

A38 Derby Junctions
TR010022
Volume 6
6.3 Environmental Statement
Appendices
Appendix 10.2: Water Monitoring
Report

Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed
Forms and Procedure) Regulations 2009

April 2019

Infrastructure Planning

Planning Act 2008

**The Infrastructure Planning
(Applications: Prescribed Forms
and Procedure) Regulations 2009**

A38 Derby Junctions
Development Consent Order 202[]

6.3 Environmental Statement Appendices
Appendix 10.2: Water Monitoring Report

Regulation Number	Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	TR010022
Application Document Reference	6.3
Author	A38 Derby Junctions Project Team, Highways England

Version	Date	Status of Version
1	April 2019	DCO Application

A38 Derby Junctions

Monitoring Report

Report Number: HE514503-ACM-VGT-A38_SW_PR_ZZ-RP-GE-003 P01 S0
August 2018

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HE514503-ACM-VGT-Z2_ZW_PR_ZZ-DR-GE-0001

HE514503-ACM-VGT-Z2_ZW_PR_ZZ-DR-GE-0003

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1 INTRODUCTION

1.1 Project Background

- 1.1.1 The A38 is the strategic route from Birmingham to Derby, through to the M1 at Junction 28. The A38 carries significant volumes of long-distance traffic, and where it passes through Derby large volumes of local traffic cross, join or leave the A38 resulting in congestion at three at-grade roundabout junctions.
- 1.1.2 The Scheme comprises the re-modelling of the roundabouts to provide grade separated junctions as follows:
- A38/A5111 Kingsway Junction.
 - A38/A52 Markeaton Junction.
 - A38/A61 Little Eaton Junction.
- 1.1.3 A ground investigation was carried out in 2016 with subsequent groundwater, surface water and ground gas monitoring carried out up to October 2017. The findings of the ground investigation and subsequent monitoring were reported and presented in the Ground Investigation Report (GIR) (HE514503-ACM-VGT-A38_SW_PR_ZZ-RP-GE-0001) prepared by AECOM in March 2018.
- 1.1.4 An additional five rounds of groundwater and surface water monitoring have been undertaken at Markeaton Junction between December 2017 and April 2018. This additional groundwater monitoring was carried out at Markeaton Junction with the aim of giving a more comprehensive image of groundwater levels within this area. Additional groundwater sampling and testing was completed due to a lack of sampling completed at Markeaton Junction during the 2016 ground investigation, as the targeted wells were dry at that time.

1.2 Purpose of Report

- 1.2.1 This report is an addendum to and should be read in conjunction with the AECOM Ground Investigation Report (HE514503-ACM-VGT-A38_SW_PR_ZZ-RP-GE-0001).
- 1.2.2 The purpose of this report is to present the findings of the additional groundwater monitoring and sampling undertaken at Markeaton Junction between December 2017 and April 2018.

2 GROUNDWATER MONITORING

2.1 General

- 2.1.1 Groundwater monitoring was carried out across all three junctions on a monthly basis for 12 months between November 2016 and October 2017 (note: no readings were taken in May and June 2017). Thirty-eight installations were monitored across thirty-four boreholes, see **Table 2.1** for the split between junctions. Following conclusion of this, an extra five rounds of monitoring were completed at Markeaton Junction between December 2017 and April 2018.

Table 2.1 Monitoring Wells

Junction location	Number of Boreholes	Number of Installations	Number Dual Installations
Kingsway	13	16	3
Markeaton	14	14	0
Little Eaton	7	8	1
Total	34	38	4

- 2.1.2 Borehole locations for Markeaton junction are presented in the following drawing:
- HE514503-ACM-VGT-Z2_ZW_PR_ZZ-DR-GE-0001 (Geotechnical Constraints Plan Markeaton Junction).
- 2.1.3 A borehole long section drawing with monitored groundwater ranges (highest and lowest levels in each installation) are presented on the following drawing:
- HE514503-ACM-VGT-Z2_ZW_PR_ZZ-DR-GE-0003 (Long Section Markeaton Junction Monitored Groundwater).

2.2 Markeaton Groundwater Monitoring

- 2.2.1 Fourteen installations at Markeaton Junction were monitored on a monthly basis for twelve months between November 2016 and October 2017 (note: no readings were taken in May and June 2017). At Markeaton an extended period of monitoring was completed from December 2017 to April 2018. See Appendix A for all monitored data in full. The first three rounds of extended monitoring were previously reported within the most recent issue of the GIR but to show the full set of data from the extended monitoring all five are considered and displayed within this report. **Table 2.2** shows the monitored levels within the Made Ground and Natural Strata for the five rounds between December 2017 and April 2018. **Table 2.3** shows the monitored levels within the Made Ground and Natural Strata over the whole monitoring period between November 2016 and April 2017.

Table 2.2 Markeaton Junction Extended Groundwater Monitored Levels (Dec 2017 - Apr 2018)

Exploratory Hole Location	Number of Rounds GW recorded	Average Monitored Groundwater Depth (mBGL) $\pm$ Standard Deviation	Average Monitored Groundwater Level (mAOD)	Strata Screened
BM02	5	8.41 $\pm$ 1.26	68.53	Residual Soil / Mercia Mudstone
BM04	5	6.91 $\pm$ 0.63	60.00	Residual Soil / Mercia Mudstone
BM05	4	2.50 $\pm$ 0.77	68.21	Residual Soil / Mercia Mudstone
BM06A	5	6.91 $\pm$ 0.57	59.23	Residual Soil / Mercia Mudstone
BM07	5	5.26 $\pm$ 0.96	61.58	Residual Soil / Mercia Mudstone
BM08	5	4.21 $\pm$ 0.23	59.23	Mercia Mudstone
BM09	5	3.84 $\pm$ 0.46	60.52	Mercia Mudstone
BM10	5	3.82 $\pm$ 0.27	58.84	Residual Soil / Mercia Mudstone
BM11	5	2.15 $\pm$ 0.14	60.13	Made Ground / Residual Soil / Mercia Mudstone
BM12	5	1.74 $\pm$ 0.19	57.99	Sand And Gravel
BM13	5	2.89 $\pm$ 0.96	58.96	Residual Soil / Mercia Mudstone
BM14	5	1.23 $\pm$ 0.30	57.72	Sand And Gravel / Residual Soil / Mercia Mudstone
BM15	4	0.74 $\pm$ 0.14	57.51	Sand And Gravel
BM16	5	0.85 $\pm$ 0.12	56.83	Sand And Gravel / Mercia Mudstone

**Table 2.3 Markeaton Junction All Groundwater Monitored Levels (Nov 2016-Apr 2018)
Inclusive of Extended Monitoring**

Exploratory Hole Location	Number of Rounds GW recorded	Average Monitored Groundwater Depth (mBGL) $\pm$ Standard Deviation	Average Monitored Groundwater Level (mAOD)	Strata Screened
BM02	15	10.04 $\pm$ 1.86	66.90	Residual Soil / Mercia Mudstone
BM04	15	7.52 $\pm$ 0.59	59.39	Residual Soil / Mercia Mudstone
BM05	9	3.51 $\pm$ 1.10	67.21	Residual Soil / Mercia Mudstone
BM06A	14	7.46 $\pm$ 0.52	58.68	Residual Soil / Mercia Mudstone
BM07	14	5.99 $\pm$ 0.69	60.85	Residual Soil / Mercia Mudstone
BM08	14	4.44 $\pm$ 0.28	59.00	Mercia Mudstone
BM09	14	4.18 $\pm$ 0.52	60.18	Mercia Mudstone
BM10	14	4.14 $\pm$ 0.30	58.52	Residual Soil / Mercia Mudstone
BM11	14	2.58 $\pm$ 0.42	59.70	Made Ground / Residual Soil / Mercia Mudstone
BM12	15	2.07 $\pm$ 0.30	57.66	Sand And Gravel
BM13	14	2.70 $\pm$ 0.47	59.15	Residual Soil / Mercia Mudstone
BM14	15	1.55 $\pm$ 0.29	57.40	Sand And Gravel / Residual Soil / Mercia Mudstone
BM15	12	1.01 $\pm$ 0.20	57.23	Sand And Gravel
BM16	15	1.11 $\pm$ 0.27	56.57	Sand And Gravel / Mercia Mudstone

The average groundwater level recorded in exploratory holes BM12, BM14, BM15 and BM16 screened within the Sand and Gravel ranged between 1.01 and 2.07 mBGL (56.57 and 57.66 mAOD) between November 2017 and April 2018. The average groundwater levels within the Mercia Mudstone in the main area of the Markeaton Junction ranged from between 2.58 and 10.04 mBGL (58.52 and 67.21 mAOD), monitoring in BM02, BM04 to BM11 and BM13 between November 2017 and April 2018. The significant variation in groundwater level across the monitored area may be due to changes in land elevation. BM02, which has the deepest groundwater level (in mBGL), has a ground level of approximately 77 mAOD.

3 GROUNDWATER SAMPLING

3.1 Markeaton Groundwater Sampling

- 3.1.1 The results and information of the original set of water sampling and analysis completed for Markeaton, along with the other two junctions, is presented in the Ground Investigation Report (HE514503-ACM-VGT-A38_SW_PR_ZZ-RP-GE-0001). The Groundwater Test Results (Tier 1 Screening) is presented in Section 6.7.1.5 of the Ground Investigation Report.
- 3.1.2 An additional three rounds of groundwater sampling was undertaken at Markeaton as part of an extended monitoring period between February 2018 and April 2018. Within this extended monitoring period groundwater samples were taken from BM06A, BM11 and BM12. **Table 3.1** provides a summary of the results of the additional groundwater testing of samples obtained at Markeaton between February 2018 and April 2018. **Table 3.2** provides a summary of the exceedances recorded in groundwater sampled from monitoring wells at Markeaton junction between December 2016 and April 2018 (i.e. incorporating all available data for Markeaton Junction). Note that the wells monitored between December 2016 and October 2017 also included BM05, which was not monitored during the extended period between February and April 2018, see Section 3.3 of this report.

Table 3.1 Summary of Exceedances Recorded in Groundwater at Markeaton Junction from extended monitoring rounds (Feb 2018 – Apr 2018) (BM06A, BM10, BM11)

Determinand	Units	EQS	BH With Exceedances	No. of Exceedances	Recorded Concentrations Range
Anthracene	µg/L	0.1	BM11	2/9	<0.005 - 0.215
Benzo(a) pyrene	µg/L	0.00017	BM10, BM11	5/9	<0.002 - 2.04
Benzo(g,h,i)perylene	µg/L	0.0082	BM06A, BM10, BM11	5/9	<0.005 - 1.71
Benzo(b)fluoranthene	µg/L	0.017	BM10, BM11	3/9	<0.005 - 2.99
Benzo(k)fluoranthene	µg/L	0.017	BM10, BM11	3/9	<0.005 - 1.29
Copper	µg/L	1	BM11	1/9	<0.3 - 1.19
Fluoranthene	µg/L	0.0063	BM06A, BM10, BM11	8/9	<0.005 - 3.37
Iron	µg/L	1,000	BM06A, BM10, BM11	9/9	4,890 – 128,000
Zinc (Filtered)	µg/L	10.9	BM06A	1/9	<1 – 11.2

Table 3.2 Summary of Exceedances Recorded in Groundwater at Markeaton Junction (Aug 2016 – Apr 2018) (BM05, BM06A, BM10, BM11)

Determinand	Units	EQS	BH With Exceedances	No. of Exceedances	Recorded Concentrations Range
Anthracene	µg/L	0.1	BM11	3/14	<0.005 - 0.215
Benzene	µg/L	10	BM05	1/14	<1 - 11
Benzo(a) pyrene	µg/L	0.00017	BM05, BM06A, BM10, BM11	7/14	<0.002 - 2.27
Benzo(g,h,i)perylene	µg/L	0.0082	BM05, BM06A, BM10, BM11	8/14	<1 - 2.04
Benzo(b)fluoranthene	µg/L	0.017	BM05, BM06A, BM10, BM11	6/14	<0.005 - 2.99
Benzo(k)fluoranthene	µg/L	0.017	BM05, BM06A, BM10, BM11	6/14	<0.005 - 1.29
Chloroform	µg/L	2.5	BM05	1/14	<0.005 - 15
Copper	µg/L	1	BM05, BM11	3/14	<0.3 - 17
Fluoranthene	µg/L	0.0063	BM05, BM06A, BM10, BM11	15/14	<0.005 – 3.37
Iron	µg/L	1,000	BM05, BM06A, BM10, BM11	16/14	120 – 70,400
Mercury	µg/L	0.07	BM05	1/2	<0.01 - 0.4
Zinc	µg/L	10.9	BM06A	1/14	<1 – 11.2

3.2 Boreholes Monitored During Extended Monitoring

3.2.1 BM06A, BM10, BM11 were the three boreholes monitored during the extended groundwater monitoring. All three boreholes were monitored on the 14/02/18, 14/03/18 and the 19/04/18.

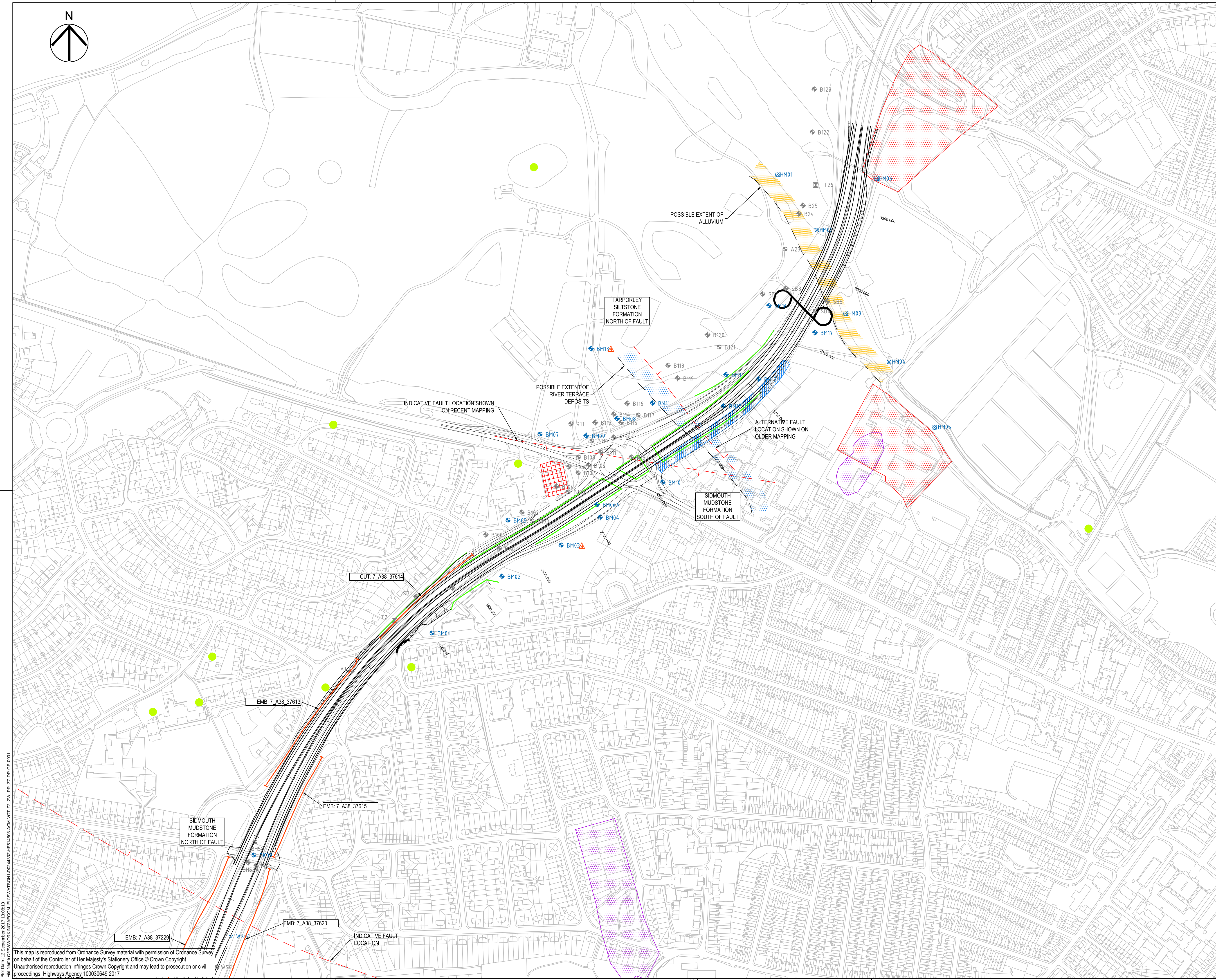
3.3 Boreholes Monitored Prior to Extended Monitoring

3.3.1 BM05 and BM06A were previously monitored. BM05 was monitored on the 04/08/16 and 23/03/17. BM06A was monitored on the 14/01/16, 21/03/17 and the 04/07/17. Attempts were made to take samples from BM07 on the same dates as BM06A but insufficient volume of water was available.

3.4 Groundwater Sampling Summary

- 3.4.1 BM05 was only sampled from twice due to the borehole being dry on multiple occasions.
- 3.4.2 The potential contaminants that have been recorded at concentrations in exceedance of their corresponding criteria are presented in **Table 3.1** and **Table 3.2**. The boreholes sampled are within the vicinity of the Markeaton roundabout fuelling station. The screening assessment indicates that majority of the elevated contaminants are from BM10 and BM11, which are located north and east of the fuel station respectively and the locations of both can be seen on drawing: HE514503-ACM-VGT-Z2_ZW_PR_ZZ-DR-GE-0001.
- 3.4.3 The chemical analysis results recorded during the additional three rounds of groundwater monitoring in 2018 indicate that the groundwater quality in the vicinity of BM10 and BM11 is consistent with the data recorded for BM05 and BM06A in 2016 / 2017 and the recommendations in the Ground Investigation Report stand. All the groundwater data will need to be reviewed to determine the appropriate option for discharge of water during dewatering of earthworks.

DRAWINGS



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION BOX

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5. ROAD ALIGNMENT AND CHAINAGE BASED ON HE514503-ACM-GEN-GEN_ZZ_ZZ_ZZ-DR-CH-0002.

6. INDICATIVE SOLID GEOLOGY FAULTS AND SUPERFICIAL DEPOSITS FROM BGS MAP 125 (2014) AND SK33NW (1969).

7. 2016 GROUND INVESTIGATION CARRIED OUT BY ESG LTD. FOR GEOFFREY OSBORNE LTD. ON BEHALF OF HIGHWAYS ENGLAND.

8. HISTORIC GROUND INVESTIGATION INFORMATION TAKEN FROM DRAWING HA514503-URS-08-DR-GE-25.004 IN PRELIMINARY SOURCES STUDY (HAGDMS No. 28093).

KEY

LOCATIONS:

BM01

BOREHOLE

TM02

TRIAL PIT

WM01

PERCUSSIVE WINDOWLESS SAMPLER

(P)

PIEZOMETER / STANDPIPE / GAS INSTALLATION

HM01

SURFACE WATER MONITORING LOCATION

ASBESTOS FIBRES IDENTIFIED (2016 GI)

HISTORIC GI LOCATIONS

BH40

BOREHOLE

T2

TRIAL PIT

WS01

WINDOW SAMPLE

GEOLOGY AND HISTORIC FEATURES REFER TO DRAWING HE514503-ACM-VGT-A38-SW-PR-ZZ-DR-GE-0001

First Issue

07/04/17

P01.1

Revision Details

By

Check

Date

Suffix

Purpose of Issue

INITIAL STATUS OR WIP

Client

Highways England

Major Projects

Piccadilly Gate

Store Street

Manchester

M1 2WD

Project Title

A38

DERBY JUNCTIONS

Drawing Title

GEOTECHNICAL CONSTRAINTS PLAN

MARKEATON JUNCTION

Designed

DG

Drawn

Checked

Approved

Date

Internal Project No.

60533462

Suitability

S0

Scale @ A1

1:2500

Zone

A38/A52 Markeaton

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Location

Z2_ZW_PR_ZZ

1 Originator

1 Volume

1 Type

1 Role

1 Number

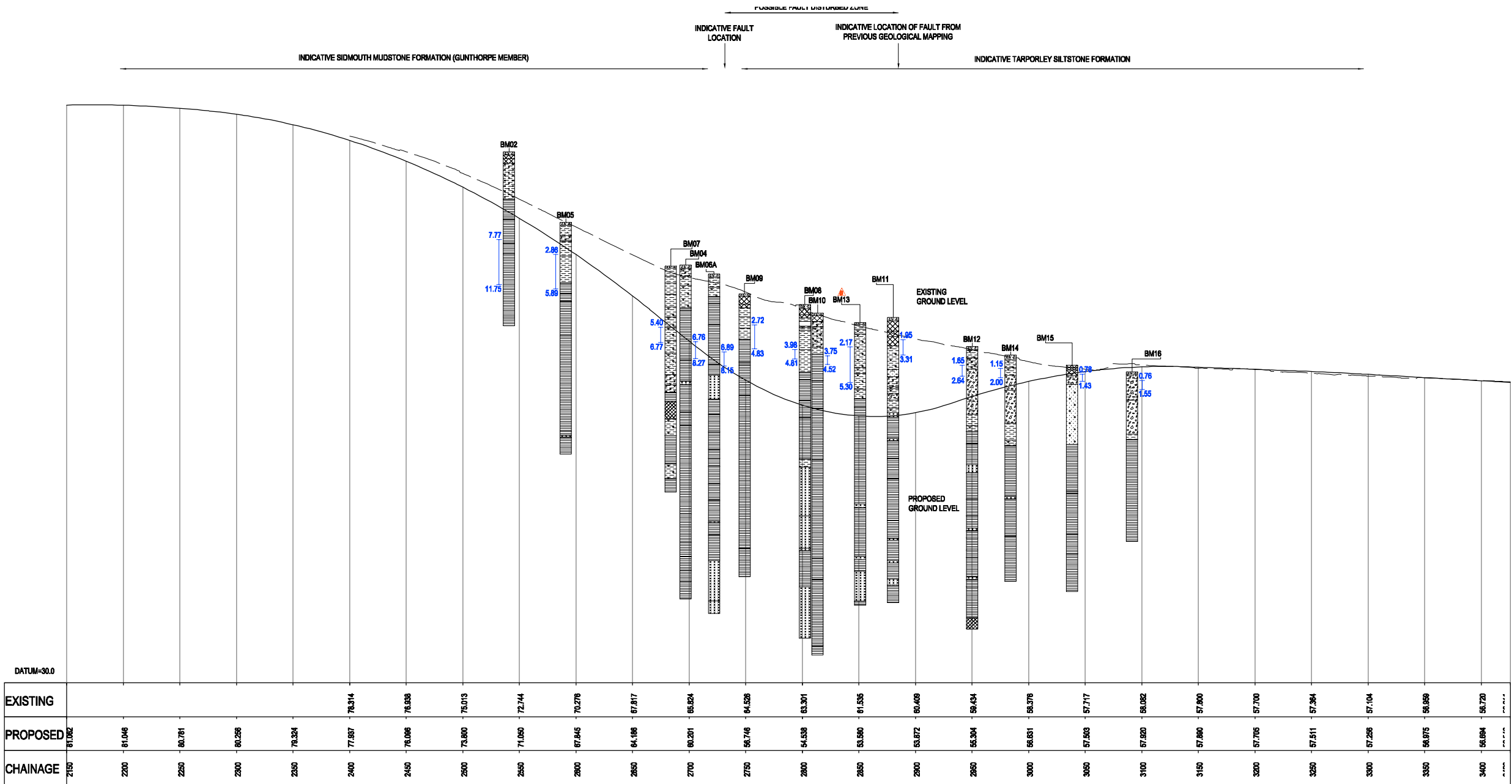
Rev

P01.1

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KEY			
	ASBESTOS FIBRES IDENTIFIED (2016 GI)		TOPSOIL
	GROUNDWATER LEVEL RANGE THROUGHOUT MONITORING RECORD (LEVELS IN mBGL)		MADE GROUND
			CLAY
			SILT
			SAND
			GRAVEL
			GRAVEL
			MUDSTONE
			SILTSTONE



SCALE 1:2000(H) 1:200(V)

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 - FOR EXPLORATORY HOLE LOCATIONS SEE GEOTECHNICAL CONSTRAINTS PLAN 47041319-URS-08-DR-GE-25.002-0D.
 - INDICATIVE FAULT & FORMATIONS FROM BGS MAP 125 (2014).
 - BOREHOLE STEM HATCHINGS ARE PRODUCED DIRECTLY FROM IMPORTED AGS DATA. NO ALTERATIONS HAVE BEEN MADE AND AECOM ACCEPT NO RESPONSIBILITY FOR THE ACCURACY OR CONSISTENCY OF HATCHING.
 - FOR MORE GROUNDWATER MONITORED DATA, SEE MONITORING REPORT.
 - GROUNDWATER STRIKES AND RISES ENCOUNTERED DURING 2016 GI NOT SHOWN FOR CLARITY.

