210-11
			Lab Sample No.(s)	21655901	21655897	21655900	21655898	21655899
			AGS Reference					
Toluene-d8**	%	TM208		98	98.2	98	85.7	96.8
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		<1 #	<1 #	<1 #	30.8 #	16.4 #
Benzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	940 #	<1 #
Toluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	181 #	<1 #
Ethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	932 #	<1 #
m,p-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	768 #	<1 #
o-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	179 #	<1 #
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	1.37 #

CERTIFICATE OF ANALYSIS

SDG:	200210-11	**Client Reference:**	60608750	**Report Number:**	541873
Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

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
TM289		Determination of Oxygenates in Waters by Headspace/GC-MS
TM336		

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:	200210-11	**Client Reference:**	60608750	**Report Number:**	541873
Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

Test Completion Dates

Lab Sample No(s)	21655901	21655897	21655900	21655898	21655899
Customer Sample Ref.	DUP	Equip Blank	MW101	MW102	MW103
AGS Ref.					
Depth					
Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Dissolved Metals by ICP-MS	13-Feb-2020	13-Feb-2020	13-Feb-2020	13-Feb-2020	13-Feb-2020
EPH CWG (Aliphatic) Aqueous GC (W)	15-Feb-2020	15-Feb-2020	15-Feb-2020	15-Feb-2020	15-Feb-2020
EPH CWG (Aromatic) Aqueous GC (W)	15-Feb-2020	15-Feb-2020	15-Feb-2020	15-Feb-2020	15-Feb-2020
GRO by GC-FID (W)	14-Feb-2020	14-Feb-2020	14-Feb-2020	17-Feb-2020	14-Feb-2020
Hexavalent Chromium (w)	13-Feb-2020	13-Feb-2020	13-Feb-2020	13-Feb-2020	13-Feb-2020
Mercury Dissolved	12-Feb-2020	12-Feb-2020	13-Feb-2020	13-Feb-2020	13-Feb-2020
n-Hexane in Waters	14-Feb-2020	14-Feb-2020	14-Feb-2020	14-Feb-2020	14-Feb-2020
Oxygenates (W)	12-Feb-2020	12-Feb-2020	12-Feb-2020	12-Feb-2020	12-Feb-2020
PAH Spec MS - Aqueous (W)	17-Feb-2020	17-Feb-2020	17-Feb-2020	17-Feb-2020	17-Feb-2020
SVOC MS (W) - Aqueous	18-Feb-2020	18-Feb-2020	18-Feb-2020	18-Feb-2020	18-Feb-2020
TPH CWG (W)	15-Feb-2020	15-Feb-2020	15-Feb-2020	17-Feb-2020	15-Feb-2020
VOC MS (W)	14-Feb-2020	14-Feb-2020	14-Feb-2020	14-Feb-2020	14-Feb-2020

CERTIFICATE OF ANALYSIS

SDG:	200210-11	**Client Reference:**	60608750	**Report Number:**	541873
Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

ASSOCIATED AQC DATA

Dissolved Metals by ICP-MS

Component	Method Code	QC 2127
Aluminium	TM152	**104.67** 90.78 : 110.89
Antimony	TM152	**100.0** 77.22 : 119.42
Arsenic	TM152	**99.83** 86.77 : 107.67
Barium	TM152	**98.83** 87.86 : 110.23
Beryllium	TM152	**101.0** 86.19 : 112.98
Bismuth	TM152	**100.17** 84.06 : 106.46
Borate	TM152	**99.38** 88.00 : 112.00
Boron	TM152	**99.67** 83.92 : 114.90
Cadmium	TM152	**100.5** 88.89 : 106.69
Calcium	TM152	**101.33** 80.24 : 117.95
Chromium	TM152	**101.5** 83.22 : 110.16
Cobalt	TM152	**102.33** 82.49 : 112.36
Copper	TM152	**103.67** 83.14 : 113.00
Iron	TM152	**103.33** 88.40 : 109.24
Lead	TM152	**100.5** 83.71 : 109.58
Lithium	TM152	**101.0** 84.50 : 114.28
Magnesium	TM152	**101.33** 87.56 : 114.57
Manganese	TM152	**101.0** 88.63 : 107.13
Molybdenum	TM152	**100.33** 85.53 : 107.42
Nickel	TM152	**101.83** 88.05 : 106.42
Phosphorus	TM152	**97.33** 82.76 : 107.72
Potassium	TM152	**98.0** 92.43 : 107.51
Selenium	TM152	**99.33** 85.61 : 111.03
Silver	TM152	**98.67** 86.73 : 107.07
Sodium	TM152	**102.67** 91.84 : 109.17
Strontium	TM152	**99.0** 83.77 : 107.87

Dissolved Metals by ICP-MS

		QC 2127
Tellurium	TM152	**96.0** 82.83 : 104.73
Thallium	TM152	**90.83** 77.47 : 113.87
Tin	TM152	**102.67** 91.00 : 109.00
Titanium	TM152	**101.33** 87.29 : 108.31
Tungsten	TM152	**103.33** 68.27 : 122.97
Uranium	TM152	**98.83** 82.46 : 105.16
Vanadium	TM152	**101.17** 88.43 : 114.30
Zinc	TM152	**103.67** 85.57 : 114.31

EPH CWG (Aliphatic) Aqueous GC (W)

Component	Method Code	QC 2198	QC 2178
Total Aliphatics >C10-C40	TM174	**101.49** 69.79 : 134.39	**104.79** 68.59 : 134.82

EPH CWG (Aromatic) Aqueous GC (W)

Component	Method Code	QC 2132	QC 2188
Total Aromatics >EC10-EC40	TM174	**95.37** 59.92 : 128.54	**88.29** 60.75 : 129.09

GRO by GC-FID (W)

Component	Method Code	QC 2194	QC 2142
Benzene by GC	TM245	**107.0** 76.38 : 121.90	**104.0** 81.54 : 119.70
Ethylbenzene by GC	TM245	**107.0** 74.02 : 123.14	**102.5** 80.99 : 121.09
m & p Xylene by GC	TM245	**109.0** 74.03 : 123.21	**104.25** 82.77 : 123.19
MTBE GC-FID	TM245	**103.5** 76.82 : 121.46	**102.5** 80.06 : 123.27
o Xylene by GC	TM245	**109.0** 74.37 : 122.75	**105.0** 84.26 : 121.50
QC	TM245	**99.88** 63.32 : 125.20	**110.41** 76.13 : 145.89
Toluene by GC	TM245	**109.0** 75.75 : 124.83	**105.5** 82.78 : 121.99

Hexavalent Chromium (w)

CERTIFICATE OF ANALYSIS

SDG:	200210-11	**Client Reference:**	60608750	**Report Number:**	541873
Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

Hexavalent Chromium (w)

Component	Method Code	QC 2116
Hexavalent Chromium	TM241	**101.4** 94.17 : 106.17

Mercury Dissolved

Component	Method Code	QC 2193	QC 2175
Mercury Dissolved (CVAF)	TM183	**86.2** 75.00 : 111.00	**88.7** 75.00 : 111.00

n-Hexane in Waters

Component	Method Code	QC 2150
n-Hexane	TM336	**103.5** 64.07 : 128.75

Oxygenates (W)

Component	Method Code	QC 2122
Diisopropyl ether	TM289	**109.5** 80.97 : 117.54
Ethanol	TM289	**99.2** 78.52 : 121.55
tert Butanol	TM289	**100.0** 82.70 : 113.90
tert-amyl methyl ether	TM289	**112.0** 78.92 : 124.29
tert-butyl ethyl ether	TM289	**110.5** 78.17 : 124.34
tert-butyl methyl ether	TM289	**111.0** 81.54 : 119.46

PAH Spec MS - Aqueous (W)

Component	Method Code	QC 2159	QC 2101
Acenaphthene by GCMS	TM178	**109.2** 97.60 : 116.80	**101.2** 97.60 : 116.80
Acenaphthylene by GCMS	TM178	**105.2** 89.20 : 113.20	**96.0** 89.20 : 113.20
Anthracene by GCMS	TM178	**98.0** 92.40 : 116.40	**96.8** 92.40 : 116.40
Benz(a)anthracene by GCMS	TM178	**96.0** 84.40 : 110.80	**92.4** 84.40 : 110.80
Benzo(a)pyrene by GCMS	TM178	**95.6** 87.20 : 106.40	**96.4** 87.20 : 106.40

PAH Spec MS - Aqueous (W)

		QC 2159	QC 2101
Benzo(b)fluoranthene by GCMS	TM178	**94.8** 84.80 : 111.20	**91.6** 84.80 : 111.20
Benzo(ghi)perylene by GCMS	TM178	**101.6** 93.60 : 112.80	**100.4** 93.60 : 112.80
Benzo(k)fluoranthene by GCMS	TM178	**104.0** 90.40 : 119.20	**99.2** 90.40 : 119.20
Chrysene by GCMS	TM178	**104.8** 96.80 : 113.60	**102.4** 96.80 : 113.60
Dibenzo(ah)anthracene by GCMS	TM178	**102.4** 88.00 : 112.00	**96.4** 88.00 : 112.00
Fluoranthene by GCMS	TM178	**105.6** 93.49 : 118.20	**104.0** 93.49 : 118.20
Fluorene by GCMS	TM178	**100.8** 94.39 : 118.66	**98.8** 94.39 : 118.66
Indeno(123cd)pyrene by GCMS	TM178	**110.0** 90.40 : 114.40	**95.2** 90.40 : 114.40
Naphthalene by GCMS	TM178	**112.8** 94.00 : 115.60	**101.2** 94.00 : 115.60
Phenanthrene by GCMS	TM178	**102.8** 94.80 : 114.00	**98.4** 94.80 : 114.00
Pyrene by GCMS	TM178	**111.2** 96.40 : 115.60	**110.0** 96.40 : 115.60

SVOC MS (W) - Aqueous

Component	Method Code	QC 2125	QC 2178
4-Bromophenylphenylether	TM176	**75.28** 58.88 : 100.16	**72.08** 58.88 : 100.16
Benzo(a)anthracene	TM176	**83.2** 58.56 : 106.08	**81.6** 58.56 : 106.08
Benzo(a)pyrene	TM176	**78.64** 55.84 : 106.24	**77.76** 55.84 : 106.24
Butylbenzyl phthalate	TM176	**90.4** 45.10 : 118.90	**93.6** 45.10 : 118.90
Hexachlorobutadiene	TM176	**69.36** 49.76 : 92.00	**68.88** 49.76 : 92.00
Naphthalene	TM176	**81.6** 65.68 : 110.32	**82.4** 65.68 : 110.32
Nitrobenzene	TM176	**80.0** 60.56 : 102.80	**76.72** 60.56 : 102.80
Phenol	TM176	**44.16** 39.44 : 60.56	**43.36** 39.44 : 60.56

VOC MS (W)

Component	Method Code	QC 2157	QC 2166
1,1,1,2-Tetrachloroethane	TM208	**95.5** 81.85 : 113.65	**101.5** 78.82 : 115.90
1,1,1-Trichloroethane	TM208	**95.0** 85.82 : 113.33	**98.5** 79.61 : 114.35
1,1-Dichloroethane	TM208	**113.5** 79.60 : 118.57	**94.5** 79.99 : 118.57
1,2-Dichloroethane	TM208	**95.0** 77.72 : 133.33	**96.5** 79.35 : 124.02

VOC MS (W)

		QC 2157	QC 2166
2-Chlorotoluene	TM208	**96.5** 82.89 : 116.61	**98.0** 79.67 : 114.74
4-Chlorotoluene	TM208	**96.5** 79.46 : 115.88	**99.0** 80.15 : 113.42
Benzene	TM208	**97.5** 81.22 : 118.60	**97.0** 84.37 : 119.68
Bromomethane	TM208	**119.0** 79.31 : 116.90	**96.0** 68.41 : 115.99
Carbontetrachloride	TM208	**95.5** 86.16 : 119.10	**100.0** 79.73 : 118.91
Chlorobenzene	TM208	**96.5** 87.25 : 116.65	**98.5** 89.49 : 115.83
Chloroform	TM208	**93.0** 83.01 : 121.64	**98.0** 82.31 : 120.71
Chloromethane	TM208	**108.0** 65.28 : 130.05	**86.5** 62.46 : 124.98
Cis-1,2-Dichloroethene	TM208	**94.5** 85.03 : 112.75	**97.0** 83.75 : 118.91
Dichloromethane	TM208	**116.0** 78.23 : 120.65	**96.0** 81.20 : 120.83
Ethylbenzene	TM208	**92.0** 79.55 : 110.51	**94.0** 80.54 : 112.31
Hexachlorobutadiene	TM208	**80.5** 67.63 : 111.28	**91.5** 72.23 : 110.63
o-Xylene	TM208	**94.0** 85.06 : 114.91	**98.0** 85.65 : 116.64
p/m-Xylene	TM208	**94.0** 84.45 : 113.50	**96.75** 83.09 : 113.86
Tert-butyl methyl ether	TM208	**101.5** 70.18 : 125.95	**88.0** 70.94 : 119.66
Tetrachloroethene	TM208	**97.5** 80.43 : 115.53	**101.5** 84.41 : 112.73
Toluene	TM208	**97.0** 79.88 : 116.83	**96.0** 81.59 : 111.56
Trichloroethene	TM208	**95.5** 82.30 : 112.45	**99.0** 79.53 : 112.32
Vinyl Chloride	TM208	**115.5** 71.34 : 122.34	**93.5** 68.68 : 119.35

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

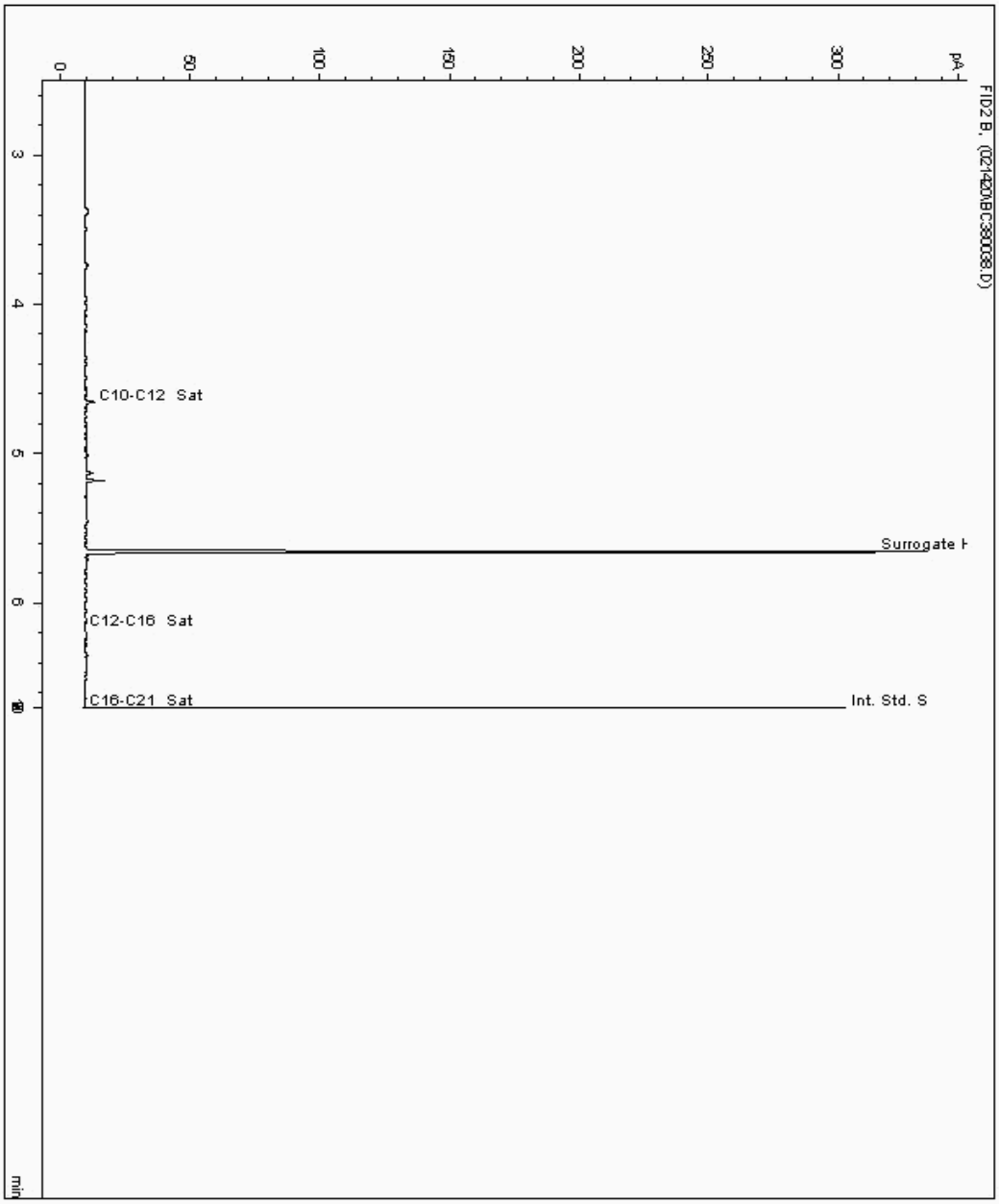
SDG:	200210-11	**Client Reference:**	60608750	**Report Number:**	541873
Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) **Sample No :** 21660086 **Sample ID :** MW103 **Depth :**

Speciated TPH - SATS (C12 - C40)

Sample Identity: 20338314-
Date Acquired : 15/02/20 04:00:32 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025



CERTIFICATE OF ANALYSIS

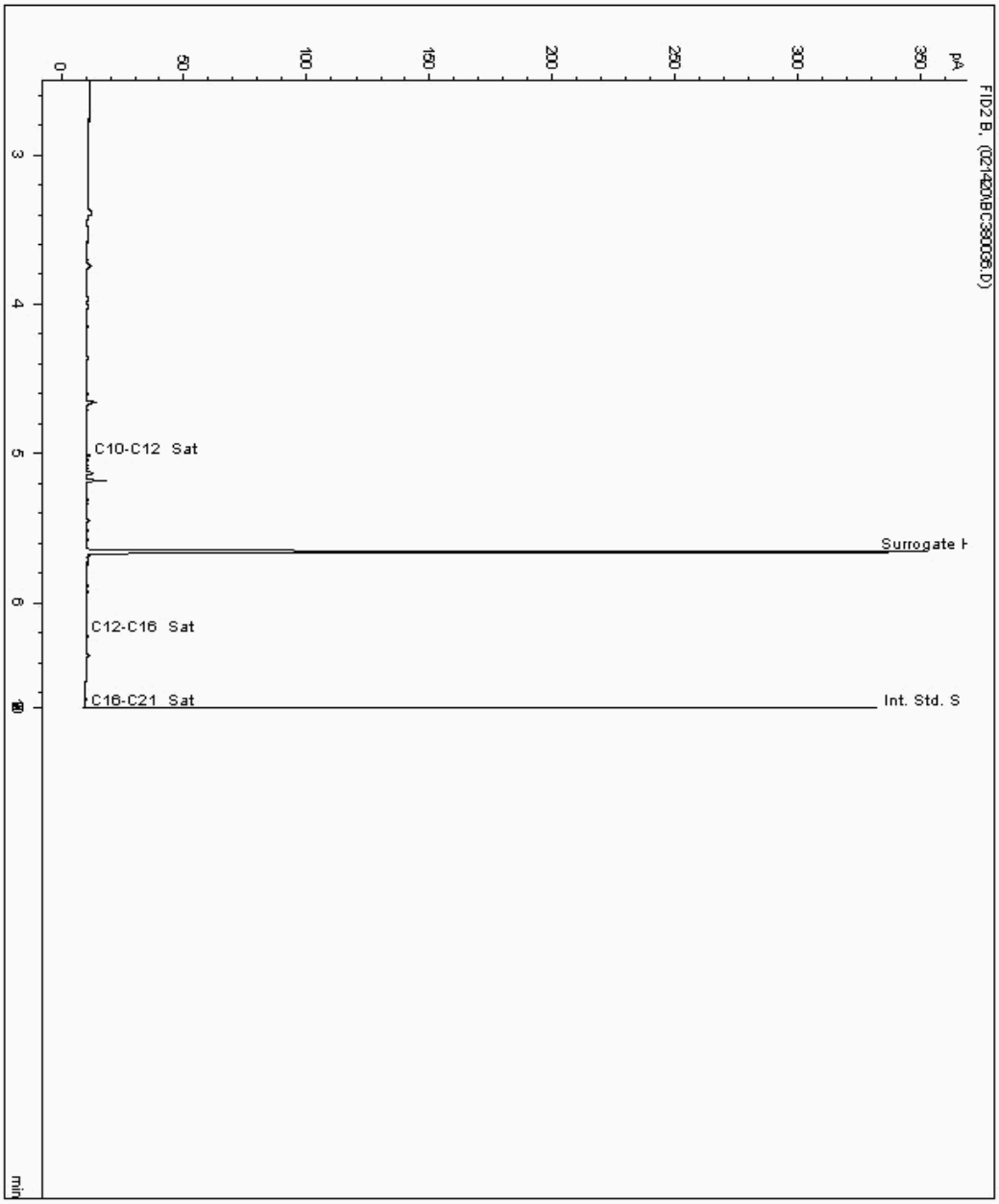
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Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) **Sample No :** 21660091 **Depth :**
Sample ID : DUP

Speciated TPH - SATS (C12 - C40)

Sample Identity: 20338336-
Date Acquired : 15/02/20 03:14:29 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025



