

22nd September 2022

National Grid Property Holdings
1-3 Strand
London
WC2N 5EH

R1737/22/5250

Bradford Road No. 2 Gasholder - Factual Technical Summary of Holder Overflow Water Methane Management

This letter report contains a factual technical summary of gasholder overflow water methane management works Englobe Regeneration UK Ltd (formerly Celtic Technologies Ltd) carried out. At the request of National Grid Property Holdings Ltd (NGPH), Englobe managed methane concentrations in gasholder overflow water at the Bradford Road No. 2 Gasholder in Manchester between 2016 and 2020. The location of the site is shown on Drawing D1737/A1, Appendix A and is accessed from Broxton Street, Manchester.

Englobe were asked to assist in early 2016 when United Utilities discharge compliance team had identified that the discharge water from the Bradford Road gasholder had methane concentrations that were failing the 0.14 ppm methane discharge consent limit.

Works Carried Out

Englobe plugged the holder discharge overflow system adjacent to Alan Turing Way to prevent discharge of water on 16th February 2016. This is shown on Drawing D1737/A2, Appendix A. Following this, Englobe mobilised and set up a water treatment system on the site. The location and layout of this system is shown on Drawing D1737/A2, Appendix A. The system is shown in Figure 1, below.

Figure 1 - Water Treatment Plant



The water treatment system abstracted water from the gasholder tank using a submersible pump and passed the water through an air stripper to remove concentrations of dissolved methane. Once treated, the water was pumped to the sites foul sewer discharge point adjacent to Alan Turing Way and discharged



from the site. The water treatment plant was powered by an electricity supply in the boiler house of the former gasholder antifreeze system.

The United Utilities discharge consent for the site had a volume limit of 15 m³/day. During the works, Englobe generally abstracted, treated and discharged 15 m³ of water daily from the gasholder tank and this was found to generally maintain the water level in the gasholder tank at 60-80 cm below the holder base tank rim level.

Englobe commenced discharging treated water to foul sewer on 12th May 2016 after commissioning the water system and testing the treated water. During the period between 16th February 2016 when Englobe plugged the holder discharge and 12th May 2016, water levels in the gasholder base increased approximately 25 cm above the normal overflow level. In order to address this, Englobe negotiated a temporary increase in the allowable daily discharge volume to 150 m³/day. During the period between 18th May and 27th May 2016, Englobe treated and discharged a total of approximately 1,146 m³ at a rate of up to 150 m³/day. This reduced the water level in the gasholder base to approximately 76 cm below the tank rim level at which point the water treatment system was set to pump, treat and discharge 15 m³ daily.

Englobe treated managed the overflow water from the gasholder tank until 13th July 2020 at which point a total of 24,377 m³ had been treated and discharged to foul sewer.

Effluent Quality

Treated water was sampled and analysed monthly during the works to ensure methane concentrations met the 0.14 ppm discharge consent criteria. In addition, samples were analysed for pH, ammoniacal nitrogen, chemical oxygen demand and suspended solids. Approximately every 6 months, the treated water was analysed for a wider gasworks suite. The site was periodically visited through Englobe's works by a United Utilities compliance officer who took independent samples of the discharge water. No issues were raised by United Utilities through the duration of Englobe's works.

A summary of the treated effluent chemical analysis results is presented in Appendix B with certificates of analysis included in Appendix C.

Demobilisation

On completion of the works in July 2020, Englobe removed the plug in the discharge drain so that the overflow would operate normally and demobilised all relatively light equipment from the site. Due to the potential risk of crossing and lifting near gas mains located near the location of the water treatment plant, the main elements of Englobes water treatment equipment were left on site on completion of the works.

Should you require any further information on the works carried out, please do not hesitate to contact us.

Yours faithfully

Ian Wright
Project Manager

ENGLOBE

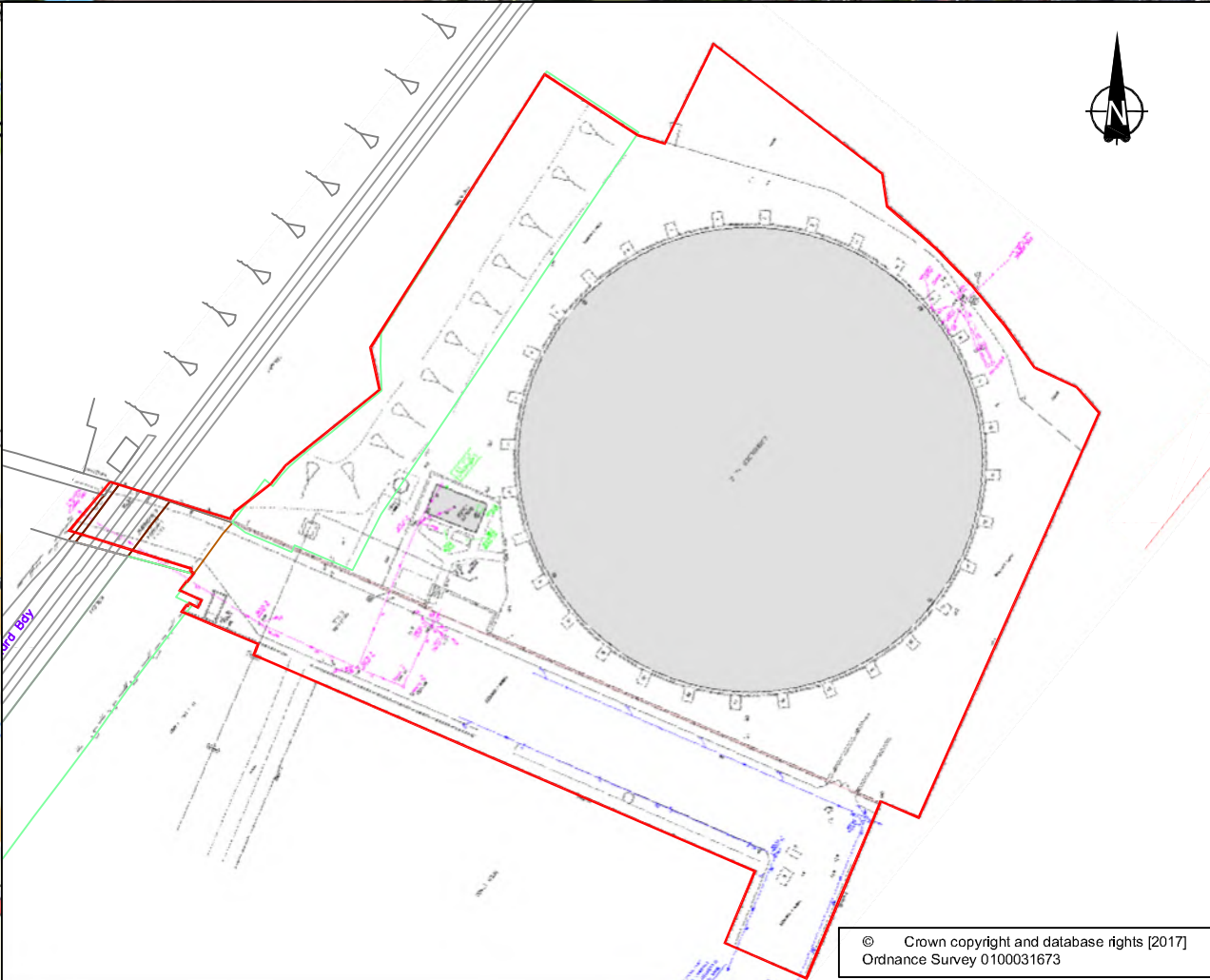
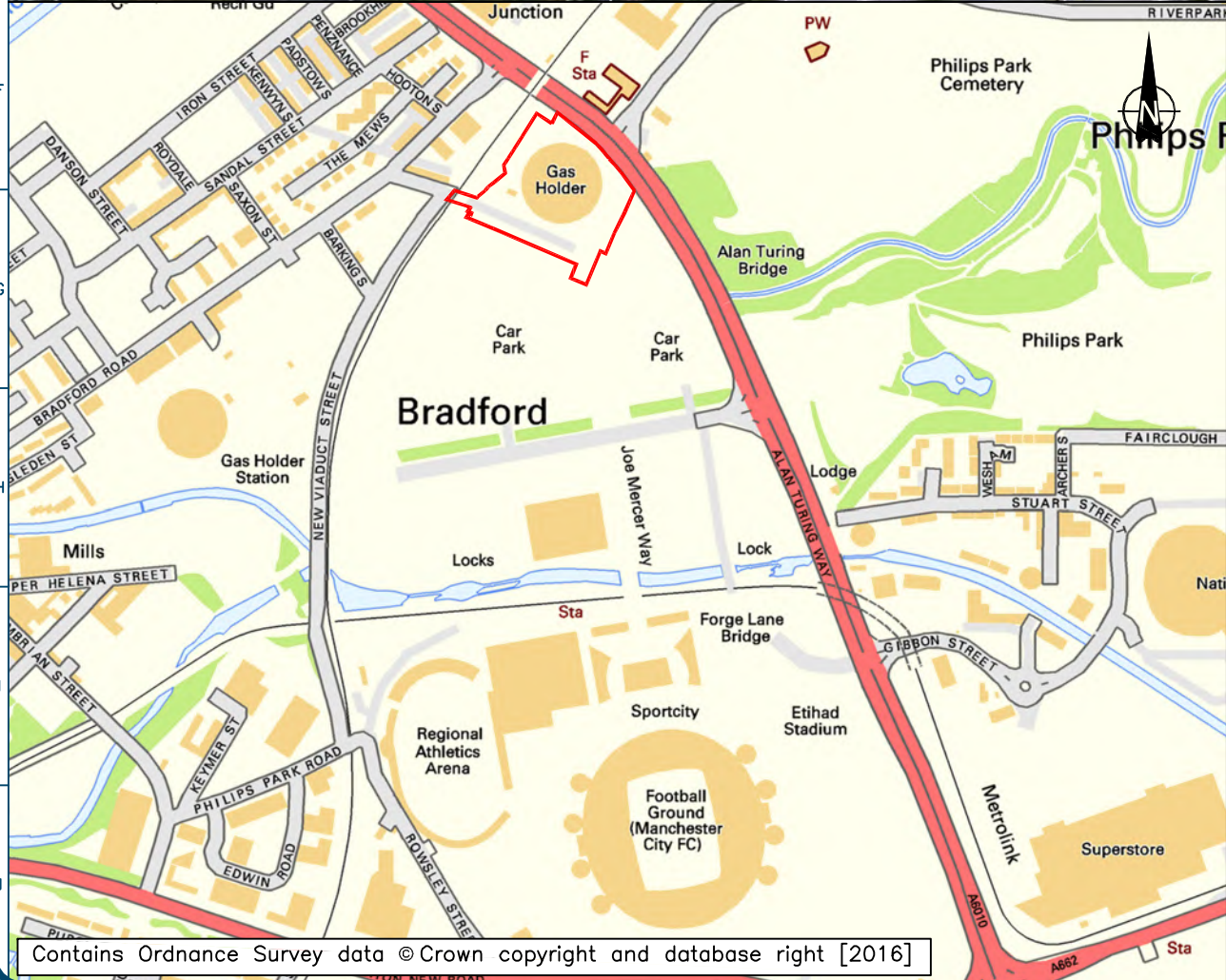