First Issue	By	Check	Date	Suffix
			27/05/18	P01.1

INITIAL STATUS OR WIP

Client
Highways England
The Cube
199 Wharfside Street
Birmingham
B1 1BN

Working on behalf of
highways
england

Project Title
**A38
DERBY JUNCTIONS**

Drawing Title
**LONG SECTION
MARKEATON JUNCTION
MONITORED
GROUNDWATER**

Designed JP	Drawn ---	Checked ---	Approved ---	Date ---
Internal Project No. 60533462		Sustainability S0		
Scale @ A1 ---		Zone A38/A52 Markeaton		

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Drawing Number Highways England only HE514503 Z2_ZW_PR_ZZ	Originator ACM	Volume VGT - DR GE-0003	Rev P01.1
Location	Type	Role	Number

Appendix A Monitored Groundwater Levels (Markeaton)

Date/ Week Commencing	10/11/2016	WC 12/12/16	16/01/2017	16/02/2017	WC 20/03/2017	26/04/2017	WC 03/07/17	10/08/2017	12/09/2017	12/10/2017	20/12/2017	18/01/2018	14/02/2018	14/03/2018	19/04/2018
	GW level MBGL	GW level MBGL	GW level MBGL	GW level MBGL	GW level MBGL	GW level MBGL	GW level MBGL	GW level MBGL	GW level MBGL	GW level MBGL	GW level MBGL	GW level MBGL	GW level MBGL	GW level MBGL	GW level MBGL
Markeaton															
BM02	11.75	11.57	11.58	8.00	7.82	11.60	11.60	11.55	11.60	11.52	11.56	7.77	7.78	7.42	7.50
BM04	8.27	8.02	8.20	7.65	6.76	7.36	7.95	7.95	8.02	8.00	8.04	7.33	6.93	6.70	5.55
BM05	Dry	5.08	4.68	3.49	2.90	5.89	Dry	Dry	Dry	Dry	3.12	3.06	2.86	0.97	Dry
BM06A	N/A	8.15	8.00	7.70	7.06	7.42	7.92	7.87	7.95	7.86	7.91	7.32	6.89	6.67	5.75
BM07	N/A	6.55	6.63	6.20	5.40	6.03	6.55	6.63	6.77	6.73	6.58	6.00	5.60	5.03	3.10
BM08	N/A	4.70	4.70	4.40	3.98	4.35	4.68	4.72	4.80	4.81	4.65	4.35	4.16	4.10	3.80
BM09	N/A	4.62	4.49	4.25	2.72	4.24	4.60	4.70	4.83	4.83	4.69	4.15	3.82	3.45	3.10
BM10	N/A	4.49	4.40	4.16	3.75	4.33	4.50	4.25	4.52	4.42	4.28	4.02	3.80	3.53	3.45
BM11	N/A	3.18	2.40	2.29	2.25	2.90	2.65	3.08	3.31	3.27	1.95	2.25	2.40	2.04	2.10
BM12	2.64	2.18	2.15	1.87	1.65	2.18	2.37	2.44	2.45	2.37	2.05	1.85	1.78	1.43	1.57
BM13	N/A	2.78	2.17	2.56	2.25	2.40	2.48	2.87	2.92	2.87	2.75	2.49	5.30	2.05	1.88
BM14	2.00	1.70	1.66	1.44	1.15	1.63	1.89	1.80	1.95	1.86	1.64	1.50	1.30	0.71	1.00
BM15	1.43	1.02	NA	1.03	NA	0.92	1.30	0.97	1.30	1.18	0.96	0.78	NA	0.60	0.60
BM16	1.55	1.21	1.09	0.82	0.76	1.17	1.45	1.40	1.53	1.43	1.16	0.80	0.85	0.64	0.80
Client Highways England		Figure Title All Markeaton Monitored Groundwater Levels (m BGL)									Figure Number Appendix A			Date Jun-18	
		Project Title A38 DERBY JUNCTIONS				Project Number HE514503									

Appendix B

Combined Tier 1 Screening Tables

[illegible]

Appendix C

Ground Water Sampling Chemical Testing

Certificates Covering all Markeaton Samples



Aecom
Royal Court
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Chesterfield
Derbyshire
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Attention: Sarah Blackburn

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

CERTIFICATE OF ANALYSIS

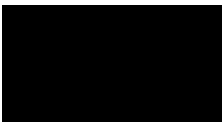
Date: 03 January 2017
Customer: H_URS_CFD
Sample Delivery Group (SDG): 161216-27
Your Reference:
Location: A38
Report No: 392404

We received 3 samples on Friday December 16, 2016 and 3 of these samples were scheduled for analysis which was completed on Tuesday January 03, 2017. 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).

Approved By:



Sonia McWhan
Operations Manager



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CERTIFICATE OF ANALYSIS

Validated

SDG: 161216-27 Client Reference: CH80346 Report Number: 392404
Location: A38 Order Number: CH80346 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
14725538	BK09			14/12/2016
14725540	BM06A			14/12/2016
14725537	HK03			14/12/2016

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

CERTIFICATE OF ANALYSIS

Validated

SDG:	161216-27	Client Reference:		Report Number:	392404
Location:	A38	Order Number:	CH80346	Superseded Report:	

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		14/25338	14/25340	14/25351
	Customer Sample Reference		BM09	BM0A	BM0G
	AGS Reference				
	Depth (m)				
	Container		VA1 AL E207 VA1 AL E240 HNO3 filtered AL E207 H2SO4 AL E240 Dissolved Metals Present 250 ml BOD AL E212 0.5 liter bottle AL E227 VA1 AL E207 VA1 AL E240 HNO3 filtered AL E207 H2SO4 AL E240 Dissolved Metals Present 0.5 liter bottle AL E227 HNO3 filtered AL E207 H2SO4 AL E240 Dissolved Metals Present 0.5 liter bottle AL E227		
Acid Herbicides (W)	All	NDPs: 0 Tests: 3	X	X	
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 3	X	X	X
BOD True Total	All	NDPs: 0 Tests: 1			X
COD Unfiltered	All	NDPs: 0 Tests: 1			X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 3			X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 3	X		X
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 3	X		
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 3	X		
GRO by GC-FID (W)	All	NDPs: 0 Tests: 3			X
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 3	X		
Mercury Dissolved	All	NDPs: 0 Tests: 3			X
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 3	X		X
Metals by iCap-OES Unfiltered (W)	All	NDPs: 0 Tests: 3			
OC, OP Pesticides and Triazine Herb	All	NDPs: 0 Tests: 3	X		
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 3	X		



CERTIFICATE OF ANALYSIS

Validated

SDG:	161216-27	Client Reference:		Report Number:	392404
Location:	A38	Order Number:	CH80346	Superseded Report:	

LIQUID Results Legend	Lab Sample No(s)		141725538		141725540
	Customer Sample Reference		BK09		BK0A
	AGS Reference				
	Depth (m)				
	Container		NH ₃ (AL-E26) HMOS Filtered (AL-E24) HSOC AL E244 Desired White Dyeat J-51 press bottle (AL-E27) Vial (AL-E28) NHOH (AL-E29) HMOS Unfiltered (AL-E20) HSOC AL E244 Desired White Dyeat Therac AL E221 J-51 press bottle (AL-E27) Vial (AL-E28) NHOH (AL-E29) HMOS Unfiltered (AL-E20) HSOC AL E244 Desired White Dyeat Therac AL E221 J-51 press bottle (AL-E27)		
pH Value	All	NDPs: 0 Tests: 3	X		X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 3		X	X
Phenols by ms (w)	All	NDPs: 0 Tests: 3	X		X
Suspended Solids	All	NDPs: 0 Tests: 1			X
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 3	X	X	X
Total Metals by ICP-MS	All	NDPs: 0 Tests: 3		X	X
Total Organic and Inorganic Carbon	All	NDPs: 0 Tests: 3	X		X
TPH CWG (W)	All	NDPs: 0 Tests: 3	X	X	X
VOC MS (W)	All	NDPs: 0 Tests: 3		X	X

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SDG:	161216-27	Client Reference:		Report Number:	392404
Location:	A38	Order Number:	CH80346	Superseded Report:	



CERTIFICATE OF ANALYSIS

Validated

SDG:	161216-27	Client Reference:		Report Number:	392404
Location:	A38	Order Number:	CH80346	Superseded Report:	

[illegible]

SDG:	161216-27	Client Reference:	Report Number:	392404
Location:	A38	Order Number:	Superseded Report:	

Acid Herbicides (W)

[illegible]

CERTIFICATE OF ANALYSIS

SDG:	161216-27	Client Reference:		Report Number:	392404
Location:	A38	Order Number:	CH80346	Superseded Report:	

OC, OP Pesticides and Triazine Herb

[illegible]

SDG:	161216-27	Client Reference:	Report Number:	392404
Location:	A38	Order Number:	Superseded Report:	

PAH Spec MS - Aqueous (W)

Results Legend			Customer Sample Ref.	BK09	BM06A	HK03	
#	IS017025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SPO Ref Lab Sample No. (s) AGS Reference	Water (GWISW) 14/12/2016 14/12/2016 16:12:16-27 14725538	Water (GWISW) 14/12/2016 14/12/2016 16:12:16-27 14725540	Water (GWISW) 14/12/2016 14/12/2016 16:12:16-27 14725537	
aq	Aqueous / settled sample.						
dis.sfil	Dissolved / filtered sample.						
tot.sfil	Total / unfiltered sample.						
*	Subcontracted test.						
**	% 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. Trigger breach confirmed						
(F)	1.54-4.0	Sample deviation (see appendix)					
Component	LOD/Units	Method					
Naphthalene (aq)	<0.1 µg/l	TM178	<0.1	#	<0.1	0.518	#
Acenaphthene (aq)	<0.015 µg/l	TM178	<0.015	#	0.04	<0.015	#
Acenaphthylene (aq)	<0.011 µg/l	TM178	<0.011	#	<0.011	<0.011	#
Fluoranthene (aq)	<0.017 µg/l	TM178	0.198	#	0.0302	<0.017	#
Anthracene (aq)	<0.015 µg/l	TM178	<0.015	#	<0.015	<0.015	#
Phenanthrene (aq)	<0.022 µg/l	TM178	0.0469	#	0.0994	<0.022	#
Fluorene (aq)	<0.014 µg/l	TM178	<0.014	#	0.0313	<0.014	#
Chrysene (aq)	<0.013 µg/l	TM178	0.12	#	<0.013	<0.013	#
Pyrene (aq)	<0.015 µg/l	TM178	0.195	#	0.0306	<0.015	#
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178	0.122	#	<0.017	<0.017	#
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178	0.274	#	<0.023	<0.023	#
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178	0.115	#	<0.027	<0.027	#
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178	0.166	#	<0.009	<0.009	#
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178	0.0238	#	<0.016	<0.016	#
Benzo(g,h)perylene (aq)	<0.016 µg/l	TM178	0.189	#	<0.016	<0.016	#
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178	0.105	#	<0.014	<0.014	#
PAH, Total Detected USEPA 16 (aq)	<0.344 µg/l	TM178	1.54		<0.344	0.518	



CERTIFICATE OF ANALYSIS

SDG:	161216-27	Client Reference:		Report Number:	392404
Location:	A38	Order Number:	CH80346	Superseded Report:	

SVOC MS (W) - Aqueous

Results L. Liquid			Customer Sample Ref.	BM09	BM0A	HK03		
#	ISO 17025 accredited.	Depth (m)						
M	mCET15 accredited.	Sample Type						
AQ	Aqueous / settled sample.	Date Sampled						
disc.frt	Dissolved / filtered sample.	Sample Time						
tp.Laurel	total / settled sample.	Date Received						
"	Subcontracted test.							
"	% 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 keyword confirmed	Lab Sample No.(s)						
1-58-4@	Sample deviation (see appendix)	AGS Reference						
Component	LOD/Units	Method						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
2-Chlorophenol (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
2-Methylphenol (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
2-Nitroaniline (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
2-Nitrophenol (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
3-Nitroaniline (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
4-Chloroaniline (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
4-Methylphenol (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
4-Nitroaniline (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
4-Nitrophenol (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
Azobenzene (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
Acenaphthylene (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
Acenaphthene (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
Anthracene (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
bis[2-Chloroethyl]ether (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
bis[2-Chloroethoxy] methane (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#
bis[2-Ethylhexyl] phthalate (aq)	<2 µg/l	TM176	<4	#	<4	#	<4	#
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<2	#	<2	#	<2	#



CERTIFICATE OF ANALYSIS

Validated

SDG: 161216-27
Location: A38
Client Reference: 161216-27
Order Number: CH80346
Report Number: 392404
Superseded Report:

SVOC MS (W) - Aqueous

Results Legend		Customer Sample Ref.	BK09	BM06A	HK03			
#	ISO 17025 accredited.							
M	mCERTS accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No. (a) AGS Reference	Water (GW/SW) 14/12/2016	Water (GW/SW) 14/12/2016	Water (GW/SW) 14/12/2016			
aq	Aqueous / settled sample.							
dis.sol	Dissolved / filtered sample.	16/12/2016	16/12/2016	16/12/2016	16/12/2016			
tot.smt	Total / unfiltered sample.							
+	Subcontracted test.	16/12/2016	16/12/2016	16/12/2016	16/12/2016			
**	% 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	16/12/2016	16/12/2016	16/12/2016	16/12/2016			
1.5k-4k	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<2	<2	<2			
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176	<2	<2	<2			
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176	<2	<2	<2			
Benzo(a)pyrene (aq)	<1 µg/l	TM176	<2	<2	<2			
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176	<2	<2	<2			
Carbazole (aq)	<1 µg/l	TM176	<2	<2	<2			
Chrysene (aq)	<1 µg/l	TM176	<2	<2	<2			
Dibenzofuran (aq)	<1 µg/l	TM176	<2	<2	<2			
n-Dibutyl phthalate (aq)	<1 µg/l	TM176	<2	<2	<2			
Diethyl phthalate (aq)	<1 µg/l	TM176	<2	<2	<2			
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176	<2	<2	<2			
Dimethyl phthalate (aq)	<1 µg/l	TM176	<2	<2	<2			
n-Dioctyl phthalate (aq)	<5 µg/l	TM176	<10	<10	<10			
Fluoranthene (aq)	<1 µg/l	TM176	<2	<2	<2			
Fluorene (aq)	<1 µg/l	TM176	<2	<2	<2			
Hexachlorobenzene (aq)	<1 µg/l	TM176	<2	<2	<2			
Hexachlorobutadiene (aq)	<1 µg/l	TM176	<2	<2	<2			
Pentachlorophenol (aq)	<1 µg/l	TM176	<2	<2	<2			
Phenol (aq)	<1 µg/l	TM176	<2	<2	<2			
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176	<2	<2	<2			
Hexachloroethane (aq)	<1 µg/l	TM176	<2	<2	<2			
Nitrobenzene (aq)	<1 µg/l	TM176	<2	<2	<2			
Naphthalene (aq)	<1 µg/l	TM176	<2	<2	<2			
Isophorone (aq)	<1 µg/l	TM176	<2	<2	<2			
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176	<2	<2	<2			
Phenanthrene (aq)	<1 µg/l	TM176	<2	<2	<2			
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176	<2	<2	<2			
Pyrene (aq)	<1 µg/l	TM176	<2	<2	<2			



CERTIFICATE OF ANALYSIS

Validated

SDG: 161216-27
Location: A38
Client Reference: 161216-27
Order Number: CH80346
Report Number: 392404
Superseded Report:

TPH CWG (W)

Results Legend		Customer Sample Ref.	BK09	BM06A	HK03			
#	ISO 17025 accredited.							
M	mCERTS accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No. (a) AGS Reference	Water (GW/SW) 14/12/2016	Water (GW/SW) 14/12/2016	Water (GW/SW) 14/12/2016			
aq	Aqueous / settled sample.							
dis.sol	Dissolved / filtered sample.	16/12/2016	16/12/2016	16/12/2016	16/12/2016			
tot.smt	Total / unfiltered sample.							
+	Subcontracted test.	16/12/2016	16/12/2016	16/12/2016	16/12/2016			
**	% 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	16/12/2016	16/12/2016	16/12/2016	16/12/2016			
1.5k-4k	Sample deviation (see appendix)							
Component	LOD/Units	Method						
GRO Surrogate % recovery**	%	TM245	87	86	89			
GRO >C5-C12	<50 µg/l	TM245	<50	<50	<50			
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245	<3	<3	<3			
Benzene	<7 µg/l	TM245	<7	<7	<7			
Toluene	<4 µg/l	TM245	<4	<4	<4			
Ethylbenzene	<5 µg/l	TM245	<5	<5	<5			
m,p-Xylene	<8 µg/l	TM245	<8	<8	<8			
o-Xylene	<3 µg/l	TM245	<3	<3	<3			
Sum of detected Xylenes	<11 µg/l	TM245	<11	<11	<11			
Sum of detected BTEX	<28 µg/l	TM245	<28	<28	<28			
Aliphatics >C5-C8	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C6-C8	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C8-C10	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C10-C12	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174	<10	<10	<10			
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174	<10	<10	<10			
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174	<10	<10	<10			
Total Aliphatics >C12-C35 (aq)	<10 µg/l	TM174	<10	<10	<10			
Aromatics >EC5-EC7	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC7-EC8	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC8-EC10	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC10-EC12	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174	<10	<10	<10			
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174	<10	<10	<10			
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174	<10	<10	<10			
Total Aromatics >EC12-EC35 (aq)	<10 µg/l	TM174	<10	<10	<10			
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM174	<10	<10	<10			



CERTIFICATE OF ANALYSIS

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SDG: 161216-27
Location: A38
Client Reference: CH80346
Report Number: 392404
Superseded Report:

VOC MS (W)

Results Legend		Customer Sample Ref.	BK09	BM06A	HK03		
#	ISO 17025 accredited.						
M	mCERIS accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No. (s) AGS Reference	Water (GW/SW) 14/12/2016	Water (GW/SW) 14/12/2016	Water (GW/SW) 14/12/2016		
dis.crit	Aqueous / settled sample.						
tot.crit	Dissolved / filtered sample.	16/12/2016 16/12/2016 16/12/2016 14/12/2016					
+	Total / settled sample.						
..	Subcontracted test.	16/12/2016 16/12/2016 16/12/2016 14/12/2016					
..	% 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 trigger breach confirmed						
(F)	1.58-4.0@ Sample deviation (see appendix)	16/12/2016 16/12/2016 16/12/2016 14/12/2016					
1.58-4.0@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM208	117	116	116		
Toluene-d8**	%	TM208	110	110	109		
4-Bromofluorobenzene**	%	TM208	108	110	107		
Dichlorodifluoromethane	<1 µg/l	TM208	<1	<1	<1		
Chloromethane	<1 µg/l	TM208	<1	<1	<1		
Vinyl chloride	<1 µg/l	TM208	<1	<1	<1		
Bromomethane	<1 µg/l	TM208	<1	<1	<1		
Chloroethane	<1 µg/l	TM208	<1	<1	<1		
Trichlorofluoromethane	<1 µg/l	TM208	<1	<1	<1		
1,1-Dichloroethene	<1 µg/l	TM208	<1	<1	<1		
Carbon disulphide	<1 µg/l	TM208	<1	<1	<1		
Dichloromethane	<3 µg/l	TM208	<3	<3	<3		
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1	<1	<1		
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1		
1,1-Dichloroethane	<1 µg/l	TM208	<1	<1	<1		
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1		
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1		
Bromochloromethane	<1 µg/l	TM208	<1	<1	<1		
Chloroform	<1 µg/l	TM208	<1	<1	<1		
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	<1	<1		
1,1-Dichloropropene	<1 µg/l	TM208	<1	<1	<1		
Carbon tetrachloride	<1 µg/l	TM208	<1	<1	<1		
1,2-Dichloroethane	<1 µg/l	TM208	<1	<1	<1		
Benzene	<1 µg/l	TM208	<1	<1	<1		
Trichloroethene	<1 µg/l	TM208	<1	<1	<1		
1,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1		
Dibromomethane	<1 µg/l	TM208	<1	<1	<1		
Bromodichloromethane	<1 µg/l	TM208	<1	<1	<1		
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1		
Toluene	<1 µg/l	TM208	<1	<1	<1		
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1		
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	<1	<1		

08:31:26 03/01/2017



CERTIFICATE OF ANALYSIS

Validated

SDG: 161216-27
Location: A38
Client Reference: CH80346
Report Number: 392404
Superseded Report:

VOC MS (W)

Results Legend		Customer Sample Ref.	BK09	BM06A	HK03		
#	ISO 17025 accredited.						
M	mCERIS accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No. (s) AGS Reference	Water (GW/SW) 14/12/2016	Water (GW/SW) 14/12/2016	Water (GW/SW) 14/12/2016		
dis.crit	Aqueous / settled sample.						
tot.crit	Dissolved / filtered sample.	16/12/2016 16/12/2016 16/12/2016 14/12/2016					
+	Total / settled sample.						
..	Subcontracted test.	16/12/2016 16/12/2016 16/12/2016 14/12/2016					
..	% 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 trigger breach confirmed						
(F)	1.58-4.0@ Sample deviation (see appendix)	16/12/2016 16/12/2016 16/12/2016 14/12/2016					
1.58-4.0@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
1,3-Dichloropropane	<1 µg/l	TM208	<1	<1	<1		
Tetrachloroethene	<1 µg/l	TM208	<1	<1	<1		
Dibromochloromethane	<1 µg/l	TM208	<1	<1	<1		
1,2-Dibromoethane	<1 µg/l	TM208	<1	<1	<1		
Chlorobenzene	<1 µg/l	TM208	<1	<1	<1		
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1	<1		
Ethylbenzene	<1 µg/l	TM208	<1	<1	<1		
m,p-Xylene	<1 µg/l	TM208	<1	<1	<1		
o-Xylene	<1 µg/l	TM208	<1	<1	<1		
Styrene	<1 µg/l	TM208	<1	<1	<1		
Bromoform	<1 µg/l	TM208	<1	<1	<1		
Isopropylbenzene	<1 µg/l	TM208	<1	<1	<1		
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1	<1		
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	<1	<1		
Bromobenzene	<1 µg/l	TM208	<1	<1	<1		
Propylbenzene	<1 µg/l	TM208	<1	<1	<1		
2-Chlorotoluene	<1 µg/l	TM208	<1	<1	<1		
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1	<1	<1		
4-Chlorotoluene	<1 µg/l	TM208	<1	<1	<1		
tert-Butylbenzene	<1 µg/l	TM208	<1	<1	<1		
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1	<1	<1		
sec-Butylbenzene	<1 µg/l	TM208	<1	<1	<1		
4-iso-Propyltoluene	<1 µg/l	TM208	<1	<1	<1		
1,3-Dichlorobenzene	<1 µg/l	TM208	<1	<1	<1		
1,4-Dichlorobenzene	<1 µg/l	TM208	<1	<1	<1		
n-Butylbenzene	<1 µg/l	TM208	<1	<1	<1		
1,2-Dichlorobenzene	<1 µg/l	TM208	<1	<1	<1		
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1	<1	<1		
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1	<1	<1		
Hexachlorobutadiene	<1 µg/l	TM208	<1	<1	<1		
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1	<1	<1		
Naphthalene	<1 µg/l	TM208	<1	<1	<1		