CERTIFICATE OF ANALYSIS

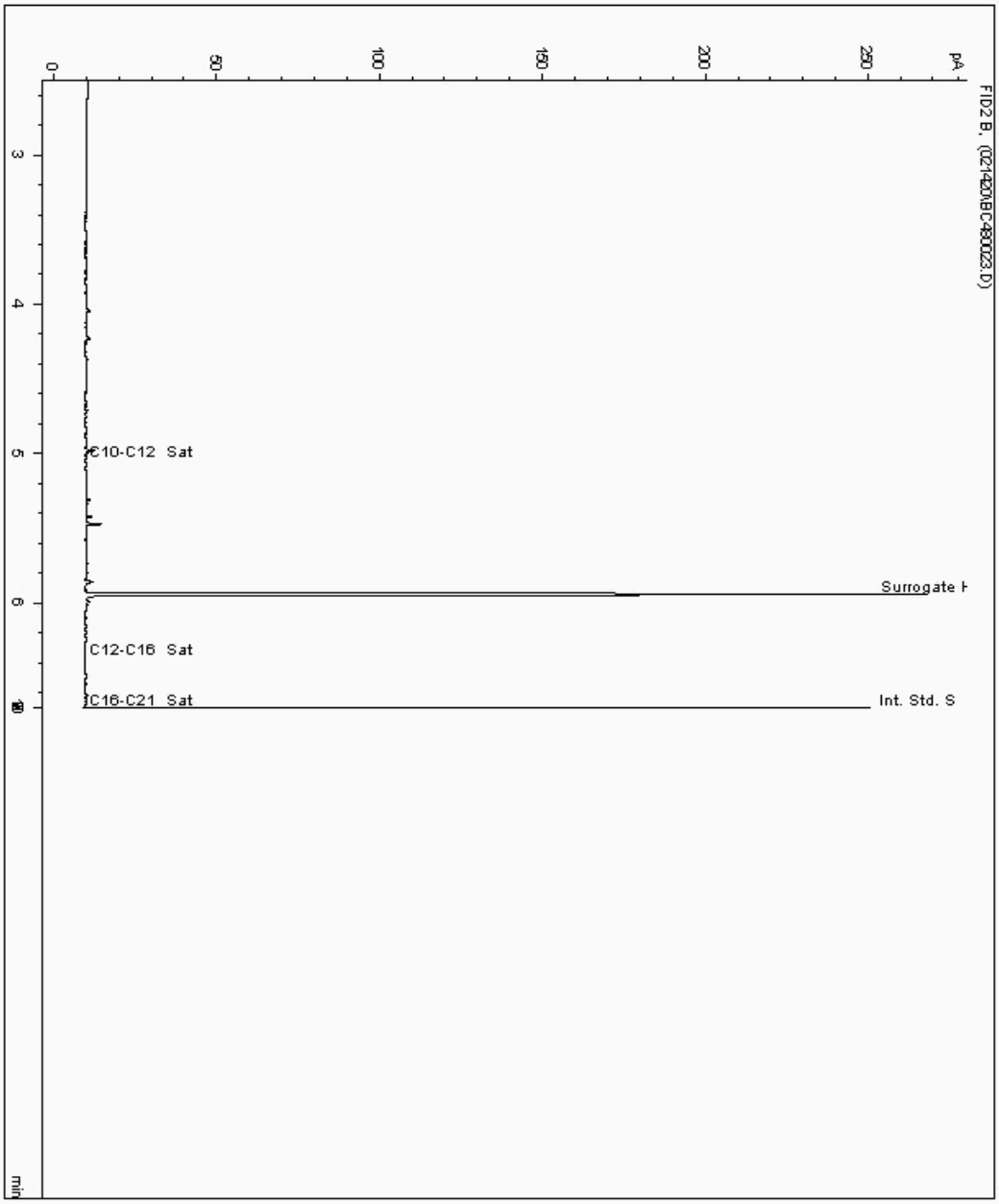
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Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) **Sample No :** 21660111 **Sample ID :** MW101 **Depth :**

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 20338325-
Date Acquired : 15/02/2020 01:13:30 PM
Units : ppb
Dilution : SE MW101[] ->
CF : 1
Multiplier : 0.026



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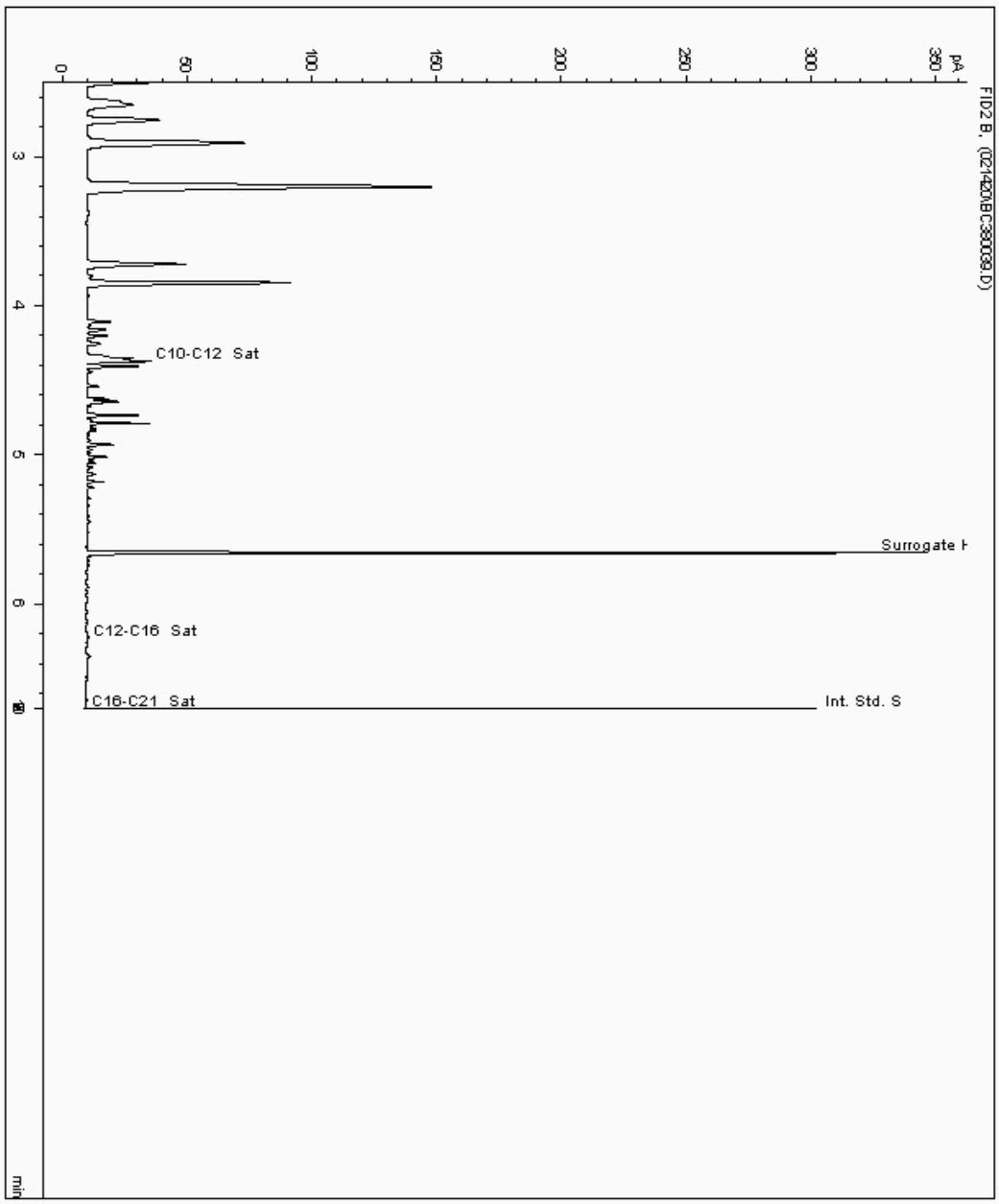
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Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) **Sample No :** 21660114 **Sample ID :** MW102 **Depth :**

Speciated TPH - SATS (C12 - C40)

Sample Identity: 20338303-
Date Acquired : 15/02/20 04:23:29 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025



CERTIFICATE OF ANALYSIS

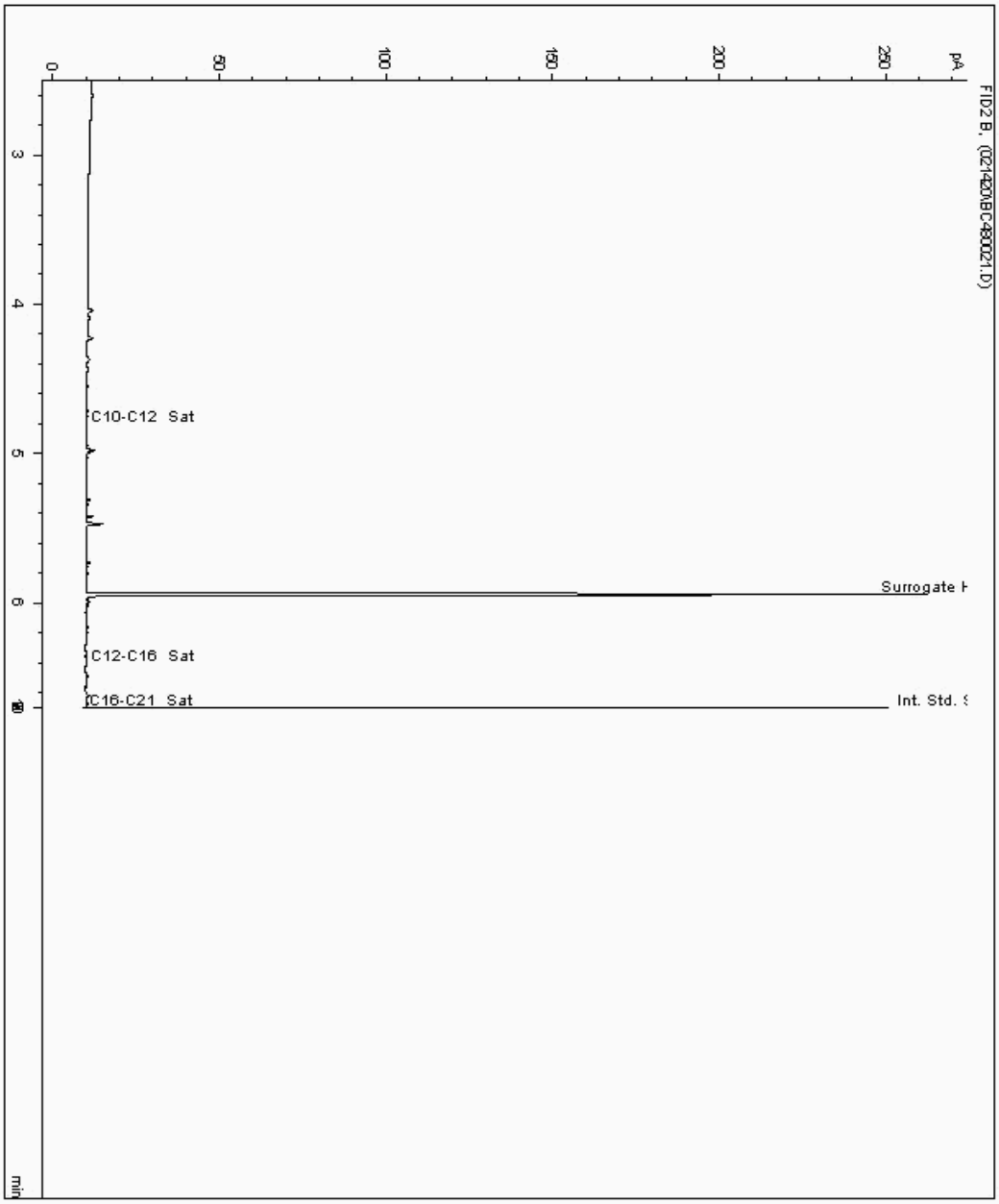
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Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) **Sample No :** 21660120 **Depth :**
Sample ID : Equip Blank

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 20338292-
Date Acquired : 15/02/2020 00:28:21 PM
Units : ppb
Dilution : SE EQUIP BLANK[ ] ->
CF : 1
Multiplier : 0.026



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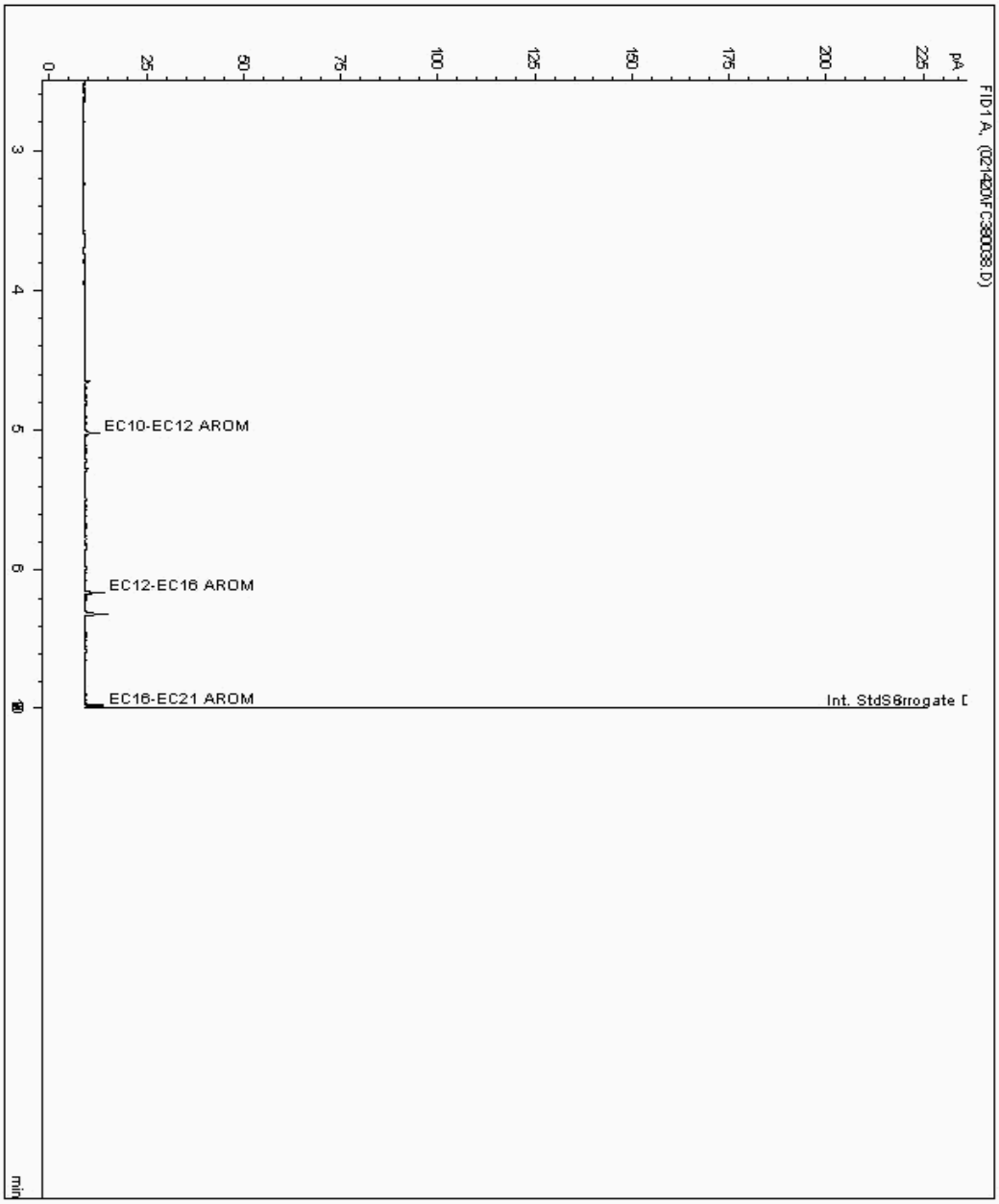
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Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) **Sample No :** 21660086 **Sample ID :** MW103 **Depth :**

Speciated TPH - AROM (C12 - C40)

Sample Identity: 20338315-
Date Acquired : 15/02/20 04:00:32 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025



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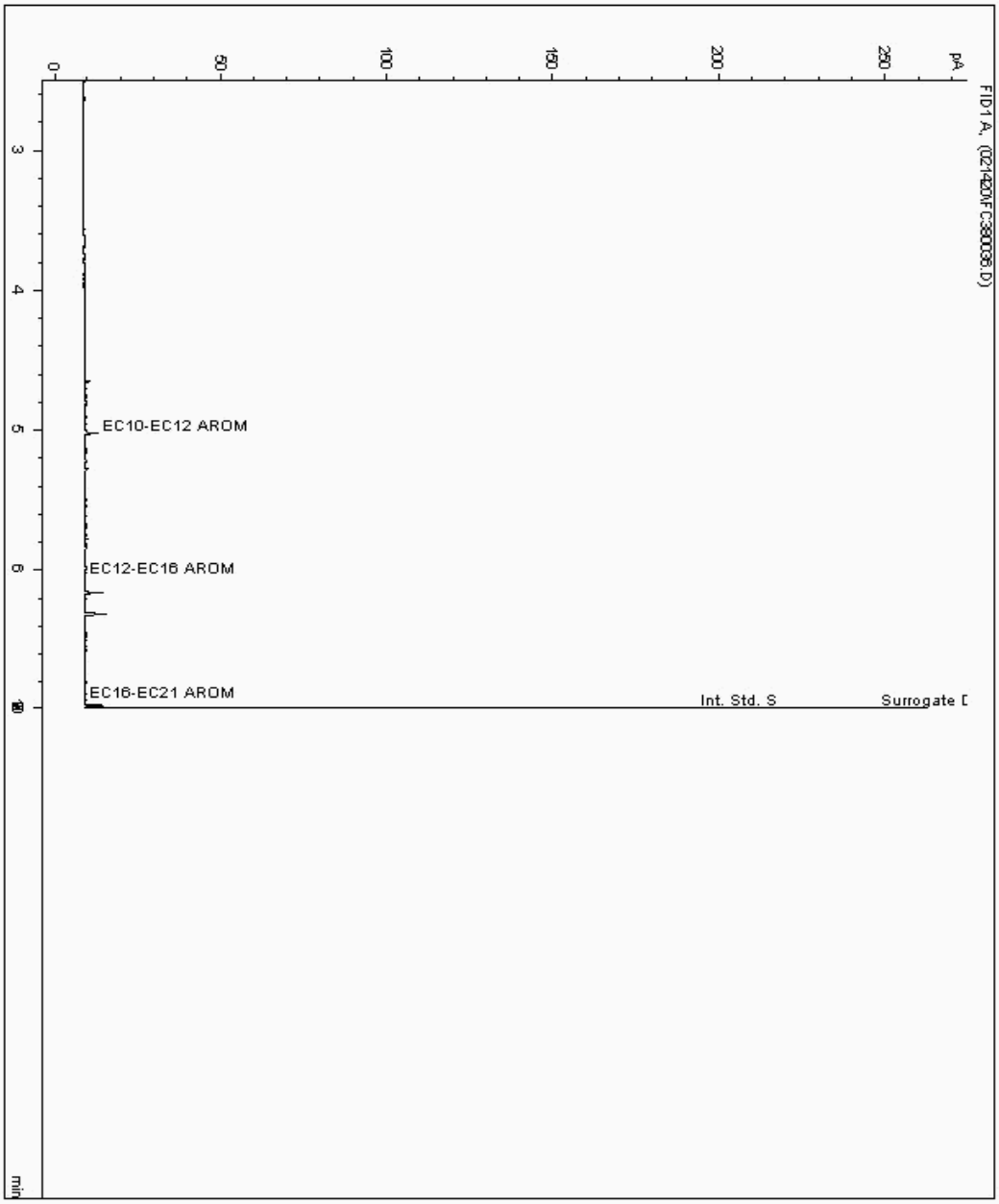
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Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) **Sample No :** 21660091 **Sample ID :** DUP **Depth :**

Speciated TPH - AROM (C12 - C40)

Sample Identity: 20338337-
Date Acquired : 15/02/20 03:14:29 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025



CERTIFICATE OF ANALYSIS

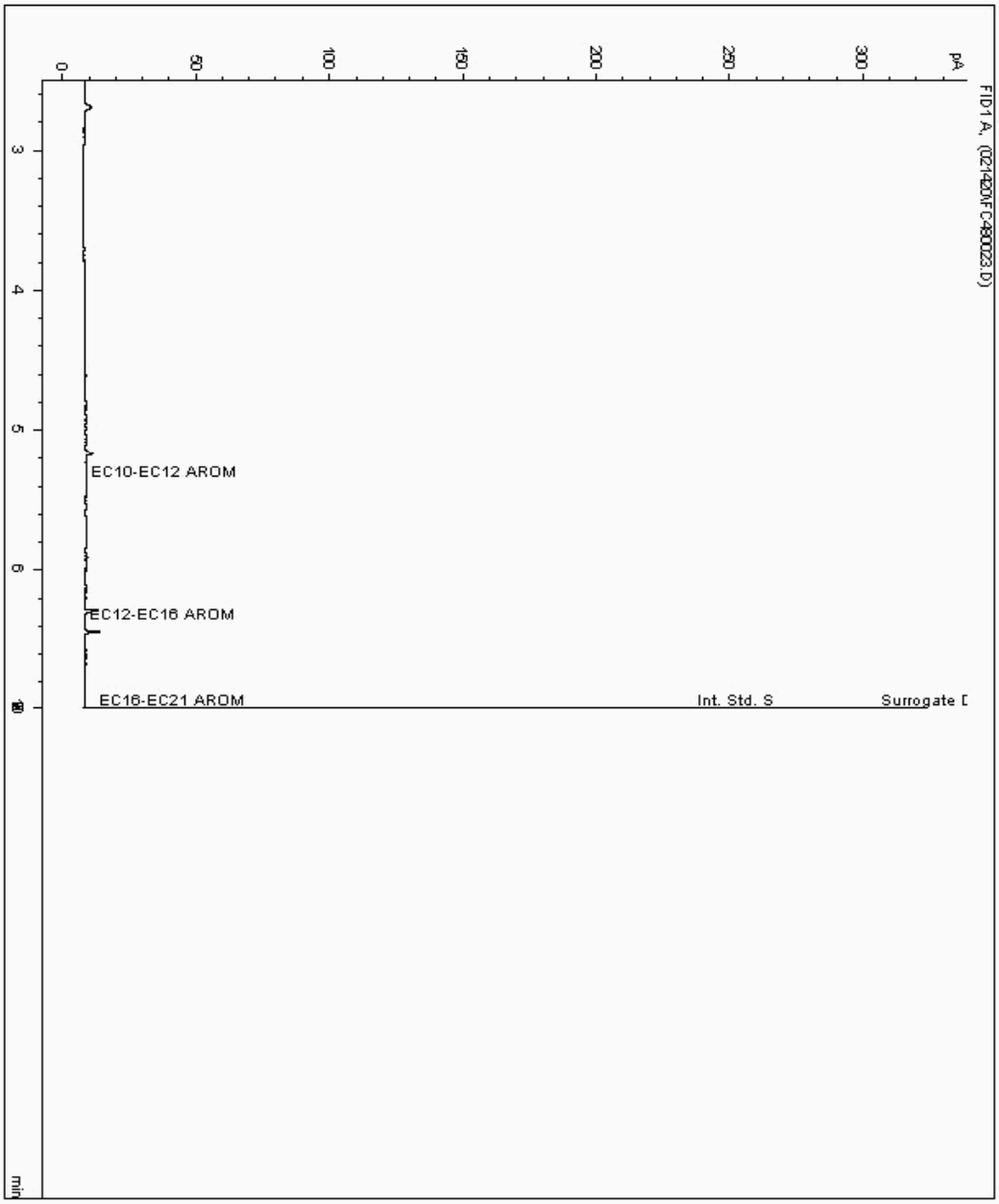
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Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) **Sample No :** 21660111 **Sample ID :** MW101 **Depth :**