Appendix A - Drawings

mm 10 20 30 40 50 60 70 80 90 100



Google 2016



Legend
Site Co-ords:386679.15,399201.89

— Site Boundary

0	ISSUED FOR COMMENT	24/05/17
REV	COMMENT	DATE

Celtic
enGlobe
Columbus House
Village Way
Cardiff
CF15 7NE
029 2036 8636
Client:

nationalgrid

Project
Bradford Road
No:2 Gasholder
Title
Site Location Plan

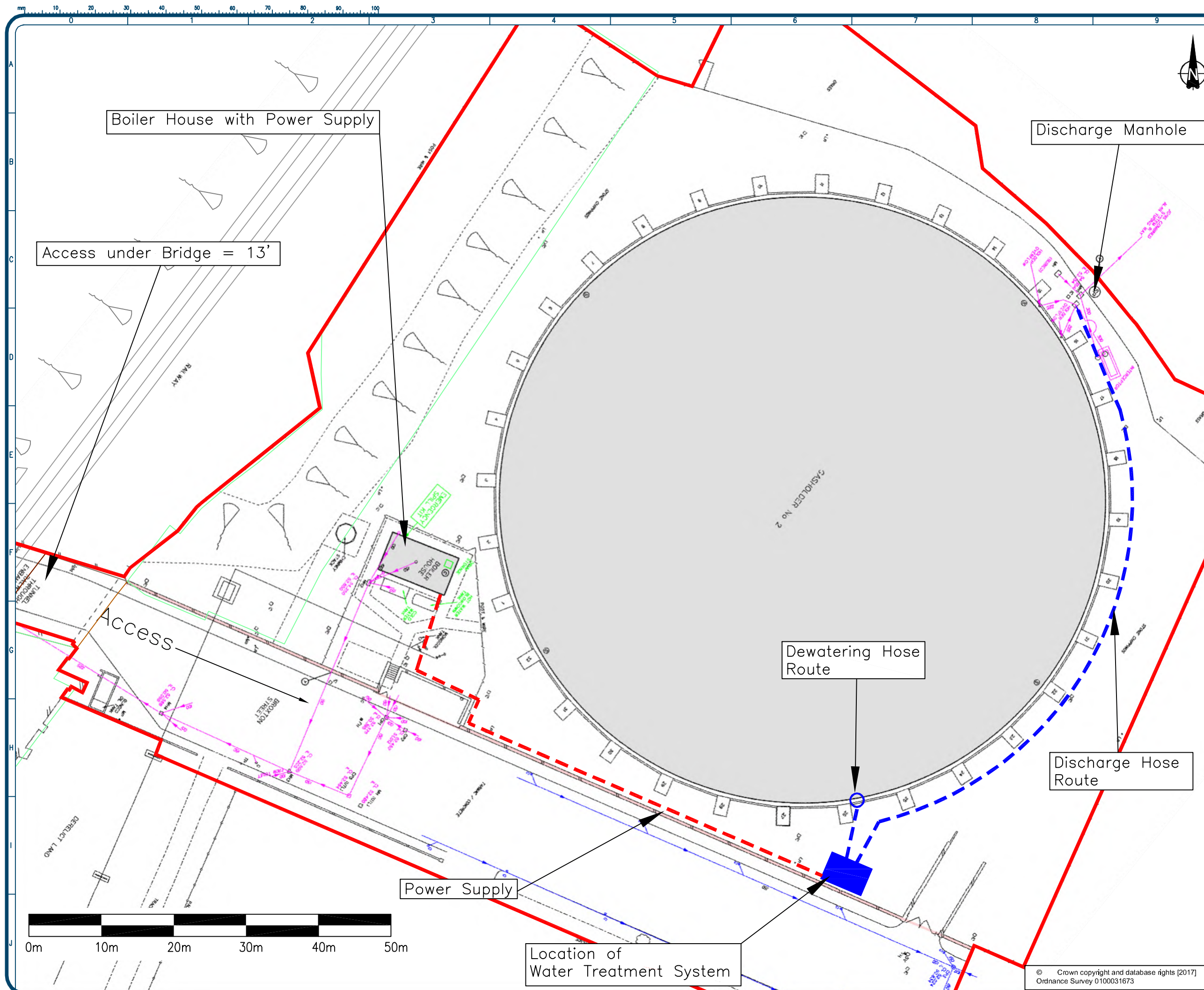
Drawn by	GEP	Checked	IW	Date	24/05/17	Authorised		Date	
Original Scale	N.T.S	Date	24/05/17	Rev	0	Paper	A3		