08:31:26 03/01/2017

SDG:	161216-27	Client Reference:		Report Number:	392404
Location:	A38	Order Number:	CH80346	Superseded Report:	

VOC MS (W)

[illegible]

CERTIFICATE OF ANALYSIS

SDG:	161216-27	Client Reference:		Report Number:	392404
Location:	A38	Order Number:	CH80346	Superseded Report:	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690, Part120 1991, BS EN 872	Determination of total suspended solids in waters		
TM045	MEWAM BOD5 2nd Ed.HMSO 1999 / Method 5210B, AWWA/APHA, 20th Ed., 1999, SCA Blue Book 130	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids		
TM061	Method for the Determination of EPH,Massachusetts Dept. of EP, 1999	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified US EPA Method 415 1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water		
TM099	BS 2690 Part 7: 1999 / BS 6069 Part12: 11: 1994	Determination of Ammonium in Water Samples using the Kone Analyser		
TM107	ISO 6060-1999	Determination of Chemical Oxygen Demand using COD Dr Lange Kit		
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 Online	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 GC/MS		
TM178	Modified US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
TM183	BS EN 23606:2002, (BS 6069-2:74:2002) ISBN 0 560 36624 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM186	Determination of Acidic Herbicides in Groundwater and Potable Water by LC/MSD Using Selective Ion Monitor ¹⁹ . Agilent Technologies Inc. Application Note 5969-5962EN	The Determination of Acid Herbicides in Environmental Water Samples and Leachates by LC/MS QQQ		
TM191	Standard Methods for the examination of waters and wastewaters 16th Edition, ALPHA, Washington DC, USA ISBN 0-87553-131-6	Determination of Unfiltered Metals in Water Matrices by ICP-MS		
TM205		Determination of Phenols in Waste Waters using Solid Phase Extraction, Acetylation, Gas Chromatography and Mass Selective Detection		
TM208	Modified US EPA Method 8260b & 824	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM227	Standard methods for the examination of water's and wastewaters 20th Edition, AWWA/APHA Method 4500	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate		
TM228	US EPA Method 8010B	Determination of Major Cations in Water by iCap 6600 Duo ICP-OES		
TM231	Agilent 6690 Gas Chromatograph system using an Agilent 5973 Mass Selective Detector (MSD)	Determination of Organochlorine and Organophosphorus Pesticides and Triazine Herbicides by GC/MS		
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1990	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser		
TM245	By GC-FID	Determination of GRO by Headspace in waters		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1979 ISBN 011 751428 4	Determination of pH in Water and Leachate using the GLpH pH Meter		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. 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

Validated

SDG: 161216-27 Client Reference: Report Number: 392404
Location: A38 Order Number: CH80346 Superseded Report:

Test Completion Dates

Lab Sample No(s)	14725538	14725540	14725537
Customer Sample Ref.	BK09	BM04A	H003
AGS Ref.			
Depth			
Type	LIQUID	LIQUID	LIQUID
Acid Herbicides (W)	22-Dec-2016	22-Dec-2016	22-Dec-2016
Ammoniacal Nitrogen	28-Dec-2016	28-Dec-2016	28-Dec-2016
BOD True Total			23-Dec-2016
COD Unfiltered			23-Dec-2016
Cyanide Comp/Free/Total/Thiocyanate	20-Dec-2016	20-Dec-2016	20-Dec-2016
Dissolved Metals by ICP-MS	22-Dec-2016	22-Dec-2016	22-Dec-2016
EPH CWG (Aliphatic) Aqueous GC (W)	23-Dec-2016	23-Dec-2016	21-Dec-2016
EPH CWG (Aromatic) Aqueous GC (W)	23-Dec-2016	23-Dec-2016	21-Dec-2016
GRO by GC-FID (W)	23-Dec-2016	23-Dec-2016	23-Dec-2016
Hexavalent Chromium (w)	29-Dec-2016	29-Dec-2016	29-Dec-2016
Mercury Dissolved	23-Dec-2016	23-Dec-2016	23-Dec-2016
Metals by iCap-OES Dissolved (W)	23-Dec-2016	23-Dec-2016	29-Dec-2016
Metals by iCap-OES Unfiltered (W)	28-Dec-2016	22-Dec-2016	21-Dec-2016
OC, OP Pesticides and Triazine Herb	21-Dec-2016	21-Dec-2016	21-Dec-2016
PAH Spec MS - Aqueous (W)	28-Dec-2016	28-Dec-2016	23-Dec-2016
pH Value	28-Dec-2016	28-Dec-2016	28-Dec-2016
Phenols by HPLC (W)	22-Dec-2016	22-Dec-2016	22-Dec-2016
Phenols by IGC (w)	21-Dec-2016	21-Dec-2016	21-Dec-2016
Suspended Solids			29-Dec-2016
SVOC MS (W) - Aqueous	23-Dec-2016	23-Dec-2016	23-Dec-2016
Total Metals by ICP-MS	28-Dec-2016	21-Dec-2016	21-Dec-2016
Total Organic and Inorganic Carbon	03-Jan-2017	03-Jan-2017	03-Jan-2017
TPH CWG (W)	23-Dec-2016	23-Dec-2016	23-Dec-2016
VOC MS (W)	23-Dec-2016	23-Dec-2016	23-Dec-2016



CERTIFICATE OF ANALYSIS

SDG: 161216-27 Client Reference: Report Number: 392404
Location: A38 Order Number: CH80346 Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) 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. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. 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.

4. 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.

5. 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.

6. 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 ISO 17025. 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 asbestos present is not determined unless specifically requested.

7. 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.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

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

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

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

13. **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 70-100%, they are generally wider for volatiles analysis, 50-150%. 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.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Triethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

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

18. 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.

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

General

20. 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 GC/FID/GCMS and all subcontracted analysis.

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

22. 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.

23. Analysis and identification of specific compounds using GC/FID 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 GC/MS should be utilised.

24. **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.

Sample Deviations

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
5	Samples exceeded holding time before preservation was performed
§	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

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.

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.



Aecom
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Attention: Sarah Blackburn

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Hawarden
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Website: www.alsenvironmental.co.uk



SDG:	170322-28	Client Reference:		Report Number:	403745
Location:	A38	Order Number:	RSCH011	Superseded Report:	

CERTIFICATE OF ANALYSIS

Validated

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
15215207	BK09			21/03/2017
15215209	BK14			21/03/2017
15215208	BK15			21/03/2017
15215206	BM06A			21/03/2017

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

CERTIFICATE OF ANALYSIS

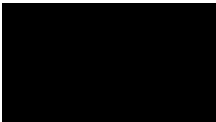
Date: 03 April 2017
Customer: H_URS_CFD
Sample Delivery Group (SDG): 170322-28
Your Reference:
Location: A38
Report No: 403745

We received 4 samples on Wednesday March 22, 2017 and 4 of these samples were scheduled for analysis which was completed on Monday April 03, 2017. 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.

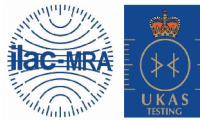
Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

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

Approved By:



Sonia McWhan
Operations Manager



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

SDG:	170322-28	Client Reference:		Report Number:	403745
Location:	A38	Order Number:	RSCH011	Superseded Report:	

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CERTIFICATE OF ANALYSIS

Validated

SDG:	170322-28	Client Reference:		Report Number:	403745
Location:	A38	Order Number:	RSCH011	Superseded Report:	

Acid Herbicides (W)

Results Legend			Customer Sample Ref.	BK09	BK14	BK15	BK0A
#	IS017625 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No. (s) JGS Reference	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
11	INERTS accredited.			2 1403.00 17	2 1403.00 17	2 1403/20 17	2 1403/20 17
12	Aqueous / settled sample.						
13	Dissolved / filtered sample.						
14	Total / unfiltered sample.						
15	Subcontracted test.						
16	% 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						
17	Trigger breach confirmed						
18	Sample deviation (see appendix)						
19	Sample deviation (see appendix)						
20	Sample deviation (see appendix)						
21	Sample deviation (see appendix)						
22	Sample deviation (see appendix)						
23	Sample deviation (see appendix)						
24	Sample deviation (see appendix)						
25	Sample deviation (see appendix)						
26	Sample deviation (see appendix)						
27	Sample deviation (see appendix)						
28	Sample deviation (see appendix)						
29	Sample deviation (see appendix)						
30	Sample deviation (see appendix)						
31	Sample deviation (see appendix)						
32	Sample deviation (see appendix)						
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34	Sample deviation (see appendix)						
35	Sample deviation (see appendix)						
36	Sample deviation (see appendix)						
37	Sample deviation (see appendix)						
38	Sample deviation (see appendix)						
39	Sample deviation (see appendix)						
40	Sample deviation (see appendix)						
41	Sample deviation (see appendix)						
42	Sample deviation (see appendix)						
43	Sample deviation (see appendix)						
44	Sample deviation (see appendix)						
45	Sample deviation (see appendix)						
46	Sample deviation (see appendix)						
47	Sample deviation (see appendix)						
48	Sample deviation (see appendix)						
49	Sample deviation (see appendix)						
50	Sample deviation (see appendix)						
51	Sample deviation (see appendix)						
52	Sample deviation (see appendix)						
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75	Sample deviation (see appendix)						
76	Sample deviation (see appendix)						
77	Sample deviation (see appendix)						
78	Sample deviation (see appendix)						
79	Sample deviation (see appendix)						
80	Sample deviation (see appendix)						
81	Sample deviation (see appendix)						
82	Sample deviation (see appendix)						
83	Sample deviation (see appendix)						
84	Sample deviation (see appendix)						
85	Sample deviation (see appendix)						
86							



CERTIFICATE OF ANALYSIS

Validated

SDG:	170322-28	Client Reference:		Report Number:	403745
Location:	A38	Order Number:	RSCH011	Superseded Report:	

OC, OP Pesticides and Triazine Herb

Results Legend			Customer Sample Ref.	BK03	BK14	BK15	BK6A		
#	ISO 17025 accredited.	AKCERT is accredited.	Depth (m)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)		
aq	Aqueous / settled sample.	Disolved / filtered sample.	Sample Type	21K03.0017	21K03.0017	21K03.0017	21K03.0017		
dis.sft	Disolved / filtered sample.	total / unfiltered sample.	Date Sampled						
tot.sft	total / unfiltered sample.	Subcontracted test.	Sample Time						
-	Subcontracted test.	% recovery of the surrogate standard to check the efficiency of the method. The results of individual components within samples aren't corrected for the recovery	Date Received	22.03.2017	22.03.2017	22.03.2017	22.03.2017		
-	% recovery of the surrogate standard to check the efficiency of the method. The results of individual components within samples aren't corrected for the recovery	Trigger breach confirmed	SDQ Ref	170322-28	170322-28	170322-28	170322-28		
(1)	Trigger breach confirmed	Lab Sample No (s)	ISO Reference	15215027	15215029	15215028	15215026		
1-54-66	Sample elevation (see appendix)								
Component	LOQ/Units	Method							
Dichlorvos	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
Mevinphos	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
alpha-Hexachlorocyclohexane (HCH / Lindane)	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
Diazinon	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
gamma-Hexachlorocyclohexane (HCH / Lindane)	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
Heptachlor	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
Aldrin	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
beta-Hexachlorocyclohexane (HCH / Lindane)	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
Methyl parathion	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
Malathion	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
Fenitrothion	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
Heptachlor epoxide	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
Parathion	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
o,p-DDE	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
Endosulphan I	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
p,p-DDE	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
Dieldrin	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
o,p-TDE (DDD)	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
Endrin	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
o,p-DDT	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
p,p-TDE (DDD)	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
Ethion	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
Endosulphan II	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
p,p-DDT	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
o,p-Methoxychlor	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
p,p-Methoxychlor	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
Endosulphan sulphate	<0.01 µg/l	TM231	<0.01	<0.01	<0.01	<0.01	<0.01		
Azinphos-methyl	<0.01 µg/l	TM231	<0.01	<0.01	<0.0				

CERTIFICATE OF ANALYSIS

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SDG:	170322-28	Client Reference:		Report Number:	403745
Location:	A38	Order Number:	RSCH011	Superseded Report:	

Client Reference:
Order Number: RSCH011

Report Number:	403745
Superseded Report:	

PAH Spec MS - Aqueous (W)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	170322-28	Client Reference:		Report Number:	403745
Location:	A38	Order Number:	RSCH011	Superseded Report:	

Client Reference:	
Order Number:	RSCH011

Report Number:	403745
Superseded Report:	

SVOC MS (W) - Aqueous

Results Listed			Customer Sample Ref.	BK14	BK14	BK15	BMSA
#	ISO 17025 accredited.	Depth (m)					
M	accredited.	Sample Type					
aq	aqueous / filtered sample.	Date Sampled					
disinf	Dissolved / filtered sample.	Sample Time					
to landfill	Total / unfiltered sample.	Date Received					
-	Subcontracted test.	SDG Ref					
-	% 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	Lab Sample No (s)					
(6)	Trigger breach confirmed	ASG Reference					
1-54-66	Sample deviation (see appendix)						
Component	LOD/Units	Method					
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<2	#	5.98	#	<2
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<2	#	4.76	#	<2
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<2	#	8.88	#	<2
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
2-Chlorophenol (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<2	#	5.75	#	<2
2-Methylphenol (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
2-Nitroaniline (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
2-Nitrophenol (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
3-Nitroaniline (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
4-Chloroaniline (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
4-Methylphenol (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
4-Nitroaniline (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
4-Nitrophenol (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
Azobenzene (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
Acenaphthylene (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
Acenaphthene (aq)	<1 µg/l	TM176	<2	#	20.6	#	<2
Anthracene (aq)	<1 µg/l	TM176	<2	#	19.8	#	<2
bis[2-Chloroethyl]ether (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
bis[2-Chloroethyl] methane (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
bis[2-Ethylhexyl] phthalate (aq)	<2 µg/l	TM176	<4	#	37.4	#	<4
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<2	#	<4	#	<2
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<2	#	19.2	#	<2

CERTIFICATE OF ANALYSIS

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SDG:	170322-28
Location:	A38

Client Reference:
Order Number: RSCH011

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SVOC MS (W) - Aqueous

Results Legend			Customer Sample Ref.	BK03	BK14	BK15	BK16	BK17
#	ISO17025 accredited.	Depth (m)	Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
m	Aqueous / settled sample.	Sample Type	Date Sampled	21403/2017	21403/2017	21403/2017	21403/2017	21403/2017
dis.filt	Dissolved / filtered sample.	Sample Type	Date Received	22403/2017	22403/2017	22403/2017	22403/2017	22403/2017
tot.filt	Total / unfiltered sample.	Sample Type	SDG Ref	170322-28	170322-28	170322-28	170322-28	170322-28
..	Subcontracted test.	Sample Type	SDG Ref	152152/07	152152/09	152152/08	152152/08	152152/06
Trigger to each confirmed			Lab Sample No. (s)	ASG Reference				
+1 sd +/- 1 sample deviation (see appendix)			Method					
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<2	19.5	<1	<2	
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<2	7.64	<1	<2	
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<2	16	<1	<2	
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<2	9.29	<1	<2	
Carbazole (aq)	<1 µg/l	TM176		<2	20.4	<1	<2	
Chrysene (aq)	<1 µg/l	TM176		<2	17.4	<1	<2	
Dibenzofuran (aq)	<1 µg/l	TM176		<2	11.5	<1	<2	
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<2	<4	<1	<2	
Diethyl phthalate (aq)	<1 µg/l	TM176		<2	<4	<1	<2	
Dibenz(a,h)anthracene (aq)	<1 µg/l	TM176		<2	<4	<1	<2	
Dimethyl phthalate (aq)	<1 µg/l	TM176		<2	26	<1	<2	
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<10	<20	<5	<10	
Fluoranthene (aq)	<1 µg/l	TM176		<2	52.4	<1	<2	
Fluorene (aq)	<1 µg/l	TM176		<2	16.8	<1	<2	
Hexachlorobenzene (aq)	<1 µg/l	TM176		<2	<4	<1	<2	
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<2	<4	<1	<2	
Pentachlorophenol (aq)	<1 µg/l	TM176		<2	<4	<1	<2	
Phenol (aq)	<1 µg/l	TM176		<2	<4	<1	<2	
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<2	<4	<1	<2	
Hexachloroethane (aq)	<1 µg/l	TM176		<2	<4	<1	<2	
Nitrobenzene (aq)	<1 µg/l	TM176		<2	<4	<1	<2	
Naphthalene (aq)	<1 µg/l	TM176		<2	12.8	<1	<2	
Isophorone (aq)	<1 µg/l	TM176		<2	<4	<1	<2	
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<2	<4	<1	<2	
Phenanthrene (aq)	<1 µg/l	TM176		<2	61.4	<1	<2	
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<2	7.65	<1	<2	
Pyrene (aq)	<1 µg/l	TM176		<2	43.3	<1	<2	



CERTIFICATE OF ANALYSIS

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SDG:	170322-28
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Client Reference:
Order Number: RSCH011

Report Number:	403745
Superseded Report:	

TPH CWG (W)[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 170322-28
Location: A38
Client Reference: RSCH011
Report Number: 403745
Superseded Report:

VOC MS (W)

Results Legend		Customer Sample Ref.	BK09		BK14		BK15		BM0A			
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No. (s) #66 Reference	Ground Water (GW) 21032017	Ground Water (GW) 21032017	Ground Water (GW) 21032017	Ground Water (GW) 21032017	Ground Water (GW) 21032017	Ground Water (GW) 21032017	Ground Water (GW) 21032017		
M	mCERIS accredited.											
dis.crit	Aqueous / settled sample.											
tot.untit	Dissolved / filtered sample.											
..	Total / unfiltered sample.											
Subcontracted test.												
% 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.												
Trigger breach confirmed												
1.58-4.00 Sample deviation (see appendix)												
Component	LOD/Units	Method										
Dibromofluoromethane**	%	TM208	106	105	107	107						
Toluene-d8**	%	TM208	99.4	97.7	102	106						
4-Bromofluorobenzene**	%	TM208	99.7	92.5	99.8	94.3						
Dichlorodifluoromethane	<1 µg/l	TM208	<1	<1	<1	<1						
Chloromethane	<1 µg/l	TM208	<1	<1	<1	<1						
Vinyl chloride	<1 µg/l	TM208	<1	<1	<1	<1						
Bromomethane	<1 µg/l	TM208	<1	<1	<1	<1						
Chloroethane	<1 µg/l	TM208	<1	4.83	<1	<1						
Trichlorofluoromethane	<1 µg/l	TM208	<1	<1	<1	<1						
1,1-Dichloroethene	<1 µg/l	TM208	<1	<1	<1	<1						
Carbon disulphide	<1 µg/l	TM208	<1	1.78	<1	<1						
Dichloromethane	<3 µg/l	TM208	<3	<3	<3	<3						
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1	<1	<1	<1						
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1	<1						
1,1-Dichloroethane	<1 µg/l	TM208	<1	<1	<1	<1						
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	13	<1						
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1	<1						
Bromochloromethane	<1 µg/l	TM208	<1	<1	<1	<1						
Chloroform	<1 µg/l	TM208	<1	<1	<1	<1						
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	<1	<1	<1						
1,1-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1						
Carbon tetrachloride	<1 µg/l	TM208	<1	<1	<1	<1						
1,2-Dichloroethane	<1 µg/l	TM208	<1	<1	<1	<1						
Benzene	<1 µg/l	TM208	<1	2.2	<1	<1						
Trichloroethene	<1 µg/l	TM208	<1	<1	<1	<1						
1,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1	<1						
Dibromomethane	<1 µg/l	TM208	<1	<1	<1	<1						
Bromodichloromethane	<1 µg/l	TM208	<1	<1	<1	<1						
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1						
Toluene	<1 µg/l	TM208	<1	<1	<1	<1						
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1						
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	<1	<1	<1						
1,3-Dichloropropane	<1 µg/l	TM208	<1	<1	<1	<1						

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Validated

SDG: 170322-28
Location: A38
Client Reference: RSCH011
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Superseded Report:

VOC MS (W)

# M aq dis.crit tot.untit (F) 1.58-4.00	Results Legend		Customer Sample Ref.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	BK09	BK14	BK15	BM0A		
	ISO 17025 accredited.									
	mCERIS accredited.									
	Aqueous / settled sample.									
	Dissolved / filtered sample.									
	Total / unfiltered sample.									
	Subcontracted test.									
	% 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.									
	Trigger breach confirmed									
	Sample deviation (see appendix)									
Component	LOD/Units	Method								
Tetrachloroethene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
Dibromochloromethane	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
1,2-Dibromoethane	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
Chlorobenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
Ethylbenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
m,p-Xylene	<1 µg/l	TM208	<1	#	1.8	#	<1	#	<1	#
o-Xylene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
Styrene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
Bromoform	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
Isopropylbenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
Bromobenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
Propylbenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
2-Chlorotoluene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
4-Chlorotoluene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
tert-Butylbenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1	#	1.5	#	<1	#	<1	#
sec-Butylbenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
4-iso-Propyltoluene	<1 µg/l	TM208	<1	#	3.36	#	<1	#	<1	#
1,3-Dichlorobenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
1,4-Dichlorobenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
n-Butylbenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
1,2-Dichlorobenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
Hexachlorobutadiene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#
Naphthalene	<1 µg/l	TM208	<1	#	4.16	#	<1	#	<1	#
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1	#	<1	#	<1	#	<1	#

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CERTIFICATE OF ANALYSIS

Validated

SDG: 170322-28
Location: A38
Client Reference: RSCH011
Order Number:
Report Number: 403745
Superseded Report:

Test Completion Dates

Lab Sample No(s)	15215207	15215209	15215208	15215206
Customer Sample Ref.	BK08	BK14	BK15	BK6A
AGS Ref.				
Depth				
Type	Ground Water	Ground Water	Ground Water	Ground Water
Acid Herbicides (W)	29-Mar-2017	03-Apr-2017	29-Mar-2017	29-Mar-2017
Ammoniacal Nitrogen	29-Mar-2017	24-Mar-2017	29-Mar-2017	29-Mar-2017
Cyanide Comp/Free/Total/Thiocyanate	25-Mar-2017	24-Mar-2017	24-Mar-2017	24-Mar-2017
Dissolved Metals by ICP-MS	29-Mar-2017	28-Mar-2017	28-Mar-2017	29-Mar-2017
EPH CWG (Aliphatic) Aqueous GC (W)	28-Mar-2017	28-Mar-2017	27-Mar-2017	27-Mar-2017
EPH CWG (Aromatic) Aqueous GC (W)	28-Mar-2017	28-Mar-2017	27-Mar-2017	27-Mar-2017
GRO by GC-FID (W)	28-Mar-2017	28-Mar-2017	28-Mar-2017	28-Mar-2017
Hexavalent Chromium (w)	23-Mar-2017	23-Mar-2017	29-Mar-2017	23-Mar-2017
Mercury Dissolved	27-Mar-2017	27-Mar-2017	27-Mar-2017	27-Mar-2017
Metals by iCap-OES Dissolved (W)	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017
Metals by iCap-OES Unfiltered (W)	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017
OC, OP Pesticides and Triazine Herb	29-Mar-2017	29-Mar-2017	30-Mar-2017	29-Mar-2017
PAH Spec MS - Aqueous (W)	28-Mar-2017	28-Mar-2017	28-Mar-2017	28-Mar-2017
pH Value	28-Mar-2017	28-Mar-2017	28-Mar-2017	28-Mar-2017
Phenols by HPLC (W)	27-Mar-2017	24-Mar-2017	24-Mar-2017	27-Mar-2017
Phenols by me (w)	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017
SVOC MS (W) - Aqueous	24-Mar-2017	30-Mar-2017	24-Mar-2017	24-Mar-2017
Total Metals by ICP-MS	29-Mar-2017	29-Mar-2017	29-Mar-2017	29-Mar-2017
Total Organic and Inorganic Carbon	24-Mar-2017	24-Mar-2017	24-Mar-2017	24-Mar-2017
TPH CWG (W)	28-Mar-2017	28-Mar-2017	28-Mar-2017	28-Mar-2017
VOC MS (W)	27-Mar-2017	27-Mar-2017	27-Mar-2017	27-Mar-2017



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Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) 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. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. 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.