Alcontrol/Geochem Analytical Services
Speciated TPH - AROM (C12 - C40)

Sample Identity: 20338326-
Date Acquired : 15/02/2020 01:13:30 PM
Units : ppb
Dilution : SE MW101[] ->
CF : 1
Multiplier : 0.026



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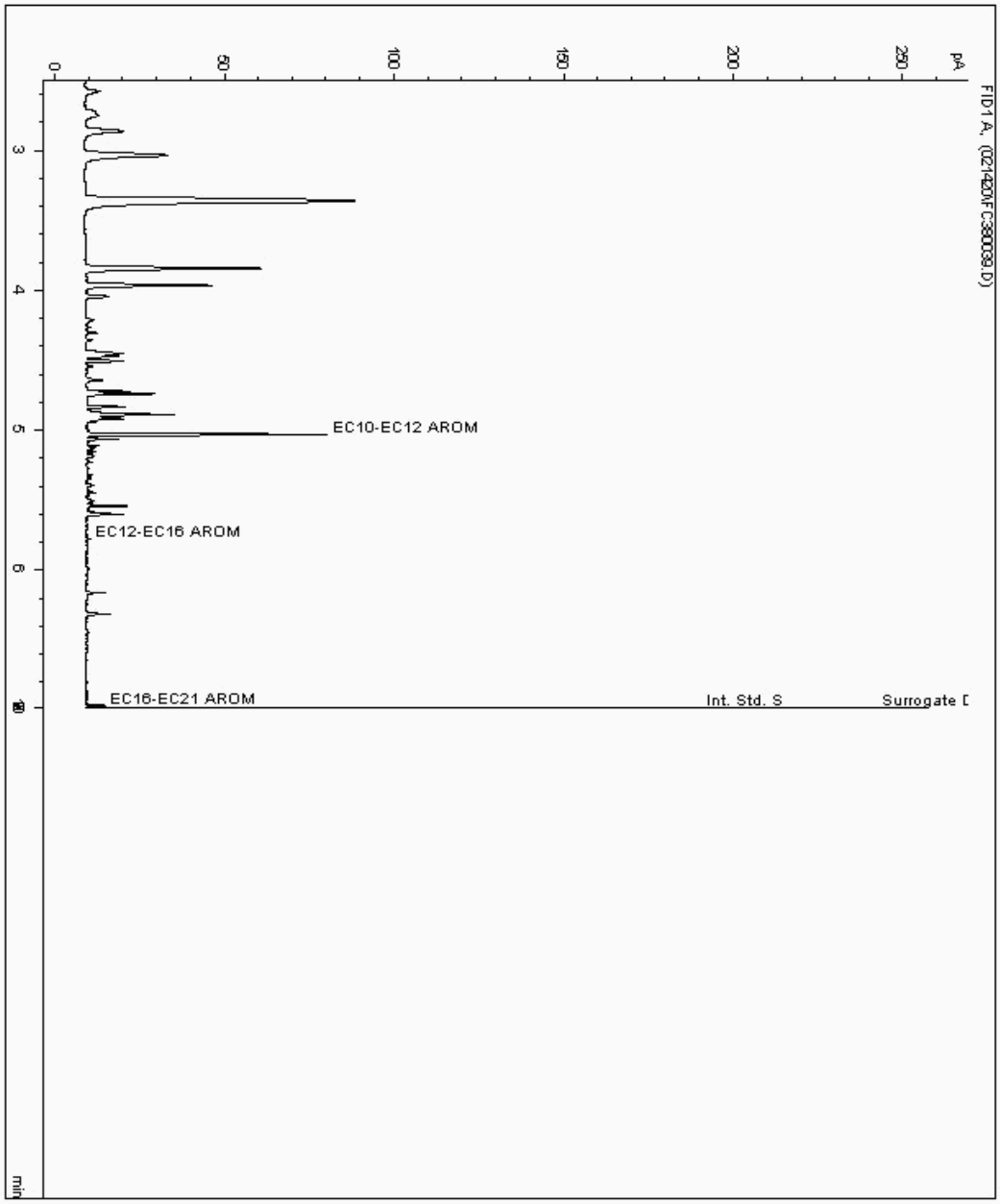
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Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) **Sample No :** 21660114 **Sample ID :** MW102 **Depth :**

Speciated TPH - AROM (C12 - C40)

Sample Identity: 20338304-
Date Acquired : 15/02/20 04:23:29 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025



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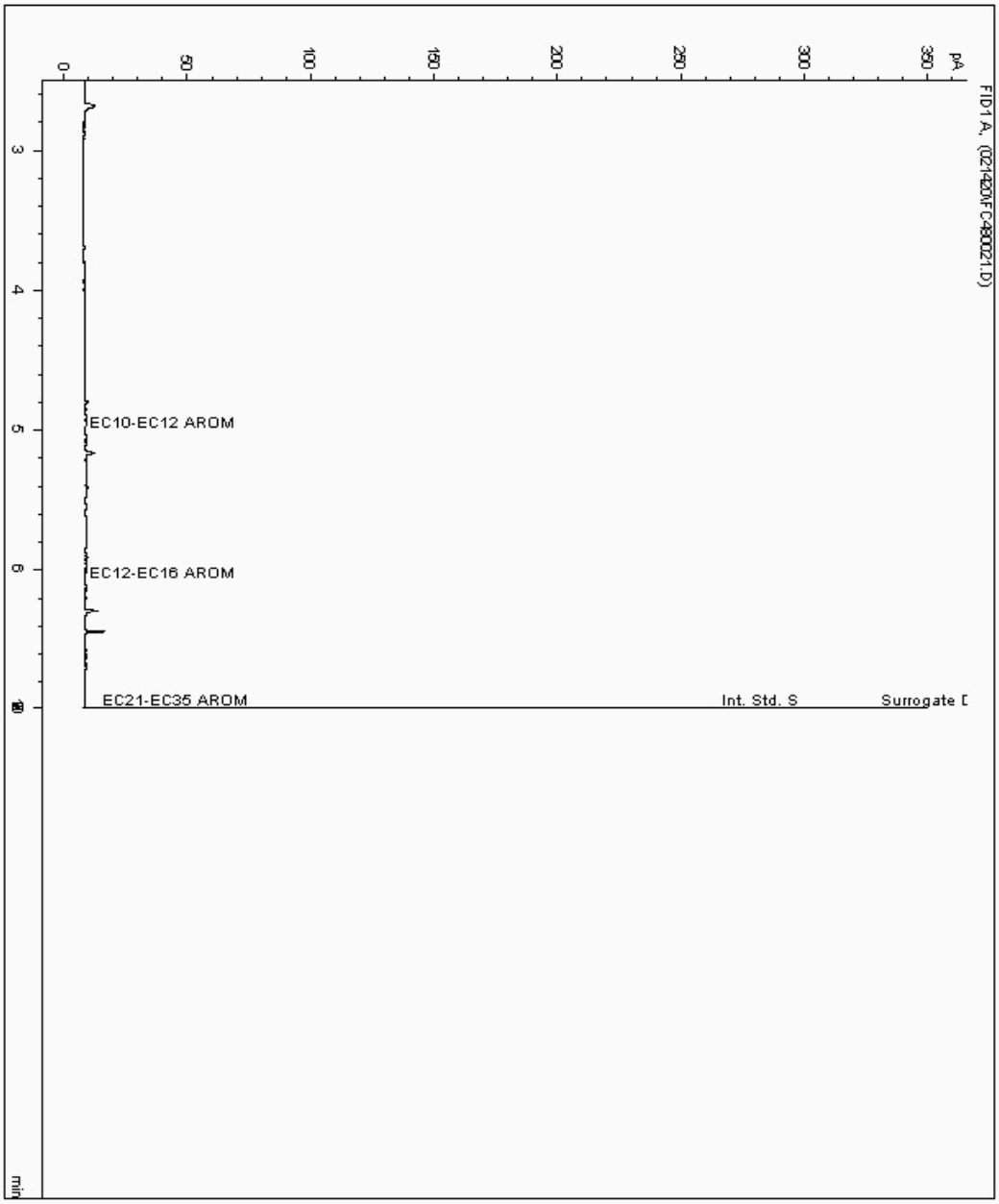
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Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) **Sample No :** 21660120 **Depth :**
Sample ID : Equip Blank

Alcontrol/Geochem Analytical Services
Speciated TPH - AROM (C12 - C40)

Sample Identity: 20338293-
Date Acquired : 15/02/2020 00:28:21 PM
Units : ppb
Dilution : SE EQUIP BLANK[ ] ->
CF : 1
Multiplier : 0.026



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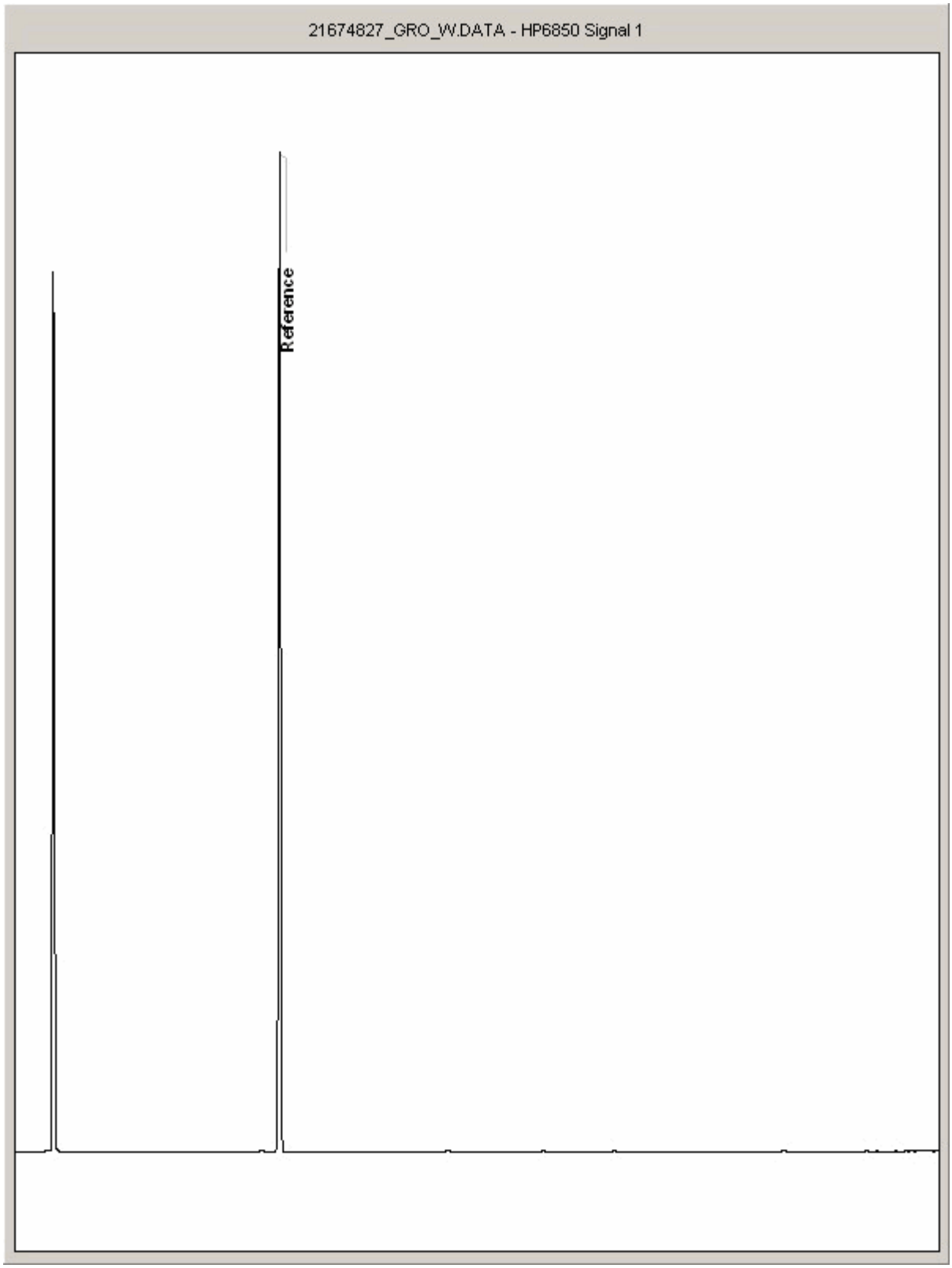
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Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 21674827
Sample ID : Equip Blank

Depth :



CERTIFICATE OF ANALYSIS

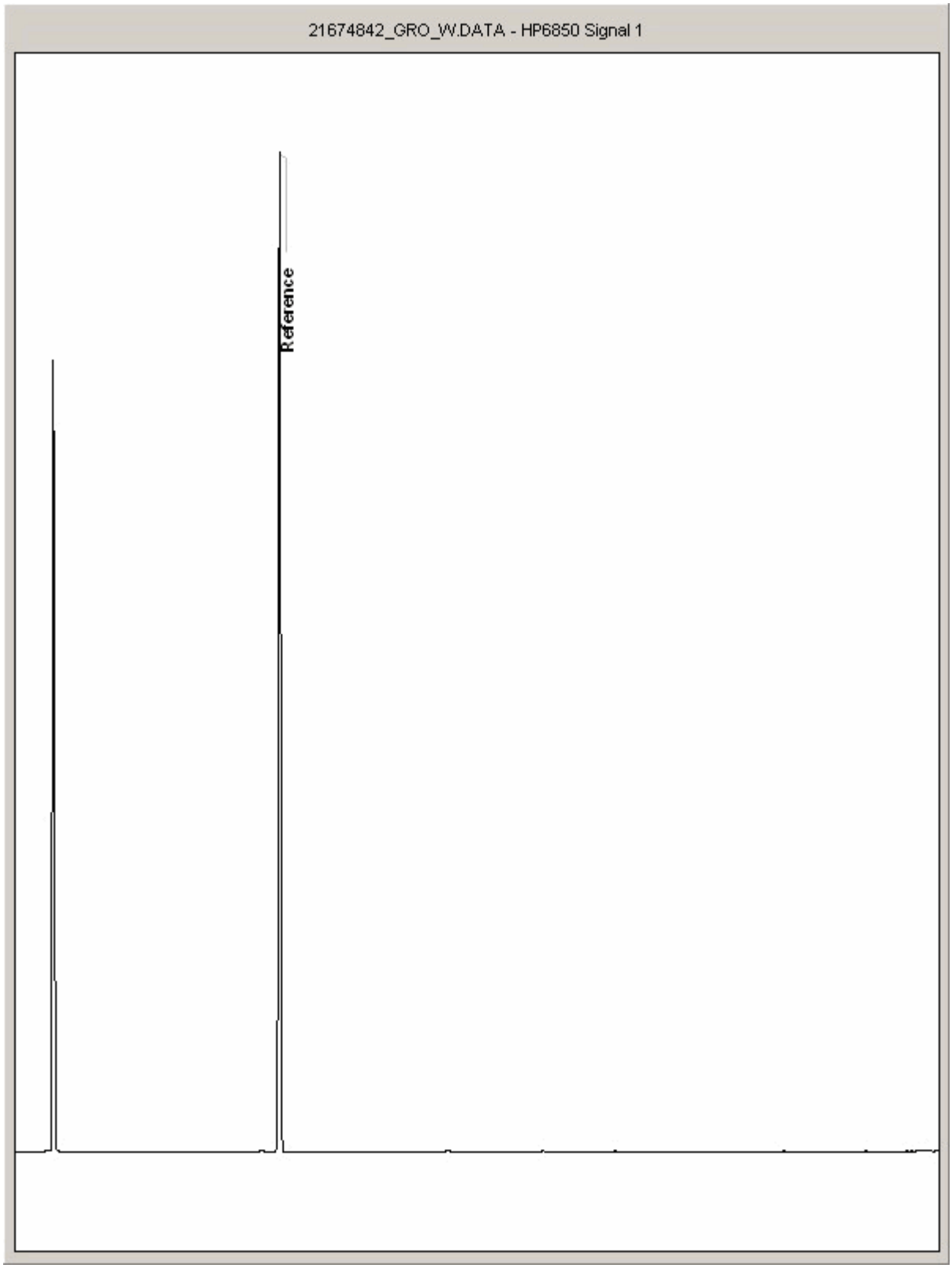
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Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 21674842
Sample ID : MW101

Depth :



CERTIFICATE OF ANALYSIS

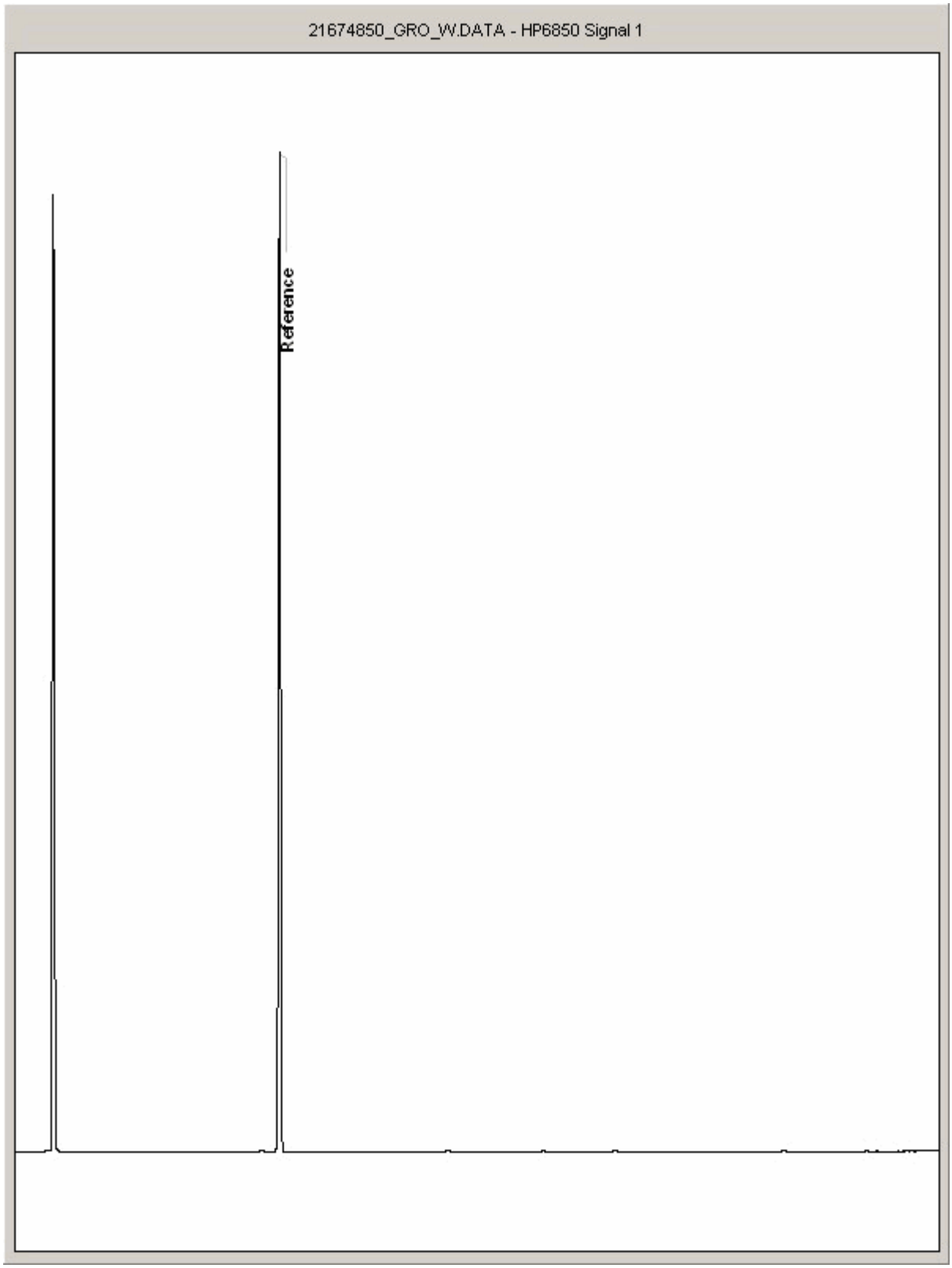
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Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 21674850
Sample ID : DUP

Depth :



CERTIFICATE OF ANALYSIS

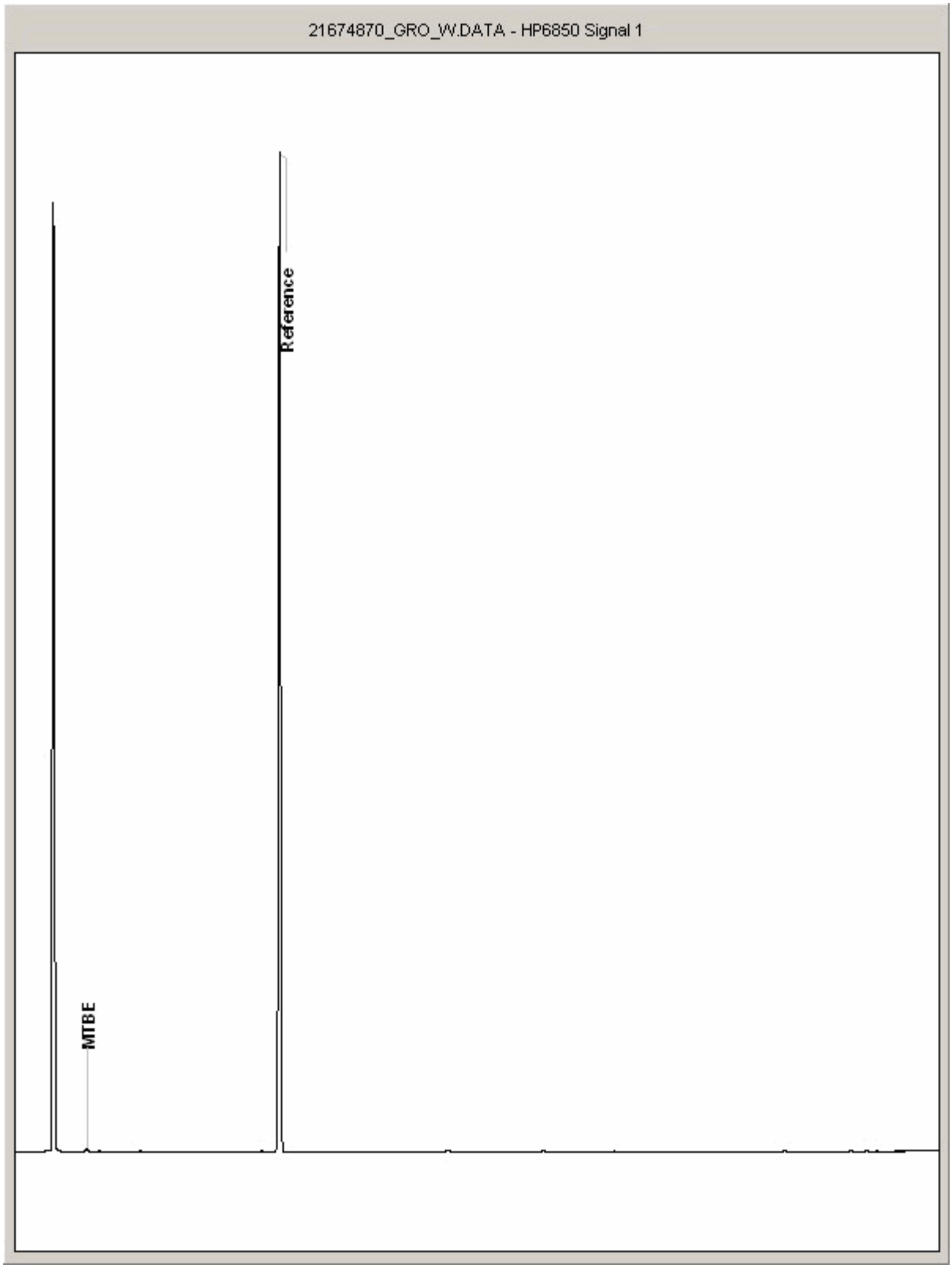
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Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 21674870
Sample ID : MW103