Drawing Number
D1737/A1

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Ordnance Survey 0100031673

CAD REF:-



Legend
Site Co-ords: 386679.15, 399201.89

— Site Boundary

KEY

—	FULL DRAIN (DIA IN MM)
—	COMBINED DRAIN (DIA IN MM)
—	STORM DRAIN (DIA IN MM)
→	DIRECTION OF FLOW
⊕	MANHOLE COVER WITH REF NO.
—	DRAIN / GULLY COVER
CL 52.687	COVER LEVEL
IL 52.045	INVERT LEVEL
ID 0.622	INVERT DEPTH
NO	NOT OPERATIONAL
UTL	UNABLE TO LIFT
—	NATIONAL GRID SITE BOUNDARY
—	WASTE (OR OTHER) STORAGE DETAILS

0	ISSUED FOR COMMENT	24/05/17
REV	COMMENT	DATE



Columbus House
Village Way
Cardiff
CF15 7NE
029 2036 8636

Client: **nationalgrid**

Project:
Bradford Road
No:2 Gasholder

Title:
Site Set Up

Drawn by	GEP	Checked	IW	Date	24/05/17	Authorised		Date	
Original Scale	1:500	Date	24/05/17	Rev	0	Paper	A3		

Drawing Number
D11737/A2

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Ordnance Survey 0100031673



Appendix B - Effluent Analysis Summary

Bradford Road No. 2 Gasholder - Summary of Treated Water Analysis Results

Customer Sample ID			Treated Water	Treated Water	Treated Water	Treated Water	Treated Water	Treated Water	Treated Water	DISCHARGE	Treated Water	Treated Water	Post (2 Stage) Treatment (AM)	Post (1 Stage) Treatment (PM)	Treated Water	Discharge	Discharge	Discharge	
Depth			0.00-0.00	0.00-0.00	-	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	
ACS Id																			
Sample Type			LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	
Sampled Date			28/04/2016	29/04/2016	11/05/2016	18/05/2016	27/05/2016	14/06/2016	29/06/2016	13/07/2016	12/08/2016	06/09/2016	26/10/2016	18/11/2016	18/11/2016	09/12/2016	12/01/2017	28/02/2017	13/03/2017
Sample Received Date			30/04/2016	30/04/2016	12/05/2016	19/05/2016	29/05/2016	16/06/2016	01/07/2016	17/07/2016	16/08/2016	08/09/2016	29/10/2016	19/11/2016	19/11/2016	13/12/2016	14/01/2017	07/03/2017	16/03/2017
Final Instruction Date			30/04/2016	30/04/2016	12/05/2016	19/05/2016	29/05/2016	16/06/2016	01/07/2016	17/07/2016	16/08/2016	08/09/2016	29/10/2016	19/11/2016	19/11/2016	13/12/2016	14/01/2017	07/03/2017	16/03/2017
Report Completed Date			04/05/2016	04/05/2016	18/05/2016	26/05/2016	07/06/2016	22/06/2016	11/07/2016	27/07/2016	23/08/2016	19/09/2016	09/11/2016	29/11/2016	29/11/2016	23/12/2016	25/01/2017	15/03/2017	24/03/2017
SDG			180430-27	180430-27	180512-83	180519-68	180529-10	180616-95	180701-114	180717-2	180816-69	180908-118	181029-38	181119-52	181119-52	181213-103	170114-33	170307-85	170316-96
Lab Sample Number			13349430	13349436	13413226	13455393	13513302	13605786	13693606	13792199	13979376	14119056	14430752	14559880	14559886	14703556	14830749	15129148	15189168
Sample Temperature					14.4	12.2	13.4	15.2	16.8	16.8	17.8	19.6	10.4	6.2	6.2	11.8	6.2	6.5	11
Discharge Consent																			
Analysis			Test	Method	Units	LOD													
Carbon			Carbon, Organic (dias.ftl)	TM090	mg/l	<3	-	-	-	-	-	-	-	-	4.18	-	-	-	5.5
Inorganics			Ammoniacal Nitrogen as N	TM099	mg/l	<0.2	1.6	1.61	1.7	1.8	-	-	1.35	1.69	-	1.33	-	1.61	1.23
			Conductivity @ 20 deg.C	TM120	mS/cm	<0.005	-	-	-	-	-	-	-	0.107	-	-	0.0878	-	0.0664
			pH	TM256	pH Units	<1	7.42	7.52	7.79	7.33	-	-	7.59	7.49	7.41	7.39	7.66	7.7	7.34
			Sulphate	TM184	mg/l	<2	-	-	-	-	-	-	-	<2	-	-	<2	-	<2
			Sulphide	TM101	mg/l	<0.01	1	-	-	-	-	-	-	0.0136	-	-	0.0181	-	<0.01
			Chloride	TM184	mg/l	<2	-	-	-	-	-	-	-	5.7	-	-	5.8	-	-
			COD, settled	TM107	mg/l	<7	19.9	20.6	20.6	11.1	-	-	21	22.1	-	27	25.5	28	14.5
			Cyanide, Total	TM227	mg/l	<0.05	-	-	-	-	-	-	-	<0.05	-	-	<0.05	-	<0.05
			Ammoniacal Nitrogen as NH4	TM099	mg/l	<0.3	-	-	-	-	-	-	-	0.445	-	-	1.07	2.3	-
			Cyanide, Free	TM227	mg/l	<0.05	1	-	-	-	-	-	-	<0.05	-	-	<0.05	-	<0.05
			Cyanide, Complex	TM227	mg/l	<0.05	1	-	-	-	-	-	-	<0.05	-	-	<0.05	-	<0.05
			Thiocyanate	TM227	mg/l	<0.05	-	-	-	-	-	-	-	<0.05	-	-	<0.05	-	<0.05
			Suspended solids, Total	TM222	mg/l	<2	14	10	2	<2	10	-	5.5	9	14	5.5	7	9	35