4. 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.

5. 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.

6. 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 ISO 17025. 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 asbestos present is not determined unless specifically requested.

7. 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.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

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

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

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

13. **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%, they are generally wider for volatiles analysis, 50-150%. 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 effect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

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

18. 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.

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

General

20. 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 GC/FID/GCMS and all subcontracted analysis.

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

22. 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.

23. Analysis and identification of specific compounds using GC/FID 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 GC/MS should be utilised.

24. **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.

Sample Deviations

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
5	Samples exceeded holding time before preservation was performed
§	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

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.

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

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



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CERTIFICATE OF ANALYSIS

Date: 04 April 2017
Customer: H_URS_CFD
Sample Delivery Group (SDG): 170324-25
Your Reference:
Location: A38
Report No: 403804

We received 8 samples on Friday March 24, 2017 and 8 of these samples were scheduled for analysis which was completed on Tuesday April 04, 2017. 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).

Approved By:



Sonia McWhan
Operations Manager



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



CERTIFICATE OF ANALYSIS

Validated

SDG: 170324-25 **Client Reference:**
Location: A38 **Order Number:** RSCH011 **Report Number:** 403804
Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
15229171	BK12			23/03/2017
15229172	BK13			23/03/2017
15229175	BL02			23/03/2017
15229178	BL08			23/03/2017
15229173	BM05			23/03/2017
15229179	HL01			23/03/2017
15229180	HL02			23/03/2017
15229174	HM02			23/03/2017

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

SDG:	170324-25	Client Reference:		Report Number:	403804
Location:	A38	Order Number:	RSCH011	Superseded Report:	

[illegible][illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 170324-25
Location: A38
Client Reference: RSCH011
Report Number: 403804
Order Number:
Superseded Report:

Results Legend	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type	
	Test											
	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											
		15229171	BM12						NaOH (ALE245)	1000ml glass bottle (ALE220)	GW	
		15229172	BM13						NaOH (ALE245)	1000ml glass bottle (ALE220)	GW	
GRO by GC-FID (W)	All								NaOH (ALE245)	1000ml glass bottle (ALE220)	GW	
Hexavalent Chromium (w)	All								NaOH (ALE245)	1000ml glass bottle (ALE220)	GW	
Mercury Dissolved	All								NaOH (ALE245)	1000ml glass bottle (ALE220)	GW	
Metals by ICap-OES Dissolved (W)	All								NaOH (ALE245)	1000ml glass bottle (ALE220)	GW	
Metals by ICap-OES Unfiltered (W)	All								NaOH (ALE245)	1000ml glass bottle (ALE220)	GW	
OC, OP Pesticides and Triazine Herb	All								NaOH (ALE245)	1000ml glass bottle (ALE220)	GW	
PAH Spec MS - Aqueous (W)	All								NaOH (ALE245)	1000ml glass bottle (ALE220)	GW	
pH Value	All								NaOH (ALE245)	1000ml glass bottle (ALE220)	GW	

15229180	HL02								NaOH (ALE245)	1000ml glass bottle (ALE220)	SW	
15229179	HL01								NaOH (ALE245)	1000ml glass bottle (ALE220)	SW	
15229178	BL08								NaOH (ALE245)	1000ml glass bottle (ALE220)	GW	
15229173	BM05								NaOH (ALE245)	1000ml glass bottle (ALE220)	GW	
15229175	BL02								NaOH (ALE245)	1000ml glass bottle (ALE220)	GW	

SDG:	170324-25	Client Reference:		Report Number:	403804
Location:	A38	Order Number:	RSCH011	Superseded Report:	

Results Legend



Test



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

[illegible][illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG: 170324-25
Location: A38

Client Reference:
Order Number: RSCH011

Report Number: 403804
Superseded Report:



CERTIFICATE OF ANALYSIS

Validated

SDG: 170324-25
Location: A38

Client Reference:
Order Number: RSCH011

Report Number: 403804
Superseded Report:

Results Legend		Customer Sample Ref.	H102	H402				
#	ISO 17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Surface Water (SW) 23.03.2017	Ground Water (GW) 23.03.2017				
M	mCERTS accredited.							
W	Aqueous / filtered sample.							
diss.filt	Dissolved / filtered sample.							
total.filt	Total / unfiltered sample.							
-	Subcontracted test.							
-	% recovery of the surrogate standard to check the efficiency of the method. The results of individual components within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1.54-6.66	Sample deviation (see appendix)							
Component	LOD/Units							
Suspended solids, Total	<2 mg/l	TM022	18.6	25.1	#	#		
BOD, unfiltered	<1 mg/l	TM045	<1	3.25	#	#		
Organic Carbon, Total	<3 mg/l	TM090	5.71	10.2	#	#		
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2	0.239	#	#		
COD, unfiltered	<7 mg/l	TM107	16.6	34.4	#	#		
Arsenic (diss.filt)	<0.51 µg/l	TM152	<0.51	1.18	#	#		
Boron (diss.filt)	<5 µg/l	TM152	18.1	43.6	#	#		
Cadmium (diss.filt)	<0.08 µg/l	TM152	0.122	<0.08	#	#		
Copper (diss.filt)	<0.86 µg/l	TM152	1.62	3.33	#	#		
Lead (diss.filt)	<0.1 µg/l	TM152	1.16	<0.1	#	#		
Nickel (diss.filt)	<0.44 µg/l	TM152	2.3	2.11	#	#		
Selenium (diss.filt)	<0.81 µg/l	TM152	<0.81	0.948	#	#		
Zinc (diss.filt)	<13 µg/l	TM152	19.5	8.16	#	#		
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01	#	#		
Chromium (tot.unfilt)	<3 µg/l	TM191	7.34	7.55	#	#		
Phenol	<0.5 µg/l	TM205	<5	<5				
2-methylphenol	<0.5 µg/l	TM205	<0.5	<0.5				
3-methylphenol	<0.5 µg/l	TM205	<0.5	<0.5				
4-methylphenol	<0.5 µg/l	TM205	<0.5	<0.5				
2-chlorophenol	<0.5 µg/l	TM205	<0.5	<0.5				
2,4-dimethylphenol	<0.5 µg/l	TM205	<0.5	<0.5				
4-chloro-3-methylphenol	<0.5 µg/l	TM205	<0.5	<0.5				
2,6-dichlorophenol	<0.5 µg/l	TM205	<0.5	<0.5				
4-Chlorophenol	<0.5 µg/l	TM205	<0.5	<0.5				
2,4-dichlorophenol	<0.5 µg/l	TM205	<0.5	<0.5				
2-nitrophenol	<0.5 µg/l	TM205	<0.5	<0.5				
2,4,6-trichlorophenol	<0.5 µg/l	TM205	<0.5	<0.5				
2,4,5-trichlorophenol	<0.5 µg/l	TM205	<0.5	<0.5				
4-nitrophenol	<0.5 µg/l	TM205	<0.5	<0.5				
2,3,5,6-tetrachlorophenol	<0.5 µg/l	TM205	<1	<0.5				
2,3,4,6-tetrachlorophenol	<0.5 µg/l	TM205	<1	<0.5				
2,4-dinitrophenol	<2.5 µg/l	TM205	<2.5	<2.5				
DNOC	<3 µg/l	TM205	<3	<3				

SDG:	170324-25	Client Reference:		Report Number:	403804
Location:	A38	Order Number:	RSCH011	Superseded Report:	

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CERTIFICATE OF ANALYSIS

SDG:	170324-25	Client Reference:		Report Number:	403804
Location:	A38	Order Number:	RSCH011	Superseded Report:	

Acid Herbicides (W)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	170324-25	Client Reference:		Report Number:	403804
Location:	A38	Order Number:	RSCH011	Superseded Report:	

Acid Herbicides (W)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	170324-25	Client Reference:		Report Number:	403804
Location:	A38	Order Number:	RSCH011	Superseded Report:	

OC, OP Pesticides and Triazine Herb

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	170324-25	Client Reference:		Report Number:	403804
Location:	A38	Order Number:	RSCH011	Superseded Report:	

OC, OP Pesticides and Triazine Herb

Results Legend		Customer Sample Ref.	HL02	HM2			
#	ISO17025 accredited.	Depth (m)	Surface Water (SW)	Ground Water (GW)			
M	mCERTS accredited.	Sample Type					
eq	Aqueous / settled sample.	Date Sampled					
dis.filt	Dissolved / filtered sample.	Sample Time					
tot.unfilt	Total / unfiltered sample.	Date Received					
**	Subcontracted test.	SDQ Ref					
**	% 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	Lab Sample No.(s)					
(*)	Trigger breach confirmed	SSS Reference					
1-6-4-6	Sample deviation (see appendix)	Method					
Component	LOD/Units	Method					
Dichlorvos	<0.01 µg/l	TM231	<0.01	<0.01			
Mevinphos	<0.01 µg/l	TM231	<0.01	<0.01			
alpha-Hexachlorocyclohexane (HCH / Lindane)	<0.01 µg/l	TM231	<0.01	<0.01			
Diazinon	<0.01 µg/l	TM231	<0.01	<0.01			
gamma-Hexachlorocyclohexane (HCH / Lindane)	<0.01 µg/l	TM231	<0.01	<0.01			
Heptachlor	<0.01 µg/l	TM231	<0.01	<0.01			
Aldrin	<0.01 µg/l	TM231	<0.01	<0.01			
beta-Hexachlorocyclohexane (HCH / Lindane)	<0.01 µg/l	TM231	<0.01	<0.01			
Methyl parathion	<0.01 µg/l	TM231	<0.01	<0.01			
Malathion	<0.01 µg/l	TM231	<0.01	<0.01			
Fenitrothion	<0.01 µg/l	TM231	<0.01	<0.01			
Heptachlor epoxide	<0.01 µg/l	TM231	<0.01	<0.01			
Parathion	<0.01 µg/l	TM231	<0.01	<0.01			
o,p-DDE	<0.01 µg/l	TM231	<0.01	<0.01			
Endosulphan I	<0.01 µg/l	TM231	<0.01	<0.01			
p,p-DDE	<0.01 µg/l	TM231	<0.01	<0.01			
Dieldrin	<0.01 µg/l	TM231	<0.01	<0.01			
o,p-TDE (DDD)	<0.01 µg/l	TM231	<0.01	<0.01			
Endrin	<0.01 µg/l	TM231	<0.01	<0.01			
o,p-DDT	<0.01 µg/l	TM231	<0.01	<0.01			
p,p-TDE (DDD)	<0.01 µg/l	TM231	<0.01	<0.01			
Ethion	<0.01 µg/l	TM231	<0.01	<0.01			
Endosulphan II	<0.01 µg/l	TM231	<0.01	<0.01			
p,p-DDT	<0.01 µg/l	TM231	<0.01	<0.01			
o,p-Methoxychlor	<0.01 µg/l	TM231	<0.01	<0.01			
p,p-Methoxychlor	<0.01 µg/l	TM231	<0.01	<0.01			
Endosulphan sulphate	<0.01 µg/l	TM231	<0.01	<0.01			
Azinphos-methyl	<0.01 µg/l	TM231	<0.01	<0.01			



CERTIFICATE OF ANALYSIS

Validated

SDG:	170324-25	Client Reference:		Report Number:	403804
Location:	A38	Order Number:	RSCH011	Superseded Report:	

PAH Spec MS - Aqueous (W)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	170324-25	Client Reference:		Report Number:	403804
Location:	A38	Order Number:	RSCH011	Superseded Report:	

Client Reference:
Order Number: RSCH011

Report Number:	403804
Superseded Report:	

PAH Spec MS - Aqueous (W)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	170324-25	Client Reference:		Report Number:	403804
Location:	A38	Order Number:	RSCH011	Superseded Report:	

RSCH011

Report Number:	403804
Superseded Report:	

SVOC MS (W) - Aqueous

Results Legend			Customer Sample Ref.		BK12	BK13	BL02	BL08	BM05	HL01
#	M	aq	Depth (m)	Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Surface Water (SW)
discrfit	total	total	Date Sampled	Date Received	230302017	230302017	230302017	230302017	230302017	230302017
total	total	total	Sample Time	SDG Ref	240302017	240302017	240302017	240302017	240302017	240302017
total	total	total	Lab Sample No (s)	265 Reference	170324-25	170324-25	170324-25	170324-25	170324-25	170324-25
total	total	total	15-45-49	Sample deviation (see appendix)	15229171	15229172	15229175	15229178	15229173	15229179
Component			LOD/Units	Method						
1,2,4-Trichlorobenzene (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
1,2-Dichlorobenzene (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
1,3-Dichlorobenzene (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
1,4-Dichlorobenzene (aq)			<1 µg/l	TM176	1.42	#	<1	#	<1	#
2,4,5-Trichlorophenol (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
2,4,6-Trichlorophenol (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
2,4-Dichlorophenol (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
2,4-Dimethylphenol (aq)			<1 µg/l	TM176	12.1	#	<1	#	<1	#
2,4-Dinitrotoluene (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
2,6-Dinitrotoluene (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
2-Chloronaphthalene (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
2-Chlorophenol (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
2-Methylnaphthalene (aq)			<1 µg/l	TM176	4.07	#	<1	#	<1	#
2-Methylphenol (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
2-Nitroaniline (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
2-Nitrophenol (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
3-Nitroaniline (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
4-Bromophenylphenylether (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
4-Chloro-3-methylphenol (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
4-Chloroaniline (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
4-Chlorophenylphenylether (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
4-Methylphenol (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
4-Nitroaniline (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
4-Nitrophenol (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
Azobenzene (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
Acenaphthylene (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
Acenaphthene (aq)			<1 µg/l	TM176	2.85	#	<1	#	<1	#
Anthracene (aq)			<1 µg/l	TM176	2.48	#	<1	#	<1	#
bis[2-Chloroethyl]ether (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
bis[2-Chloroethyl] methane (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
bis[2-Ethylhexyl] phthalate (aq)			<2 µg/l	TM176	18.1	#	<2	#	<2	#
Butylbenzyl phthalate (aq)			<1 µg/l	TM176	<1	#	<1	#	<1	#
Benzo(a)anthracene (aq)			<1 µg/l	TM176	2.9	#	<1	#	<1	#

CERTIFICATE OF ANALYSIS

Validated

SDG:	170324-25
Location:	A38

Client Reference:
Order Number: RSCH011

Report Number:	403804
Superseded Report:	

SVOC MS (W) - Aqueous

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	170324-25
Location:	A38

Client Reference:	
Order Number:	RSCH011

Report Number:	403804
Superseded Report:	

TPH CWG (W)

Results Legend			Customer Sample Ref.		BK12	BK13	BL02	SL08	BM05	HL01
#	ISO 17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No(s) AGS Reference Sample deviation (see appendix)								
M	mCEBTS accredited.									
AQ	Aqueous / settled sample.									
DIS.FIT	Dissolved / filtered sample.									
TOTALSRT	Total / settled sample.									
+	Subcontracted test.									
-	% 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 trigger (reach confirmed)									
(F)	Sample deviation (see appendix)									
1-56-66	Component	LOD/Units	Method							
	GRO Surrogate % recovery**	%	TM245	84	86	91	87	92	102	
	GRO >C5-C12	<50 µg/l	TM245	683	<50	<50	<50	<50	<50	
				#	#	#	#	#	#	#
	Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245	<3	<3	<3	<3	<3	<3	#
	Benzene	<7 µg/l	TM245	10	<7	<7	<7	<7	<7	#
	Toluene	<4 µg/l	TM245	12	<4	<4	<4	<4	<4	#
	Ethylbenzene	<5 µg/l	TM245	9	<5	<5	<5	<5	<5	#
	m,p-Xylene	<8 µg/l	TM245	122	<8	<8	<8	<8	<8	#
	o-Xylene	<3 µg/l	TM245	8	<3	<3	<3	<3	<3	#
	Sum of detected Xylenes	<11 µg/l	TM245	130	<11	<11	<11	<11	<11	
	Sum of detected BTEX	<28 µg/l	TM245	161	<28	<28	<28	<28	<28	
	Aliphatics >C5-C8	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10	
	Aliphatics >C8-C8	<10 µg/l	TM245	27	<10	<10	<10	<10	<10	
	Aliphatics >C8-C10	<10 µg/l	TM245	121	<10	<10	<10	<10	<10	
	Aliphatics >C10-C12	<10 µg/l	TM245	173	<10	<10	<10	<10	<10	
	Aliphatics >C12-C16 (aq)	<10 µg/l	TM174	24	<10	<10	<10	<20	<10	
	Aliphatics >C16-C21 (aq)	<10 µg/l	TM174	290	<10	<10	<10	25	<10	
	Aliphatics >C21-C35 (aq)	<10 µg/l	TM174	2610	<10	<10	<10	1250	<10	
	Total Aliphatics >C12-C35 (aq)	<10 µg/l	TM174	2930	<10	<10	<10	1270	<10	
	Aromatics >EC5-EC7	<10 µg/l	TM245	10	<10	<10	<10	<10	<10	
	Aromatics >EC7-EC9	<10 µg/l	TM245	12	<10	<10	<10	<10	<10	
	Aromatics >EC9-EC10	<10 µg/l	TM245	220	<10	<10	<10	<10	<10	
	Aromatics >EC10-EC12	<10 µg/l	TM245	115	<10	<10	<10	<10	<10	
	Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174	99	<10	<10	<10	<20	<10	
	Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174	258	<10	<10	<10	26	<10	
	Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174	994	<10	<10	<10	591	<10	
	Total Aromatics >EC12-EC35 (aq)	<10 µg/l	TM174	1350	<10	<10	<10	317	<10	
	Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM174	4960	14	<10	<10	1890	<10	

CERTIFICATE OF ANALYSIS

Validated

SDG: 170324-25
Location: A38

Client Reference:
Order Number: RSCH011

Report Number: 403804
Superseded Report:

TPH CWG (W)

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CERTIFICATE OF ANALYSIS

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SDG: 170324-25
Location: A38

Client Reference:
Order Number: RSCH011

Report Number: 403804
Superseded Report:

VOC MS (W)

Results Legend			Customer Sample Ref.		BK12	BK13	BL02	BL08	BM05	HL01
# M eq. diss./lit total	ISO 17025 accredited. ncERTS accredited. Aqueous / settled sample. Total / unfiltered sample. Subcontracted test. % 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 Trigger breach confirmed 1.5x diff. Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No(s) AGS Reference		Ground Water (GW) 23/03/2017	Ground Water (GW) 23/03/2017	Ground Water (GW) 23/03/2017	Ground Water (GW) 23/03/2017	Ground Water (GW) 23/03/2017	Ground Water (GW) 23/03/2017	Surface Water (SW) 23/03/2017
Component	LODA Units	Method								
Dibromofluoromethane**	%	TM209		119	111	115	114	116	121	
Toluene-d8**	%	TM209		100	101	99.5	100	98.7	100	
4-Bromofluorobenzene**	%	TM209		99.2	99.4	97.1	95.1	93.9	96.8	
Dichlorodifluoromethane	<1 µg/l	TM209	#	#	#	#	#	#	#	
Chloromethane	<1 µg/l	TM209	#	#	#	#	#	#	#	
Vinyl chloride	<1 µg/l	TM209	#	#	#	#	#	#	#	
Bromomethane	<1 µg/l	TM209	#	#	#	#	#	#	#	
Chloroethane	<1 µg/l	TM209	#	#	#	#	#	#	#	
Trichlorofluoromethane	<1 µg/l	TM209	#	#	#	#	#	#	#	
1,1-Dichloroethene	<1 µg/l	TM209	#	#	#	#	#	#	#	
Carbon disulphide	<1 µg/l	TM209	#	#	#	#	#	#	#	
Dichloromethane	<3 µg/l	TM209	#	#	#	#	#	#	#	
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM209	#	#	#	#	#	#	#	
trans-1,2-Dichloroethene	<1 µg/l	TM209	#	#	#	#	#	#	#	
1,1-Dichloroethane	<1 µg/l	TM209	#	#	#	#	#	#	#	
cis-1,2-Dichloroethene	<1 µg/l	TM209	#	#	#	#	#	#	#	
2,2-Dichloropropane	<1 µg/l	TM209	#	#	#	#	#	#	#	
Bromochloromethane	<1 µg/l	TM209	#	#	#	#	#	#	#	
Chloroform	<1 µg/l	TM209	#	#	#	#	#	#	#	
1,1,1-Trichloroethane	<1 µg/l	TM209	#	#	#	#	#	#	#	
1,1-Dichloropropene	<1 µg/l	TM209	#	#	#	#	#	#	#	
Carbon tetrachloride	<1 µg/l	TM209	#	#	#	#	#	#	#	
1,2-Dichloroethane	<1 µg/l	TM209	#	#	#	#	#	#	#	
Benzene	<1 µg/l	TM209	#	#	#	#	#	#	#	
Trichloroethene	<1 µg/l	TM209	#	#	#	#	#	#	#	
1,2-Dichloropropane	<1 µg/l	TM209	#	#	#	#	#	#	#	
Dibromomethane	<1 µg/l	TM209	#	#	#	#	#	#	#	
Bromodichloromethane	<1 µg/l	TM209	#	#	#	#	#	#	#	
cis-1,3-Dichloropropene	<1 µg/l	TM209	#	#	#	#	#	#	#	
Toluene	<1 µg/l	TM209	#	#	#	#	#	#	#	
Trans-1,3-Dichloropropene	<1 µg/l	TM209	#	#	#	#	#	#	#	
1,1,2-Trichloroethane	<1 µg/l	TM209	#	#	#	#	#	#	#	
1,3-Dichloropropane	<1 µg/l	TM209	#	#	#	#	#	#	#	



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Validated

SDG: 170324-25
Location: A38
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VOC MS (W)