Depth :



CERTIFICATE OF ANALYSIS

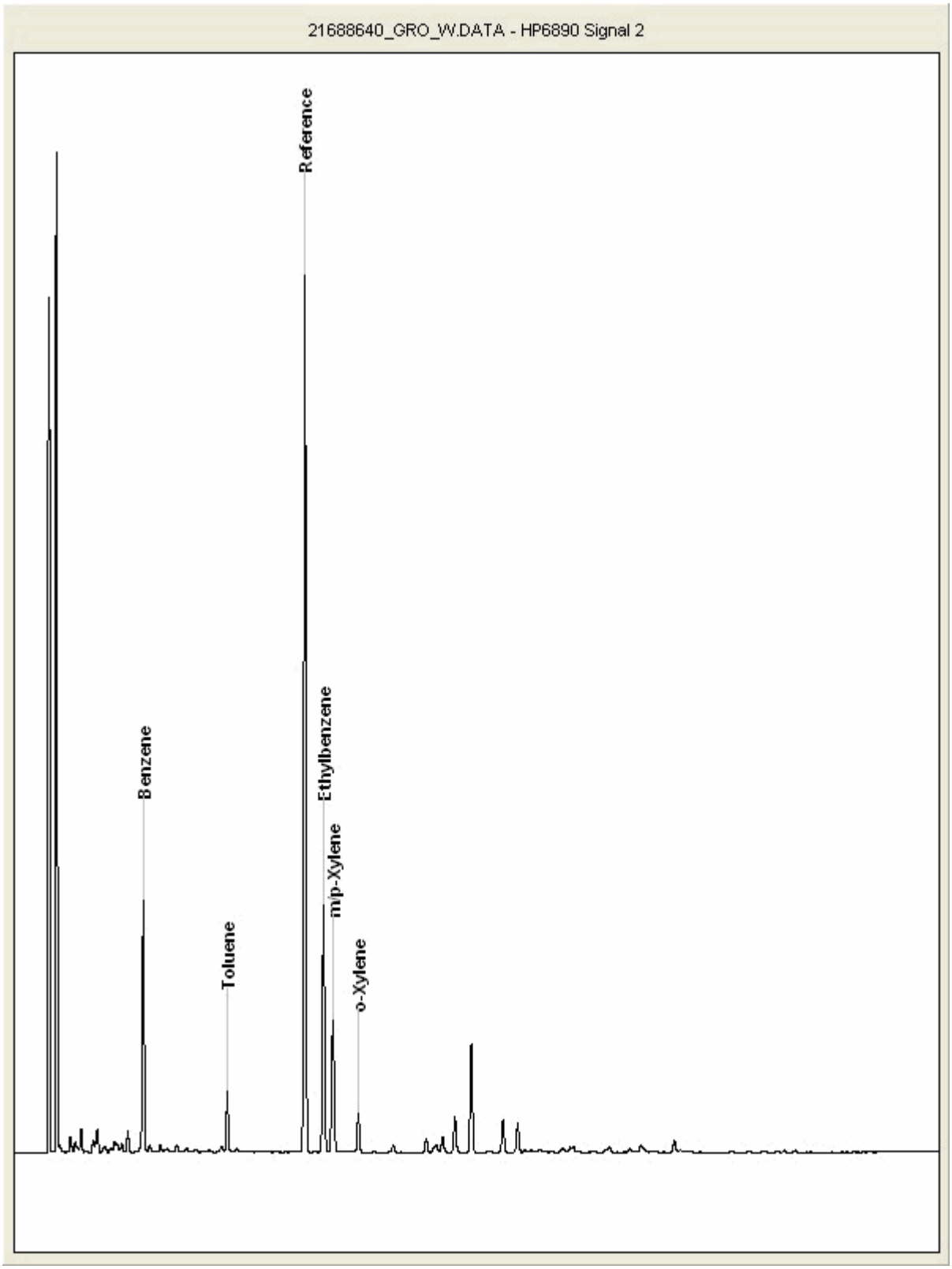
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Location:	Shell Whitemare Pool	**Order Number:**	60608760	**Superseded Report:**	541679

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 21688640
Sample ID : MW102

Depth :



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.

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

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

Attention: Sophie Doyle

CERTIFICATE OF ANALYSIS

Date of report Generation:	19 February 2020
Customer:	AECOM
Sample Delivery Group (SDG):	200211-83
Your Reference:	60608750
Location:	Shell Whitemare Pool
Report No:	541945

We received 2 samples on Tuesday February 11, 2020 and 2 of these samples were scheduled for analysis which was completed on Wednesday February 19, 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 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:	200211-83	**Client Reference:**	60608750	**Report Number:**	541945
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
21663649	MW106			07/02/2020
21663650	Trip Blank			07/02/2020

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.

CERTIFICATE OF ANALYSIS

SDG:	200211-83	**Client Reference:**	60608750	**Report Number:**	541945
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)							21663649	21663650
Customer Sample Reference							MW106	Trip Blank
AGS Reference								
Depth (m)								
Container							1000ml glass bottle (ALE220)	1lplastic (ALE221)	HNO3 Filtered (ALE204)	Vial (ALE297)	Vial (ALE297)
Sample Type							GW	GW	GW	GW	GW
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1							X		
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 1					X				
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 1					X				
GRO by GC-FID (W)	All	NDPs: 0 Tests: 1								X	
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1						X			
Mercury Dissolved	All	NDPs: 0 Tests: 1							X		
n-Hexane in Waters	All	NDPs: 0 Tests: 1								X	
Oxygenates (W)	All	NDPs: 0 Tests: 1								X	
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 1					X				
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 1					X				
TPH CWG (W)	All	NDPs: 0 Tests: 1					X				
VOC MS (W)	All	NDPs: 0 Tests: 2								X	X

CERTIFICATE OF ANALYSIS

SDG:	200211-83	**Client Reference:**	60608750	**Report Number:**	541945
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)

Customer Sample Ref.			MW106						
Depth (m)			.						
Sample Type			Ground Water (GW)						
Date Sampled			07/02/2020						
Sampled Time			.						
Date Received			11/02/2020						
SDG Ref			200211-83						
Lab Sample No.(s)			21663649						
AGS Reference									
Component	**LOD/Units**	**Method**							
Arsenic (diss.filt)	<0.5 µg/l	TM152	21.6 #						
Boron (diss.filt)	<10 µg/l	TM152	99.5 #						
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	5.27 #						
Copper (diss.filt)	<0.3 µg/l	TM152	0.69 #						
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	5 #						
Selenium (diss.filt)	<1 µg/l	TM152	<1 #						
Zinc (diss.filt)	<1 µg/l	TM152	11 #						
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	100						
Bromofluorobenzene**	%	TM289	104						
Ethanol	<50 µg/l	TM289	<50						
tert Butanol	<10 µg/l	TM289	<10						
Diisopropyl ether	<1 µg/l	TM289	1.75						
tert-butyl ethyl ether	<1 µg/l	TM289	<1						
n-Hexane	<2 µg/l	TM336	<2						

CERTIFICATE OF ANALYSIS

SDG:	200211-83	**Client Reference:**	60608750	**Report Number:**	541945
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

PAH Spec MS - Aqueous (W)

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)

Customer Sample Ref.	MW106
Depth (m)	.
Sample Type	Ground Water (GW)
Date Sampled	07/02/2020
Sampled Time	.
Date Received	11/02/2020
SDG Ref	200211-83
Lab Sample No.(s)	21663649
AGS Reference	

Component	LOD/Units	Method	
Naphthalene (aq)	<0.01 µg/l	TM178	1.86 #
Acenaphthene (aq)	<0.005 µg/l	TM178	0.0556 #
Acenaphthylene (aq)	<0.005 µg/l	TM178	<0.005 #
Fluoranthene (aq)	<0.005 µg/l	TM178	0.0068 #
Anthracene (aq)	<0.005 µg/l	TM178	<0.005 #
Phenanthrene (aq)	<0.005 µg/l	TM178	0.0113 #
Fluorene (aq)	<0.005 µg/l	TM178	0.0405 #
Chrysene (aq)	<0.005 µg/l	TM178	<0.005 #
Pyrene (aq)	<0.005 µg/l	TM178	0.00887 #
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 #
PAH, Total Detected USEPA 16 (aq)	<0.082 µg/l	TM178	1.99 #

CERTIFICATE OF ANALYSIS

SDG:	200211-83	**Client Reference:**	60608750	**Report Number:**	541945
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

SVOC MS (W) - Aqueous

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.	Depth (m)	Sample Type	Date Sampled	Sampled Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
			MW106	.	Ground Water (GW)	07/02/2020	.	11/02/2020	200211-83	21663649	
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<10 @ #								

Validated

CERTIFICATE OF ANALYSIS

SDG:	200211-83	**Client Reference:**	60608750	**Report Number:**	541945
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

TPH CWG (W)

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)

Customer Sample Ref.	MW106
Depth (m)	.
Sample Type	Ground Water (GW)
Date Sampled	07/02/2020
Sampled Time	.
Date Received	11/02/2020
SDG Ref	200211-83
Lab Sample No.(s)	21663649
AGS Reference	

Component	LOD/Units	Method	
GRO Surrogate % recovery**	%	TM245	98
Aliphatics >C5-C6	<10 µg/l	TM245	62
Aliphatics >C6-C8	<10 µg/l	TM245	264
Aliphatics >C8-C10	<10 µg/l	TM245	199
Aliphatics >C10-C12	<10 µg/l	TM245	303
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	135
Aromatics >EC10-EC12	<10 µg/l	TM245	202
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174	25
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	1190

CERTIFICATE OF ANALYSIS

SDG:	200211-83	**Client Reference:**	60608750	**Report Number:**	541945
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

VOC MS (W)

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.	MW106	Trip Blank
			Depth (m)	.	.
			Sample Type	Ground Water (GW)	Ground Water (GW)
			Date Sampled	07/02/2020	07/02/2020
			Sampled Time	.	.
			Date Received	11/02/2020	11/02/2020
			SDG Ref	200211-83	200211-83
			Lab Sample No.(s)	21663649	21663650
			AGS Reference		
Toluene-d8**	%	TM208		98.7	
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		9.99 #	
Benzene	<1 µg/l	TM208		<1 #	<1 #
Toluene	<1 µg/l	TM208		<1 #	<1 #
Ethylbenzene	<1 µg/l	TM208		<1 #	<1 #
m,p-Xylene	<1 µg/l	TM208		1 #	<1 #
o-Xylene	<1 µg/l	TM208		<1 #	<1 #
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208		<1 #	
Sum of detected Xylenes	<2 µg/l	TM208			<2

CERTIFICATE OF ANALYSIS

SDG:	200211-83	**Client Reference:**	60608750	**Report Number:**	541945
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

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
TM289		Determination of Oxygenates in Waters by Headspace/GC-MS
TM336		

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:	200211-83	**Client Reference:**	60608750	**Report Number:**	541945
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	21663649	21663650
Customer Sample Ref.	MW106	Trip Blank
AGS Ref.		
Depth		
Type	Ground Water	Ground Water
Dissolved Metals by ICP-MS	14-Feb-2020	
EPH CWG (Aliphatic) Aqueous GC (W)	18-Feb-2020	
EPH CWG (Aromatic) Aqueous GC (W)	18-Feb-2020	
GRO by GC-FID (W)	14-Feb-2020	
Hexavalent Chromium (w)	13-Feb-2020	
Mercury Dissolved	14-Feb-2020	
n-Hexane in Waters	14-Feb-2020	
Oxygenates (W)	13-Feb-2020	
PAH Spec MS - Aqueous (W)	17-Feb-2020	
SVOC MS (W) - Aqueous	19-Feb-2020	
TPH CWG (W)	18-Feb-2020	
VOC MS (W)	17-Feb-2020	17-Feb-2020

ASSOCIATED AQC DATA

Dissolved Metals by ICP-MS

Component	Method Code	QC 2116
Aluminium	TM152	**105.0** 90.78 : 110.89
Antimony	TM152	**101.83** 77.22 : 119.42
Arsenic	TM152	**101.0** 86.77 : 107.67
Barium	TM152	**100.0** 87.86 : 110.23
Beryllium	TM152	**95.0** 86.19 : 112.98
Bismuth	TM152	**100.17** 84.06 : 106.46
Borate	TM152	**90.74** 88.00 : 112.00
Boron	TM152	**90.67** 83.92 : 114.90
Cadmium	TM152	**101.17** 88.89 : 106.69
Calcium	TM152	**103.33** 80.24 : 117.95
Chromium	TM152	**101.0** 83.22 : 110.16
Cobalt	TM152	**101.17** 82.49 : 112.36
Copper	TM152	**101.17** 83.14 : 113.00
Iron	TM152	**104.0** 88.40 : 109.24
Lead	TM152	**100.83** 83.71 : 109.58
Lithium	TM152	**95.5** 84.50 : 114.28
Magnesium	TM152	**104.67** 87.56 : 114.57
Manganese	TM152	**102.67** 88.63 : 107.13
Molybdenum	TM152	**100.33** 85.53 : 107.42
Nickel	TM152	**100.0** 88.05 : 106.42
Phosphorus	TM152	**100.5** 82.76 : 107.72
Potassium	TM152	**101.33** 92.43 : 107.51
Selenium	TM152	**102.83** 85.61 : 111.03
Silver	TM152	**97.83** 86.73 : 107.07
Sodium	TM152	**103.33** 91.84 : 109.17
Strontium	TM152	**101.33** 83.77 : 107.87

Dissolved Metals by ICP-MS

		QC 2116
Tellurium	TM152	**95.5** 82.83 : 104.73
Thallium	TM152	**90.67** 77.47 : 113.87
Tin	TM152	**104.67** 91.00 : 109.00
Titanium	TM152	**101.67** 87.29 : 108.31
Tungsten	TM152	**101.17** 68.27 : 122.97
Uranium	TM152	**100.33** 82.46 : 105.16
Vanadium	TM152	**100.67** 88.43 : 114.30
Zinc	TM152	**103.67** 85.57 : 114.31

EPH CWG (Aliphatic) Aqueous GC (W)

Component	Method Code	QC 2135
Total Aliphatics >C10-C40	TM174	**98.68** 0.00 : 0.00

EPH CWG (Aromatic) Aqueous GC (W)

Component	Method Code	QC 2155
Total Aromatics >EC10-EC40	TM174	**93.41** 60.75 : 129.09

GRO by GC-FID (W)

Component	Method Code	QC 2149
Benzene by GC	TM245	**98.0** 81.54 : 119.70
Ethylbenzene by GC	TM245	**97.5** 80.99 : 121.09
m & p Xylene by GC	TM245	**99.5** 82.77 : 123.19
MTBE GC-FID	TM245	**95.0** 80.06 : 123.27
o Xylene by GC	TM245	**99.5** 84.26 : 121.50
QC	TM245	**116.18** 76.13 : 145.89
Toluene by GC	TM245	**100.5** 82.78 : 121.99

Hexavalent Chromium (w)

Hexavalent Chromium (w)

Component	Method Code	QC 2135
Hexavalent Chromium	TM241	**100.2** 94.17 : 106.17

Mercury Dissolved

Component	Method Code	QC 2143
Mercury Dissolved (CVAF)	TM183	**86.9** 75.00 : 111.00

n-Hexane in Waters

Component	Method Code	QC 2150
n-Hexane	TM336	**103.5** 64.07 : 128.75

Oxygenates (W)

Component	Method Code	QC 2129
Diisopropyl ether	TM289	**106.5** 80.97 : 117.54
Ethanol	TM289	**105.6** 78.52 : 121.55
tert Butanol	TM289	**105.0** 82.70 : 113.90
tert-amyl methyl ether	TM289	**108.5** 78.92 : 124.29
tert-butyl ethyl ether	TM289	**107.0** 78.17 : 124.34
tert-butyl methyl ether	TM289	**109.0** 81.54 : 119.46

PAH Spec MS - Aqueous (W)

Component	Method Code	QC 2197
Acenaphthene by GCMS	TM178	**109.2** 97.60 : 116.80
Acenaphthylene by GCMS	TM178	**102.0** 89.20 : 113.20
Anthracene by GCMS	TM178	**97.6** 92.40 : 116.40
Benz(a)anthracene by GCMS	TM178	**92.8** 84.40 : 110.80
Benzo(a)pyrene by GCMS	TM178	**101.6** 87.20 : 106.40

PAH Spec MS - Aqueous (W)

		QC 2197
Benzo(b)fluoranthene by GCMS	TM178	**92.4** 84.80 : 111.20
Benzo(ghi)perylene by GCMS	TM178	**103.2** 93.60 : 112.80
Benzo(k)fluoranthene by GCMS	TM178	**102.0** 90.40 : 119.20
Chrysene by GCMS	TM178	**102.4** 96.80 : 113.60
Dibenzo(ah)anthracene by GCMS	TM178	**96.0** 88.00 : 112.00
Fluoranthene by GCMS	TM178	**108.0** 93.49 : 118.20
Fluorene by GCMS	TM178	**106.8** 94.39 : 118.66
Indeno(123cd)pyrene by GCMS	TM178	**102.4** 90.40 : 114.40
Naphthalene by GCMS	TM178	**110.0** 94.00 : 115.60
Phenanthrene by GCMS	TM178	**100.0** 94.80 : 114.00
Pyrene by GCMS	TM178	**110.4** 96.40 : 115.60

SVOC MS (W) - Aqueous

Component	Method Code	QC 2178
4-Bromophenylphenylether	TM176	**72.08** 58.88 : 100.16
Benzo(a)anthracene	TM176	**81.6** 58.56 : 106.08
Benzo(a)pyrene	TM176	**77.76** 55.84 : 106.24
Butylbenzyl phthalate	TM176	**93.6** 45.10 : 118.90
Hexachlorobutadiene	TM176	**68.88** 49.76 : 92.00
Naphthalene	TM176	**82.4** 65.68 : 110.32
Nitrobenzene	TM176	**76.72** 60.56 : 102.80
Phenol	TM176	**43.36** 39.44 : 60.56

VOC MS (W)

Component	Method Code	QC 2109
1,1,1,2-Tetrachloroethane	TM208	**99.5** 78.82 : 115.90
1,1,1-Trichloroethane	TM208	**99.0** 79.61 : 114.35
1,1-Dichloroethane	TM208	**95.5** 79.99 : 118.57
1,2-Dichloroethane	TM208	**96.5** 79.35 : 124.02

VOC MS (W)

		QC 2109
2-Chlorotoluene	TM208	**97.0** 79.67 : 114.74
4-Chlorotoluene	TM208	**96.5** 80.15 : 113.42
Benzene	TM208	**97.5** 84.37 : 119.68
Bromomethane	TM208	**94.5** 68.41 : 115.99
Carbontetrachloride	TM208	**101.5** 79.73 : 118.91
Chlorobenzene	TM208	**97.5** 89.49 : 115.83
Chloroform	TM208	**99.0** 82.31 : 120.71
Chloromethane	TM208	**85.5** 62.46 : 124.98
Cis-1,2-Dichloroethene	TM208	**98.0** 83.75 : 118.91
Dichloromethane	TM208	**96.0** 81.20 : 120.83
Ethylbenzene	TM208	**92.0** 80.54 : 112.31
Hexachlorobutadiene	TM208	**90.0** 72.23 : 110.63
o-Xylene	TM208	**95.5** 85.65 : 116.64
p/m-Xylene	TM208	**94.5** 83.09 : 113.86
Tert-butyl methyl ether	TM208	**88.0** 70.94 : 119.66
Tetrachloroethene	TM208	**99.0** 84.41 : 112.73
Toluene	TM208	**96.5** 81.59 : 111.56
Trichloroethene	TM208	**99.0** 79.53 : 112.32
Vinyl Chloride	TM208	**89.0** 68.68 : 119.35