			Sulphur, Free	TM294	mg/l	<0.05	-	-	-	-	-	-	-	<0.05	-	-	<0.05	-	<0.05
Filtered (Dissolved) Me			Iron, Ferri	TM125	mg/l	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-
			Mercury (dias.ftl)	TM183	mg/l	<0.00001	-	-	-	-	-	-	-	<0.00001	-	-	<0.00001	-	<0.00001
			Arsenic (dias.ftl)	TM152	mg/l	<0.00012	-	-	-	-	-	-	-	0.00206	-	-	0.00167	-	0.00826
			Iron (dias.ftl)	TM228	mg/l	<0.019	-	-	-	-	-	-	-	0.0277	-	-	0.0207	-	0.857
			Boron (dias.ftl)	TM152	mg/l	<0.0094	-	-	-	-	-	-	-	0.00975	-	-	0.0211	-	0.00725
			Iron, Ferrous	TM125	mg/l	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
			Cadmium (dias.ftl)	TM152	mg/l	<0.0001	-	-	-	-	-	-	-	<0.00008	-	-	<0.00008	-	0.000088
			Chromium (dias.ftl)	TM152	mg/l	<0.00022	-	-	-	-	-	-	-	<0.0012	-	-	<0.0012	-	<0.0012
			Copper (dias.ftl)	TM152	mg/l	<0.00085	-	-	-	-	-	-	-	<0.00085	-	-	<0.00085	-	0.00217
			Lead (dias.ftl)	TM152	mg/l	<0.00002	-	-	-	-	-	-	-	<0.0001	-	-	0.000207	-	0.00279
			Nickel (dias.ftl)	TM152	mg/l	<0.00015	-	-	-	-	-	-	-	0.000614	-	-	0.000513	-	0.000544
			Selenium (dias.ftl)	TM152	mg/l	<0.00099	-	-	-	-	-	-	-	<0.00081	-	-	<0.00081	-	<0.00081
			Zinc (dias.ftl)	TM152	mg/l	<0.00041	-	-	-	-	-	-	-	0.029	-	-	0.00647	-	0.0365
Phenols			Resorcinol	TM259	mg/l	<0.01	-	-	-	-	-	-	-	<0.01	-	-	<0.01	-	<0.01
			Catechol	TM259	mg/l	<0.01	-	-	-	-	-	-	-	<0.01	-	-	<0.01	-	<0.01
			Phenol	TM259	mg/l	<0.002	-	-	-	-	-	-	-	<0.002	-	-	<0.002	-	<0.002
			Cresols	TM259	mg/l	<0.006	-	-	-	-	-	-	-	0.02	-	-	<0.006	-	<0.006
			Xylenols	TM259	mg/l	<0.008	-	-	-	-	-	-	-	<0.008	-	-	<0.008	-	<0.008
			1-Naphthol	TM259	mg/l	<0.01	-	-	-	-	-	-	-	<0.01	-	-	<0.01	-	<0.01
			2,3,5-Trimethylphenol	TM259	mg/l	<0.003	-	-	-	-	-	-	-	<0.003	-	-	<0.003	-	<0.003
			2-Isopropylphenol	TM259	mg/l	<0.006	-	-	-	-	-	-	-	<0.006	-	-	<0.006	-	<0.006
			Phenols, Total Detected 8 Speciated	TM259	mg/l	<0.045	-	-	-	-	-	-	-	<0.045	-	-	<0.045	-	<0.045
EPH (Extractable Petro			EPH Range >C10 - C40 (aq)	TM172	mg/l	<0.046	-	-	-	-	-	-	-	0.543	-	-	0.179	-	0.235
Polyaromatic Hydrocar			Naphthalene (aq)	TM178	mg/l	<0.0001	-	-	-	-	-	-	-	<0.0001	-	-	<0.0001	-	<0.0001
			Acenaphthene (aq)	TM178	mg/l	<0.000015	-	-	-	-	-	-	-	<0.000015	-	-	<0.000015	-	<0.000015
			Acenaphthylene (aq)	TM178	mg/l	<0.000011	-	-	-	-	-	-	-	<0.000011	-	-	<0.000011	-	<0.000011
			Fluoranthene (aq)	TM178	mg/l	<0.000017	-	-	-	-	-	-	-	<0.000017	-	-	<0.000017	-	<0.000017
			Anthracene (aq)	TM178	mg/l	<0.000015	-	-	-	-	-	-	-	<0.000015	-	-	<0.000015	-	<0.000015
			Phenanthrene (aq)	TM178	mg/l	<0.000022	-	-	-	-	-	-	-	<0.000022	-	-	<0.000022	-	<0.000022
			Fluorene (aq)	TM178	mg/l	<0.000014	-	-	-	-	-	-	-	<0.000014	-	-	<0.000014	-	<0.000014
			Chrysene (aq)	TM178	mg/l	<0.000013	-	-	-	-	-	-	-	<0.000013	-	-	<0.000013	-	<0.000013
			Pyrene (aq)	TM178	mg/l	<0.000015	-	-	-	-	-	-	-	<0.000015	-	-	0.000047	-	0.000042
			Benzo(a)anthracene (aq)	TM178	mg/l	<0.000017	-	-	-	-	-	-	-	0.000032	-	-	<0.000017	-	<0.000017
			Benzo(b)fluoranthene (aq)	TM178	mg/l	<0.000023	-	-	-	-	-	-	-	0.000025	-	-	<0.000023	-	<0.000023
			Benzo(k)fluoranthene (aq)	TM178	mg/l	<0.000027	-	-	-	-	-	-	-	<0.000027	-	-	<0.000027	-	<0.000027
			Benzo(a)pyrene (aq)	TM178	mg/l	<0.000009	-	-	-	-	-	-	-	<0.000009	-	-	<0.000009	-	<0.000009
			Dibenzo(a,h)anthracene (aq)	TM178	mg/l	<0.000016	-	-	-	-	-	-	-	<0.000016	-	-	<0.000016	-	<0.000016
			Benzo(g,h)perylene (aq)	TM178	mg/l	<0.000016	-	-	-	-	-	-	-	<0.000016	-	-	<0.000016	-	<0.000016
			Indeno(1,2,3-cd)pyrene (aq)	TM178	mg/l	<0.000014	-	-	-	-	-	-	-	<0.000014	-	-	<0.000014	-	<0.000014
			PAH, Total Detected USEPA 16 (aq)	TM178	mg/l	<0.000344	-	-	-	-	-	-	-	<0.000344	-	-	<0.000344	-	<0.000344
Volatile Organic Comp			Benzene	TM208	mg/l	<0.001	-	-	-	-	-	-	-	<0.001	-	-	<0.001	-	<0.001
			Toluene	TM208	mg/l	<0.001	-	-	-	-	-	-	-	<0.001	-	-	<0.001	-	<0.001
			Ethylbenzene	TM208	mg/l	<0.001	-	-	-	-	-	-	-	<0.001	-	-	<0.001	-	<0.001
			m,p-Xylene	TM208	mg/l	<0.001	-	-	-	-	-	-	-	<0.001	-	-	<0.001	-	<0.001
			o-Xylene	TM208	mg/l	<0.00.													