Results Legend		Customer Sample Ref.	HL02	HM02				
#	ISO17025 accredited.							
M	mCERIS accredited.	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No. (s)
disc./lit	Aqueous / settled sample.							
disc./lit	Disolved / filtered sample.	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No. (s)	AGS Reference
tot./unlit	Total / unfiltered sample.							
..	Subcontracted test.	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No. (s)	AGS Reference
..	% 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. Trigger breach confirmed							
(F)	1-58-48-00 Sample deviation (see appendix)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No. (s)	AGS Reference
Component	LOD/Units	Method	HL02	HM02				
Dibromofluoromethane**	%	TM208	112	115				
Toluene-d8**	%	TM208	97.1	100				
4-Bromofluorobenzene**	%	TM208	98.7	100				
Dichlorodifluoromethane	<1 µg/l	TM208	<1	<1				
Chloromethane	<1 µg/l	TM208	<1	<1				
Vinyl chloride	<1 µg/l	TM208	<1	<1				
Bromomethane	<1 µg/l	TM208	<1	<1				
Chloroethane	<1 µg/l	TM208	<1	<1				
Trichlorofluoromethane	<1 µg/l	TM208	<1	<1				
1,1-Dichloroethene	<1 µg/l	TM208	<1	<1				
Carbon disulphide	<1 µg/l	TM208	<1	<1				
Dichloromethane	<3 µg/l	TM208	<3	<3				
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1	<1				
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1				
1,1-Dichloroethane	<1 µg/l	TM208	<1	<1				
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1				
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1				
Bromochloromethane	<1 µg/l	TM208	<1	<1				
Chloroform	<1 µg/l	TM208	<1	<1				
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	<1				
1,1-Dichloropropene	<1 µg/l	TM208	<1	<1				
Carbon tetrachloride	<1 µg/l	TM208	<1	<1				
1,2-Dichloroethane	<1 µg/l	TM208	<1	<1				
Benzene	<1 µg/l	TM208	<1	<1				
Trichloroethene	<1 µg/l	TM208	<1	<1				
1,2-Dichloropropane	<1 µg/l	TM208	<1	<1				
Dibromomethane	<1 µg/l	TM208	<1	<1				
Bromodichloromethane	<1 µg/l	TM208	<1	<1				
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1				
Toluene	<1 µg/l	TM208	<1	<1				
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1				
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	<1				
1,3-Dichloropropane	<1 µg/l	TM208	<1	<1				

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Validated

SDG: 170324-25
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Client Reference: RSCH011
Report Number: 403804
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VOC MS (W)

Results Legend		Customer Sample Ref.	HL02	HM02				
#	ISO 17025 accredited.							
M	mCERIS accredited.	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)
disc./lit	Aqueous / settled sample.							
disc./lit	Disolved / filtered sample.	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No. (s)	AGS Reference
tot./unlit	Total / unfiltered sample.							
..	Subcontracted test.	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No. (s)	AGS Reference
..	% 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. Trigger breach confirmed							
(F)	1-58-48-00 Sample deviation (see appendix)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No. (s)	AGS Reference
Component	LOD/Units	Method	HL02	HM02				
Tetrachloroethene	<1 µg/l	TM208	<1	<1	#	#		
Dibromochloromethane	<1 µg/l	TM208	<1	<1	#	#		
1,2-Dibromoethane	<1 µg/l	TM208	<1	<1	#	#		
Chlorobenzene	<1 µg/l	TM208	<1	<1	#	#		
1,1,1,2-Tetrachloroethane	<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	#	#		
Styrene	<1 µg/l	TM208	<1	<1	#	#		
Bromoform	<1 µg/l	TM208	<1	<1	#	#		
Isopropylbenzene	<1 µg/l	TM208	<1	<1	#	#		
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1	#	#		
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	<1	#	#		
Bromobenzene	<1 µg/l	TM208	<1	<1	#	#		
Propylbenzene	<1 µg/l	TM208	<1	<1	#	#		
2-Chlorotoluene	<1 µg/l	TM208	<1	<1	#	#		
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1	<1	#	#		
4-Chlorotoluene	<1 µg/l	TM208	<1	<1	#	#		
tert-Butylbenzene	<1 µg/l	TM208	<1	<1	#	#		
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1	<1	#	#		
sec-Butylbenzene	<1 µg/l	TM208	<1	<1	#	#		
4-iso-Propyltoluene	<1 µg/l	TM208	<1	<1	#	#		
1,3-Dichlorobenzene	<1 µg/l	TM208	<1	<1	#	#		
1,4-Dichlorobenzene	<1 µg/l	TM208	<1	<1	#	#		
n-Butylbenzene	<1 µg/l	TM208	<1	<1	#	#		
1,2-Dichlorobenzene	<1 µg/l	TM208	<1	<1	#	#		
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1	<1				
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1	<1	#	#		
Hexachlorobutadiene	<1 µg/l	TM208	<1	<1	#	#		
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1	<1	#	#		
Naphthalene	<1 µg/l	TM208	<1	<1	#	#		
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1	<1	#	#		

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SDG:	170324-25	Client Reference:		Report Number:	403804
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SDG:	170324-25	Client Reference:		Report Number:	403804
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Method No	Reference	Description	Wet/Dry Sample *	Surrogate Corrected
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2600: Part120 1991 / BS EN 872	Determination of total suspended solids in waters		
TM045	MEWAM BOD5 2nd Ed HMS O 1999 / Method 5210B, AWWA/APHA, 20th Ed., 1999, SCA Blue Book 139	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids		
TM061	Method for the Determination of EPH/Massachusetts Dept of EP, 1999	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified US EPA Method 415.1 & 8060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water		
TM099	BS 2690, Part 7: 1999 / BS 6098: Part2 11:1994	Determination of Ammonium in Water Samples using the Kone Analyser		
TM107	ISO 6060-1999	Determination of Chemical Oxygen Demand using COD Dr Lange Kit		
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 GC/MS		
TM178	Modified US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
TM183	BS EN 23606:2002, (BS 6098-2:74:2002) ISBN 0 580 36924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM186	Determination of Acidic Herbicides in Groundwater and Potable Water by LC/MSD Using Selective Ion Monitoring, Agilent Technologies Inc: Application Note 5968-5962EN	The Determination of Acid Herbicides in Environmental Water Samples and Leachates by LC/MS QQQ		
TM191	Standard Methods for the examination of waters and wastewaters: 18th Edition, ALPHA, Washington DC, USA, ISBN 0-87553-131-8	Determination of Unfiltered Metals in Water Matrices by ICP-MS		
TM205		Determination of Phenols in Waste Waters using Solid Phase Extraction, Acetylation, Gas Chromatography and Mass Selective Detection		
TM208	Modified US EPA Method 8200b & 824	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate		
TM228	US EPA Method 8010B	Determination of Major Cations in Water by iCap 6600 Duo ICP-OES		
TM231	Agilent 6890 Gas Chromatograph system using an Agilent 5973 Mass Selective Detector (MSD)	Determination of Organochlorine and Organophosphorus Pesticides and Triazine Herbicides by GC/MS		
TM241	Methods for the Examination of Waters and Associated Materials, Chromium in Raw and Potable Waters and Sewage Effluents 1990	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser		
TM245	By GC-FID	Determination of GRO by Headspace in waters		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters: HMSO, 1979. ISBN 0111 751429 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

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



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Test Completion Dates

Lab Sample No(s) Customer Sample Ref.	15229171	15229172	15229175	15229176	15229173	15229179	15229180	15229174
AGS Ref.	BK12	BK13	BLI2	BLI8	BMF5	HLI1	HLI2	HMI2
Depth								
Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Surface Water	Surface Water	Ground Water
Acid Herbicides (W)	04-Apr-2017	04-Apr-2017	04-Apr-2017	04-Apr-2017	04-Apr-2017	24-Apr-2017	04-Apr-2017	04-Apr-2017
Ammoniacal Nitrogen	31-Mar-2017	31-Mar-2017	31-Mar-2017	31-Mar-2017	31-Mar-2017	31-Mar-2017	31-Mar-2017	01-Apr-2017
BOD True Total						30-Mar-2017	30-Mar-2017	30-Mar-2017
COD Unfiltered						13-Apr-2017	31-Mar-2017	03-Apr-2017
Cyanide Comp/Free/Total/Thiocyanate	29-Mar-2017	28-Mar-2017	29-Mar-2017	29-Mar-2017	29-Mar-2017	29-Mar-2017	28-Mar-2017	29-Mar-2017
Dissolved Metals by ICP-MS	30-Mar-2017	29-Mar-2017	30-Mar-2017	03-Apr-2017	29-Mar-2017	13-Apr-2017	29-Mar-2017	30-Mar-2017
EPH CWG (Aliphatic) Aqueous GC (W)	28-Mar-2017	30-Mar-2017	28-Mar-2017	28-Mar-2017	28-Mar-2017	29-Mar-2017	28-Mar-2017	29-Mar-2017
EPH CWG (Aromatic) Aqueous GC (W)	28-Mar-2017	30-Mar-2017	28-Mar-2017	28-Mar-2017	28-Mar-2017	29-Mar-2017	28-Mar-2017	29-Mar-2017
GRO by GC-FID (W)	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017
Hexavalent Chromium (w)	31-Mar-2017	31-Mar-2017	31-Mar-2017	31-Mar-2017	31-Mar-2017	31-Mar-2017	31-Mar-2017	31-Mar-2017
Mercury Dissolved	28-Mar-2017	28-Mar-2017	28-Mar-2017	28-Mar-2017	28-Mar-2017	28-Mar-2017	28-Mar-2017	28-Mar-2017
Metals by ICap-OES Dissolved (W)	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017	03-Apr-2017	30-Mar-2017	03-Apr-2017	03-Apr-2017
Metals by ICap-OES Unfiltered (W)	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017
OC, OP Pesticides and Triazine Herb	31-Mar-2017	31-Mar-2017	31-Mar-2017	31-Mar-2017	31-Mar-2017	31-Mar-2017	31-Mar-2017	31-Mar-2017
PAH Spec MS - Aqueous (W)	29-Mar-2017	29-Mar-2017	29-Mar-2017	29-Mar-2017	29-Mar-2017	29-Mar-2017	29-Mar-2017	29-Mar-2017
pH Value	29-Mar-2017	30-Mar-2017	29-Mar-2017	29-Mar-2017	30-Mar-2017	29-Mar-2017	30-Mar-2017	30-Mar-2017
Phenols by HPLC (W)	28-Mar-2017	28-Mar-2017	28-Mar-2017	28-Mar-2017	28-Mar-2017	28-Mar-2017	28-Mar-2017	28-Mar-2017
Phenols by ms (w)	31-Mar-2017	31-Mar-2017	31-Mar-2017	31-Mar-2017	31-Mar-2017	31-Mar-2017	31-Mar-2017	31-Mar-2017
Suspended Solids						30-Mar-2017	30-Mar-2017	30-Mar-2017
SVOC MS (W) - Aqueous	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017
Total Metals by ICP-MS	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017
Total Organic and Inorganic Carbon	03-Apr-2017	03-Apr-2017	29-Mar-2017	29-Mar-2017	27-Mar-2017	29-Mar-2017	27-Mar-2017	29-Mar-2017
TPH CWG (W)	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017	30-Mar-2017
VOC MS (W)	29-Mar-2017	29-Mar-2017	29-Mar-2017	29-Mar-2017	29-Mar-2017	29-Mar-2017	29-Mar-2017	29-Mar-2017



CERTIFICATE OF ANALYSIS

SDG: 170324-25
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Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) 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. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. 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.

4. 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.

5. 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.

6. 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 ISO 17025. 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 asbestos present is not determined unless specifically requested.

7. 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.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

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

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

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

13. **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%, they are generally wider for volatiles analysis, 50-150%. 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 effect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

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

18. 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.

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

General

20. 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 GC/FID/GCMS and all subcontracted analysis.

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

22. 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.

23. Analysis and identification of specific compounds using GC/FID 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 GC/MS should be utilised.

24. **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.

Sample Deviations

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
5	Samples exceeded holding time before preservation was performed
§	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

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.

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.



Aecom
Royal Court
Basil Close
Chesterfield
Derbyshire
S41 7SL

Attention: Sarah Blackburn

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

CERTIFICATE OF ANALYSIS

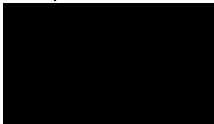
Date: 14 July 2017
Customer: H_URS_CFD
Sample Delivery Group (SDG): 170705-38
Your Reference:
Location: A38
Report No: 416127

We received 4 samples on Wednesday July 05, 2017 and 4 of these samples were scheduled for analysis which was completed on Friday July 14, 2017. 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.

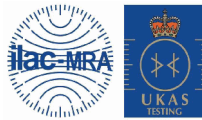
Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

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

Approved By:



Sonia McWhan
Operations Manager



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



CERTIFICATE OF ANALYSIS

Validated

SDG: 170705-38 Client Reference:
Location: A38 Order Number: Report Number: 416127
Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
15787279	BK09			04/07/2017
15787281	BM06A			04/07/2017
15787277	HK02			04/07/2017
15787278	HK03			04/07/2017

Maximum Sample/Coolbox Temperature (°C) :

18.4

ISO 6667-3 Water quality - Sampling - Part 3

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

Validated

SDG: 170705-38
Location: A38

Client Reference:
Order Number:

Report Number: 416127
Superseded Report:

[illegible][illegible]



Report Number: 416127
Superseded Report:

Ground

[illegible]

Report Number: 416127
Superseded Report:

Customer Sample Re
 Depth (m)
 Sample Type
 Date Sample
 Sample Tim
 Date Receive
 SDG Re
 Lab Sample No.(s)
 ACS Referen

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	170705-38	Client Reference:	Report Number:	416127
Location:	A38	Order Number:	Superseded Report:	

Client Reference:
Order Number:

Report Number:	416127
Superseded Report:	

PAH Spec MS - Aqueous (W)

Results Legend			Customer Sample Ref.		BK05	BK06A	BK02	BK03
#	ISO17025 accredited.		Depth (m)					
M	ISO17025 accredited.		Sample Type					
aq	Aqueous / settled sample.		Date Sampled					
dis.filt	Dissolved / filtered sample.		Sample Time					
tot.filt	Total / unfiltered sample.		Date Received					
**	Subtracted test.		SDG Ref					
	% recovery of the surrogate standard to check the efficiency of the method. The results of individual components within samples aren't corrected for the recovery		Lab Sample No.(s)					
(*)	1.0-4.0% Sample deviation (see appendix)		SDG Reference					
Trigger leach confirmed								
Component	LOD/Units	Method						
Naphthalene (aq)	<0.1 µg/l	TM178	<0.1	#	<0.1	#	<0.1	#
Acenaphthene (aq)	<0.015 µg/l	TM178	<0.015	#	0.059	#	<0.015	#
Acenaphthylene (aq)	<0.011 µg/l	TM178	<0.011	#	0.0578	#	<0.011	#
Fluoranthene (aq)	<0.017 µg/l	TM178	0.15	#	0.0533	#	0.0326	#
Anthracene (aq)	<0.015 µg/l	TM178	<0.015	#	0.0545	#	<0.015	#
Phenanthrene (aq)	<0.022 µg/l	TM178	0.0321	#	0.0617	#	0.171	#
Fluorene (aq)	<0.014 µg/l	TM178	<0.014	#	0.0569	#	0.0145	#
Chrysene (aq)	<0.013 µg/l	TM178	0.0718	#	0.0572	#	0.322	#
Pyrene (aq)	<0.015 µg/l	TM178	0.135	#	0.0507	#	0.0283	#
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178	0.076	#	0.0632	#	0.0208	#
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178	0.179	#	0.103	#	0.0241	#
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178	0.0568	#	0.0961	#	<0.027	#
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178	0.0619	#	0.0669	#	0.0162	#
Dibenz(a,h)anthracene (aq)	<0.016 µg/l	TM178	0.0163	#	0.0618	#	<0.016	#
Benzo(g,h,i)perylene (aq)	<0.016 µg/l	TM178	0.0739	#	0.0703	#	<0.016	#
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178	0.0747	#	0.075	#	<0.014	#
PAH, Total Detected USEPA 16 (aq)	<0.344 µg/l	TM178	0.956	#	1.01	#	<0.344	#



CERTIFICATE OF ANALYSIS

Validated

SDG:	170705-38	Client Reference:	Report Number:	416127
Location:	A38	Order Number:	Superseded Report:	

Client Reference:
Order Number:

Report Number:	416127
Superseded Report:	

SVOC MS (W) - Aqueous

Results Legend			Customer Sample Ref.	B009	B06A	HX02	HX03		
#	ISO 17025 accredited.	mCERTS accredited.	Depth (m)	Ground Water (GW)	Ground Water (GW)	Surface Water (SW)	Surface Water (SW)		
M	As per / certified sample.	As per / certified sample.	Sample Type	04072017	04072017	04072017	04072017		
ag	Discolored / filtered sample.	Discolored / filtered sample.	Date Sampled						
disc.M	total / unfiltered sample.	total / unfiltered sample.	Sample Time						
total.M	Subcontracted test.	% 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	Date Received	05/07/2017	05/07/2017	05/07/2017	05/07/2017		
total.M	Trigger breach confirmed (see appendix)	Sample deviation (see appendix)	SDO Ref	170705-38	170705-38	170705-38	170705-38		
(F)			Lab Sample No.(s)	15787279	15787241	15787277	15787278		
156-68			SSS Reference						
Component	LOD/Units	Method							
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<1	#	#	#	#		
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	#	#	#	#		
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	#	#	#	#		
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	#	#	#	#		
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<1	#	#	#	#		
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<1	#	#	#	#		
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<1	#	#	#	#		
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<1	#	#	#	#		
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	#	#	#	#		
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	#	#	#	#		
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<1	#	#	#	#		
2-Chlorophenol (aq)	<1 µg/l	TM176	<1	#	#	#	#		
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<1	#	#	#	#		
2-Methylphenol (aq)	<1 µg/l	TM176	<1	#	#	#	#		
2-Nitroaniline (aq)	<1 µg/l	TM176	<1	#	#	#	#		
2-Nitrophenol (aq)	<1 µg/l	TM176	<1	#	#	#	#		
3-Nitroaniline (aq)	<1 µg/l	TM176	<1	#	#	#	#		
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<1	#	#	#	#		
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<1	#	#	#	#		
4-Chloroaniline (aq)	<1 µg/l	TM176	<1	#	#	#	#		
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<1	#	#	#	#		
4-Methylphenol (aq)	<1 µg/l	TM176	<1	#	#	#	#		
4-Nitroaniline (aq)	<1 µg/l	TM176	<1	#	#	#	#		
4-Nitrophenol (aq)	<1 µg/l	TM176	<1	#	#	#	#		
Azobenzene (aq)	<1 µg/l	TM176	<1	#	#	#	#		
Acenaphthylene (aq)	<1 µg/l	TM176	<1	#	#	#	#		
Acenaphthene (aq)	<1 µg/l	TM176	<1	#	#	#	#		
Anthracene (aq)	<1 µg/l	TM176	<1	#	#	#	#		
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<1	#	#	#	#		
bis(2-Chloroethoxy) methane (aq)	<1 µg/l	TM176	<1	#	#	#	#		
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<2	#	#	#	#		
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<1	#	#	#	#		
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<1	#	#	#	#		

CERTIFICATE OF ANALYSIS

Validated

SDG: 170705-38
Location: A38

Client Reference:
Order Number:

Report Number: 416127
Superseded Report:

SVOC MS (W) - Aqueous

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG: 170705-38
Location: A38

Client Reference:
Order Number:

Report Number: 416127
Superseded Report:

TPH CWG (W)

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CERTIFICATE OF ANALYSIS

Validated

SDG: 170705-38
Location: A38

Client Reference:
Order Number:

Report Number: 416127
Superseded Report:

VOC MS (W)

Results Legend		Customer Sample Ref.	B009	BMD6A	H002	H003		
#	ISO 17025 accredited.							
M	mCERIS accredited.	Depth (m)	Ground Water (GW)	Ground Water (GW)	Surface Water (SW)	Surface Water (SW)	Sample Type	Date Sampled
disc.	disc.							
tot.untit	tot.untit	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type
+	+	Date Sampled	Date Sampled	Date Sampled	Date Sampled	Date Sampled	Date Sampled	Date Sampled
+	+	Sample Time	Sample Time	Sample Time	Sample Time	Sample Time	Sample Time	Sample Time
+	+	Date Received	Date Received	Date Received	Date Received	Date Received	Date Received	Date Received
+	+	SDG Ref	SDG Ref	SDG Ref	SDG Ref	SDG Ref	SDG Ref	SDG Ref
(F)	(F)	Lab Sample No.(s)	Lab Sample No.(s)	Lab Sample No.(s)	Lab Sample No.(s)	Lab Sample No.(s)	Lab Sample No.(s)	Lab Sample No.(s)
1-58-48	1-58-48	AGS Reference	AGS Reference	AGS Reference	AGS Reference	AGS Reference	AGS Reference	AGS Reference
Sample deviation (see appendix)	Sample deviation (see appendix)	Method	Method	Method	Method	Method	Method	Method
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM208	105	106	112	114		
Toluene-d8**	%	TM208	101	99.2	99.1	99.3		
4-Bromofluorobenzene**	%	TM208	97	96.5	96.3	97.6		
Dichlorodifluoromethane	<1 µg/l	TM208	<1	<1	<1	<1		
Chloromethane	<1 µg/l	TM208	<1	<1	<1	<1		
Vinyl chloride	<1 µg/l	TM208	<1	<1	<1	<1		
Bromomethane	<1 µg/l	TM208	<1	<1	<1	<1		
Chloroethane	<1 µg/l	TM208	<1	<1	<1	<1		
Trichlorofluoromethane	<1 µg/l	TM208	<1	<1	<1	<1		
1,1-Dichloroethene	<1 µg/l	TM208	<1	<1	<1	<1		
Carbon disulphide	<1 µg/l	TM208	<1	<1	<1	<1		
Dichloromethane	<3 µg/l	TM208	<3	<3	<3	<3		
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1	<1	<1	<1		
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1	<1		
1,1-Dichloroethane	<1 µg/l	TM208	<1	<1	<1	<1		
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1	<1		
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1	<1		
Bromochloromethane	<1 µg/l	TM208	<1	<1	<1	<1		
Chloroform	<1 µg/l	TM208	<1	<1	<1	<1		
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	<1	<1	<1		
1,1-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1		
Carbontetrachloride	<1 µg/l	TM208	<1	<1	<1	<1		
1,2-Dichloroethane	<1 µg/l	TM208	<1	<1	<1	<1		
Benzene	<1 µg/l	TM208	<1	<1	<1	<1		
Trichloroethene	<1 µg/l	TM208	<1	<1	<1	<1		
1,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1	<1		
Dibromomethane	<1 µg/l	TM208	<1	<1	<1	<1		
Bromodichloromethane	<1 µg/l	TM208	<1	<1	<1	<1		
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1		
Toluene	<1 µg/l	TM208	<1	<1	<1	<1		
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1		
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	<1	<1	<1		
1,3-Dichloropropane	<1 µg/l	TM208	<1	<1	<1	<1		

08:42:19 14/07/2017



CERTIFICATE OF ANALYSIS

Validated

SDG: 170705-38
Location: A38

Client Reference:
Order Number:

Report Number: 416127
Superseded Report:

VOC MS (W)