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

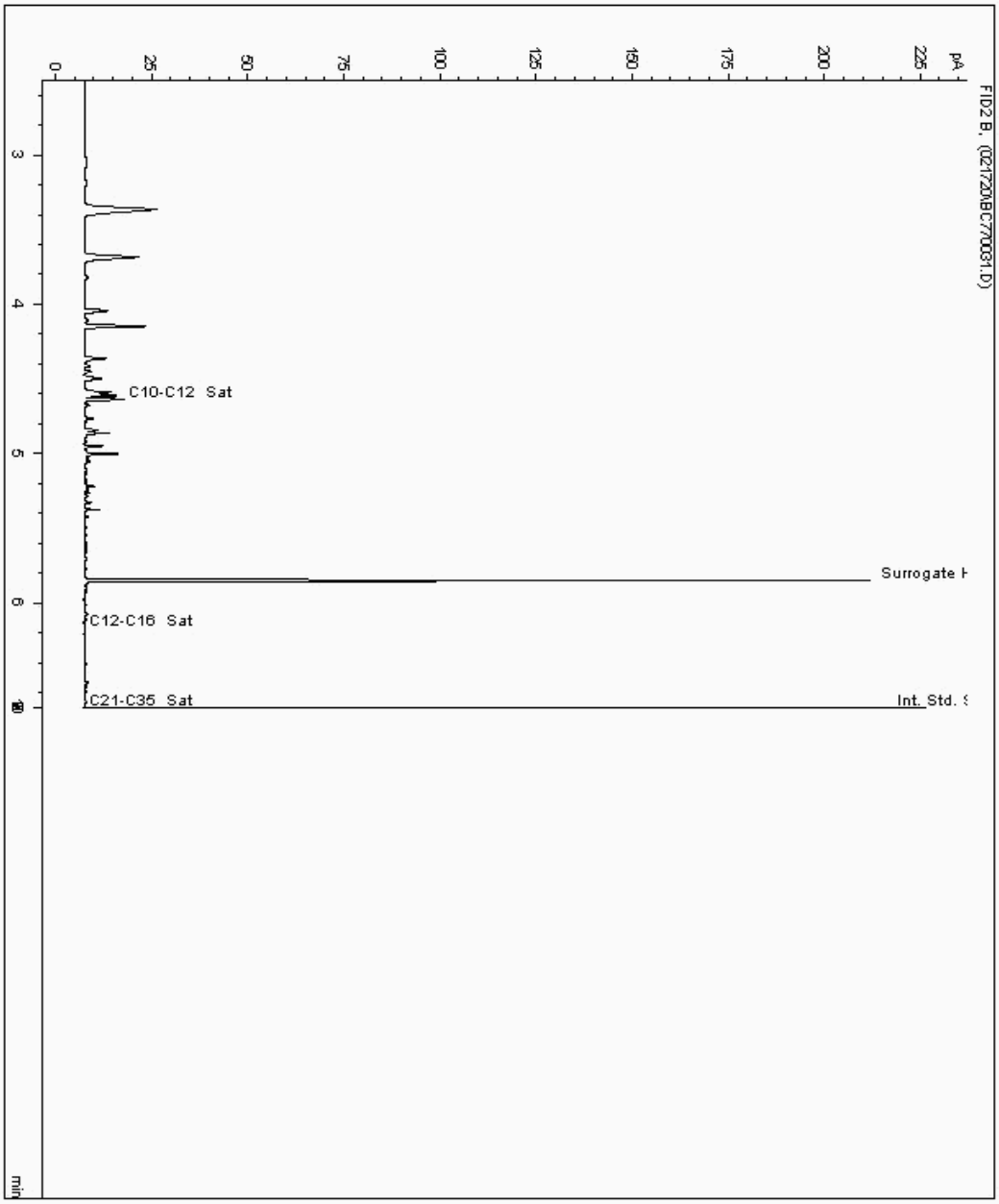
SDG:	200211-83	**Client Reference:**	60608750	**Report Number:**	541945
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) **Sample No :** 21672760 **Sample ID :** MW106 **Depth :**

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 20345596-
Date Acquired : 2/17/2020 9:56:08 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025



CERTIFICATE OF ANALYSIS

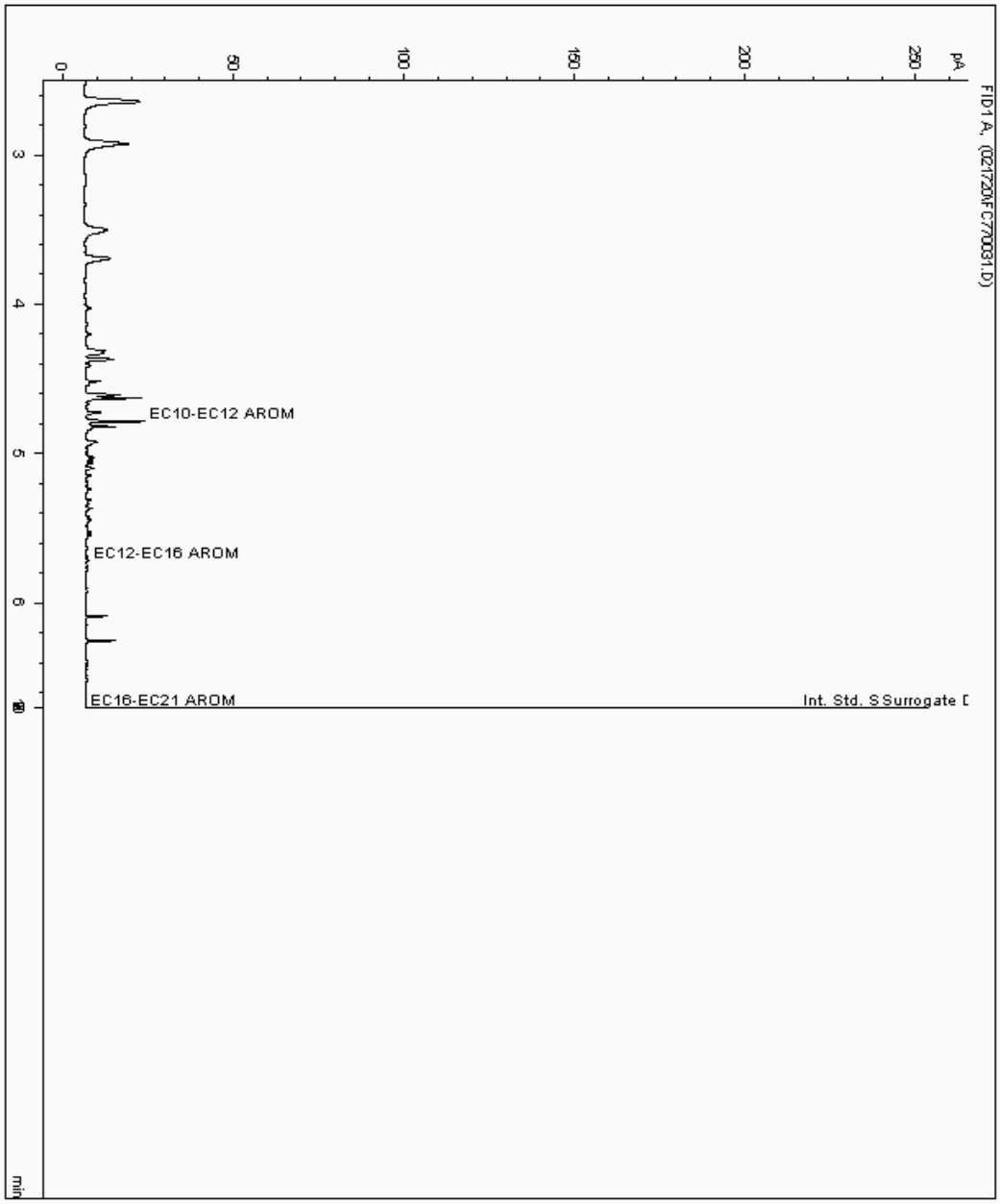
SDG:	200211-83	**Client Reference:**	60608750	**Report Number:**	541945
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) **Sample No :** 21672760 **Depth :**
Sample ID : MW106

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 20345597-
Date Acquired : 2/17/2020 9:56:08 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025



CERTIFICATE OF ANALYSIS

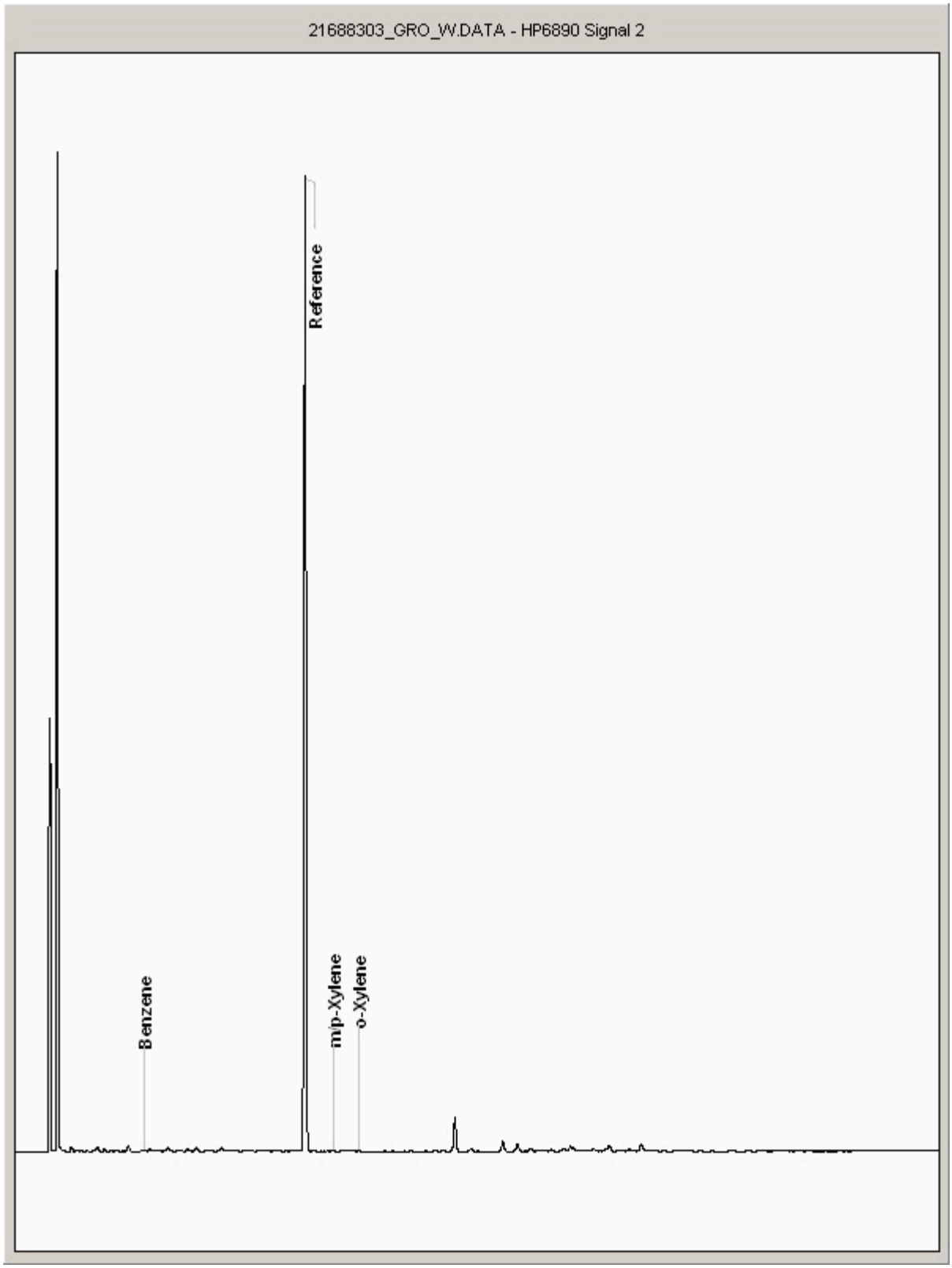
SDG:	200211-83	**Client Reference:**	60608750	**Report Number:**	541945
Location:	Shell Whitemare Pool	**Order Number:**	60608750	**Superseded Report:**	

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 21688303
Sample ID : MW106

Depth :



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.

Contents

Surrogate Variation > 30% or outside lab LCL or UCL

SDG	Lab_Report_Number	Lab_Report_Number	Sample_Type	Matrix_Type	SampleCode	Field_ID	Depth	Sampled_Date_Time	Compound	Recovery %	Unit	LCL	UCL	Lab_Qualifier	Lab_Comments
191115-83	531775	531775	Normal	soil	21151158	MW105	0.500	13/11/2019	GRO Surrogate %	142	%				
191123-48	532253	532253	Normal	soil	21210319	MW109	2.300 - 2.500	19/11/2019	Perylene-d12	63.7	%				
191123-48	532253	532253	Normal	soil	21210319	MW109	2.300 - 2.500	19/11/2019	Chrysene-d12 (surr.)	63.3	%				

Contents

Holding Time Errors

SDG	Matrix_Type	SampleCode	Field_ID	Depth	Sampled_Date_Time	Volatility	ChemName	Result	Sampled_to_Extraction_Days	Sampled_to_Analysis_Days	Major_Exceedance
191212-165	water	21351800	Active		10/12/2019	SVOC	Anthracene	0.005 µg/l		17	N
191212-165	water	21351800	Active		10/12/2019	SVOC	Pyrene	0.005 µg/l		17	N
191212-165	water	21351800	Active		10/12/2019	SVOC	Benzo(g,h,i)peryl	0.005 µg/l		17	N
191212-165	water	21351800	Active		10/12/2019	SVOC	Indeno(1,2,3-c,d)p	0.005 µg/l		17	N
191212-165	water	21351800	Active		10/12/2019	SVOC	Benzo(b)fluoranth	0.005 µg/l		17	N
191212-165	water	21351800	Active		10/12/2019	SVOC	Fluoranthene	0.005 µg/l		17	N
191212-165	water	21351800	Active		10/12/2019	SVOC	Benzo(k)fluoranth	0.005 µg/l		17	N
191212-165	water	21351800	Active		10/12/2019	SVOC	Acenaphthylene	0.005 µg/l		17	N
191212-165	water	21351800	Active		10/12/2019	SVOC	Chrysene	0.005 µg/l		17	N
191212-165	water	21351800	Active		10/12/2019	SVOC	Benzo(a)pyrene	0.002 µg/l		17	N
191212-165	water	21351800	Active		10/12/2019	SVOC	Dibenz(a,h)anthra	0.005 µg/l		17	N
191212-165	water	21351800	Active		10/12/2019	SVOC	Benzo(a)anthrace	0.005 µg/l		17	N
191212-165	water	21351800	Active		10/12/2019	SVOC	Acenaphthene	0.005 µg/l		17	N
191212-165	water	21351800	Active		10/12/2019	SVOC	Phenanthrene	0.005 µg/l		17	N
191212-165	water	21351800	Active		10/12/2019	SVOC	Fluorene	0.005 µg/l		17	N
191212-165	water	21351800	Active		10/12/2019	SVOC	Naphthalene	0.01 µg/l		17	N
191212-165	water	21351800	Active		10/12/2019	SVOC	>C12-C16 Alipha	10 µg/l		20	N
191212-165	water	21351800	Active		10/12/2019	SVOC	>C16-C21 Alipha	10 µg/l		20	N
191212-165	water	21351800	Active		10/12/2019	SVOC	>C21-C35 Alipha	10 µg/l		20	N
191212-165	water	21351800	Active		10/12/2019	SVOC	>EC12-EC16 Aro	10 µg/l		20	N
191212-165	water	21351800	Active		10/12/2019	SVOC	>EC16-EC21 Aro	10 µg/l		20	N
191212-165	water	21351800	Active		10/12/2019	SVOC	>EC21-EC35 Aro	10 µg/l		20	N
191212-165	water	21351800	Active		10/12/2019	SVOC	PAH 16 Total	0.082 µg/l		17	N
191212-165	water	21351801	Static		10/12/2019	SVOC	Anthracene	0.005 µg/l		17	N
191212-165	water	21351801	Static		10/12/2019	SVOC	Pyrene	0.005 µg/l		17	N
191212-165	water	21351801	Static		10/12/2019	SVOC	Benzo(g,h,i)peryl	0.005 µg/l		17	N
191212-165	water	21351801	Static		10/12/2019	SVOC	Indeno(1,2,3-c,d)p	0.005 µg/l		17	N
191212-165	water	21351801	Static		10/12/2019	SVOC	Benzo(b)fluoranth	0.005 µg/l		17	N
191212-165	water	21351801	Static		10/12/2019	SVOC	Fluoranthene	0.00654 µg/l		17	N
191212-165	water	21351801	Static		10/12/2019	SVOC	Benzo(k)fluoranth	0.005 µg/l		17	N
191212-165	water	21351801	Static		10/12/2019	SVOC	Acenaphthylene	0.005 µg/l		17	N
191212-165	water	21351801	Static		10/12/2019	SVOC	Chrysene	0.005 µg/l		17	N
191212-165	water	21351801	Static		10/12/2019	SVOC	Benzo(a)pyrene	0.002 µg/l		17	N
191212-165	water	21351801	Static		10/12/2019	SVOC	Dibenz(a,h)anthra	0.005 µg/l		17	N
191212-165	water	21351801	Static		10/12/2019	SVOC	Benzo(a)anthrace	0.005 µg/l		17	N
191212-165	water	21351801	Static		10/12/2019	SVOC	Acenaphthene	0.005 µg/l		17	N
191212-165	water	21351801	Static		10/12/2019	SVOC	Phenanthrene	0.0105 µg/l		17	N
191212-165	water	21351801	Static		10/12/2019	SVOC	Fluorene	0.005 µg/l		17	N
191212-165	water	21351801	Static		10/12/2019	SVOC	Naphthalene	0.01 µg/l		17	N
191212-165	water	21351801	Static		10/12/2019	SVOC	>C12-C16 Alipha	10 µg/l		20	N
191212-165	water	21351801	Static		10/12/2019	SVOC	>C16-C21 Alipha	10 µg/l		20	N
191212-165	water	21351801	Static		10/12/2019	SVOC	>C21-C35 Alipha	10 µg/l		20	N
191212-165	water	21351801	Static		10/12/2019	SVOC	>EC12-EC16 Aro	10 µg/l		20	N
191212-165	water	21351801	Static		10/12/2019	SVOC	>EC16-EC21 Aro	10 µg/l		20	N
191212-165	water	21351801	Static		10/12/2019	SVOC	>EC21-EC35 Aro	10 µg/l		20	N
191212-165	water	21351801	Static		10/12/2019	SVOC	PAH 16 Total	0.082 µg/l		17	N
191212-165	water	21351802	DUP1		10/12/2019	SVOC	Anthracene	0.005 µg/l		17	N
191212-165	water	21351802	DUP1		10/12/2019	SVOC	Pyrene	0.005 µg/l		17	N
191212-165	water	21351802	DUP1		10/12/2019	SVOC	Benzo(g,h,i)peryl	0.005 µg/l		17	N
191212-165	water	21351802	DUP1		10/12/2019	SVOC	Indeno(1,2,3-c,d)p	0.005 µg/l		17	N
191212-165	water	21351802	DUP1		10/12/2019	SVOC	Benzo(b)fluoranth	0.005 µg/l		17	N
191212-165	water	21351802	DUP1		10/12/2019	SVOC	Fluoranthene	0.005 µg/l		17	N
191212-165	water	21351802	DUP1		10/12/2019	SVOC	Benzo(k)fluoranth	0.005 µg/l		17	N
191212-165	water	21351802	DUP1		10/12/2019	SVOC	Acenaphthylene	0.005 µg/l		17	N
191212-165	water	21351802	DUP1		10/12/2019	SVOC	Chrysene	0.005 µg/l		17	N
191212-165	water	21351802	DUP1		10/12/2019	SVOC	Benzo(a)pyrene	0.002 µg/l		17	N
191212-165	water	21351802	DUP1		10/12/2019	SVOC	Dibenz(a,h)anthra	0.005 µg/l		17	N
191212-165	water	21351802	DUP1		10/12/2019	SVOC	Benzo(a)anthrace	0.005 µg/l		17	N
191212-165	water	21351802	DUP1		10/12/2019	SVOC	Acenaphthene	0.005 µg/l		17	N
191212-165	water	21351802	DUP1		10/12/2019	SVOC	Phenanthrene	0.0089 µg/l		17	N
191212-165	water	21351802	DUP1		10/12/2019	SVOC	Fluorene	0.005 µg/l		17	N
191212-165	water	21351802	DUP1		10/12/2019	SVOC	Naphthalene	0.01 µg/l		17	N
191212-165	water	21351802	DUP1		10/12/2019	SVOC	>C12-C16 Alipha	10 µg/l		20	N
191212-165	water	21351802	DUP1		10/12/2019	SVOC	>C16-C21 Alipha	10 µg/l		20	N
191212-165	water	21351802	DUP1		10/12/2019	SVOC	>C21-C35 Alipha	10 µg/l		20	N
191212-165	water	21351802	DUP1		10/12/2019	SVOC	>EC12-EC16 Aro	10 µg/l		20	N
191212-165	water	21351802	DUP1		10/12/2019	SVOC	>EC16-EC21 Aro	10 µg/l		20	N
191212-165	water	21351802	DUP1		10/12/2019	SVOC	>EC21-EC35 Aro	10 µg/l		20	N
191212-165	water	21351802	DUP1		10/12/2019	SVOC	PAH 16 Total	0.082 µg/l		17	N
191212-165	water	21351803	Equipment Blank		10/12/2019	SVOC	Anthracene	0.005 µg/l		17	N
191212-165	water	21351803	Equipment Blank		10/12/2019	SVOC	Pyrene	0.005 µg/l		17	N
191212-165	water	21351803	Equipment Blank		10/12/2019	SVOC	Benzo(g,h,i)peryl	0.005 µg/l		17	N
191212-165	water	21351803	Equipment Blank		10/12/2019	SVOC	Indeno(1,2,3-c,d)p	0.005 µg/l		17	N
191212-165	water	21351803	Equipment Blank		10/12/2019	SVOC	Benzo(b)fluoranth	0.005 µg/l		17	N
191212-165	water	21351803	Equipment Blank		10/12/2019	SVOC	Fluoranthene	0.005 µg/l		17	N
191212-165	water	21351803	Equipment Blank		10/12/2019	SVOC	Benzo(k)fluoranth	0.005 µg/l		17	N
191212-165	water	21351803	Equipment Blank		10/12/2019	SVOC	Acenaphthylene	0.005 µg/l		17	N
191212-165	water	21351803	Equipment Blank		10/12/2019	SVOC	Chrysene	0.005 µg/l		17	N
191212-165	water	21351803	Equipment Blank		10/12/2019	SVOC	Benzo(a)pyrene	0.002 µg/l		17	N
191212-165	water	21351803	Equipment Blank		10/12/2019	SVOC	Dibenz(a,h)anthra	0.005 µg/l		17	N
191212-165	water	21351803	Equipment Blank		10/12/2019	SVOC	Benzo(a)anthrace	0.005 µg/l		17	N
191212-165	water	21351803	Equipment Blank		10/12/2019	SVOC	Acenaphthene	0.005 µg/l		17	N
191212-165	water	21351803	Equipment Blank		10/12/2019	SVOC	Phenanthrene	0.005 µg/l		17	N
191212-165	water	21351803	Equipment Blank		10/12/2019	SVOC	Fluorene	0.005 µg/l		17	N
191212-165	water	21351803	Equipment Blank		10/12/2019	SVOC	Naphthalene	0.01 µg/l		17	N
191212-165	water	21351803	Equipment Blank		10/12/2019	SVOC	>C12-C16 Alipha	10 µg/l		20	N
191212-165	water	21351803	Equipment Blank		10/12/2019	SVOC	>C16-C21 Alipha	10 µg/l		20	N
191212-165	water	21351803	Equipment Blank		10/12/2019	SVOC	>C21-C35 Alipha	10 µg/l		20	N
191212-165	water	21351803	Equipment Blank		10/12/2019	SVOC	>EC12-EC16 Aro	10 µg/l		20	N
191212-165	water	21351803	Equipment Blank		10/12/2019	SVOC	>EC16-EC21 Aro	10 µg/l		20	N
191212-165	water	21351803	Equipment Blank		10/12/2019	SVOC	>EC21-EC35 Aro	10 µg/l		20	N
191212-165	water	21351803	Equipment Blank		10/12/2019	SVOC	PAH 16 Total	0.082 µg/l		17	N
191213-128	water	21362397	MW101		11/12/2019	SVOC	>C12-C16 Alipha	10 µg/l		19	N
191213-128	water	21362397	MW101		11/12/2019	SVOC	>C16-C21 Alipha	10 µg/l		19	N
191213-128	water	21362397	MW101		11/12/2019	SVOC	>C21-C35 Alipha	10 µg/l		19	N
191213-128	water	21362397	MW101		11/12/2019	SVOC	>EC12-EC16 Aro	10 µg/l		19	N
191213-128	water	21362397	MW101		11/12/2019	SVOC	>EC16-EC21 Aro	10 µg/l		19	N
191213-128	water	21362397	MW101		11/12/2019	SVOC	>EC21-EC35 Aro	10 µg/l		19	N
191213-128	water	21362398	MW102		11/12/2019	SVOC	>C12-C16 Alipha	22 µg/l		19	N
191213-128	water	21362398	MW102		11/12/2019	SVOC	>C16-C21 Alipha	10 µg/l		19	N
191213-128	water	21362398	MW102		11/12/2019	SVOC	>C21-C35 Alipha	10 µg/l		19	N
191213-128	water	21362398	MW102		11/12/2019	SVOC	>EC12-EC16 Aro	32 µg/l		19	N
191213-128	water	21362398	MW102		11/12/2019	SVOC	>EC16-EC21 Aro	10 µg/l		19	N
191213-128	water	21362398	MW102		11/12/2019	SVOC	>EC21-EC35 Aro	10 µg/l		19	N
191213-128	water	21362399	MW103		11/12/2019	SVOC	>C12-C16 Alipha	10 µg/l		19	N
191213-128	water	21362399	MW103		11/12/2019	SVOC	>C16-C21 Alipha	10 µg/l		19	N
191213-128	water	21362399	MW103		11/12/2019	SVOC	>C21-C35 Alipha	10 µg/l		19	N
191213-128	water	21362399	MW103		11/12/2019	SVOC	>EC12-EC16 Aro	10 µg/l		19	N
191213-128	water	21362399	MW103		11/12/2019	SVOC	>EC16-EC21 Aro	10 µg/l		19	N