[illegible]

Bradford Road No. 2 Gasholder - Summary of Treated Water Analysis Results

				Customer Sample ID	Effluent	Discharge	Effluent	Effluent	Effluent	Effluent	Discharge	Effluent	Effluent	Effluent	Effluent	Effluent	Discharge	Effluent	Effluent	Effluent				
				Depth	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00				
				AGS Id																				
SDQ(s):				Sample Type	TRADE_EFFLUENT	TRADE_EFFLUENT	TRADE_EFFLUENT	TRADE_EFFLUENT	TRADE_EFFLUENT	TRADE_EFFLUENT	TRADE_EFFLUENT	TRADE_EFFLUENT	TRADE_EFFLUENT	TRADE_EFFLUENT	TRADE_EFFLUENT	TRADE_EFFLUENT	TRADE_EFFLUENT	TRADE_EFFLUENT	TRADE_EFFLUENT	TRADE_EFFLUENT				
Client Reference / Location:				Sample Received Date	04/10/2018	08/11/2018	14/12/2018	25/01/2019	25/01/2019	15/02/2019	21/03/2019	08/04/2019	15/05/2019	12/06/2019	04/07/2019	26/07/2019	27/08/2019	13/09/2019	30/10/2019	14/11/2019	03/12/2019			
Order no:				Sample Completed Date	06/10/2018	10/11/2018	19/12/2018	27/01/2019	27/01/2019	19/02/2019	23/03/2019	09/04/2019	17/05/2019	20/06/2019	06/07/2019	29/07/2019	29/08/2019	17/09/2019	01/11/2019	16/11/2019	05/12/2019			
				Final Instruction Date	06/10/2018	10/11/2018	19/12/2018	27/01/2019	27/01/2019	19/02/2019	23/03/2019	09/04/2019	17/05/2019	20/06/2019	09/07/2019	29/07/2019	29/08/2019	18/09/2019	01/11/2019	16/11/2019	05/12/2019			
				Report Completed Date	17/10/2018	22/11/2018	06/02/2019	06/02/2019	06/02/2019	11/03/2019	09/04/2019	18/04/2019	29/05/2019	01/07/2019	16/07/2019	08/09/2019	08/09/2019	01/10/2019	12/11/2019	26/11/2019	17/12/2019			
				Lab Sample Number	181006-21	181110-54	181218-115	190127-46	190127-46	190219-54	190323-102	190409-8	190517-138	190623-102	190706-15	190726-36	190829-101	190917-41	191101-25	191116-79	191205-122			
				Discharge Consent	18474512	18709058	19003831	19210131	19210131	19386762	19615269	19737726	19977857	20193179	20284373	20420288	20609842	20737501	21059874	21160437	21298515			
				Sample Temperature	14.2	10.6	7.2	4.6	4.6	5.8	8.8	8.4	10.8	12.8	9.6	18.2	16.8	15.6	10.2	10.8	1.8			
Analysis				Method	Units	LOD																		
Carbon				Carbon, Organic (diss.filt)	TM090	mg/l	<3	-	5.2	-	-	-	4.66	-	-	-	-	-	3.65	-	-			
Inorganics				Ammoniacal Nitrogen as N	TM099	mg/l	<0.2	1.36	-	1.34	1.06	1.06	0.941	-	0.366	1.45	1.35	0.993	35.9	<0.2	-	0.64		
				Conductivity @ 20 deg.C	TM120	mS/cm	<0.005	-	0.0973	-	-	-	-	0.0881	-	-	-	-	0.0812	-	-			
				pH	TM256	pH Units	<1	7.72	7.37	7.41	7.42	7.42	7.24	7.2	7.77	7.49	7.49	7.43	7.34	7.26	7.64	7.23	7.18	7.67
				Sulphate	TM184	mg/l	<2	-	2.6	-	-	-	-	-	-	-	-	-	-	<2	-	-	-	
				Sulphide	TM101	mg/l	<0.01	-	<0.01	-	-	-	-	<0.01	-	-	-	-	-	<0.01	-	-	-	
				Chloride	TM184	mg/l	<2	-	6.5	-	-	-	-	6	-	-	-	-	-	5.3	-	-	-	
				COD, settled	TM107	mg/l	<7	15.3	21.7	9.48	12.6	12.6	18.3	20.1	17.4	18	18	17.6	31	49.1	18.2	<7	20.1	9.23
				Cyanide, Total	TM227	mg/l	<0.05	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	<0.05	-	-	-	
				Ammoniacal Nitrogen as NH4	TM099	mg/l	<0.3	-	2.02	-	-	-	-	0.972	-	-	-	-	-	1.77	-	-	-	
				Cyanide, Free	TM227	mg/l	<0.05	1	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-	-	-	
				Cyanide, Complex	TM227	mg/l	<0.05	1	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-	-	-	
				Thiocyanate	TM227	mg/l	<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	-	-	
				Suspended solids, Total	TM222	mg/l	<2	3.95	4.5	8.87	8.1	8.1	31.2	30	9.67	2.5	18.3	21.9	8.3	24.6	8.5	<2	18.2	14.1
				Sulphur, Free	TM294	mg/l	<0.05	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	<0.05	-	-	-	
Filtered (Dissolved) Me				Iron, Ferric	TM125	mg/l	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Mercury (diss.filt)	TM183	mg/l	<0.00001	-	<0.00001	-	-	-	-	<0.00001	-	-	-	-	-	<0.00001	-	-	-	
				Arsenic (diss.filt)	TM152	mg/l	<0.00012	-	0.00327	-	-	-	-	0.00105	-	-	-	-	-	0.00119	-	-	-	
				Iron (diss.filt)	TM228	mg/l	<0.019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Boron (diss.filt)	TM152	mg/l	<0.0094	-	<0.01	-	-	-	-	<0.01	-	-	-	-	-	<0.01	-	-	-	
				Iron, Ferrous	TM125	mg/l	<0.1	-	<0.00008	-	-	-	-	<0.00008	-	-	-	-	-	<0.00008	-	-	-	
				Cadmium (diss.filt)	TM152	mg/l	<0.0001	-	<0.001	-	-	-	-	<0.001	-	-	-	-	-	<0.001	-	-	-	
				Chromium (diss.filt)	TM152	mg/l	<0.00022	-	0.000737	-	-	-	-	0.00169	-	-	-	-	-	0.00566	-	-	-	
				Copper (diss.filt)	TM152	mg/l	<0.00085	-	0.00105	-	-	-	-	<0.0002	-	-	-	-	-	<0.0002	-	-	-	
				Lead (diss.filt)	TM152	mg/l	<0.00002	-	0.00881	-	-	-	0.00559	-	-	-	-	-	0.00656	-	-	-		
				Nickel (diss.filt)	TM152	mg/l	<0.00015	-	<0.001	-	-	-	<0.001	-	-	-	-	-	<0.001	-	-	-		
				Selenium (diss.filt)	TM152	mg/l	<0.00039	-	3.54	-	-	-	1.32	-	-	-	-	-	0.381	-	-	-		
				Zinc (diss.filt)	TM152	mg/l	<0.00041	-	1.38	-	-	-	0.0538	-	-	-	-	-	0.039	-	-	-		
Phenols				Resorcinol	TM259	mg/l	<0.01	-	<0.01	-	-	-	-	<0.01	-	-	-	-	-	<0.01	-	-	-	
				Catechol	TM259	mg/l	<0.01	-	<0.01	-	-	-	-	<0.01	-	-	-	-	-	<0.01	-	-	-	
				Phenol	TM259	mg/l	<0.002	-	<0.002	-	-	-	-	<0.002	-	-	-	-	-	<0.002	-	-	-	
				Cresols	TM259	mg/l	<0.006	-	<0.006	-	-	-	-	<0.006	-	-	-	-	-	<0.006	-	-	-	
				Xylenols	TM259	mg/l	<0.008	-	<0.008	-	-	-	-	<0.008	-	-	-	-	-	<0.008	-	-	-	
				1-Naphthol	TM259	mg/l	<0.01	-	<0.01	-	-	-	-	<0.01	-	-	-	-	-	<0.01	-	-	-	
				2,3,5-Trimethylphenol	TM259	mg/l	<0.003	-	<0.003	-	-	-	-	<0.003	-	-	-	-	-	<0.003	-	-	-	
				2-Isopropylphenol	TM259	mg/l	<0.006	-	<0.006	-	-	-	-	0.01	-	-	-	-	-	<0.006	-	-	-	
				Phenols, Total Detected 8 Speciated	TM259	mg/l	<0.045	-	<0.045	-	-	-	-	<0.045	-	-	-	-	-	<0.045	-	-	-	
EPH (Extractable Petro				EPH Range >C10 - C40 (aq)	TM172	mg/l	<0.046	-	0.332	-	-	-	-	0.235	-	-	-	-	-	0.437	-	-	-	
Polyaromatic Hydrocar				Naphthalene (aq)	TM178	mg/l	<0.0001	-	<0.00001	-	-	-	-	<0.00001	-	-	-	-	-	<0.00001	-	-	-	
				Acenaphthene (aq)	TM178	mg/l	<0.000015	-	<0.000005	-	-	-	-	<0.000005	-	-	-	-	-	<0.000005	-	-	-	
				Acenaphthylene (aq)	TM178	mg/l	<0.000011	-	<0.000005	-	-	-	-	<0.000005	-	-	-	-	-	<0.000005	-	-	-	
				Fluoranthene (aq)	TM178	mg/l	<0.000017	-	<0.000005	-	-	-	-	<0.000005	-	-	-	-	-	<0.000005	-	-	-	
				Anthracene (aq)	TM178	mg/l	<0.000015	-	<0.000005	-	-	-	-	<0.000005	-	-	-	-	-	<0.000005	-	-	-	
				Phenanthrene (aq)	TM178	mg/l	<0.000022	-	<0.000005	-	-	-	-	<0.000005	-	-	-	-	-	<0.000005	-	-	-	
				Fluorene (aq)	TM178	mg/l	<0.000014	-	<0.000005	-	-	-	-	<0.000005	-	-	-	-	-	<0.000005	-	-	-	
				Chrysene (aq)	TM178	mg/l	<0.000013	-	<0.000005	-	-	-	-	<0.000005	-	-	-	-	-	<0.000005	-	-	-	
				Pyrene (aq)	TM178	mg/l	<0.000015	-	0.000088	-	-	-	-	0.000027	-	-	-	-	-	<0.000005	-	-	-	
				Benzo(a)anthracene (aq)	TM178	mg/l	<0.000017	-	<0.000005	-	-	-	-	<0.000005	-	-	-	-	-	<0.000005	-	-	-	
				Benzo(b)fluoranthene (aq)	TM178	mg/l	<0.000023	-	0.00002	-	-	-	-	0.000011	-	-	-	-	-	<0.000005	-	-	-	
				Benzo(k)fluoranthene (aq)	TM178	mg/l	<0.000027	-	0.000007	-	-	-	-	<0.000005	-	-	-	-	-	<0.000005	-	-	-	
				Benzo(a)pyrene (aq)	TM178	mg/l	<0.000009	-	0.000006	-	-	-	-	<0.000002	-	-	-	-	-	<0.000002	-	-	-	
				Dibenzo(a,h)anthracene (aq)	TM178	mg/l	<0.000016	-	<0.000005	-	-	-	-	<0.000005	-	-	-	-	-	<0.000005	-	-	-	
				Benzo(g,h,i)perylene (aq)	TM178	mg/l	<0.000016	-	<0.000005	-	-	-	-	<0.000005	-	-	-	-	-	<0.000005	-	-	-	
				Indeno(1,2,3-cd)pyrene (aq)	TM178	mg/l	<0.000014	-	<0.000005	-	-	-	-	<0.000005	-	-	-	-	-	<0.000005	-	-	-	
				PAH, Total Detected USEPA 16 (aq)	TM178	mg/l	<0.000344	-	0.00012	-	-	-	-	<0.000082	-	-	-	-	-	<0.000082	-	-	-	
Volatile Organic Comp				Benzene	TM208	mg/l	<0.001	-	<0.001	-	-	-	-	<0.001	-	-	-	-	-	<0.001	-	-	-	
				Toluene	TM208	mg/l	<0.001	-	<0.001	-	-	-	-	<0.001	-	-	-	-	-	<0.001	-	-	-	
				Ethylbenzene	TM208	mg/l	<0.001	-	<0.001	-	-	-	-	<0.001	-	-	-	-	-	<0.001	-	-	-	
				m,p-Xylene	TM208	mg/l	<0.001	-	<0.001	-	-	-	-	<0.001	-	-	-	-	-&gt					