Results Legend		Customer Sample Ref.	B009	BMD6A	H002	H003		
#	ISO 17025 accredited.							
M	mCERIS accredited.	Depth (m)	Ground Water (GW)	Ground Water (GW)	Surface Water (SW)	Surface Water (SW)	Sample Type	Date Sampled
disc.	disc.							
tot.untit	tot.untit	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type
+	+	Date Sampled	Date Sampled	Date Sampled	Date Sampled	Date Sampled	Date Sampled	Date Sampled
+	+	Sample Time	Sample Time	Sample Time	Sample Time	Sample Time	Sample Time	Sample Time
+	+	Date Received	Date Received	Date Received	Date Received	Date Received	Date Received	Date Received
+	+	SDG Ref	SDG Ref	SDG Ref	SDG Ref	SDG Ref	SDG Ref	SDG Ref
(F)	(F)	Lab Sample No.(s)	Lab Sample No.(s)	Lab Sample No.(s)	Lab Sample No.(s)	Lab Sample No.(s)	Lab Sample No.(s)	Lab Sample No.(s)
1-58-48	1-58-48	AGS Reference	AGS Reference	AGS Reference	AGS Reference	AGS Reference	AGS Reference	AGS Reference
Sample deviation (see appendix)	Sample deviation (see appendix)	Method	Method	Method	Method	Method	Method	Method
Component	LOD/Units	Method						
Tetrachloroethene	<1 µg/l	TM208	<1	<1	<1	<1		
Dibromochloromethane	<1 µg/l	TM208	<1	<1	<1	<1		
1,2-Dibromoethane	<1 µg/l	TM208	<1	<1	<1	<1		
Chlorobenzene	<1 µg/l	TM208	<1	<1	<1	<1		
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1	<1	<1		
Ethylbenzene	<1 µg/l	TM208	<1	<1	<1	<1		
m,p-Xylene	<1 µg/l	TM208	<1	<1	<1	<1		
o-Xylene	<1 µg/l	TM208	<1	<1	<1	<1		
Styrene	<1 µg/l	TM208	<1	<1	<1	<1		
Bromoform	<1 µg/l	TM208	<1	<1	<1	<1		
Isopropylbenzene	<1 µg/l	TM208	<1	<1	<1	<1		
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1	<1	<1		
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	<1	<1	<1		
Bromobenzene	<1 µg/l	TM208	<1	<1	<1	<1		
Propylbenzene	<1 µg/l	TM208	<1	<1	<1	<1		
2-Chlorotoluene	<1 µg/l	TM208	<1	<1	<1	<1		
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1	<1	<1	<1		
4-Chlorotoluene	<1 µg/l	TM208	<1	<1	<1	<1		
tert-Butylbenzene	<1 µg/l	TM208	<1	<1	<1	<1		
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1	<1	<1	<1		
sec-Butylbenzene	<1 µg/l	TM208	<1	<1	<1	<1		
4-iso-Propyltoluene	<1 µg/l	TM208	<1	<1	<1	<1		
1,3-Dichlorobenzene	<1 µg/l	TM208	<1	<1	<1	<1		
1,4-Dichlorobenzene	<1 µg/l	TM208	<1	<1	<1	<1		
n-Butylbenzene	<1 µg/l	TM208	<1	<1	<1	<1		
1,2-Dichlorobenzene	<1 µg/l	TM208	<1	<1	<1	<1		
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1	<1	<1	<1		
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1	<1	<1	<1		
Hexachlorobutadiene	<1 µg/l	TM208	<1	<1	<1	<1		
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1	<1	<1	<1		
Naphthalene	<1 µg/l	TM208	<1	<1	<1	<1		
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1	<1	<1	<1		

08:42:19 14/07/2017



Validated

Client Reference:
Order Number:

Report Number:	416127
Superseded Report:	

Customer Sample Ref.
 Depth (m)
 Sample Type
 Date Sampled
 Sample Time
 Date Received
 SDG Ref
 Lab Sample No.(s)
 AGS Reference

Depth (m)
Sample Type
Date Sampled
Sample Time
Date Received
SDG Ref
Lab Sample No.(s)
AGS Reference

Lab Sample No.(s) _____
AGS Reference _____

[illegible]

Validated

Client Reference:
Order Number:

Report Number:	416127
Superseded Report:	

Wet/Dry Sample ¹	Surrogate Corrected
--------------------------------	------------------------

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1991/BS EN 972	Determination of total suspended solids in waters		
TM045	MEWAM BOD5 2nd Ed/HMSO 1998 / Method 5210B, AWWA/APHA, 20th Ed., 1999, SCA Blue Book 130	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids		
TM061	Method for the Determination of EPH,Massachusetts Dept of EP, 1999	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water		
TM099	BS 2690 Part 7: 1998 / BS 6068 Part2 11: 1994	Determination of Ammonium in Water Samples using the Kone Analyser		
TM107	ISO 6060: 1999	Determination of Chemical Oxygen Demand using COD Dr Lange Kit		
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 OnLine	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 23606:2002, [BS 6068-2:74:2002] ISBN 0 590 36924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM186	Determination of Acidic Herbicides in Groundwater and Potable Water by LC/MSD Using Selective Ion Monitoring; Agilent Technologies Inc. Application Note 5969-5969ZEN	The Determination of Acid Herbicides in Environmental Water Samples and Leachates by LC/MS QQQ		
TM191	Standard Methods for the examination of waters and wastewaters 16th Edition, ALPHA, Washington DC, USA ISBN 0-67553-131-6	Determination of Unfiltered Metals in Water Matrices by ICP-MS		
TM205				
TM208	Modified US EPA Method 8260B & 824	Determination of Phenols in Waste Waters using Solid Phase Extraction, Acetylation, Gas Chromatography and Mass Selective Detection		
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM228	US EPA Method 6010B	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate		
TM231	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM231	Agilent 6990 Gas Chromatograph system using an Agilent 5973 Mass Selective Detector (MSD)	Determination of Organochlorine and Organophosphorus Pesticides and Triazine Herbicides by GCMS		
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1990	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser		
TM245	By GC-FID	Determination of GRO by Headspace in waters		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters: HMSO, 1978 ISBN 011 751428 4	Determination of pH in Water and Leachate using the GLpH pH Meter		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		

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

Validated

SDG: 170705-38
Location: A38

Client Reference:
Order Number:

Report Number: 416127
Superseded Report:

Test Completion Dates

Lab Sample No(s)	15787279	15787281	15787277	15787278
Customer Sample Ref.	BK09	BMBIA	H002	H003
AGS Ref.				
Depth				
Type	Ground Water	Ground Water	Surface Water	Surface Water
Acid Herbicides (W)	14-Jul-2017	14-Jul-2017	14-Jul-2017	14-Jul-2017
Ammoniacal Nitrogen	06-Jul-2017	06-Jul-2017	06-Jul-2017	06-Jul-2017
BOD True Total			10-Jul-2017	10-Jul-2017
COD Unfiltered	06-Jul-2017	06-Jul-2017	06-Jul-2017	06-Jul-2017
Cyanide CompFreeTotal/Thiocyanate	07-Jul-2017	07-Jul-2017	07-Jul-2017	07-Jul-2017
Dissolved Metals by ICP-MS	12-Jul-2017	12-Jul-2017	12-Jul-2017	12-Jul-2017
EPH CWG (Aliphatic) Aqueous GC (W)	07-Jul-2017	07-Jul-2017	07-Jul-2017	12-Jul-2017
EPH CWG (Aromatic) Aqueous GC (W)	07-Jul-2017	07-Jul-2017	07-Jul-2017	12-Jul-2017
GRO by GC-FID (W)	08-Jul-2017	08-Jul-2017	07-Jul-2017	07-Jul-2017
Hexavalent Chromium (w)	08-Jul-2017	08-Jul-2017	08-Jul-2017	08-Jul-2017
Mercury Dissolved	10-Jul-2017	10-Jul-2017	07-Jul-2017	10-Jul-2017
Metals by iCap-OES Dissolved (W)	13-Jul-2017	12-Jul-2017	12-Jul-2017	13-Jul-2017
Metals by iCap-OES Unfiltered (W)	10-Jul-2017	10-Jul-2017	10-Jul-2017	10-Jul-2017
OC, OP Pesticides and Triazine Herb	13-Jul-2017	10-Jul-2017	13-Jul-2017	13-Jul-2017
PAH Spec MS - Aqueous (W)	07-Jul-2017	07-Jul-2017	07-Jul-2017	07-Jul-2017
pH Value	06-Jul-2017	06-Jul-2017	06-Jul-2017	06-Jul-2017
Phenols by HPLC (W)	07-Jul-2017	07-Jul-2017	07-Jul-2017	07-Jul-2017
Phenols by ms (w)	13-Jul-2017	12-Jul-2017	13-Jul-2017	13-Jul-2017
Suspended Solids	06-Jul-2017	06-Jul-2017	06-Jul-2017	06-Jul-2017
SVOC MS (W) - Aqueous	11-Jul-2017	11-Jul-2017	11-Jul-2017	11-Jul-2017
Total Metals by ICP-MS	10-Jul-2017	10-Jul-2017	10-Jul-2017	10-Jul-2017
Total Organic and Inorganic Carbon	07-Jul-2017	07-Jul-2017	07-Jul-2017	07-Jul-2017
TPH CWG (W)	08-Jul-2017	08-Jul-2017	07-Jul-2017	12-Jul-2017
VOC MS (W)	07-Jul-2017	07-Jul-2017	07-Jul-2017	07-Jul-2017



CERTIFICATE OF ANALYSIS

SDG: 170705-38
Location: A38

Client Reference:
Order Number:

Report Number: 416127
Superseded Report:

Appendix

21. Results are expressed on a dry weight basis (dried at 35°C) 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. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. 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.

4. 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.

5. 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.

6. 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 ISO 17025. 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 asbestos present is not determined unless specifically requested.

7. 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.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

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

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

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

13. **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 70-100%, they are generally wider for volatiles analysis, 50-150%. 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 effect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

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

18. 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.

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

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

General

21. 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 GC/FID/GCMS and all subcontracted analysis.

22. 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.

23. Analysis and identification of specific compounds using GC/FID 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 GC/MS should be utilised.

24. **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.

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
4	Holding time exceeded before sample received
5	Samples exceeded holding time before preservation was performed
\$	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

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 Anorthophyllite	-
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.

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

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



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Basil Close
Chesterfield
Derbyshire
S41 7SL

Attention: James Penny

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Hawarden
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Website: www.alsenvironmental.co.uk



PRELIMINARY/INTERIM REPORT

Preliminary

SDG: 180215-127 Client Reference: 60533462 Report Number: 445460
Location: A38 Order Number: 60533462 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
17056293	BM10			14/02/2018
17056294	BM11			14/02/2018
17056292	BM06A			14/02/2018

Maximum Sample/Coolbox Temperature (°C) :

6.2

ISO6667-3 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.

PRELIMINARY/INTERIM REPORT

Date: 21 February 2018
Customer: H_URS_CFD
Sample Delivery Group (SDG): 180215-127
Your Reference:
Location: A38
Report No: 445460

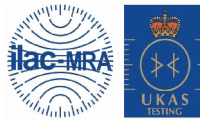
We received 3 samples on Thursday February 15, 2018 and 3 of these samples were scheduled for analysis which was completed on Wednesday February 21, 2018. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of 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).

This is a preliminary report which has not had final authorisation.

Approved By:



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

15:52:24 21/02/2018



PRELIMINARY/INTERIM REPORT

Preliminary

SDG: 180215-127
Location: A38

Client Reference: 60533462
Order Number:

Report Number: 445460
Superseded Report:

Results Legend	Lab Sample No(s)	17056292	17056294	17056294	17056292
	Customer Sample Reference	BM10	BM11	BM11	BM06A
	AGS Reference				
	Depth (m)				
	Container	NaOH (ALE245) HNO3 Filtered (ALE204) H2SO4 (ALE244) 250ml Amber GI PTFE/PE (ALE219) 0.5l glass bottle (ALE227) GW	NaOH (ALE245) HNO3 Filtered (ALE204) H2SO4 (ALE244) 250ml Amber GI PTFE/PE (ALE219) 0.5l glass bottle (ALE227) GW	NaOH (ALE245) HNO3 Filtered (ALE204) H2SO4 (ALE244) 250ml Amber GI PTFE/PE (ALE219) 0.5l glass bottle (ALE227) GW	NaOH (ALE245) HNO3 Filtered (ALE204) H2SO4 (ALE244) 250ml Amber GI PTFE/PE (ALE219) 0.5l glass bottle (ALE227) GW
	Sample Type	GW	GW	GW	GW
Acid Herbicides (Suite 3) (W)	All	NDPs: 0 Tests: 3	X	X	X
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 3		X	X
COD Unfiltered	All	NDPs: 0 Tests: 3	X	X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 3		X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 3		X	X
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 3	X	X	X
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 3	X	X	
GRO by GC-FID (W)	All	NDPs: 0 Tests: 3	X		X
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 3	X	X	
Mercury Dissolved	All	NDPs: 0 Tests: 3		X	X
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 3		X	X
Metals by iCap-OES Unfiltered (W)	All	NDPs: 0 Tests: 3	X	X	
OC, OP Pesticides and Thiazine Herb	All	NDPs: 0 Tests: 3	X	X	
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 3	X	X	
pH Value	All	NDPs: 0 Tests: 3	X	X	



PRELIMINARY/INTERIM REPORT

Preliminary

SDG: 180215-127
Location: A38

Client Reference: 60533462
Order Number:

Report Number: 445460
Superseded Report:

Results Legend	Lab Sample No(s)	17056293	17056294	17056292
	Customer Sample Reference	BM10	BM11	BM06A
	AGS Reference			
	Depth (m)			
	Container	NaOH (ALE245) HNO3 Filtered (ALE204) H2SO4 (ALE244) 250ml Amber GI PTFE/PE (ALE219) 0.5l glass bottle (ALE227) GW	NaOH (ALE245) HNO3 Filtered (ALE204) H2SO4 (ALE244) 250ml Amber GI PTFE/PE (ALE219) 0.5l glass bottle (ALE227) GW	NaOH (ALE245) HNO3 Filtered (ALE204) H2SO4 (ALE244) 250ml Amber GI PTFE/PE (ALE219) 0.5l glass bottle (ALE227) GW
	Sample Type	GW	GW	GW
Phenols by HPLC (W)	All	NDPs: 0 Tests: 3	X	X
Phenols by ms (w)	All	NDPs: 0 Tests: 3	X	X
Suspended Solids	All	NDPs: 0 Tests: 3	X	X
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 3	X	X
Total Metals by ICP-MS	All	NDPs: 0 Tests: 3	X	X
Total Organic and Inorganic Carbon	All	NDPs: 0 Tests: 3	X	X
TPH CWG (W)	All	NDPs: 0 Tests: 3	X	X
VOC MS (W)	All	NDPs: 0 Tests: 3	X	X

PRELIMINARY/INTERIM REPORT

Preliminary

SDG:	180215-127	Client Reference:		Report Number:	445460
Location:	A38	Order Number:	60533462	Superseded Report:	

OC, OP Pesticides and Triazine Herb

Results Legend # ISO17025 accredited. M UKAS accredited. eq Aqueous / settled sample. diss, fil Dissolved / filtered sample. tot, unfil Total / unfiltered sample. " Subtracted test. " % 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. 1.5-4.5% Sample deviation (see appendix)			Customer Sample Ref.	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDQ Ref	Lab Sample No.(s)	SSS Reference	BM10	BM11	BM06A				
Component	LOD/Units	Method		Ground Water (GW)	Ground Water (GW)	Ground Water (GW)												
Dichlorvos	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
Mevinphos	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
alpha-Hexachlorocyclohexane (HCH / Lindane)	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
Diazinon	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
gamma-Hexachlorocyclohexane (HCH / Lindane)	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
Heptachlor	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
Aldrin	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
beta-Hexachlorocyclohexane (HCH / Lindane)	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
Methyl parathion	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
Malathion	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
Fenitrothion	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
Heptachlor epoxide	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
Parathion	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
o,p-DDE	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
Endosulphan I	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
p,p-DDE	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
Dieldrin	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
o,p-TDE (DDD)	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
Endrin	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
o,p-DDT	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
p,p-TDE (DDD)	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
Ethion	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
Endosulphan II	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
p,p-DDT	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
o,p-Methoxychlor	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
p,p-Methoxychlor	<0.01 µg/l	TM231		<0.01	<0.01	<0.01												
Endosulphan sulphate	<0.01 µg/l	TM231		<0.01</														



PRELIMINARY/INTERIM REPORT

Preliminary

SDG:	180215-127	Client Reference:	Report Number:	445460
Location:	A38	Order Number:	60533462	Superseded Report:

PAH Spec MS - Aqueous (W)



PRELIMINARY/INTERIM REPORT

Preliminary

SDG: 180215-127
Location: A38
Client Reference: 60533462
Report Number: 445460
Superseded Report:

SVOC MS (W) - Aqueous

Results Legend		Customer Sample Ref.	EM10	EM11	BM6A			
#	ISO 17025 accredited.							
M	mCERIS accredited.	Depth (m)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)			
aq	Aqueous / settled sample.							
dis.cnt	Discolored / filtered sample.	Sample Type	14/02/2018	14/02/2018	14/02/2018			
tot.unfit	Total / unfitted sample.	Date Sampled						
-	Subcontracted test.	Sample Time						
-	% 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.	Date Received	15/02/2018	15/02/2018	15/02/2018			
(F)	Trigger breach confirmed	SDG Ref	180215-127	180215-127	180215-127			
1-58-48	Sample deviation (see appendix)	Lab Sample No.(s)	17056293	17056294	17056292			
AGS Reference								
Component	LOD/Units	Method						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2-Chlorophenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2-Methylphenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2-Nitrophenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
3-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
4-Chloroaniline (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
4-Methylphenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
4-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
4-Nitrophenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Azobenzene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Acenaphthylene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Acenaphthene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Anthracene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<2	<2	<2	#	#	#
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#

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PRELIMINARY/INTERIM REPORT

Preliminary

SDG: 180215-127
Location: A38
Client Reference: 60533462
Report Number: 445460
Superseded Report:

SVOC MS (W) - Aqueous

Results Legend		Customer Sample Ref.	BM0	BM1	BM6A			
#	ISO 17025 accredited.							
M	mCERIS accredited.	Depth (m)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)			
aq	Aqueous / settled sample.							
dis.cnt	Discolored / filtered sample.	Sample Type	14/02/2018	14/02/2018	14/02/2018			
tot.unfit	Total / unfitted sample.	Date Sampled						
-	Subcontracted test.	Sample Time						
-	% 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.	Date Received	15/02/2018	15/02/2018	15/02/2018			
(F)	Trigger breach confirmed	SDG Ref	180215-127	180215-127	180215-127			
1-58-48	Sample deviation (see appendix)	Lab Sample No.(s)	17056293	17056294	17056292			
AGS Reference								
Component	LOD/Units	Method						
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Benzo(a)pyrene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Carbazole (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Chrysene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Dibenzofuran (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
n-Dibutyl phthalate (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Diethyl phthalate (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Dimethyl phthalate (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
n-Diethyl phthalate (aq)	<5 µg/l	TM176	<5	<5	<5	#	#	#
Fluoranthene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Fluorene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Hexachlorobenzene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Hexachlorobutadiene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Pentachlorophenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Phenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Hexachloroethane (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Nitrobenzene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Naphthalene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Isophorone (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Phenanthrene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Pyrene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#

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PRELIMINARY/INTERIM REPORT

Preliminary

SDG: 180215-127
Location: A38
Client Reference: 60533462
Report Number: 445460
Superseded Report:

TPH CWG (W)

Results Legend		Customer Sample Ref.	EM10	EM11	BM6A			
#	ISO 17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
dis.ftr	Disolved / filtered sample.							
tot.unftr	Total / unfiltered sample.							
+	Subcontracted test.							
**	% 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. Trigger breach confirmed							
(F)	1.5x-4x Sample deviation (see appendix)							
Component	LOD/Units	Method						
GRO Surrogate % recovery**	%	TM245	93	86	86			
GRO >C5-C12	<50 µg/l	TM245	54	<50	<50			
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245	54	<3	<3			
Benzene	<7 µg/l	TM245	<7	<7	<7			
Toluene	<4 µg/l	TM245	<4	<4	<4			
Ethylbenzene	<5 µg/l	TM245	<5	<5	<5			
m,p-Xylene	<8 µg/l	TM245	<8	<8	<8			
o-Xylene	<3 µg/l	TM245	<3	<3	<3			
Sum of detected Xylenes	<11 µg/l	TM245	<11	<11	<11			
Sum of detected BTEX	<28 µg/l	TM245	<28	<28	<28			
Aliphatics >C5-C6	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C6-C8	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C8-C10	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C10-C12	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174	<10	<20	<10			
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174	<10	56	<10			
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174	<10	604	<10			
Total Aliphatics >C12-C35 (aq)	<10 µg/l	TM174	<10	660	<10			
Aromatics >EC5-EC7	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC7-EC8	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC8-EC10	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC10-EC12	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174	<10	<20	<10			
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174	<10	32	<10			
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174	<10	231	<10			
Total Aromatics >EC12-EC35 (aq)	<10 µg/l	TM174	<10	263	<10			
Total Aliphatics & Aromatics >C5-C35 (aq)	<10 µg/l	TM174	<10	323	<10			
Aliphatics >C16-C35 Aqueous	<10 µg/l	TM174	<10	660	<10			

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PRELIMINARY/INTERIM REPORT

Preliminary

SDG: 180215-127
Location: A38
Client Reference: 60533462
Report Number: 445460
Superseded Report:

VOC MS (W)

Results Legend		Customer Sample Ref.	BM0	BM1	BM6A			
#	ISO 17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
dis.ftr	Disolved / filtered sample.							
tot.unftr	Total / unfiltered sample.							
+	Subcontracted test.							
**	% 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. Trigger breach confirmed							
(F)	1.5x-4x Sample deviation (see appendix)							
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM209	108	108	111			
Toluene-d8**	%	TM209	99	99	98.7			
4-Bromofluorobenzene**	%	TM209	99.4	102	99.9			
Dichlorodifluoromethane	<1 µg/l	TM209	<1	<1	<1			
Chloromethane	<1 µg/l	TM209	<1	<1	<1			
Vinyl chloride	<1 µg/l	TM209	<1	<1	<1			
Bromomethane	<1 µg/l	TM209	<1	<1	<1			
Chloroethane	<1 µg/l	TM209	<1	<1	<1			
Trichlorofluoromethane	<1 µg/l	TM209	<1	<1	<1			
1,1-Dichloroethene	<1 µg/l	TM209	<1	<1	<1			
Carbon disulphide	<1 µg/l	TM209	<1	<1	<1			
Dichloromethane	<3 µg/l	TM209	<3	<3	<3			
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM209	48.7	<1	<1			
trans-1,2-Dichloroethene	<1 µg/l	TM209	<1	<1	<1			
1,1-Dichloroethane	<1 µg/l	TM209	<1	<1	<1			
cis-1,2-Dichloroethene	<1 µg/l	TM209	<1	<1	<1			
2,2-Dichloropropane	<1 µg/l	TM209	<1	<1	<1			
Bromochloromethane	<1 µg/l	TM209	<1	<1	<1			
Chloroform	<1 µg/l	TM209	<1	<1	<1			
1,1,1-Trichloroethane	<1 µg/l	TM209	<1	<1	<1			
1,1-Dichloropropene	<1 µg/l	TM209	<1	<1	<1			
Carbon tetrachloride	<1 µg/l	TM209	<1	<1	<1			
1,2-Dichloroethane	<1 µg/l	TM209	<1	<1	<1			
Benzene	<1 µg/l	TM209	<1	<1	<1			
Trichloroethene	<1 µg/l	TM209	<1	<1	<1			
1,2-Dichloropropane	<1 µg/l	TM209	<1	<1	<1			
Dibromomethane	<1 µg/l	TM209	<1	<1	<1			
Bromodichloromethane	<1 µg/l	TM209	<1	<1	<1			
cis-1,3-Dichloropropene	<1 µg/l	TM209	<1	<1	<1			
Toluene	<1 µg/l	TM209	<1	<1	<1			
trans-1,3-Dichloropropene	<1 µg/l	TM209	<1	<1	<1			
1,1,2-Trichloroethane	<1 µg/l	TM209	<1	<1	<1			
1,3-Dichloropropane	<1 µg/l	TM209	<1	<1	<1			

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PRELIMINARY/INTERIM REPORT

Preliminary

SDG: 180215-127
Location: A38
Client Reference: 60533462
Report Number: 445460
Superseded Report:

VOC MS (W)