191213-128	water	21362399	MW103		11/12/2019	SVOC	>EC21-EC35 Aro	10	µg/l			19	N
191213-128	water	21362400	MW105		12/12/2019	SVOC	>C12-C16 Aliph	10	µg/l			18	N
191213-128	water	21362400	MW105		12/12/2019	SVOC	>C16-C21 Aliph	10	µg/l			18	N
191213-128	water	21362400	MW105		12/12/2019	SVOC	>C21-C35 Aliph	10	µg/l			18	N
191213-128	water	21362400	MW105		12/12/2019	SVOC	>EC12-EC16 Aro	10	µg/l			18	N
191213-128	water	21362400	MW105		12/12/2019	SVOC	>EC16-EC21 Aro	10	µg/l			18	N
191213-128	water	21362400	MW105		12/12/2019	SVOC	>EC21-EC35 Aro	10	µg/l			18	N
191213-128	water	21362401	MW106		11/12/2019	SVOC	>C12-C16 Aliph	11	µg/l			19	N
191213-128	water	21362401	MW106		11/12/2019	SVOC	>C16-C21 Aliph	10	µg/l			19	N
191213-128	water	21362401	MW106		11/12/2019	SVOC	>C21-C35 Aliph	10	µg/l			19	N
191213-128	water	21362401	MW106		11/12/2019	SVOC	>EC12-EC16 Aro	51	µg/l			19	N
191213-128	water	21362401	MW106		11/12/2019	SVOC	>EC16-EC21 Aro	10	µg/l			19	N
191213-128	water	21362401	MW106		11/12/2019	SVOC	>EC21-EC35 Aro	10	µg/l			19	N
191213-128	water	21362402	MW109		12/12/2019	SVOC	>C12-C16 Aliph	10	µg/l			18	N
191213-128	water	21362402	MW109		12/12/2019	SVOC	>C16-C21 Aliph	10	µg/l			18	N
191213-128	water	21362402	MW109		12/12/2019	SVOC	>C21-C35 Aliph	10	µg/l			18	N
191213-128	water	21362402	MW109		12/12/2019	SVOC	>EC12-EC16 Aro	10	µg/l			18	N
191213-128	water	21362402	MW109		12/12/2019	SVOC	>EC16-EC21 Aro	10	µg/l			18	N
191213-128	water	21362402	MW109		12/12/2019	SVOC	>EC21-EC35 Aro	10	µg/l			18	N
191213-128	water	21362403	DUP2		11/12/2019	SVOC	>C12-C16 Aliph	11	µg/l			19	N
191213-128	water	21362403	DUP2		11/12/2019	SVOC	>C16-C21 Aliph	10	µg/l			19	N
191213-128	water	21362403	DUP2		11/12/2019	SVOC	>C21-C35 Aliph	10	µg/l			19	N
191213-128	water	21362403	DUP2		11/12/2019	SVOC	>EC12-EC16 Aro	22	µg/l			19	N
191213-128	water	21362403	DUP2		11/12/2019	SVOC	>EC16-EC21 Aro	10	µg/l			19	N
191213-128	water	21362403	DUP2		11/12/2019	SVOC	>EC21-EC35 Aro	10	µg/l			19	N
191113-115	soil	21137334	MW104	0.500	11/11/2019	SVOC	PCB 118	3	µg/kg			17	N
191113-115	soil	21137334	MW104	0.500	11/11/2019	SVOC	PCB 153	3	µg/kg			17	N
191113-115	soil	21137334	MW104	0.500	11/11/2019	SVOC	PCB 138	3	µg/kg			17	N
191113-115	soil	21137334	MW104	0.500	11/11/2019	SVOC	PCB 180	3	µg/kg			17	N
191113-115	soil	21137334	MW104	0.500	11/11/2019	SVOC	PCB 52	3	µg/kg			17	N
191113-115	soil	21137334	MW104	0.500	11/11/2019	SVOC	PCB 101	3	µg/kg			17	N
191113-115	soil	21137334	MW104	0.500	11/11/2019	SVOC	PCB 28	3	µg/kg			17	N
191115-83	soil	21151158	MW105	0.500	13/11/2019	SVOC	PCB 118	3	µg/kg			15	N
191115-83	soil	21151158	MW105	0.500	13/11/2019	SVOC	PCB 153	3	µg/kg			15	N
191115-83	soil	21151158	MW105	0.500	13/11/2019	SVOC	PCB 138	3	µg/kg			15	N
191115-83	soil	21151158	MW105	0.500	13/11/2019	SVOC	PCB 180	3	µg/kg			15	N
191115-83	soil	21151158	MW105	0.500	13/11/2019	SVOC	PCB 52	3	µg/kg			15	N
191115-83	soil	21151158	MW105	0.500	13/11/2019	SVOC	PCB 101	3	µg/kg			15	N
191115-83	soil	21151158	MW105	0.500	13/11/2019	SVOC	PCB 28	3	µg/kg			15	N
191113-115	soil	21137334	MW104	0.500	11/11/2019	Low_Stability	Chloride	18.2	mg/kg			36	Y
191202-26	soil	21273190	SKIP		29/11/2019	Low_Stability	Sulphate	13	mg/l	10		10	N
191202-26	soil	21273190	SKIP		29/11/2019	Low_Stability	Chloride	9.4	mg/l	10		10	N
191202-26	soil	21273190	SKIP		29/11/2019	Low_Stability	Fluoride	1.83	mg/l	10		10	N
191202-26	soil	21273190	SKIP		29/11/2019	Low_Stability	Electrical conduc	184	µS/cm	8		8	N

Field Duplicates (wate	SDG	191212-165	191212-165		191213-128	191213-128		200210-11	200210-11	
Filter: ALL	Field ID	Active	DUP1	RPD	MW102	DUP2	RPD	MW101	DUP	RPD
	Sampled Date/Time	10/12/2019	10/12/2019		11/12/2019	11/12/2019		06/02/2020	06/02/2020	

Parameter	Units	Method Detection Limit									
BTEX											
Benzene	µg/L	10				750	743	1			
Benzene	µg/L	1	<1	<1	0				<1	<1	0
Toluene	µg/L	1	<1	<1	0	69.2	63.5	9	<1	<1	0
Ethylbenzer	µg/L	10				753	728	3			
Ethylbenzer	µg/L	1	<1	<1	0				<1	<1	0
Xylene (m &	µg/L	1	<1	<1	0	342	332	3	<1	<1	0
Xylene (o)	µg/L	1	<1	<1	0	194	192	1	<1	<1	0
Oxygenates											
Diisopropyl	µg/L	1	<1	<1	0	4.81	4.55	6	<1	<1	0
Ethyl Tert B	µg/L	1	<1	<1	0	<1	<1	0	<1	<1	0
Methyl Tert	µg/L	1	<1	<1	0	25.8	24.2	6	<1	<1	0
Tert Amyl M	µg/L	1	<1	<1	0	<1	<1	0	<1	<1	0
Tert Butyl A	µg/L	10	<10	<10	0	<10	<10	0	<10	<10	0
Ethanol	µg/L	50	<50	<50	0	<50	<50	0	<50	<50	0
n-Hexane	µg/L	2	<2	<2	0	5.75	4.93	15	<2	<2	0
PAH											
Acenaphthe	µg/L	0.005	<0.005	<0.005	0	**0.145**	**0.104**	**33**	<0.005	<0.005	0
Acenaphthy	µg/L	0.005	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0
Anthracene	µg/L	0.005	<0.005	<0.005	0	0.0219	0.0143	42	<0.005	<0.005	0
Benzo(a)ar	µg/L	0.005	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0
Benzo(a)py	µg/L	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
Benzo(b)flu	µg/L	0.005	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0
Benzo(g,h,i	µg/L	0.005	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0
Benzo(k)flu	µg/L	0.005	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0
Chrysene	µg/L	0.005	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0
Dibenz(a,h	µg/L	0.005	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0
Fluoranther	µg/L	0.005	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0
Fluorene	µg/L	0.005	<0.005	<0.005	0	**0.2**	**0.124**	**47**	<0.005	<0.005	0
Indeno(1,2,	µg/L	0.005	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0
Naphthalen	µg/L	0.01	<0.01	<0.01	0	**48.8**	**30.9**	**45**	<0.01	<0.01	0
Phenanthre	µg/L	0.005	<0.005	0.0089	56	**0.0725**	**0.0388**	**61**	<0.005	<0.005	0
Pyrene	µg/L	0.005	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0
PAH 16 To	µg/L	0.082	<0.082	<0.082	0	**49.3**	**31.2**	**45**	<0.082	<0.082	0
TPH											
>EC5-EC7	µg/L	10	<10	<10	0	688	778	12	<10	<10	0
>EC7-EC8	µg/L	10	<10	<10	0	**89**	**213**	**82**	<10	<10	0
>EC8-EC1	µg/L	10	<10	<10	0	1780	1980	11	<10	<10	0
>EC10-EC	µg/L	10	<10	<10	0	321	262	20	<10	<10	0
>EC12-EC	µg/L	10	<10	<10	0	32	22	37	<10	<10	0
>EC16-EC	µg/L	10	<10	<10	0	<10	<10	0	<10	<10	0
>EC21-EC	µg/L	10	<10	<10	0	<10	<10	0	<10	<10	0
>C5-C6 Ali	µg/L	10	<10	<10	0	296	245	19	<10	<10	0
>C6-C8 Ali	µg/L	10	<10	<10	0	548	430	24	<10	<10	0
>C8-C10 A	µg/L	10	<10	<10	0	619	504	20	<10	<10	0
>C10-C12	µg/L	10	<10	<10	0	482	394	20	<10	<10	0
>C12-C16	µg/L	10	<10	<10	0	22	11	67	<10	<10	0
>C16-C21	µg/L	10	<10	<10	0	<10	<10	0	<10	<10	0
>C21-C35	µg/L	10	<10	<10	0	<10	<10	0	<10	<10	0
>C5-C35 A	µg/L	10	<10	<10	0	4870	4840	1	<10	<10	0
SVOC											
2-Methylna	µg/L	1	<1	<1	0	8.84	5.96	39	<1	<1	0
Metals											
Arsenic (Fi	µg/L	0.5	<0.5	<0.5	0	2.61	2.66	2	0.986	0.952	4
Boron (Filte	µg/L	10	<10	<10	0	92.6	86.5	7	86.6	86.6	0
Cadmium (I	µg/L	0.08	<0.08	<0.08	0	<0.08	<0.08	0	<0.08	<0.08	0
Chromium	µg/l	30	<30	<30	0	<30	<30	0	<30	<30	0
Chromium	µg/L	1	<1	<1	0	<1	<1	0	<1	<1	0
Cobalt (Filt	µg/L	0.5	<0.5	<0.5	0	1.36	1.48	8	<0.5	<0.5	0
Copper (Fil	µg/L	0.3	8.36	8.66	4	**<0.3**	**1.66**	**139**	**5.77**	**1.85**	**103**
Lead (Filter	µg/L	0.2	<0.2	<0.2	0	**<0.2**	**0.623**	**103**	0.287	<0.2	36
Mercury (F	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Molybdenur	µg/L	3	<3	<3	0	<3	<3	0	<3	<3	0
Nickel (Filte	µg/L	0.4	1.53	1.23	22	2.79	2.84	2	2.21	2.41	9
Selenium (I	µg/L	1	<1	<1	0	<1	<1	0	<1	<1	0
Tin (Filtered	µg/L	1	<1	<1	0	<1	<1	0	<1	<1	0
Zinc (Filtere	µg/L	1	7.57	7.3	4	1.95	3.1	46	4.34	2.13	68

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

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 80 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))

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

Field Blanks (water)
Filter: ALL

SDG	191212-165	200210-11	191213-128	200211-83
Field ID	Equipment Blank	Equip Blank	TRIP 2	Trip Blank
Sampled_Date/Time	10/12/2019	07/02/2020	11/12/2020	07/02/2020
Sample Type	Rinsate	Rinsate	Trip_B	Trip_B

ChemName	Units	EQL				
BTEX						
Benzene	µg/L	1	<1	<1	<1	<1
Toluene	µg/L	1	<1	<1	<1	<1
Ethylbenzene	µg/L	1	<1	<1	<1	<1
Xylene (m & p)	µg/L	1	<1	<1	<1	<1
Xylene (o)	µg/L	1	<1	<1	<1	<1
Xylene Total	µg/L	2			<2	<2
Metals						
Arsenic (Filtered)	µg/L	0.5	<0.5	<0.5		
Boron (Filtered)	µg/L	10	<10	<10		
Cadmium (Filtered)	µg/L	0.08	<0.08	<0.08		
Chromium (hexavalent) (Filtered)	µg/l	30	<30	<30		
Chromium (III+VI) (Filtered)	µg/L	1	**7.72**	**5.76**		
Cobalt (Filtered)	µg/L	0.5	<0.5	<0.5		
Copper (Filtered)	µg/L	0.3	**1.48**	**0.77**		
Lead (Filtered)	µg/L	0.2	<0.2	<0.2		
Mercury (Filtered)	µg/L	0.01	<0.01	<0.01		
Molybdenum (Filtered)	µg/L	3	<3	<3		
Nickel (Filtered)	µg/L	0.4	<0.4	<0.4		
Selenium (Filtered)	µg/L	1	<1	<1		
Tin (Filtered)	µg/L	1	<1	<1		
Zinc (Filtered)	µg/L	1	**1.42**	**3.69**		
Oxygenates						
Diisopropyl Ether	µg/L	1	<1	<1		
Ethyl Tert Butyl Ether	µg/L	1	<1	<1		
Methyl Tert Butyl Ether	µg/L	1	<1	<1		
Tert Amyl Methyl Ether	µg/L	1	<1	<1		
Tert Butyl Alcohol	µg/L	10	<10	<10		
Ethanol	µg/L	50	<50	<50		
n-Hexane	µg/L	2	<2	<2		
PAH						
Acenaphthene	µg/L	0.005	<0.005	<0.005		
Acenaphthylene	µg/L	0.005	<0.005	<0.005		
Anthracene	µg/L	0.005	<0.005	<0.005		
Benzo(a)anthracene	µg/L	0.005	<0.005	<0.005		
Benzo(a)pyrene	µg/L	0.002	<0.002	<0.002		
Benzo(b)fluoranthene	µg/L	0.005	<0.005	<0.005		
Benzo(g,h,i)perylene	µg/L	0.005	<0.005	<0.005		
Benzo(k)fluoranthene	µg/L	0.005	<0.005	<0.005		
Chrysene	µg/L	0.005	<0.005	<0.005		
Dibenz(a,h)anthracene	µg/L	0.005	<0.005	<0.005		
Fluoranthene	µg/L	0.005	<0.005	<0.005		
Fluorene	µg/L	0.005	<0.005	<0.005		
Indeno(1,2,3-c,d)pyrene	µg/L	0.005	<0.005	<0.005		
Naphthalene	µg/L	0.01	<0.01	<0.01		
Phenanthrene	µg/L	0.005	<0.005	<0.005		
Pyrene	µg/L	0.005	<0.005	<0.005		
PAH 16 Total	µg/L	0.082	<0.082	<0.082		
SVOC						
2-Methylnaphthalene	µg/L	1	<1	<1		
TPH						
>EC5-EC7 Aromatics	µg/L	10	<10	<10		
>EC7-EC8 Aromatics	µg/L	10	<10	<10		
>EC8-EC10 Aromatics	µg/L	10	<10	<10		
>EC10-EC12 Aromatics	µg/L	10	<10	<10		
>EC12-EC16 Aromatics	µg/L	10	<10	<10		
>EC16-EC21 Aromatics	µg/L	10	<10	<10		
>EC21-EC35 Aromatics	µg/L	10	<10	<10		
>C5-C6 Aliphatics	µg/L	10	<10	<10		
>C6-C8 Aliphatics	µg/L	10	<10	<10		
>C8-C10 Aliphatics	µg/L	10	<10	<10		
>C10-C12 Aliphatics	µg/L	10	<10	<10		
>C12-C16 Aliphatics	µg/L	10	<10	<10		
>C16-C21 Aliphatics	µg/L	10	<10	<10		
>C21-C35 Aliphatics	µg/L	10	<10	<10		
>C5-C35 Aliphatics & Aromatics	µg/L	10	<10	<10		

Contents

Detects in Lab Blanks

SDG	Lab_Report_Number	Matrix_Type	SampleCode	Field_ID	Depth	Sampled_Date_Time	Sample_Type	Compound	Prefix	Result	Result_Unit	Extraction_Date
191113-115		soil	21145930				MB	Ethanol		64.5	µg/kg	
191115-8		soil	21174621				MB	Ethanol		61.2	µg/kg	
191212-165		water	21408155				MB	Chromium (hexavalent)		0.999	mg/l	

APPENDIX G GEOTECHNICAL ANALYTICAL RESULTS CERTIFICATES

LABORATORY REPORT

4043

Contract Number: PSL19/7555

Report Date: 08 January 2020

Client's Reference: 1388056

Client Name: Aecom
6th Floor
1 New York Street
Manchester
M1 4HD

For the attention of: Sophie Doyle

Contract Title: Shell Whitemare Pool

Date Received: 11/12/2019
Date Commenced: 11/12/2019
Date Completed: 8/1/2020

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson (Director)
A Watkins (Director)
R Berriman (Quality Manager)

[redacted]

L Knight (Senior Technician)
S Eyre (Senior Technician)
S Royle (Laboratory Manager)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
tel: +44 (0)844 815 6641
fax: +44 (0)844 815 6642
e-mail: rgunson@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
MW103		S	1.20	1.50	Brown slightly gravelly sandy CLAY.
MW109		S	2.00	2.30	Brown slightly gravelly sandy CLAY.
MW102		S	2.60	2.80	Brown gravelly sandy CLAY.

UKAS TESTING
4043

PSL
Professional Soils Laboratory

Shell Whitemare Pool

Contract No:
PSL19/7555
Client Ref:

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
MW103		S	1.20	1.50	22			46	22	24	90	Intermediate plasticity CI.
MW109		S	2.00	2.30	21			43	20	23	92	Intermediate plasticity CI.
MW102		S	2.60	2.80	18			38	19	19	79	Intermediate plasticity CI.