Bradford Road No. 2 Gasholder - Summary of Treated Water Analysis Results

SDQ(s): Customer: Client Reference / Location: Order no:	Celtic Cardiff (5490) Bradford Road, Manchester 76084	Customer Sample ID	Discharge	Effluent	Effluent	Effluent	Effluent	Effluent
		Depth	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00
		ACS Id						
		Sample Type	TRADE_EFFLUENT TRADE_EFFLUENT TRADE_EFFLUENT TRADE_EFFLUENT TRADE_EFFLUENT TRADE_EFFLUENT					
		Sampled Date	09/01/2020	2/26/2020	3/17/2020	4/14/2020	09/12/2020	06/24/2020
		Sample Received Date	13/01/2020	2/28/2020	3/19/2020	4/16/2020	5/14/2020	06/26/2020
		Final Instruction Date	20/01/2020	3/11/2020	3/29/2020			
		Report Completed Date	20/11/20	200228-18	200319-128	200416-21	200416-21	200626-26
		SDG	Discharge	200113-20	200228-18	200319-128	200416-21	200416-21
		Lab Sample Number	Consent	21479146	21782481	21923079	22031312	22142393
			Sample Temperature	7.4	4.4	6.2	5.8	6
Analysis	Test	Method	Units	LOD				
Carbon								
	Carbon, Organic (dias.ftt)	TM090	mg/l	<3	3.55	-	-	-
Inorganics								
	Ammoniacal Nitrogen as N	TM099	mg/l	<0.2	-	0.357	1.34	1.74
	Conductivity @ 20 deg.C	TM120	mS/cm	<0.005	0.0832	-	-	-
	pH	TM256	pH Units	<1	7.33	7.3	7.01	7.56
	Sulphate	TM184	mg/l	<2	1000	-	-	-
	Sulphide	TM101	mg/l	<0.01	1	<0.01	-	-
	Chloride	TM184	mg/l	<2	5.3	-	-	-
	COD, settled	TM107	mg/l	<7	31.8	<7	14.6	24.2
	Cyanide, Total	TM227	mg/l	<0.05	0.05	-	-	-
	Ammoniacal Nitrogen as NH4	TM099	mg/l	<0.3	1.72	-	-	-
	Cyanide, Free	TM227	mg/l	<0.05	1	<0.05	-	-
	Cyanide, Complex	TM227	mg/l	<0.05	1	0.05	-	-
	Thiocyanate	TM227	mg/l	<0.05	<0.05	-	-	-
	Suspended solids, Total	TM022	mg/l	<2	10	3.9	3.45	7
	Sulphur, Free	TM294	mg/l	<0.05	<0.05	-	-	-
Filtered (Dissolved) Metals								
	Iron, Ferric	TM125	mg/l	<0.05	As Below	-	-	-
	Mercury (dias.ftt)	TM183	mg/l	<0.00001	<0.00001	-	-	-
	Arsenic (dias.ftt)	TM152	mg/l	<0.00012	0.000788	-	-	-
	Iron (dias.ftt)	TM228	mg/l	<0.019	0.0205	-	-	-
	Boron (dias.ftt)	TM152	mg/l	<0.0094	<0.01	-	-	-
	Iron, Ferrous	TM125	mg/l	<0.1	-	-	-	-
	Cadmium (dias.ftt)	TM152	mg/l	<0.0001	<0.00008	-	-	-
	Chromium (dias.ftt)	TM152	mg/l	<0.00022	<0.001	-	-	-
	Copper (dias.ftt)	TM152	mg/l	<0.00085	0.00365	-	-	-
	Lead (dias.ftt)	TM152	mg/l	<0.00002	<0.00002	-	-	-
	Nickel (dias.ftt)	TM152	mg/l	<0.000015	0.00405	-	-	-
	Selenium (dias.ftt)	TM152	mg/l	<0.00039	<0.001	-	-	-
	Zinc (dias.ftt)	TM152	mg/l	<0.00041	1.25	-	-	-
Phenols								
	Resorcinol	TM259	mg/l	<0.01	<0.01	-	-	-
	Catechol	TM259	mg/l	<0.01	<0.01	-	-	-
	Phenol	TM259	mg/l	<0.002	<0.002	-	-	-
	Cresols	TM259	mg/l	<0.006	<0.006	-	-	-
	Xylenols	TM259	mg/l	<0.008	<0.008	-	-	-
	1-Naphthol	TM259	mg/l	<0.01	<0.01	-	-	-
	2,3,5-Trimethylphenol	TM259	mg/l	<0.003	<0.003	-	-	-
	2-Isopropylphenol	TM259	mg/l	<0.006	<0.006	-	-	-
	Phenols, Total Detected & Speciated	TM259	mg/l	<0.045	<0.045	-	-	-
EPH (Extractable Petro)								
	EPH Range >C10 - C40 (aq)	TM172	mg/l	<0.046	0.227	-	-	-
Polyaromatic Hydrocar								
	Naphthalene (aq)	TM178	mg/l	<0.0001	<0.00001	-	-	-
	Acenaphthene (aq)	TM178	mg/l	<0.000015	<0.000005	-	-	-
	Acenaphthylene (aq)	TM178	mg/l	<0.000011	<0.000005	-	-	-
	Fluoranthene (aq)	TM178	mg/l	<0.000017	<0.000005	-	-	-
	Anthracene (aq)	TM178	mg/l	<0.000015	<0.000005	-	-	-
	Phenanthrene (aq)	TM178	mg/l	<0.000022	<0.000005	-	-	-
	Fluorene (aq)	TM178	mg/l	<0.000014	<0.000005	-	-	-
	Chrysene (aq)	TM178	mg/l	<0.000013	<0.000005	-	-	-
	Pyrene (aq)	TM178	mg/l	<0.000015	0.000031	-	-	-
	Benzo(a)anthracene (aq)	TM178	mg/l	<0.000017	<0.000005	-	-	-
	Benzo(b)fluoranthene (aq)	TM178	mg/l	<0.000023	0.000006	-	-	-
	Benzo(k)fluoranthene (aq)	TM178	mg/l	<0.000027	<0.000005	-	-	-
	Benzo(a)pyrene (aq)	TM178	mg/l	<0.000009	<0.000002	-	-	-
	Dibenzo(a,h)anthracene (aq)	TM178	mg/l	<0.000016	<0.000005	-	-	-
	Benzo(g,h,i)perylene (aq)	TM178	mg/l	<0.000016	<0.000005	-	-	-
	Indeno(1,2,3-cd)pyrene (aq)	TM178	mg/l	<0.000014	<0.000005	-	-	-
	PAH, Total Detected USEPA 16 (aq)	TM178	mg/l	<0.000344	<0.000082	-	-	-
Volatile Organic Comp								
	Benzene	TM208	mg/l	<0.001	<0.001	-	-	-
	Toluene	TM208	mg/l	<0.001	<0.001	-	-	-
	Ethylbenzene	TM208	mg/l	<0.001	<0.001	-	-	-
	m,p-Xylene	TM208	mg/l	<0.001	<0.001	-	-	-
	o-Xylene	TM208	mg/l	<0.001	<0.001	-	-	-
	Sum of detected Xylenes	TM208	mg/l	<0.002	<0.002	-	-	-
Dissolved Gases								
	Methane, dissolved	TM223	mg/l	<0.001	0.14	<0.001	<0.00217	<0.001