Results Legend		Customer Sample Ref.	BM10	BM11	BM6A			
#	ISO 17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No. (s) AGS Reference	Ground Water (GW) 14/02/2018	Ground Water (GW) 14/02/2018	Ground Water (GW) 14/02/2018			
m	Aqueous / settled sample.							
dis.filt	Disinfectant / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
+	Subcontracted test.							
-	% 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 trigger breach confirmed							
(F)	1.5x-4x Sample deviation (see appendix)							
Component	LOD/Units	Method						
Tetrachloroethene	<1 µg/l	TM208	<1	<1	<1	2 #		
Dibromochloromethane	<1 µg/l	TM208	<1	<1	<1	2 #		
1,2-Dibromochloromethane	<1 µg/l	TM208	<1	<1	<1	2 #		
Chlorobenzene	<1 µg/l	TM208	<1	<1	<1	2 #		
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1	<1	2 #		
Ethylbenzene	<1 µg/l	TM208	<1	<1	<1	2 #		
m,p-Xylene	<1 µg/l	TM208	<1	<1	<1	2 #		
o-Xylene	<1 µg/l	TM208	<1	<1	<1	2 #		
Styrene	<1 µg/l	TM208	<1	<1	<1	2 #		
Bromoform	<1 µg/l	TM208	<1	<1	<1	2 #		
Isopropylbenzene	<1 µg/l	TM208	<1	<1	<1	2 #		
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1	<1	2 #		
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	<1	<1	2 #		
Bromobenzene	<1 µg/l	TM208	<1	<1	<1	2 #		
Propylbenzene	<1 µg/l	TM208	<1	<1	<1	2 #		
2-Chlorotoluene	<1 µg/l	TM208	<1	<1	<1	2 #		
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1	<1	<1	2 #		
4-Chlorotoluene	<1 µg/l	TM208	<1	<1	<1	2 #		
tert-Butylbenzene	<1 µg/l	TM208	<1	<1	<1	2 #		
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1	<1	<1	2 #		
sec-Butylbenzene	<1 µg/l	TM208	<1	<1	<1	2 #		
4-iso-Propyltoluene	<1 µg/l	TM208	<1	<1	<1	2 #		
1,3-Dichlorobenzene	<1 µg/l	TM208	<1	<1	<1	2 #		
1,4-Dichlorobenzene	<1 µg/l	TM208	<1	<1	<1	2 #		
n-Butylbenzene	<1 µg/l	TM208	<1	<1	<1	2 #		
1,2-Dichlorobenzene	<1 µg/l	TM208	<1	<1	<1	2 #		
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1	<1	<1	2		
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1	<1	<1	2 #		
Hexachlorobutadiene	<1 µg/l	TM208	<1	<1	<1	2 #		
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1	<1	<1	2 #		
Naphthalene	<1 µg/l	TM208	<1	<1	<1	2 #		
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1	<1	<1	2 #		



PRELIMINARY/INTERIM REPORT

Preliminary

SDG: 180215-127
Location: A38
Client Reference: 60533462
Report Number: 445460
Superseded Report:

VOC MS (W)

Results Legend		Customer Sample Ref.	BM10	BM11	BM6A			
#	ISO 17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No. (s) AGS Reference	Ground Water (GW) 14/02/2018	Ground Water (GW) 14/02/2018	Ground Water (GW) 14/02/2018			
m	Aqueous / settled sample.							
dis.filt	Disinfectant / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
+	Subcontracted test.							
-	% 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 trigger breach confirmed							
(F)	1.5x-4x Sample deviation (see appendix)							
Component	LOD/Units	Method						
1,3,5-Trichlorobenzene	<1 µg/l	TM208	<1	<1	<1	2		



PRELIMINARY/INTERIM REPORT

Preliminary

SDG: 180215-127
Location: A38
Client Reference: 60533462
Order Number:
Report Number: 445460
Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
SUB		Subcontracted Test
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981, BS EN 872	Determination of total suspended solids in waters
TM061	Method for the Determination of EPH, Massachusetts Dept. of EP, 1999	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7: 1968 / BS 6068: Part2 11: 1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM107	ISO 6060-1999	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
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 36924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM191	Standard Methods for the examination of waters and wastewaters 16th Edition, ALPHA, Washington DC, USA ISBN 0-87553-131-8	Determination of Unfiltered Metals in Water Matrices by ICP-MS
TM205		Determination of Phenols in Waste Waters using Solid Phase Extraction, Acetylation, Gas Chromatography and Mass Selective Detection
TM208	Modified: US EPA Method 8260b 8, 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES
TM231	Agilent 6890 Gas Chromatograph system using an Agilent 5973 Mass Selective Detector (MSD)	Determination of Organochlorine and Organophosphorus Pesticides and Triazine Herbicides by GCMS
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1990	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC

NA = not applicable.

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



PRELIMINARY/INTERIM REPORT

Preliminary

SDG: 180215-127
Location: A38
Client Reference: 60533462
Order Number:
Report Number: 445460
Superseded Report:

Test Completion Dates

Lab Sample No(s)	17056293	17056294	17056292
Customer Sample Ref.	BM11	BM1	BM1A
AGS Ref.			
Depth			
Type	Ground Water	Ground Water	Ground Water
Ammoniacal Nitrogen	16-Feb-2018	16-Feb-2018	16-Feb-2018
COD Unfiltered	20-Feb-2018	20-Feb-2018	20-Feb-2018
Cyanide Comp/Free/Total/Thiocyanate	20-Feb-2018	20-Feb-2018	20-Feb-2018
Dissolved Metals by ICP-MS	20-Feb-2018	20-Feb-2018	20-Feb-2018
EPH CWG (Aliphatic) Aqueous GC (W)	21-Feb-2018	21-Feb-2018	20-Feb-2018
EPH CWG (Aromatic) Aqueous GC (W)	21-Feb-2018	21-Feb-2018	20-Feb-2018
GRO by GC-FID (W)	19-Feb-2018	19-Feb-2018	19-Feb-2018
Hexavalent Chromium (w)	20-Feb-2018	20-Feb-2018	20-Feb-2018
Mercury Dissolved	19-Feb-2018	19-Feb-2018	19-Feb-2018
Metals by iCap-OES Dissolved (W)	20-Feb-2018	20-Feb-2018	20-Feb-2018
Metals by iCap-OES Unfiltered (W)	20-Feb-2018	21-Feb-2018	20-Feb-2018
OC, OP Pesticides and Triazine Herb	21-Feb-2018	21-Feb-2018	21-Feb-2018
PAH Spec MS - Aqueous (W)	21-Feb-2018	21-Feb-2018	20-Feb-2018
pH Value	16-Feb-2018	16-Feb-2018	16-Feb-2018
Phenols by HPLC (W)	17-Feb-2018	17-Feb-2018	17-Feb-2018
Phenols by ms (w)	21-Feb-2018	21-Feb-2018	21-Feb-2018
Suspended Solids	16-Feb-2018	16-Feb-2018	16-Feb-2018
SVOC MS (W) - Aqueous	20-Feb-2018	20-Feb-2018	20-Feb-2018
Total Metals by ICP-MS	19-Feb-2018	19-Feb-2018	19-Feb-2018
Total Organic and Inorganic Carbon	21-Feb-2018	20-Feb-2018	20-Feb-2018
TPH CWG (W)	21-Feb-2018	21-Feb-2018	20-Feb-2018
VOC MS (W)	17-Feb-2018	17-Feb-2018	17-Feb-2018



PRELIMINARY/INTERIM REPORT

SDG:	180215-127	Client Reference:		Report Number:	445460
Location:	A38	Order Number:	60533462	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) 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. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. 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.

4. 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.

5. 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.

6. 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 ISO 17025. 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 asbestos present is not determined unless specifically requested.

7. 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.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

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

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

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

13. **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%, they are generally wider for volatiles analysis, 50-150%. 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 effect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

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

18. 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.

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

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

General

21. 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.

22. 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.

23. 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.

24. **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.

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
4	Holding time exceeded before sample received
5	Samples exceeded holding time before preservation was performed
§	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

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
Onychite	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.

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.



Aecom
Royal Court
Basil Close
Chesterfield
Derbyshire
S41 7SL

Attention: James Penny

CERTIFICATE OF ANALYSIS

Date:	23 March 2018
Customer:	H_URS_CFD
Sample Delivery Group (SDG):	180315-16
Your Reference:	
Location:	A38
Report No:	449202

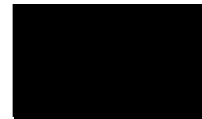
This report has been revised and directly supersedes 449035 in its entirety.

We received 3 samples on Thursday March 15, 2018 and 3 of these samples were scheduled for analysis which was completed on Friday March 23, 2018. 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).

Approved By:



Sonia McWhan

Operations Manager

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





Received Sample Overview

Maximum Sample/Coolbox Temperature (°C) :	9.4
ISO6667-3 Water quality - Sampling - Part 3 -	AL
During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.	AL 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.



Results Legend																			
X Test	Lab Sample No(s)																		
N No Determination Possible	Customer Sample Reference																		
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	AGS Reference																		
	Depth (m)																		
	Container																		
	Sample Type																		
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 3				X							X						X
BOD True Total	All	NDPs: 0 Tests: 3			X							X						X	
COD Unfiltered	All	NDPs: 0 Tests: 3			X						X							X	
Cyanide Comp.Free/Total/Thiocyanate	All	NDPs: 0 Tests: 3																	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 3					X							X					
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 3				X								X					
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 3			X													X	
GRO by GC-FID (W)	All	NDPs: 0 Tests: 3							X								X		
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 3			X							X							X
Mercury Dissolved	All	NDPs: 0 Tests: 3					X						X						
Metals by ICAP-OES Unfiltered (W)	All	NDPs: 0 Tests: 3					X							X					
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 3			X														
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 3			X						X							X	
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 3			X						X							X	
Pesticides (Suite III) by GCMS	All	NDPs: 0 Tests: 3			X						X							X	



CERTIFICATE OF ANALYSIS

Validated

SDG:	180315-16	Client Reference:		Report Number:	449202
Location:	A38	Order Number:	60533462	Superseded Report:	449035

Results Legend



Test



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

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CERTIFICATE OF ANALYSIS

Validated

SDG: 180315-16 Client Reference: 60533462 Report Number: 449202
Location: A38 Order Number: 60533462 Superseded Report: 449035

Results Legend		Customer Sample Ref.	BM10	BM11	BM6A			
#	ISO 17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No. (s) AGS Reference						
M	Aqueous / settled sample.							
dis.M	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
+	Subcontracted test.							
+	% 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							
1-5k+g#	Sample deviation (see appendix)							
Component	LOD/Units	Method						
2,4-dinitrophenol	<2.5 µg/l	TM205	<5	<5	<5			
DNOC	<3 µg/l	TM205	<6	<6	<6			
Pentachlorophenol	<2 µg/l	TM205	<2	<2	<2			
Dimoseb	<4 µg/l	TM205	<8	<8	<8			
Cyanide, Total	<0.05 mg/l	TM227	<0.05	<0.05	<0.05			
Cyanide, Free	<0.05 mg/l	TM227	<0.05	<0.05	<0.05	#	#	#
Hardness, Total as CaCO ₃ unfiltered	<0.35 mg/l	TM228	1320	1690	750			
Chromium, Hexavalent	<0.03 mg/l	TM241	<0.03	<0.03	<0.03	#	#	#
pH	<1 pH Units	TM256	7.17	7.13	7.25	#	#	#
Phenol	<0.002 mg/l	TM259	<0.002	<0.002	<0.002	#	#	#
Cresols	<0.006 mg/l	TM259	<0.006	<0.006	<0.006	#	#	#
Xylenols	<0.006 mg/l	TM259	<0.006	<0.006	<0.006	#	#	#
Phenols, Total Detected monohydric	<0.016 mg/l	TM259	<0.016	<0.016	<0.016	#	#	#
Trifluralin	<0.01 µg/l	TM343	<0.01	<0.02	<0.01			
alpha-HCH	<0.01 µg/l	TM343	<0.01	<0.02	<0.01			
gamma-HCH (Lindane)	<0.01 µg/l	TM343	<0.01	<0.02	<0.01			
Heptachlor	<0.01 µg/l	TM343	<0.01	<0.02	<0.01			
Aldrin	<0.01 µg/l	TM343	<0.01	<0.02	<0.01			
beta-HCH	<0.01 µg/l	TM343	<0.01	<0.02	<0.01			
Isodrin	<0.01 µg/l	TM343	<0.01	<0.02	<0.01			
delta-HCH	<0.01 µg/l	TM343	<0.05	<0.1	<0.05			
Heptachlor epoxide	<0.01 µg/l	TM343	<0.01	<0.02	<0.01			
o,p'-DDE	<0.01 µg/l	TM343	<0.01	<0.02	<0.01			
Endosulphan I	<0.01 µg/l	TM343	<0.01	<0.02	<0.01			
trans-Chlordane	<0.01 µg/l	TM343	<0.01	<0.02	<0.01			
cis-Chlordane	<0.01 µg/l	TM343	<0.01	<0.02	<0.01			
p,p'-DDE	<0.01 µg/l	TM343	<0.01	<0.02	<0.01			
Dieldrin	<0.01 µg/l	TM343	<0.01	<0.02	<0.01			
o,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.01	<0.02	<0.01			
Endrin	<0.01 µg/l	TM343	<0.02	<0.04	<0.02			
o,p'-DDT	<0.01 µg/l	TM343	<0.02	<0.04	<0.02			
p,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.01	<0.02	<0.01			



CERTIFICATE OF ANALYSIS

Validated

SDG: 180315-16 Client Reference: 60533462 Report Number: 449202
Location: A38 Order Number: 60533462 Superseded Report: 449035

Results Legend		Customer Sample Ref.	BM10	BM11	BM6A			
#	ISO 17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No. (s) AGS Reference						
M	Aqueous / settled sample.							
dis.M	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
+	Subcontracted test.							
+	% 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							
1-5k+g#	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Endosulphan II	<0.02 µg/l	TM343	<0.02	<0.04	<0.02			
p,p'-DDT	<0.01 µg/l	TM343	<0.02	<0.04	<0.02			
o,p'-Methoxychlor	<0.01 µg/l	TM343	<0.02	<0.04	<0.02			
p,p'-Methoxychlor	<0.01 µg/l	TM343	<0.02	<0.04	<0.02			
Endosulphan Sulphate	<0.02 µg/l	TM343	<0.04	<0.08	<0.04			
Permethrin I	<0.01 µg/l	TM343	<0.01	<0.02	<0.01			
Permethrin II	<0.01 µg/l	TM343	<0.01	<0.02	<0.01			
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
Hexachlorobutadiene	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
Dichlorvos	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
Dichlobenil	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
Mevinphos	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
Tecnazene	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
Hexachlorobenzene	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
Demeton-S-methyl	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
Phorate	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
Diazinon	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
Triallate	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
Atrazine	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
Simazine	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
Disulfoton	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
Propetamphos	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
Chlorpyrifos-methyl	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
Dimethoate	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
Pintrifos-methyl	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
Chlorpyrifos	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
Methyl Parathion	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
Malathion	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
Fenitrothion	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			
Fenitrothion	<0.01 µg/l	TM344	<0.01	<0.01	<0.01			

CERTIFICATE OF ANALYSIS

Validated

SDG: 180315-16
Location: A38

Client Reference:
Order Number: 60533462

Report Number: 449202
Superseded Report: 449035



CERTIFICATE OF ANALYSIS

Validated

SDG: 180315-16
Location: A38

Client Reference:
Order Number: 60533462

Report Number:	449202
Superseded Report:	449035

PAH Spec MS - Aqueous (W)



CERTIFICATE OF ANALYSIS

Validated

SDG: 180315-16
Location: A38Client Reference:
Order Number: 60533462Report Number: 449202
Superseded Report: 449035

SVOC MS (W) - Aqueous

Results Legend		Customer Sample Ref.	EM10	EM11	BMD6A			
#	ISO 17025 accredited.							
M	mCERTS accredited.	Depth (m)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)			
aq	Aqueous / settled sample.							
dis.cnt	Discolored / filtered sample.	Sample Type	1403/2018	1403/2018	1403/2018			
tot.unfit	Total / unfitted sample.	Date Sampled						
-	Subcontracted test.	Sample Time						
-	% 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.	Date Received	15/03/2018	15/03/2018	15/03/2018			
(F)	Trigger breach confirmed	SDG Ref	180315-16	180315-16	180315-16			
1-58-40	Sample deviation (see appendix)	Lab Sample No.(s)	17209830	17209834	17209832			
AGS Reference								
Component	LOD/Units	Method						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2-Chlorophenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2-Methylphenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2-Nitrophenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
3-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
4-Chloroaniline (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
4-Methylphenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
4-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
4-Nitrophenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Azobenzene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Acenaphthylene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Acenaphthene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Anthracene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<2	<2	<2	#	#	#
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#

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CERTIFICATE OF ANALYSIS

Validated

SDG: 180315-16
Location: A38Client Reference:
Order Number: 60533462Report Number: 449202
Superseded Report: 449035

SVOC MS (W) - Aqueous

Results Legend		Customer Sample Ref.	BMD0	BMD1	BMD6A			
#	ISO 17025 accredited.							
M	mCERTS accredited.	Depth (m)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)			
aq	Aqueous / settled sample.							
dis.cnt	Discolored / filtered sample.	Sample Type	1403/2018	1403/2018	1403/2018			
tot.unfit	Total / unfitted sample.	Date Sampled						
-	Subcontracted test.	Sample Time						
-	% 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.	Date Received	15/03/2018	15/03/2018	15/03/2018			
(F)	Trigger breach confirmed	SDG Ref	180315-16	180315-16	180315-16			
1-58-40	Sample deviation (see appendix)	Lab Sample No.(s)	17209830	17209834	17209832			
AGS Reference								
Component	LOD/Units	Method						
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Benzo(a)pyrene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Carbazole (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Chrysene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Dibenzofuran (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
n-Dibutyl phthalate (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Diethyl phthalate (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Dimethyl phthalate (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
n-Diethyl phthalate (aq)	<5 µg/l	TM176	<5	<5	<5	#	#	#
Fluoranthene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Fluorene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Hexachlorobenzene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Hexachlorobutadiene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Pentachlorophenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Phenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Hexachloroethane (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Nitrobenzene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Naphthalene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Isophorone (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Phenanthrene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Pyrene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#

12:35:47 23/03/2018



CERTIFICATE OF ANALYSIS

Validated

SDG: 180315-16
Location: A38Client Reference:
Order Number: 60533462Report Number: 449202
Superseded Report: 449035

TPH CWG (W)

Results Legend		Customer Sample Ref.	EM10	EM11	BM6A			
#	ISO 17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
dis.cnt	Discolored / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
+	Subcontracted test.							
..	% 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. Trigger breach confirmed							
(F)	1.5x-4x Sample deviation (see appendix)							
Component	LOD/Units	Method						
GRO Surrogate % recovery**	%	TM245	100	99	102			
GRO >C5-C12	<50 µg/l	TM245	<50	<50	<50			
			#	#	#			
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245	49	<3	<3			
Benzene	<7 µg/l	TM245	<7	<7	<7			
Toluene	<4 µg/l	TM245	<4	<4	<4			
Ethylbenzene	<5 µg/l	TM245	<5	<5	<5			
m,p-Xylene	<8 µg/l	TM245	<8	<8	<8			
o-Xylene	<3 µg/l	TM245	<3	<3	<3			
Sum of detected Xylenes	<11 µg/l	TM245	<11	<11	<11			
Sum of detected BTEX	<28 µg/l	TM245	<28	<28	<28			
Aliphatics >C5-C6	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C6-C8	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C8-C10	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C10-C12	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174	<10	<10	<10			
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174	<10	23	<10			
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174	<10	314	<10			
Total Aliphatics >C12-C35 (aq)	<10 µg/l	TM174	<10	337	<10			
Aromatics >EC5-EC7	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC7-EC8	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC8-EC10	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC10-EC12	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174	<10	<10	<10			
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174	<10	16	<10			
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174	<10	125	<10			
Total Aromatics >EC12-EC35 (aq)	<10 µg/l	TM174	<10	141	<10			
Total Aliphatics & Aromatics >C5-C35 (aq)	<10 µg/l	TM174	<10	478	<10			
Aliphatics >C16-C35 Aqueous	<10 µg/l	TM174	<10	337	<10			



CERTIFICATE OF ANALYSIS

Validated

SDG: 180315-16
Location: A38Client Reference:
Order Number: 60533462Report Number: 449202
Superseded Report: 449035

VOC MS (W)

Results Legend		Customer Sample Ref.	BM0	BM1	BM6A			
#	ISO 17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
dis.cnt	Discolored / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
+	Subcontracted test.							
..	% 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. Trigger breach confirmed							
(F)	1.5x-4x Sample deviation (see appendix)							
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM209	105	111	108			
Toluene-d8**	%	TM209	99.1	99.9	99.3			
4-Bromofluorobenzene**	%	TM209	97.4	99.8	97.5			
Dichlorodifluoromethane	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
Chloromethane	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
Vinyl chloride	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
Bromomethane	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
Chloroethane	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
Trichlorofluoromethane	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
1,1-Dichloroethene	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
Carbon disulphide	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
Dichloromethane	<3 µg/l	TM209	<3	<3	<3			
			#	#	#			
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM209	55.3	<1	<1			
			#	#	#			
trans-1,2-Dichloroethene	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
1,1-Dichloroethane	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
cis-1,2-Dichloroethene	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
2,2-Dichloropropane	<1 µg/l	TM209	<1	<1	<1			
Bromochloromethane	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
Chloroform	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
1,1,1-Trichloroethane	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
1,1-Dichloropropene	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
Carbon tetrachloride	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
1,2-Dichloroethane	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
Benzene	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
Trichloroethene	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
1,2-Dichloropropane	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
Dibromomethane	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
Bromodichloromethane	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
cis-1,3-Dichloropropene	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
Toluene	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
trans-1,3-Dichloropropene	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
1,1,2-Trichloroethane	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			
1,3-Dichloropropane	<1 µg/l	TM209	<1	<1	<1			
			#	#	#			



Validated

Report Number:	449202
Superseded Report:	449035

VOC MS (W)