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL Professional Soils Laboratory

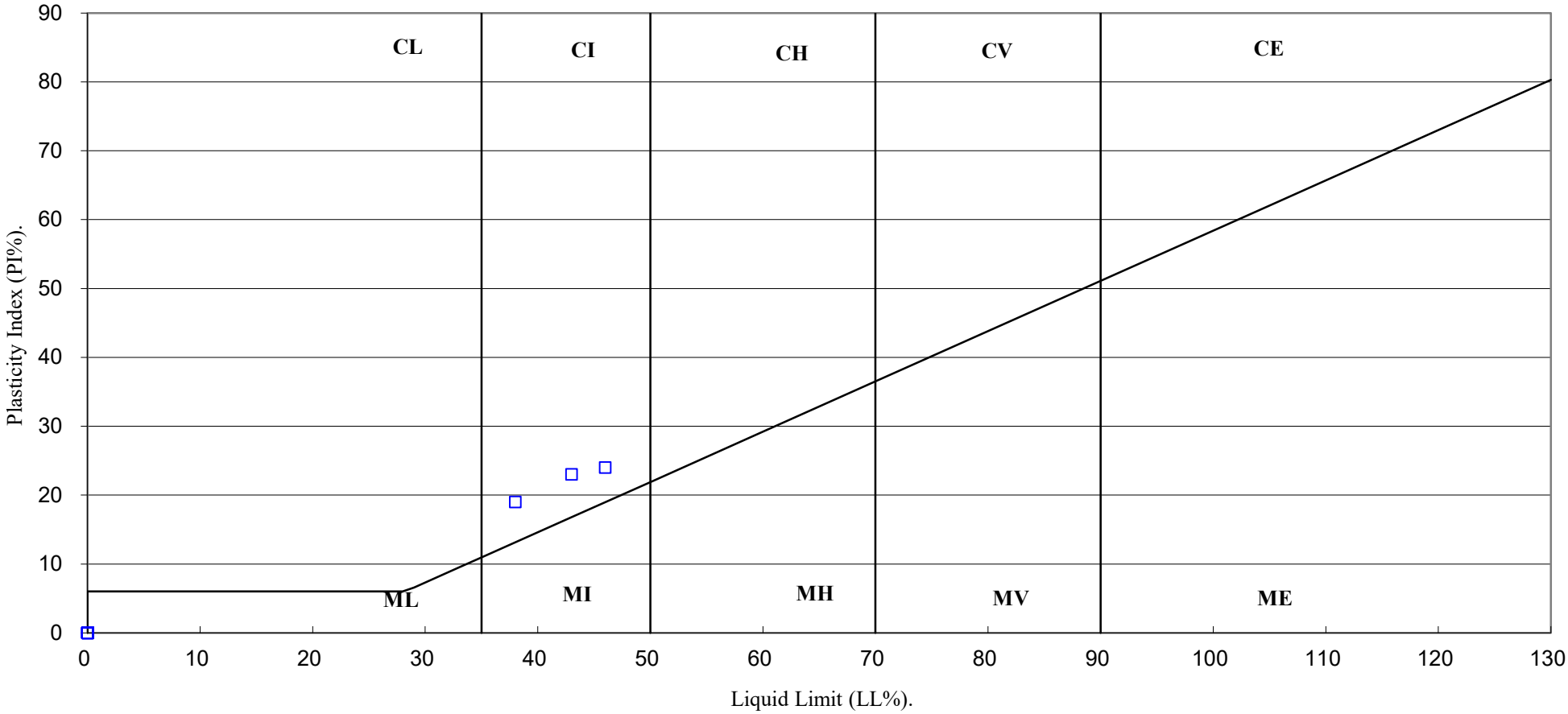
Shell Whitemare Pool

Contract No:

PSL19/7555

Client Ref:

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	Shell Whitemare Pool	Contract No: PSL19/7555 Client Ref:

PARTICLE SIZE DISTRIBUTION TEST

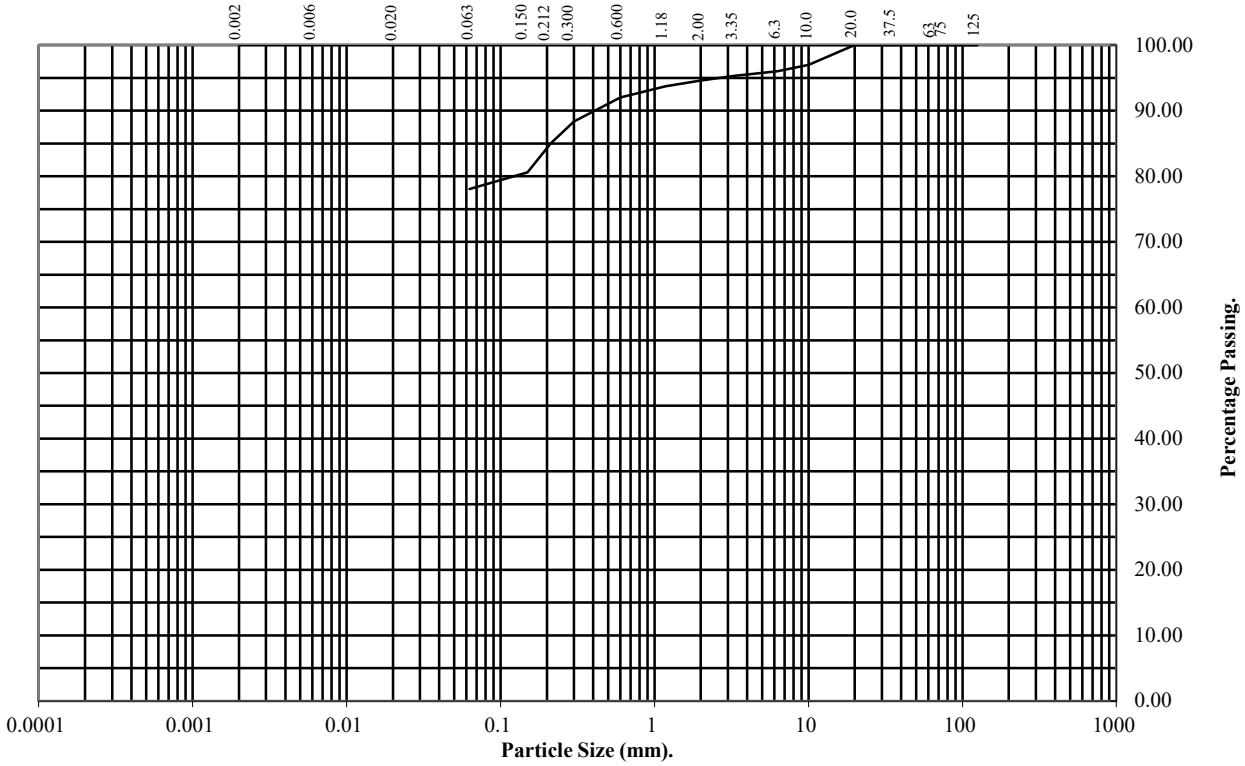
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **MW103** **Top Depth (m):** **1.20**

Sample Number: **Base Depth(m):** **1.50**

Sample Type: **S**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	97
6.3	96
3.35	95
2	95
1.18	94
0.6	92
0.3	88
0.212	85
0.15	81
0.063	78

Soil Fraction	Total Percentage
Cobbles	0
Gravel	5
Sand	17
Silt/Clay	78

Remarks:

See Summary of Soil Descriptions

UKAS TESTING 4043

PSL Professional Soils Laboratory

Shell Whitemare Pool

Contract No: PSL19/7555

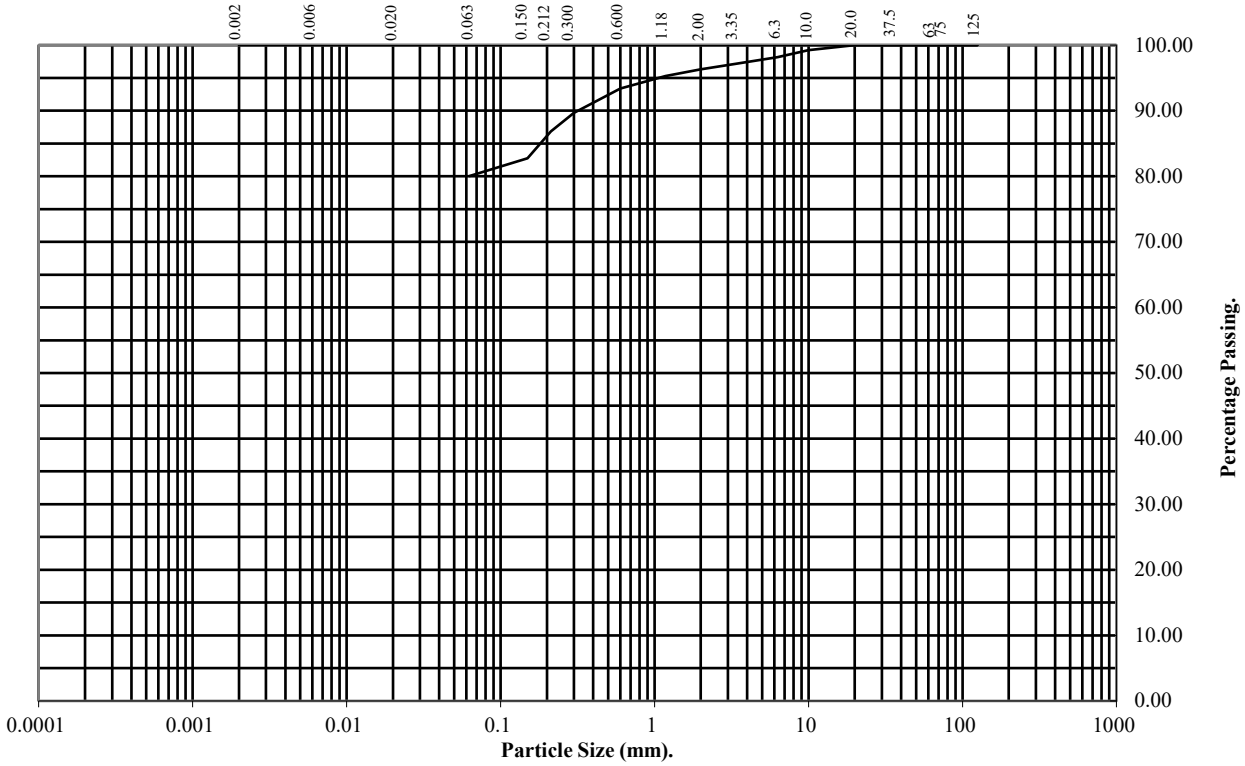
Client Ref:

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**MW109**	**Top Depth (m):**	**2.00**
Sample Number:		**Base Depth(m):**	**2.30**
Sample Type:	**S**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	99
6.3	98
3.35	97
2	96
1.18	95
0.6	93
0.3	90
0.212	87
0.15	83
0.063	80

Soil Fraction	Total Percentage
Cobbles	0
Gravel	4
Sand	16
Silt/Clay	80

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

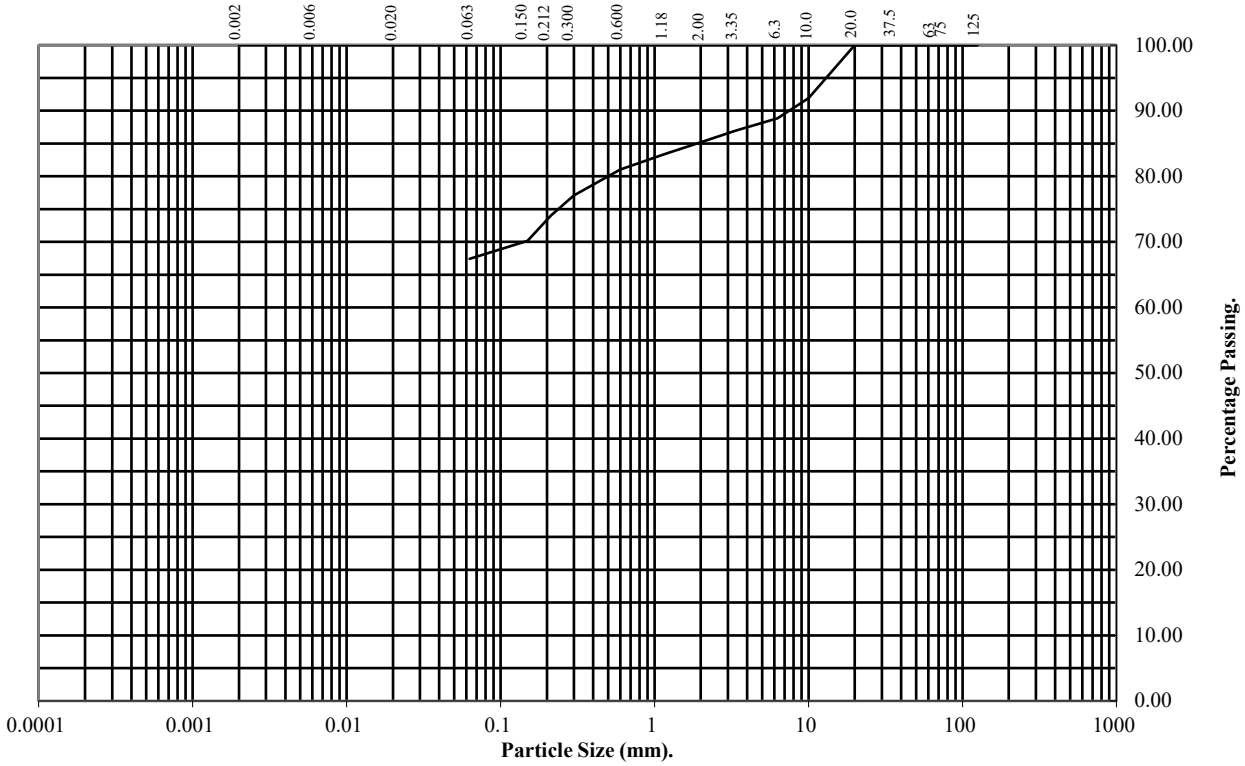
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **MW102** **Top Depth (m):** **2.60**

Sample Number: **Base Depth(m):** **2.80**

Sample Type: **S**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	92
6.3	89
3.35	87
2	85
1.18	83
0.6	81
0.3	77
0.212	74
0.15	70
0.063	67

Soil Fraction	Total Percentage
Cobbles	0
Gravel	15
Sand	18
Silt/Clay	67

Remarks:

See Summary of Soil Descriptions

Certificate of Analysis

Certificate Number 19-25603

19-Dec-19

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference 19-25603

Client Reference PSL19/7555

Order No (not supplied)

Contract Title Shell Whitemare Pool

Description 3 Soil samples.

Date Received 13-Dec-19

Date Started 13-Dec-19

Date Completed 19-Dec-19

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By [redacted]

Adam Fenwick
Contracts Manager

UKAS TESTING
2139

Summary of Chemical Analysis
Soil Samples

Our Ref 19-25603
Client Ref PSL19/7555
Contract Title Shell Whitemare Pool

			Lab No	1613253	1613254	1613255
			Sample ID	MW103	MW109	MW102
			Depth	1.20-1.50	2.00-2.30	2.60-2.80
			Other ID			
			Sample Type	SOIL	SOIL	SOIL
			Sampling Date	12/12/19	12/12/19	12/12/19
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Inorganics						
pH	DETSC 2008#		pH	7.3	7.4	8.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	50	40	29

Key: # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 19-25603
Client Ref PSL19/7555
Contract Shell Whitemare Pool

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1613253	MW103 1.20-1.50 SOIL	12/12/19	PT 500ml		
1613254	MW109 2.00-2.30 SOIL	12/12/19	PT 500ml		
1613255	MW102 2.60-2.80 SOIL	12/12/19	PT 500ml		

Key: P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

APPENDIX H WASTE TRANSFER NOTE

Biffa

Office Copy

Biffa Waste Service Ltd
Head Office
Coronation Road, Cressex
High Wycombe Bucks HP12 3TZ
Telephone: 01494 521221
Facsimile: 01494 463368

VAT REG No. 537 9116 27	Depot Telephone 0800 601 601 SOUTH SHIELDS DEPOT	Contract No./Site 2659159/822
CARRIER No. CBDU104360	CONVEYANCE NOTE No. 648/738089	Day Shift
	648/738089	Date 11/11/19

Special	EWC 170904	SIC 41.10

Customer RECONOMY (UK) LIMITED 5241273

Service RECONOMY UK LTD,AECOM LTD
Site SHELL WHITEMARE POOL, WHITEMARE POOL , TYNE AND WEAR, N
Address (DAN WRIGHT 07387262846)

Vehicle No. NK16VZB	Vehicle Type MULTI-BUCKET	
Driver's Comments	Time in: Out:	Wasted Journey
		Wait and Load
		WaitingTime

1 6.1 CU M OPEN SKIP Delivered
Standard C & D Mixed

XXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXX THIS IS NOT A VAT INVOICE
XXXXXXXXXXXXXXXXXXX

I confirm that I have fulfilled my duty to apply the waste hierarchy as required by regulation 12 of the Waste (England & Wales) Regulations 2011

Signed on behalf of the customer [redacted]	Driver's Signature
	Print Name [redacted]

SERVICE TIMES : NO RESTRICTIONS

CONTROLLED WASTE DESCRIPTION AND TRANSFER NOTE

esa Member of the Environmental Services Association

Registered office Biffa Waste Service Ltd. Coronation Road, Cressex, High Wycombe, Bucks HP12 3TZ
Registered in England No. 946107

All orders accepted by us and quotations given by us are our standard conditions of trading.

REMONDIS®

WORKING FOR THE FUTURE

Delivery Ticket / Waste Transfer Note

WASTE CARRIER LICENCE No. : CBDU46746

Ticket No:	30503	**Date:**	20/12/2019	**Job Type:**	Collection
Round:		**Order No:**	8597896	**Veh. Reg:**	NX66HHY

Customer Details:	**Site Details:**	**Disposal Site:**
Reconomy UK Ltd Kelsall House Stafford Court Stafford Park 1 Telford, TF3 3BD	AECOM LTD Shell Whitemare Pool White Mare Pool Gateshead NE10 8YB **SIC2007 Code:**	Birtley Transfer station Westline Industrial Estate Birtley County Durham DH2 1AU **Licence no:**

Container:	8 yd
Desc:	8 yard open chain skip
Time:	-

Material Type:	Soils
Desc:	
EWC Code:	17 05 04

Special Instructions: Tip at Ellington / Site Contact 07387 264313 - Being tipped at Augean BEING TIPPED AT AUGEAN ON CUSTOMERS ACCOUNT ONLY CHARGING HAUALGE 11AM

By signing below I confirm that I have fullfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Customer Print & Sign	**Driver Print & Sign:**
	Harjit Singh
	[redacted]

REMONDIS Ltd, Barrington Industrial Estate, Bedlington, Northumberland, NE22 7DL
Tel: 01670 827820 Emaill: info@remondis.co.uk

REMONDIS®

WORKING FOR THE FUTURE

Weighbridge Ticket

Under Section 34 of the Act, persons transporting and disposing of waste will be under a duty of care. A written description of the waste must be kept and handed to the person receiving the waste. Waste must not be transferred to any person not authorised or licenced to receive such waste. Failure to observe the duty will be a criminal offence.

Ticket No:	6811	**Date:**	20/12/2019 14:40:00	**Direction:**	Incoming
Job/Round:	30503	**Order No:**		**Veh. Reg:**	NX66HHY
Veh. Type:	NX66HHY	**Carrier:**	Remondis Ltd	**Carrier Reg. No:**	CBDU65654

Invoice Address:	**Origin:** AECOM LTD	**Disposal Site:**
RECONOMY - Kelsall House Stafford Court Stafford Park 1 Telford, Reconomy UK Ltd TF3 3BD	Shell Whitemare Pool White Mare Pool Gateshead NE10 8YB **SIC2007 Code:**	Birtley Transfer station Westline Industrial Estate Birtley County Durham DH2 1AU **Licence no:**

Material Type:	Soils
Desc:	
EWC Code:	17 05 04
Container:	8 yd
Zone:	Bir - Bulking Station

Weights:	**Kg**	**Seq. No**	**Date & Time**
Gross:	12,640		23/12/2019 14:41:50
Tare:	10,360		23/12/2019 14:41:54
Nett:	2,280		

Bales:		**Cont. No:**	
Area:	Gateshead	**Seal No:**	

Comments:

By signing below I confirm that I have fullfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Driver Print & Sign	**WB Operator Print & Sign:**
	Alex Moir

REMONDIS Ltd, Barrington Industrial Estate, Bedlington, Northumberland, NE22 7DL
Tel: 01670 827820 Email: info@remondis.co.uk

APPENDIX I GEOPHYSICAL INVESTIGATION REPORT



Shell Whitemare Pool

Geophysical Investigation

Shell UK Oil Products Ltd.

Project number: 60608750

October 2019

Quality information

Prepared by	Checked by	Approved by
[redacted]	[redacted]	[redacted]
James Eason Assistant Geophysicist	Arre Verweerd Associate Geophysicist	Oliver Chrisp Associate Geophysicist

Revision History

Revision	Revision date	Details	Authorized	Name	Position

Distribution List

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Prepared for:

Shell UK Oil Products Ltd.

Prepared by:

James Eason
Assistant Geophysicist

AECOM Infrastructure & Environment UK Limited
12 Regan Way
Chetwynd Business Park
Nottingham NG9 6RZ
United Kingdom

T: +44 (115) 907 7000
aecom.com

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The methodology adopted and the sources of information used by AECOM in providing its services are outlined in this Report. The work described in this Report was undertaken on one shift on the 15th and 16th October 2019 and is based on the conditions encountered and the information available during the said period of time. The scope of this Report and the services are accordingly factually limited by these circumstances.

Where assessments of works or costs identified in this Report are made, such assessments are based upon the information available at the time and where appropriate are subject to further investigations or information which may become available.

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Where field investigations are carried out, these have been restricted to a level of detail required to meet the stated objectives of the services. The results of any measurements taken may vary spatially or with time and further confirmatory measurements should be made after any significant delay in issuing this Report.

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1. Introduction

AECOM has undertaken a geophysical survey of the entire accessible site located at Shell Whitemare Pool, Learn Lane, Gateshead, NE10 8YB, to determine the presence and location of buried tanks, underground obstructions or other on-site features.

1.1 Terms of Reference

Ground Penetrating Radar (GPR) was chosen as the geophysical technique to map subsurface material variations at the site. The survey included orthogonal grids of GPR profiles acquired using antenna frequencies of 300 MHz and 800 MHz, to provide both depth of signal penetration and near surface detail respectively.

Measurements can be made from the GPR data by analysing the following fundamental information:

- The travel time of the signal, when combined with a known velocity, can be used to calculate the depth of the observed feature.
- The amplitude and phase of the signal shows the contrast between the materials and can be used to determine the presence of voids or honeycombing beneath the structure.
- The continuity of the signal can be used to identify the shape of an observed feature.
- Changes in the relative wavelength and amplitude of the signal can be used as indicative features to assess the presence of saturated materials and increasing levels of moisture (this technique is however highly sensitive to material type).

This report and Drawing **60608750-02** document the findings of the GPR survey for the Shell Whitemore Pool site.

The findings presented are based on indirect measurements resulting from the interpretation of electrical and electromagnetic signals. The findings of this report and drawing represent the professional opinions of the authors based on their experience. There is a degree of subjective interpretation when analysing any electrical or electromagnetic signals, and care has been taken to reduce possible omissions or errors.

In addition to changes in construction and the location of buried features, radar signals returned from the interior of a structure contain a wide variety of information. Not all of this information is of engineering significance and much relates to the electrical properties of the materials in the signals path. As well as changes in construction, changes in response may relate to variations in compaction, moisture or hydrocarbons/chemicals within the materials present.

This report supersedes any previous reports whether written or oral.