Results Legend			Customer Sample Ref.	BM10	BM11	BM6A			
#	IS	IS	Depth (m)						
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210
211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230
231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250
251	252	253	254	255	256	257	258	259	260
261	262	263	264	265	266	267	268	269	270
271	272	273	274	275	276	277	278	279	280
281	282	283	284	285	286	287	288	289	290
291	292	293	294	295	296	297	298	299	300
301	302	303	304	305	306	307	308	309	310
311	312	313	314	315	316	317	318	319	320
321	322	323	324	325	326	327	328	329	330
331	332	333	334	335	336	337	338	339	340
341	342	343	344	345	346	347	348	349	350
351	352	353	354	355	356	357	358	359	360
361	362	363	364	365	366	367	368	369	370
371	372	373	374	375	376	377	378	379	380
381	382	383	384	385	386	387	388	389	390
391	392	393	394	395	396	397	398	399	400
401	402	403	404	405	406	407	408	409	410
411	412	413	414	415	416	417	418	419	420
421	422	423	424	425	426	427	428	429	430
431	432	433	434	435	436	437	438	439	440
441	442	443	444	445	446	447	448	449	450
451	452	453	454	455	456	457	458	459	460
461	462	463	464	465	466	467	468	469	470
471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490
491	492	493	494	495	496	497	498	499	500
501	502	503	504	505	506	507	508	509	510
511	512	513	514	515	516	517	518	519	520
521	522	523	524	525	526	527	528	529	530
531	532	533	534	535	536	537	538	539	540
541	542	543	544	545	546	547	548	549	550
551	552	553	554	555	556	557	558	559	560
561	562	563	564	565	566	567	568	569	570
571	572	573	574	575	576	577	578	579	580
581	582	583	584	585	586	587	588	589	590
591	592	593	594	595	596	597	598	599	600
601	602	603	604	605	606	607	608	609	610
611	612	613	614	615	616	617	618	619	620
621	622	623	624	625	626	627	628	629	630
631	632	633	634	635	636	637	638	639	640
641	642	643	644	645	646	647	648	649	650
651	652	653	654	655	656	657	658	659	660
661	662	663	664	665	666	667	668	669	670
671	672	673	674	675	676	677	678	679	680
681	682	683	684	685	686	687	688	689	690
691	692	693	694	695	696	697	698	699	700
701	702	703	704	705	706	707	708	709	710
711	712	713	714	715	716	717	718	719	720
721	722	723	724	725	726	727	728	729	730
731	732	733	734	735	736	737	738	739	740
741	742	743	744	745	746	747	748	749	750
751	752	753	754	755	756	757	758	759	760
761	762	763	764	765	766	767	768	769	770
771	772	773	774	775	776	777	778	779	780
781	782	783	784	785	786	787	788	789	790
791	792	793	794	795	796	797	798	799	800
801	802	803	804	805	806	807	808	809	810
811	812	813	814	815	816	817	818	819	820
821	822	823	824	825	826	827	828	829	830
831	832	833	834	835	836	837	838	839	840
841	842	843	844	845	846	847	848	849	850
851	852	853	854	855	856	857	858	859	860
861	862	863	864	865	866	867	868	869	870
871	872	873	874	875	876	877	878	879	880
881	882	883	884	885	886	887	888	889	890
891	892	893	894	895	896	897	898	899	900
901	902	903	904	905	906	907	908	909	910
911	912	913	914	915	916	917	918	919	920
921	922	923	924	925	926	927	928	929	930
931	932	933	934	935	936	937	938	939	940
941	942	943	944	945	946	947	948	949	950
951	952	953	954	955	956	957	958	959	960
961	962	963	964	965	966	967	968	969	970
971	972	973	974	975	976	977	978	979	980
981	982	983	984	985	986	987	988	989	990
991	992	993	994	995	996	997	998	999	1000
1001	1002	1003	1004	1005	1006	1007	1008	1009	1010
1011	1012	1013	1014	1015	1016	1017	1018	1019	1020
1021	1022	1023	1024	1025	1026	1027	1028	1029	1030
1031	1032	1033	1034	1035	1036	1037	1038	1039	1040
1041	1042	1043	1044	1045	1046	1047	1048	1049	1050
1051	1052	1053	1054	1055	1056	1057	1058	1059	1060
1061	1062	1063	1064	1065	1066	1067	1068	1069	1070
1071	1072	1073	1074	1075	1076	1077	1078	1079	1080
1081	1082	1083	1084	1085	1086	1087	1088	1089	1090
1091	1092	1093	1094	1095	1096	1097	1098	1099	1100
1101	1102	1103	1104	1105	1106	1107	1108	1109	1110
1111	1112	1113	1114	1115	1116	1117	1118	1119	1120
1121	1122	1123	1124	1125	1126	1127	1128	1129	1130
1131	1132	1133	1134	1135	1136	1137	1138	1139	1140
1141	1142	1143	1144	1145	1146	1147	1148	1149	1150
1151	1152	1153	1154	1155	1156	1157	1158	1159	1160
1161	1162	1163	1164	1165	1166	1167	1168	1169	1170
1171	1172	1173	1174	1175	1176	1177	1178	1179	1180
1181	1182	1183	1184	1185	1186	1187	1188	1189	1190
1191	1192	1193	1194	1195	1196	1197	1198	1199	1200
1201	1202	1203	1204	1205	1206	1207	1208	1209	1210
1211	1212	1213	1214	1215	1216	1217	1218	1219	1220
1221	1222	1223	1224	1225	1226	1227	1228	1229	1230
1231	1232	1233	1234	1235	1236	1237	1238	1239	1240
1241	1242	1243	1244	1245	1246	1247	1248	1249	1250
1251	1252	1253	1254	1255	1256	1257	1258	1259	1260
1261	1262	1263	1264	1265	1266	1267	1268	1269	1270
1271	1272	1273	1274	1275	1276	1277	1278	1279	1280
1281	1282	1283	1284	1285	1286	1287	1288	1289	1290
1291	1292	1293	1294	1295	1296	1297	1298	1299	1300
1301	1302	1303	1304	1305	1306	1307	1308	1309	1310
1311	1312	1313	1314	1315	1316	1317	1318	1319	1320
1321	1322	1323	1324	1325	1326	1327	1328	1329	1330
1331	1332	1333	1334	1335	1336	1337	1338	1339	1340
1341	1342	1343	1344	1345	1346	1347	1348	1349	1350
1351	1352	1353	1354	1355	1356	1357	1358	1359	1360
1361	1362	1363	1364	1365	1366	1367	1368	1369	1370
1371	1372	1373	1374	1375	1376	1377	1378	1379	1380
1381	1382	1383	1384	1385	1386	1387	1388	1389	1390
1391	1392	1393	1394	1395	1396	1397	1398	1399	1400
1401	1402	1403	1404	1405	1406	1407	1408	1409	1410
1411	1412	1413	1414	1415	1416	1417	1418	1419	1420
1421	1422	1423							



Validated

Report Number:	449202
Superseded Report:	449035

VOC MS (W)

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 180315-16 Client Reference: 449202
Location: A38 Order Number: 60533462 Superseded Report: 449035

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690, Part120 1991,BS EN 872	Determination of total suspended solids in waters
TM045	MEWAM BOD5 2nd Ed HMSO 1999 / Method 5210B, AWWA/APHA, 20th Ed., 1999, SCA Blue Book 100	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids
TM061	Method for the Determination of EPH, Massachusetts Dept of EP, 1999	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690, Part 7: 1999 / BS 6069, Part2 11: 1994	Determination of Ammonium in Water Samples using the Kone Analyser
TM107	ISO 6060: 1999	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
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 23508:2002, (BS 6068-2:74:2002) ISBN 0 560 36624 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM191	Standard Methods for the examination of waters and wastewaters 18th Edition, ALPHA, Washington DC, USA. ISBN 0-87553-131-8	Determination of Unfiltered Metals in Water Matrices by ICP-MS
TM205		Determination of Phenols in Waste Waters using Solid Phase Extraction, Acetylation, Gas Chromatography and Mass Selective Detection
TM208	Modified: US EPA Method 8260b & 824	Determination of Volatile Organic Compounds by Headspace /GC-MS in Waters
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 199C	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751429 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM343	EPA 8270D - Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of Selected Pesticides (Suite I) in Liquids by GCMS
TM344	EPA 8270D - Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite II) by GCMS
TM345	EPA 8270D - Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite III) by GCMS

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

Validated

SDG: 180315-16 Client Reference: 449202
Location: A38 Order Number: 60533462 Superseded Report: 449035

Test Completion Dates

Lab Sample No(s)	17209663	17209694	17209692
Customer Sample Ref.	BM11	BM1	BM1A
AGS Ref.			
Depth			
Type	Ground Water	Ground Water	Ground Water
Ammoniacal Nitrogen	17-Mar-2018	17-Mar-2018	20-Mar-2018
BOD True Total	21-Mar-2018	21-Mar-2018	21-Mar-2018
COD Unfiltered	17-Mar-2018	17-Mar-2018	17-Mar-2018
Cyanide Comp-Free/Total/Thiocyanate	19-Mar-2018	19-Mar-2018	19-Mar-2018
Dissolved Metals by ICP-MS	21-Mar-2018	21-Mar-2018	21-Mar-2018
EPH CWG (Aliphatic) Aqueous GC (W)	21-Mar-2018	22-Mar-2018	21-Mar-2018
EPH CWG (Aromatic) Aqueous GC (W)	21-Mar-2018	22-Mar-2018	21-Mar-2018
GRO by GC-FID (W)	19-Mar-2018	19-Mar-2018	19-Mar-2018
Hexavalent Chromium (w)	21-Mar-2018	21-Mar-2018	21-Mar-2018
Mercury Dissolved	20-Mar-2018	20-Mar-2018	20-Mar-2018
Metals by iCap-OES Unfiltered (W)	20-Mar-2018	20-Mar-2018	20-Mar-2018
PAH Spec MS - Aqueous (W)	21-Mar-2018	21-Mar-2018	21-Mar-2018
Pesticides (Suite I) by GCMS	23-Mar-2018	23-Mar-2018	23-Mar-2018
Pesticides (Suite II) by GCMS	22-Mar-2018	22-Mar-2018	22-Mar-2018
Pesticides (Suite III) by GCMS	21-Mar-2018	21-Mar-2018	21-Mar-2018
pH Value	16-Mar-2018	16-Mar-2018	16-Mar-2018
Phenols by HPLC (W)	16-Mar-2018	16-Mar-2018	16-Mar-2018
Phenols by ms (w)	21-Mar-2018	21-Mar-2018	21-Mar-2018
Suspended Solids	15-Mar-2018	15-Mar-2018	15-Mar-2018
SVOC MS (W) - Aqueous	21-Mar-2018	21-Mar-2018	21-Mar-2018
Total Metals by ICP-MS	19-Mar-2018	19-Mar-2018	20-Mar-2018
Total Organic and Inorganic Carbon	17-Mar-2018	20-Mar-2018	17-Mar-2018
TPH CWG (W)	21-Mar-2018	22-Mar-2018	21-Mar-2018
VOC MS (W)	17-Mar-2018	17-Mar-2018	17-Mar-2018



CERTIFICATE OF ANALYSIS

SDG:	180315-16	Client Reference:		Report Number:	449202
Location:	A38	Order Number:	60533462	Superseded Report:	449035

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) 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. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. 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.

4. 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.

5. 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.

6. 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 ISO 17025. 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 asbestos present is not determined unless specifically requested.

7. 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.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

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

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

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

13. **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%, they are generally wider for volatiles analysis, 50-150%. 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 effect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

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

18. 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.

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

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

General

21. 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.

22. 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.

23. 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.

24. **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.

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
4	Holding time exceeded before sample received
5	Samples exceeded holding time before preservation was performed
§	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

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
Onychite	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.

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.



Aecom
Royal Court
Basil Close
Chesterfield
Derbyshire
S41 7SL

Attention: James Penny

CERTIFICATE OF ANALYSIS

Date:	04 May 2018
Customer:	H_URS_CFD
Sample Delivery Group (SDG):	180420-28
Your Reference:	
Location:	A38
Report No:	454857

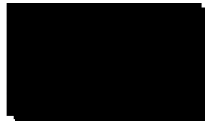
This report has been revised and directly supersedes 454131 in its entirety.

We received 3 samples on Friday April 20, 2018 and 3 of these samples were scheduled for analysis which was completed on Friday May 04, 2018. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

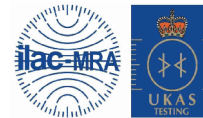
Approved By:



Sonia McWhan

Operations Manager

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Website: www.alsenvironmental.co.uk





CERTIFICATE OF ANALYSIS

Validated

SDG: 180420-28 Client Reference: 454857
Location: A38 Order Number: Superseded Report: 454131

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
17405997	BM10			19/04/2018
17405999	BM11			19/04/2018
17405995	BM06A			19/04/2018

Maximum Sample/Coolbox Temperature (°C) :**14.8**

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

Validated

SDG: 180420-28 Client Reference: 454857
Location: A38 Order Number: Superseded Report: 454131

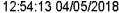
Results Legend		Test		No Determination Possible	
Sample Types -		S - Soil/Solid		UNS - Unspecified Solid	
		GW - Ground Water		SW - Surface Water	
		LE - Land Leachate		PL - Prepared Leachate	
		PR - Process Water		SA - Saline Water	
		TE - Trade Effluent		TS - Treated Sewage	
		US - Untreated Sewage		RE - Recreational Water	
		DWW - Drinking Water Non-regulatory		UNL - Unspecified Liquid	
		SL - Sludge		G - Gas	
		OTH - Other			
Lab Sample No(s)		Customer Sample Reference		AGS Reference	
Depth (m)		Container		Sample Type	
17405997	BM10	500ml Plastic (AL E208)	GW		
17405999	BM11	250ml BOD (AL E212)	GW		
17405995	BM06A	0.5g glass bottle (AL E227)	GW		
17405995	BM06A	500ml Plastic (AL E227)	GW		
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 3			
COD Unfiltered	All	NDPs: 0 Tests: 3			
Cyanide CompFree/Total/Thiocyanate	All	NDPs: 0 Tests: 3			
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 3			
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 3			
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 3			
GRO by GC-FID (W)	All	NDPs: 0 Tests: 3			
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 3			
Mercury Dissolved	All	NDPs: 0 Tests: 3			
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 3			
pH Value	All	NDPs: 0 Tests: 3			
Phenols by HPLC (W)	All	NDPs: 0 Tests: 3			
Phenols by ms (w)	All	NDPs: 0 Tests: 3			
Suspended Solids	All	NDPs: 0 Tests: 3			
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 3			



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Validated

SDG:	180420-28	Client Reference:	Report Number:	454857
Location:	A38	Order Number:	Superseded Report:	454131

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SDG:	180420-28	Client Reference:	Report Number:	454857
Location:	A38	Order Number:	Superseded Report:	454131



Report Number: 454857
Superseded Report: 454131



Validated

Report Number:	454857
Superseded Report:	454131

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12:54:13 04/05/2018



CERTIFICATE OF ANALYSIS

Validated

SDG: 180420-28
Location: A38Client Reference:
Order Number:Report Number: 454857
Superseded Report: 454131

SVOC MS (W) - Aqueous

Results Legend		Customer Sample Ref.	EM10	EM11	BMD6A			
#	ISO 17025 accredited.							
M	mCERTS accredited.	Depth (m)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)			
aq	Aqueous / settled sample.							
dis.cnt	Discolored / filtered sample.	Sample Type	19/04/2018	19/04/2018	19/04/2018			
tot.unfilt	Total / unfiltered sample.	Date Sampled						
-	Subcontracted test.	Sample Time	20/04/2018	20/04/2018	20/04/2018			
-	% 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.	Date Received	18/04/2018	18/04/2018	18/04/2018			
(F)	Trigger breach confirmed	SDG Ref	17/05/97	17/05/99	17/05/95			
1-58-40	Sample deviation (see appendix)	Lab Sample No.(s)						
AGS Reference								
Component	LOD/Units	Method						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2-Chlorophenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2-Methylphenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
2-Nitrophenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
3-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
4-Chloroaniline (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
4-Methylphenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
4-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
4-Nitrophenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Azobenzene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Acenaphthylene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Acenaphthene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Anthracene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<2	<2	<2	#	#	#
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#

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CERTIFICATE OF ANALYSIS

Validated

SDG: 180420-28
Location: A38Client Reference:
Order Number:Report Number: 454857
Superseded Report: 454131

SVOC MS (W) - Aqueous

Results Legend		Customer Sample Ref.	BMD	BMD1	BMD6A			
#	ISO 17025 accredited.							
M	mCERTS accredited.	Depth (m)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)			
aq	Aqueous / settled sample.							
dis.cnt	Discolored / filtered sample.	Sample Type	19/04/2018	19/04/2018	19/04/2018			
tot.unfilt	Total / unfiltered sample.	Date Sampled						
-	Subcontracted test.	Sample Time	20/04/2018	20/04/2018	20/04/2018			
-	% 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.	Date Received	18/04/2018	18/04/2018	18/04/2018			
(F)	Trigger breach confirmed	SDG Ref	17/05/97	17/05/99	17/05/95			
1-58-40	Sample deviation (see appendix)	Lab Sample No.(s)						
AGS Reference								
Component	LOD/Units	Method						
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Benzo(a)pyrene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Carbazole (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Chrysene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Dibenzofuran (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
n-Dibutyl phthalate (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Diethyl phthalate (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Dimethyl phthalate (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
n-Diethyl phthalate (aq)	<5 µg/l	TM176	<5	<5	<5	#	#	#
Fluoranthene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Fluorene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Hexachlorobenzene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Hexachlorobutadiene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Pentachlorophenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Phenol (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Hexachloroethane (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Nitrobenzene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Naphthalene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Isophorone (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Phenanthrene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#
Pyrene (aq)	<1 µg/l	TM176	<1	<1	<1	#	#	#

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CERTIFICATE OF ANALYSIS

Validated

SDG: 180420-28
Location: A38Client Reference:
Order Number:Report Number: 454857
Superseded Report: 454131

TPH CWG (W)

Results Legend		Customer Sample Ref.	EM10	EM11	BMGA			
#	ISO 17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
dis.cnt	Disolved / filtered sample.							
tot.unfilt	Total / unfiltred sample.							
+	Subcontracted test.							
..	% 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							
1.58-4.0	Sample deviation (see appendix)							
Component	LOD/Units	Method						
GRO Surrogate % recovery**	%	TM245	101	94	96			
GRO >C5-C12	<50 µg/l	TM245	56	<50	<50			
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245	56	3	<3			
Benzene	<7 µg/l	TM245	<7	<7	<7			
Toluene	<4 µg/l	TM245	<4	<4	<4			
Ethylbenzene	<5 µg/l	TM245	<5	<5	<5			
m,p-Xylene	<8 µg/l	TM245	<8	<8	<8			
o-Xylene	<3 µg/l	TM245	<3	<3	<3			
Sum of detected Xylenes	<11 µg/l	TM245	<11	<11	<11			
Sum of detected BTEX	<28 µg/l	TM245	<28	<28	<28			
Aliphatics >C5-C6	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C6-C8	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C8-C10	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C10-C12	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174	<10	<10	<10			
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174	<10	<10	<10			
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174	<10	<10	<10			
Total Aliphatics >C12-C35 (aq)	<10 µg/l	TM174	<10	<10	<10			
Aromatics >EC5-EC7	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC7-EC8	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC8-EC10	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC10-EC12	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174	<10	<10	<10			
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174	<10	16	<10			
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174	<10	29	<10			
Total Aromatics >EC12-EC35 (aq)	<10 µg/l	TM174	<10	45	<10			
Total Aliphatics & Aromatics >C5-C35 (aq)	<10 µg/l	TM174	<10	45	<10			
Aliphatics >C16-C35 Aqueous	<10 µg/l	TM174	<10	<10	<10			



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Location: A38Client Reference:
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VOC MS (W)

Results Legend		Customer Sample Ref.	EM10	EM11	BMGA			
#	ISO 17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
dis.cnt	Disolved / filtered sample.							
tot.unfilt	Total / unfiltred sample.							
+	Subcontracted test.							
..	% 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							
1.58-4.0	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM209	103	103	105			
Toluene-d8**	%	TM209	99.9	99.2	99.2			
4-Bromofluorobenzene**	%	TM209	98.4	97.4	98.5			
Dichlorodifluoromethane	<1 µg/l	TM209	<1	<1	<1			
Chloromethane	<1 µg/l	TM209	<1	<1	<1			
Vinyl chloride	<1 µg/l	TM209	<1	<1	<1			
Bromomethane	<1 µg/l	TM209	<1	<1	<1			
Chloroethane	<1 µg/l	TM209	<1	<1	<1			
Trichlorofluoromethane	<1 µg/l	TM209	<1	<1	<1			
1,1-Dichloroethene	<1 µg/l	TM209	<1	<1	<1			
Carbon disulphide	<1 µg/l	TM209	<1	<1	<1			
Dichloromethane	<3 µg/l	TM209	<3	<3	<3			
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM209	50.8	<1	<1			
trans-1,2-Dichloroethene	<1 µg/l	TM209	<1	<1	<1			
1,1-Dichloroethane	<1 µg/l	TM209	<1	<1	<1			
cis-1,2-Dichloroethene	<1 µg/l	TM209	<1	<1	<1			
2,2-Dichloropropane	<1 µg/l	TM209	<1	<1	<1			
Bromochloromethane	<1 µg/l	TM209	<1	<1	<1			
Chloroform	<1 µg/l	TM209	<1	<1	<1			
1,1,1-Trichloroethane	<1 µg/l	TM209	<1	<1	<1			
1,1-Dichloropropene	<1 µg/l	TM209	<1	<1	<1			
Carbon tetrachloride	<1 µg/l	TM209	<1	<1	<1			
1,2-Dichloroethane	<1 µg/l	TM209	<1	<1	<1			
Benzene	<1 µg/l	TM209	<1	<1	<1			
Trichloroethene	<1 µg/l	TM209	<1	<1	<1			
1,2-Dichloropropane	<1 µg/l	TM209	<1	<1	<1			
Dibromomethane	<1 µg/l	TM209	<1	<1	<1			
Bromodichloromethane	<1 µg/l	TM209	<1	<1	<1			
cis-1,3-Dichloropropene	<1 µg/l	TM209	<1	<1	<1			
Toluene	<1 µg/l	TM209	<1	<1	<1			
trans-1,3-Dichloropropene	<1 µg/l	TM209	<1	<1	<1			
1,1,2-Trichloroethane	<1 µg/l	TM209	<1	<1	<1			
1,3-Dichloropropane	<1 µg/l	TM209	<1	<1	<1			



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VOC MS (W)

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VOC MS (W)

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Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690, Part120 1991,BS EN 872	Determination of total suspended solids in waters
TM061	Method for the Determination of EPH,Massachusetts Dept of EP, 1999	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690, Part 7: 1969 / BS 6069: Part2:11: 1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM107	ISO 6060: 1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
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 36924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM205		Determination of Phenols in Waste Waters using Solid Phase Extraction, Acetylation, Gas Chromatography and Mass Selective Detection
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1990	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751426 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC

NA = not applicable.

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



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Test Completion Dates

Lab Sample No(s)	17405987	17405999	17405995
Customer Sample Ref.	BMTU	BMT1	BMTA
AGS Ref.			
Depth			
Type	Ground Water	Ground Water	Ground Water
Ammoniacal Nitrogen	25-Apr-2018	25-Apr-2018	25-Apr-2018
COD Unfiltered	26-Apr-2018	26-Apr-2018	26-Apr-2018
Cyanide Comp/Free/Total/Thiocyanate	26-Apr-2018	26-Apr-2018	26-Apr-2018
Dissolved Metals by ICP-MS	30-Apr-2018	30-Apr-2018	04-May-2018
EPH CWG (Aliphatic) Aqueous GC (W)	25-Apr-2018	25-Apr-2018	25-Apr-2018
EPH CWG (Aromatic) Aqueous GC (W)	25-Apr-2018	25-Apr-2018	25-Apr-2018
GRO by GC-FID (W)	25-Apr-2018	25-Apr-2018	25-Apr-2018
Hexavalent Chromium (w)	26-Apr-2018	26-Apr-2018	26-Apr-2018
Mercury Dissolved	30-Apr-2018	30-Apr-2018	30-Apr-2018
PAH Spec MS - Aqueous (W)	26-Apr-2018	26-Apr-2018	26-Apr-2018
pH Value	24-Apr-2018	24-Apr-2018	24-Apr-2018
Phenols by HPLC (W)	24-Apr-2018	24-Apr-2018	24-Apr-2018
Phenols by ms (w)	26-Apr-2018	26-Apr-2018	26-Apr-2018
Suspended Solids	25-Apr-2018	23-Apr-2018	23-Apr-2018
SVOC MS (W) - Aqueous	26-Apr-2018	26-Apr-2018	26-Apr-2018
Total Metals by ICP-MS	28-Apr-2018	28-Apr-2018	28-Apr-2018
Total Organic and Inorganic Carbon	24-Apr-2018	26-Apr-2018	24-Apr-2018
TPH CWG (W)	25-Apr-2018	25-Apr-2018	25-Apr-2018
VOC MS (W)	25-Apr-2018	25-Apr-2018	25-Apr-2018



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Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) 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. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. 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.

4. 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.

5. 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.

6. 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 ISO 17025. 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 asbestos present is not determined unless specifically requested.

7. 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.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

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

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

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

13. **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%, they are generally wider for volatiles analysis, 50-150%. 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 effect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

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

18. 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.

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

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

General

21. 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.

22. 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.

23. 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.

24. **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.

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
4	Holding time exceeded before sample received
5	Samples exceeded holding time before preservation was performed
§	Sampled on date not provided
⬇	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

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
Onychite	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.

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.