2. Fieldwork

2.1 The Survey

The Shell Whitemare Pool site consisted of an active petrol filling station forecourt and surrounding grounds including Roman Road behind the forecourt. The entire accessible survey area was approximately 3100 m^2. The limits of the survey were identified on the drawings provided by the client and are in accordance with the red line boundary shown on the Shell title plan for the site. The survey was conducted over two day shifts on the 15th and 16th October 2019, using a two-man site team. Traffic management in the form of barriers and cones in order to block off areas of the site so the survey could be undertaken safely was provided by AECOM personnel.

The survey area was divided into four main components; main forecourt area consisting of an asphalt and concrete surface, grassy areas to the southwest and northeast and Roman Road behind the forecourt. The survey was conducted over the whole extents of these areas with the exception of the heavily vegetated areas between the main forecourt and Roman Road, sales building and substation.

The GPR survey consisted of data acquisition in an orthogonal profile orientation using a cart-mounted GPR system with 300 MHz and 800 MHz antennas over the site extents. Nominal profile spacing was 1 m across the site with 0.5 m spacing across the current tank farm.

The details of the survey grids are presented on Drawing **60608750-01.**

3. Survey findings

3.1 GPR Findings

The results of the GPR survey are presented in Drawing **60608750-02** as a plot detailing a variety of different subsurface anomalies.

3.2 Type 1 Features

Type 1 features represent those consistent with buried fuel storage tank. Construction of these typically includes a number of features located in a tank farm. Not all of these features are well defined. Old tanks which have been backfilled or foam filled where the metal has deteriorated do not typically show as clearly in the GPR data when compared with more recent tanks in a good condition.

The current tank farm composed of six tanks vessels with a NW-SE orientation was observed on the eastern side of the forecourt. The tanks consisted of six individual tanks with varying capacity between 12,920 and 34,580 L and identified as Features 1A-1F in Drawing **60608750-02.** The tanks were relatively well defined although their full extents may have been obscured in places by reinforced concrete and fuel infrastructure.

Features consistent with tanks, tank farms and manhole chambers associated with tanks have been observed at the following locations:

1A This tank-like feature corresponded to the location of T4 with a capacity of 24,700 L. This feature was located at an approximate depth of 1.2-1.3 m below ground level. The resolvable extents of the tank have an estimated width of 2.0 m, with a length of approximately 4 m. The orientation of the feature was roughly NW-SE.

1B Feature **1B** was related to the biggest tank by capacity, tank T1, with a capacity of 34,580 L. It was located at a depth of 1.0 m below the surface. This feature was of similar orientation to the other tanks in the tank farm and had slightly larger extents than Feature **1A**.

1C This feature corresponds to two manholes for T2 although no tank-like response was observed beyond the easternmost manhole indicating the full extent of the tank may not have been resolved beneath the manhole cover and reinforcement. The associated tank had a capacity of 21,660 L and was observed at a varying depth between 0.8 to 1.0 m.

1D Feature **1D** was associated with tank T5 which had the same capacity of tank T2. A larger extent of this feature was resolved than Feature **1C** mainly due to the differing layout of the manhole covers. The approximate length of this tank is 4.5 m and the resolved width is 1.8 m. The data indicated the tank was at a depth of between 0.95 and 1.1 m below the surface.

1E The smallest of the tanks by capacity was tank T3 with a capacity of 12,920 L. The tank was located in the vicinity of Feature **1E** which was observed at a depth of approximately 0.9 to 1.0 m. The anomaly related to this tank was the smallest of the tank-like features observed and measured at 3 m x 2 m and had a NW-SE orientation.

1F The final tank-like feature observed was associated with tank T6 which had the same capacity as tank T3. However, the total extents of the feature was 0.5 m longer than the adjacent tank and had a similar width as Feature **1E**. The depth to this feature was approximately 0.85 – 1.0 m.

3.3 Type 2 Features

Type 2 features represent areas of reinforced concrete construction. The reflective nature of the steel reinforcement makes identification of underlying features such as buried tanks or services difficult, reducing confidence in the findings.

2A The largest area of reinforced concrete on the site was observed above the tank farm. The full extent of this area covered by reinforcement was approximately 350 m^2. The depth to the reinforcement varied between 70 and 210 mm although the longitudinal reinforcement bars perpendicular to the tanks tended to lie above the transverse reinforcement bars. The reinforcement bars were laid in an orthogonal grid at 200 mm intervals.

2B A narrow slab of reinforced concrete is located beneath the asphalt surface with the top of the slab varying in depth between 140 and 300 mm. The reinforcement mesh dipped towards the southwest where it was at its deepest point of 420 mm compared the northeast of the slab where the reinforcement bars are located at a depth of 225 mm below the surface. The bars were spaced every 200 mm.

2C A small slab of reinforced concrete was located to the northeast of the sales building. The depth of the reinforcement bars was approximately 220 mm and the reinforcement spacing was 200 mm.

2D A square area of reinforced concrete associated with two drainage manholes was present on site. The depth to the reinforcement bars in this location was approximately 65 – 140 mm and the spacing between the bars was 200 mm.

2E A further buried reinforced concrete slab was located between Feature **2D** and the sales building. The top of this small slab was observed at a depth of approximately 200 mm and the reinforcement was 280 to 350 mm below the surface.

2F The reinforced concrete slab classified as Feature **2F** was associated with the manhole within the eastern grassy area. The reinforcement covers a 1.5 m x 3.5 m area which encompassed the foul water manhole. The reinforcement bars are located at a depth of 110-120 mm and are spaced at 200 mm intervals in both directions.

2G There was reinforced concrete protecting the manhole that contained electricity cables between the sales building and fuel pumps. The depth to the reinforcement bars is 70 – 85 mm and the bar spacing is 200 mm.

2H A second large area of reinforced concrete is located around the pump islands. The depth to the reinforcement bars varied between 70-230 mm and were spaced at 200 mm intervals. The GPR data suggested there was potentially a second layer of reinforcement slightly below the first layer but the nature of the second layer was unable to be resolved.

Drawing **60608750-02** shows the full extent of the reinforced concrete.

3.4 Type 3 Features

Type 3 features represent significant changes in response within the ground. These can be characteristic of changes in materials such as backfill material where objects have been removed, service trenches or other localised features including buried structures and foundations.

A number of areas of interest were noted across the site including:

3A This rectangular area between the storage tanks and offset fills & vent pipes contained a dense network of infrastructure related to the filling and ventilation of the tanks. This network of pipes was observed at differing levels between 0.5 and 1.0 m.

3B An oblong anomaly was observed in the area associated with the surface water manholes and interceptor at a depth of 0.95 – 1.0 m. The full extent of this anomaly may not have been fully resolved due to the overlying reinforced concrete.

3C A high amplitude response was observed in the GPR data at a depth of 0.95 m. This response may be related to a service and a protective cap above it.

3D This feature related to a buried reinforced concrete slab. See Feature **2B** for a further description.

3E This feature was similar to Feature **3C** and contains a high amplitude response above disturbed ground which was likely to feature services. The depth of the high amplitude horizon was between 0.65 and 0.75 m.

3F This feature related to a buried reinforced concrete slab. See Feature **2E** for a further description.

3G Feature **3G** was related to the construction change on Roman Road. The layer of asphalt appeared to get thicker towards the centre of this rectangular area which may be related to the infilling of subsidence.

3H A sharply dipping high amplitude anomaly was located within the eastern grassy area. The feature dips from 0.65 m in the northwest to 1.3 m in the southwest.

3I A relatively large area between the sales building and exit featured a very high amplitude reflector at depths between 0.85 and 1.25 m. The response was consistent with multiple protected service ducts and featured multiple hyperbolic responses typical of services.

3J A further high amplitude response was observed at a depth of 1.25 m and extended from the most easterly pump island towards Feature **3I**. This feature could be related to the same ducting system and include services.

3K A small area southwest of the fuel pumps also featured an anomaly consistent with features **3I** and **3J**. The depth of this feature is approximately 1.2 m and was likely to denote the presence of services.

3L Feature **3L** was consistent with the presence of fuel infrastructure transporting fuel from the storage tanks to the fuel pumps. The depth to the top of the responses varied between 0.35 and 0.75 m below the surface.

3M The feature was also likely to be related to fuel infrastructure. The high amplitude response was observed at a depth between 1.0 and 1.3 m.

3.5 Buried Services

Location of buried services was not included as part of this survey scope. It was understood that a utility survey has been conducted separately to this survey. However, where potential services have been identified within the GPR data, these have been included as an additional item on the drawings submitted with this report (Drawing **60608750-02**). Several potential services were found across the site.

4. Summary

Approximately 30% of the site was covered by reinforced concrete, limiting the resolution of the GPR survey beneath these areas. Two reinforced concrete slabs were also present at depths between 140 and 300 mm below the surface. Despite this the overall quality of the GPR data was good with the majority of the tank infrastructure being well resolved. The full extent of the GPR survey grid can be found in Drawing **60608750-01.**

There was evidence from the GPR data to suggest that several tanks and other underground structures exist within the site. Any areas that could contain potential obstructions such as tanks or structures have been highlighted in the attached drawings and within this report.

West of the pump islands, six tank-like features were observed, corresponding to the current tank farm. The tanks had an orientation of NW-SE and at an average depth of 1.0 m. Apart from these tank-like

features no other features were observed that could directly be interpreted as an underground storage tank.

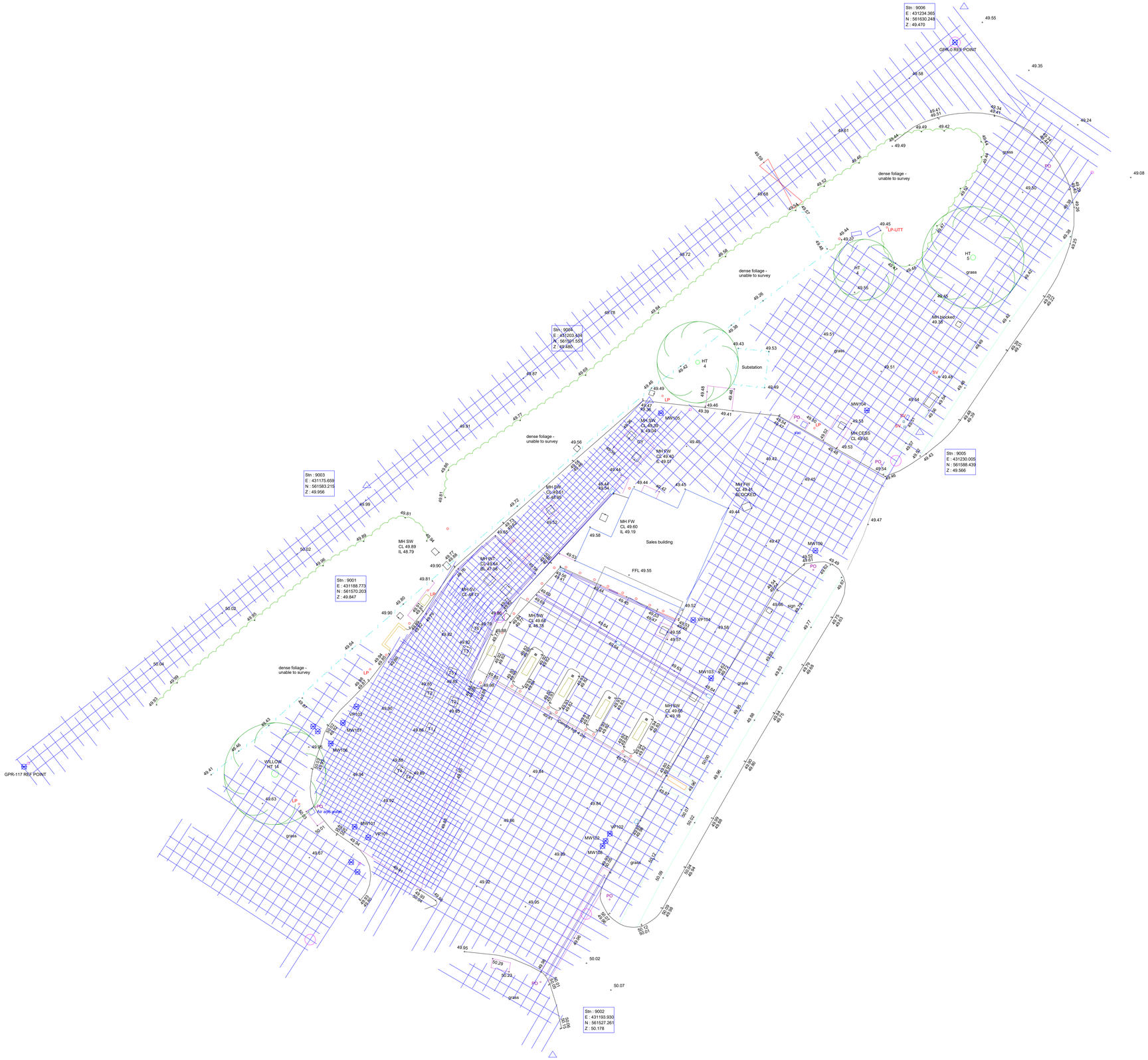
Several areas of buried obstructions or disturbed ground have been observed at the site, associated with known fuel infrastructure and the interceptor as well as other areas consistent with buried services.

These zones of disturbed ground, buried services and buried objects have been identified in Drawing **60608750-02**.

The survey has been conducted with the due diligence of a professional engineer. Due to the non-intrusive nature of these surveys, it cannot be guaranteed that all tanks have been located. Highly degraded, well backfilled tanks in particular may not be clearly evident within the ground. Poor ground conditions, high water tables and extensive areas of reinforced concrete can have a significant effect on data quality, reducing the resolution of features.

Appendix A Drawing 60608750-01

GPR Survey Profile Locations



N

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION BOX

IT IS ASSUMED THAT ALL WORKS ON THIS DRAWING WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROPRIATE METHOD STATEMENT.

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT.

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTATION.
2. DO NOT SCALE FROM THIS DRAWING, USE ONLY PRINTED DIMENSIONS.
3. ALL DIMENSIONS IN MILLIMETRES, ALL CHAINAGES, LEVELS AND COORDINATES ARE IN METRES UNLESS DEFINED OTHERWISE.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE PROJECT HEALTH & SAFETY FILE FOR ANY IDENTIFIED POTENTIAL RISKS.

KEY

GPR Survey Line

Disclaimer

Unless otherwise stated, all tanks and other below ground features shown on this plan have been identified using Ground Penetrating Radar (GPR). Although all reasonable steps have been taken to locate all features, AECOM cannot guarantee that all are present on the drawing as surface obstructions present at the time of the survey can obscure the data beneath.

The features represented on this drawing have been located using Ground Penetrating Radar (GPR) on 15th and 16th October 2019.

The methodology used for this survey includes an orthogonal grid of GPR profiles, collected using a variety of antenna frequencies to optimise depth of penetration and resolution of data. The results of this survey are non-intrusive in nature, based upon the interpretation of electrical responses. As such there is no guarantee that all tanks or buried obstructions have been located or their functions correctly identified.

All depths quoted are relative to existing ground level at the time of survey, and represent minimum depth of feature at the location referenced.

Areas of contaminated, disturbed or poorly compacted ground reduce the definition of features within. This can make identification of tanks and buried obstructions difficult to identify (if present). Though these areas often relate to areas where tanks have been removed and backfilled, care should be taken if excavating.

Areas of dense reinforcement reduce the resolution of any features beneath. Tank locations are often overlain by reinforced concrete, making the exact limits of the tanks more difficult to identify, though highlighting areas where tanks are likely to occur.

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Revision Details	By / Check	Date	Suffix

Purpose of issue

Final

Client

AECOM (Internal) for Shell

Project Title

Shell Whitemare Pool

Drawing Title

GPR Survey Profile Locations

Designed	Drawn	Checked	Approved	Date
JE	JE	AV	OC	October 2019

AECOM Internal Project No.	Suitability
60608750	
Scale @ A1	Zone
1:200	

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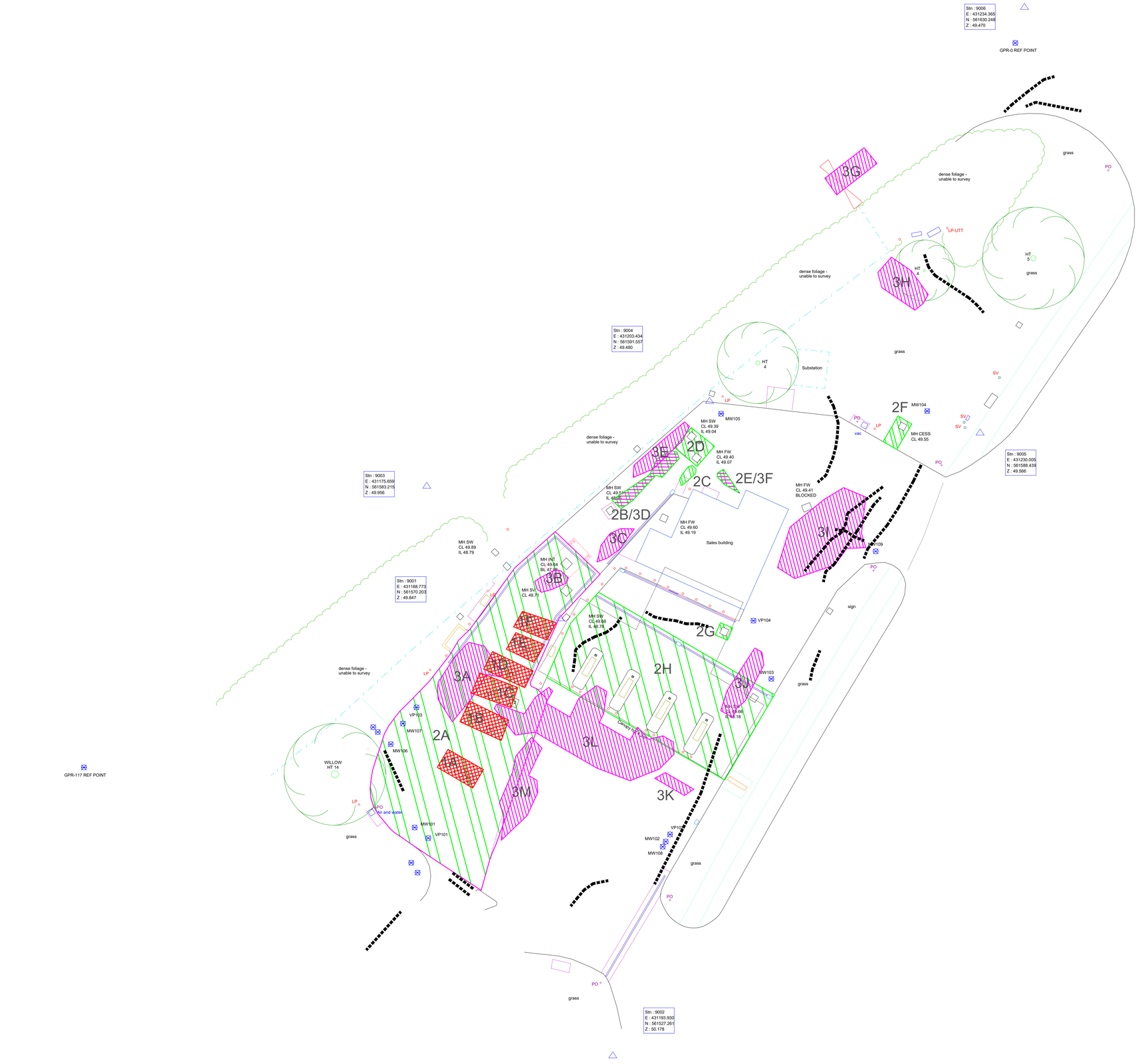
AECOM Infrastructure & Environment UK Limited
12 Regan Way
Chetwynd Business Park, Chilwell
Nottingham, NG9 6RZ
Tel:+44 (0)115 907 7000
Fax:+44 (0)115 907 7001
www.aecom.com

Drawing Number	Rev
60608750-01	01

Plot Date: 10/31/2019 3:59 PM
File Name: DRAWING 60608750 WHITEMARE POOL_1

Appendix B Drawing 60608750-02

Interpretation of GPR Survey Data



Plot Date : 10/31/2019 3:58 PM
File Name : DRAWING 60608750 WHITEMARE POOL_1

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION BOX

IT IS ASSUMED THAT ALL WORKS ON THIS DRAWING WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROPRIATE METHOD STATEMENT.

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT.

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTATION.
2. DO NOT SCALE FROM THIS DRAWING. USE ONLY PRINTED DIMENSIONS.
3. ALL DIMENSIONS IN MILLIMETRES, ALL CHAINAGES, LEVELS AND COORDINATES ARE IN METRES UNLESS DEFINED OTHERWISE.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE PROJECT HEALTH & SAFETY FILE FOR ANY IDENTIFIED POTENTIAL RISKS.

KEY

	Location of buried tanks
	Orientation of tanks as suggested by GPR data
	Orientation of poorly resolved possible tank
	Buried obstructions (Foundations, service ducting/trenches and other obstructions)
	Reinforced concrete
	Potential Buried Utilities

Disclaimer

Unless otherwise stated, all tanks and other below ground features shown on this plan have been identified using Ground Penetrating Radar (GPR). Although all reasonable steps have been taken to locate all features, AECOM cannot guarantee that all are present on the drawing as surface obstructions present at the time of the survey can obscure the data beneath.

The features represented on this drawing have been located using Ground Penetrating Radar (GPR) on 15th and 16th October 2019.

The methodology used for this survey includes an orthogonal grid of GPR profiles collected using a variety of antenna frequencies to optimise depth of penetration and resolution of data. The results of this survey are non-intrusive in nature, based upon the interpretation of electrical responses. As such there is no guarantee that all tanks or buried obstructions have been located or their functions correctly identified.

All depths quoted are relative to existing ground level at the time of survey, and represent minimum depth of features at the location referenced.

Areas of contaminated, disturbed or poorly compacted ground reduce the definition of features within. This can make identification of tanks and buried obstructions difficult to identify (if present). Though these areas often relate to areas where tanks have been removed and backfilled, care should be taken if excavating.

Areas of dense reinforcement reduce the resolution of any features beneath. Tank locations are often overlain by reinforced concrete, making the exact limits of the tanks more difficult to identify, though highlighting areas where tanks are likely to occur.

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Dynamic Multi-Line Revision Block	ZZZ / ZZZ	00:00:00	REV
Revision Details	By / Check	Date	Suffix

Purpose of issue

Final

Client

AECOM (Internal) for Shell

Project Title

Shell Whitemare Pool

Drawing Title

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