ENGLOBE



Appendix C - Analysis Certificates



Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 04 May 2016
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 160430-27
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 359363

We received 2 samples on Saturday April 30, 2016 and 2 of these samples were scheduled for analysis which was completed on Tuesday May 03, 2016. 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.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

SDG:	160430-27	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-184	Customer:	Celtic	Report Number:	359363
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
13349430	Treated Water		0.00 - 0.00	28/04/2016
13349436	Treated Water		0.00 - 0.00	29/04/2016

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



SDG: 160430-27
Job: H_CELTIC_CDF-184
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 359363
Superseded Report:

LIQUID**Results Legend**

Test

No Determination
Possible**Lab Sample No(s)**

13349430

13349436

**Customer
Sample Reference**

Treated Water

Treated Water

AGS Reference**Depth (m)**

0.00 - 0.00

0.00 - 0.00

ContainerVial (ALE297)
H2SO4 (ALE244)
11plastic (ALE221)
Vial (ALE297)
H2SO4 (ALE244)
11plastic (ALE221)

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 2

X

X

COD on Settled Sample

All

NDPs: 0
Tests: 2

X

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 2

X

X

pH Value

All

NDPs: 0
Tests: 2

X

X

Suspended Solids

All

NDPs: 0
Tests: 2

X

X

Order Number: 76084
Report Number: 359363
Superseded Report:

Page 4 of 8



SDG:	160430-27	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-184	Customer:	Celtic	Report Number:	359363
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis		
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters		
TM099	BS 2690: Part 7:1968 / BS 6068: 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		
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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		

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



SDG:	160430-27	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-184	Customer:	Celtic	Report Number:	359363
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	13349430	13349436
Customer Sample Ref.	Treated Water	Treated Water
AGS Ref.		
Depth	0.00 - 0.00	0.00 - 0.00
Type	LIQUID	LIQUID

Ammoniacal Nitrogen	03-May-2016	03-May-2016
COD on Settled Sample	03-May-2016	03-May-2016
Determination of Dissolved Gases	03-May-2016	03-May-2016
pH Value	03-May-2016	03-May-2016
Suspended Solids	03-May-2016	03-May-2016



SDG: 160430-27
Job: H_CELTIC_CDF-184
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 359363
Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1307
Ammoniacal Nitrogen as N	TM099	101.6 93.43 : 111.07

COD on Settled Sample

Component	Method Code	QC 1348
COD	TM107	100.57 96.99 : 102.87

Determination of Dissolved Gases

Component	Method Code	QC 1398
Carbon Dioxide Dissolved Raw	TM223	48.8 85.00 : 115.00
Ethane Dissolved Raw	TM223	97.79 96.29 : 102.65
Methane Dissolved Raw	TM223	96.9 92.64 : 110.66
Propane Dissolved Raw	TM223	97.62 95.38 : 101.02

pH Value

Component	Method Code	QC 1385
pH	TM256	100.13 99.33 : 102.56

Suspended Solids

Component	Method Code	QC 1378
Total Suspended Solids	TM022	95.49 92.62 : 101.22

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



SDG: 160430-27
Job: H_CELTIC_CDF-184
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 359363
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. ALcontrol Laboratories 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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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 GCFID/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 GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTX). 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

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 ALcontrol Laboratories (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 ALcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Crystalline	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Amosite	-
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.



Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 18 May 2016
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 160512-83
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 361137

We received 1 sample on Thursday May 12, 2016 and 1 of these samples were scheduled for analysis which was completed on Tuesday May 17, 2016. 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.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	160512-83	Location:	Bradford Road, Manchester	Order Number:	
Job:	H_CELTIC_CDF-184	Customer:	Celtic	Report Number:	361137
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
13413226	C1680			11/05/2016

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



SDG: 160512-83
Job: H_CELTIC_CDF-184
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number:
Report Number: 361137
Superseded Report:

LIQUID**Results Legend**

Test

No Determination
Possible**Lab Sample No(s)**

13413226

**Customer
Sample Reference**

C1680

AGS Reference**Depth (m)****Container**Vial (ALE297)
H2SO4 (ALE244)
11plastic (ALE221)

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1**X**

COD on Settled Sample

All

NDPs: 0
Tests: 1**X**

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1**X**

pH Value

All

NDPs: 0
Tests: 1**X**

Suspended Solids

All

NDPs: 0
Tests: 1**X**

Order Number:
Report Number: 361137
Superseded Report:

Page 4 of 8



SDG:	160512-83	Location:	Bradford Road, Manchester	Order Number:	
Job:	H_CELTIC_CDF-184	Customer:	Celtic	Report Number:	361137
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis		
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters		
TM099	BS 2690: Part 7:1968 / BS 6068: 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		
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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		

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



SDG:	160512-83	Location:	Bradford Road, Manchester	Order Number:	
Job:	H_CELTIC_CDF-184	Customer:	Celtic	Report Number:	361137
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	13413226
Customer Sample Ref.	C1680
AGS Ref.	
Depth	
Type	LIQUID

Ammoniacal Nitrogen	13-May-2016
COD on Settled Sample	17-May-2016
Determination of Dissolved Gases	17-May-2016
pH Value	13-May-2016
Suspended Solids	17-May-2016



SDG: 160512-83
Job: H_CELTIC_CDF-184
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number:
Report Number: 361137
Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1352
Ammoniacal Nitrogen as N	TM099	99.2 93.43 : 111.07

COD on Settled Sample

Component	Method Code	QC 1363
COD	TM107	99.81 96.99 : 102.87

Determination of Dissolved Gases

Component	Method Code	QC 1358
Carbon Dioxide Dissolved Raw	TM223	47.8 85.00 : 115.00
Ethane Dissolved Raw	TM223	97.12 93.36 : 102.66
Methane Dissolved Raw	TM223	96.62 91.86 : 105.30
Propane Dissolved Raw	TM223	96.72 93.58 : 102.48

pH Value

Component	Method Code	QC 1351
pH	TM256	100.54 99.33 : 102.56

Suspended Solids

Component	Method Code	QC 1346
Total Suspended Solids	TM022	99.47 92.62 : 101.22

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



SDG: 160512-83
Job: H_CELTIC_CDF-184
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number:
Report Number: 361137
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. ALcontrol Laboratories 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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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 GCFID/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 GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTX). 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

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 ALcontrol Laboratories (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 ALcontrol Laboratories (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.



Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Grant Harrington

CERTIFICATE OF ANALYSIS

Date: 26 May 2016
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 160519-68
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 362556

We received 1 sample on Thursday May 19, 2016 and 1 of these samples were scheduled for analysis which was completed on Thursday May 26, 2016. 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.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	160519-68	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-189	Customer:	Celtic	Report Number:	362556
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Grant Harrington	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
13455393	Treated Water		0.00 - 0.00	18/05/2016

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



SDG: 160519-68
Job: H_CELTIC_CDF-189
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Grant Harrington

Order Number: 76084
Report Number: 362556
Superseded Report:

LIQUID**Results Legend**

Test

No Determination
Possible**Lab Sample No(s)**

13455393

**Customer
Sample Reference**

Treated Water

AGS Reference**Depth (m)**

0.00 - 0.00

ContainerVial (ALE297)
H2SO4 (ALE244)
11plastic (ALE221)

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

COD on Settled Sample

All

NDPs: 0
Tests: 1

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

pH Value

All

NDPs: 0
Tests: 1

Suspended Solids

All

NDPs: 0
Tests: 1

Order Number: 76084
Report Number: 362556
Superseded Report:

Page 4 of 8



SDG:	160519-68	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-189	Customer:	Celtic	Report Number:	362556
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Grant Harrington	Superseded Report:	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis		
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters		
TM099	BS 2690: Part 7:1968 / BS 6068: 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		
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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		

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



SDG:	160519-68	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-189	Customer:	Celtic	Report Number:	362556
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Grant Harrington	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	13455393
Customer Sample Ref.	Treated Water
AGS Ref.	
Depth	0.00 - 0.00
Type	LIQUID
Ammoniacal Nitrogen	24-May-2016
COD on Settled Sample	26-May-2016
Determination of Dissolved Gases	25-May-2016
pH Value	25-May-2016
Suspended Solids	24-May-2016



SDG: 160519-68
Job: H_CELTIC_CDF-189
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Grant Harrington

Order Number: 76084
Report Number: 362556
Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1334
Ammoniacal Nitrogen as N	TM099	105.2 93.43 : 111.07

COD on Settled Sample

Component	Method Code	QC 1345
COD	TM107	100.0 96.99 : 102.87

Determination of Dissolved Gases

Component	Method Code	QC 1393
Carbon Dioxide Dissolved Raw	TM223	50.9 85.00 : 115.00
Ethane Dissolved Raw	TM223	99.94 96.29 : 102.65
Methane Dissolved Raw	TM223	98.88 92.64 : 110.66
Propane Dissolved Raw	TM223	99.21 91.79 : 106.67

pH Value

Component	Method Code	QC 1378
pH	TM256	100.54 99.33 : 102.56

Suspended Solids

Component	Method Code	QC 1376
Total Suspended Solids	TM022	95.76 92.62 : 101.22

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



SDG: 160519-68
Job: H_CELTIC_CDF-189
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Grant Harrington

Order Number: 76084
Report Number: 362556
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. ALcontrol Laboratories 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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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 GCFID/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 GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTX). 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

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 ALcontrol Laboratories (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 ALcontrol Laboratories (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 Almandine	-
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.



Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 07 June 2016
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 160529-10
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 363961

We received 3 samples on Sunday May 29, 2016 and 3 of these samples were scheduled for analysis which was completed on Tuesday June 07, 2016. 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.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	160529-10	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-190	Customer:	Celtic	Report Number:	363961
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
13513299	After Pump Nozzle Tank		0.00 - 0.00	27/05/2016
13513295	Pre Treatment		0.00 - 0.00	27/05/2016
13513302	Treated Water		0.00 - 0.00	27/05/2016

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

SDG:	160529-10
Job:	H_CELTIC_CDF-190
Client Reference:	Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number:	76084
Report Number:	363961
Superseded Report:	

LIQUID

Results Legend



Test



No Determination Possible

Lab Sample No(s)

**Customer
Sample Reference**

AGS Reference

Depth (m)

Container

13513302	Treated Water	0.00 - 0.00	Vial (ALE297)
13513295	Pre Treatment	0.00 - 0.00	Vial (ALE297)
13513299	After Pump Nozzle	0.00 - 0.00	Vial (ALE297)

Determination of Dissolved Gases

All

NDPs: 0
Tests: 3

X	X		X
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Suspended Solids

All

NDPs: 0
Tests: 1

		X
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Order Number: 76084
Report Number: 363961
Superseded Report:

Page 4 of 8



SDG:	160529-10	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-190	Customer:	Celtic	Report Number:	363961
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	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 1981;BS EN 872	Determination of total suspended solids in waters		
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases in waters		

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



SDG:	160529-10	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-190	Customer:	Celtic	Report Number:	363961
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	13513299	13513295	13513302
Customer Sample Ref.	After Pump Nozzle Tank	Pre Treatment	Treated Water
AGS Ref.			
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	LIQUID	LIQUID	LIQUID
Determination of Dissolved Gases	06-Jun-2016	06-Jun-2016	07-Jun-2016
Suspended Solids			02-Jun-2016



SDG: 160529-10
Job: H_CELTIC_CDF-190
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 363961
Superseded Report:

ASSOCIATED AQC DATA

Determination of Dissolved Gases

Component	Method Code	QC 1321	QC 1327
Carbon Dioxide Dissolved Raw	TM223	51.5 85.00 : 115.00	50.9 85.00 : 115.00
Ethane Dissolved Raw	TM223	98.06 93.36 : 102.66	99.62 96.29 : 102.65
Methane Dissolved Raw	TM223	97.3 91.86 : 105.30	98.56 92.64 : 110.66
Propane Dissolved Raw	TM223	97.77 93.58 : 102.48	98.66 91.79 : 106.67

Suspended Solids

Component	Method Code	QC 1301
Total Suspended Solids	TM022	96.29 92.62 : 101.22

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



SDG: 160529-10
Job: H_CELTIC_CDF-190
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 363961
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. ALcontrol Laboratories 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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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 GCFID/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 GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTX). 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

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 ALcontrol Laboratories (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 ALcontrol Laboratories (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.



Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date:	22 June 2016
Customer:	H_CELTIC_CDF
Sample Delivery Group (SDG):	160616-95
Your Reference:	Bradford Road No. 2 Gasholder
Location:	Bradford Road, Manchester
Report No:	365976

We received 1 sample on Thursday June 16, 2016 and 1 of these samples were scheduled for analysis which was completed on Wednesday June 22, 2016. 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.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:

Sonia McWhan

Operations Manager



CERTIFICATE OF ANALYSIS

SDG:	160616-95	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-175	Customer:	Celtic	Report Number:	365976
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
13605786	Treated Water		0.00 - 0.00	14/06/2016

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



CERTIFICATE OF ANALYSIS

SDG:	160616-95	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-175	Customer:	Celtic	Report Number:	365976
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		13605786
	Customer Sample Reference		Treated Water
	AGS Reference		
	Depth (m)		0.00 - 0.00
	Container		Vial (ALE297)
Determination of Dissolved Gases	All	NDPs: 0 Tests: 1	X

Order Number: 76084
Report Number: 365976
Superseded Report:

Page 4 of 8



SDG:	160616-95	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-175	Customer:	Celtic	Report Number:	365976
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases in waters		

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



SDG:	160616-95	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-175	Customer:	Celtic	Report Number:	365976
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	13605786
Customer Sample Ref.	Treated Water
AGS Ref.	
Depth	0.00 - 0.00
Type	LIQUID
Determination of Dissolved Gases	22-Jun-2016



SDG:	160616-95	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-175	Customer:	Celtic	Report Number:	365976
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

ASSOCIATED AQC DATA

Determination of Dissolved Gases

Component	Method Code	QC 1328
Carbon Dioxide Dissolved Raw	TM223	50.8 85.00 : 115.00
Ethane Dissolved Raw	TM223	99.07 96.29 : 102.65
Methane Dissolved Raw	TM223	98.53 92.64 : 110.66
Propane Dissolved Raw	TM223	98.35 91.79 : 106.67

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



SDG: 160616-95
Job: H_CELTIC_CDF-175
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 365976
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. ALcontrol Laboratories 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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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 GCFID/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 GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTX). 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

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 ALcontrol Laboratories (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 ALcontrol Laboratories (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.



Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date:	11 July 2016
Customer:	H_CELTIC_CDF
Sample Delivery Group (SDG):	160701-114
Your Reference:	Bradford Road No. 2 Gasholder
Location:	Bradford Road, Manchester
Report No:	368466

We received 1 sample on Friday July 01, 2016 and 1 of these samples were scheduled for analysis which was completed on Monday July 11, 2016. 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.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:

Sonia McWhan

Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG:	160701-114	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-175	Customer:	Celtic	Report Number:	368466
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
13693606	Treated Water		0.00 - 0.00	29/06/2016

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



CERTIFICATE OF ANALYSIS

SDG:	160701-114	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-175	Customer:	Celtic	Report Number:	368466
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		13693606
	Customer Sample Reference		Treated Water
	AGS Reference		
	Depth (m)		0.00 - 0.00
	Container		Vial (ALE297)
Determination of Dissolved Gases	All	NDPs: 0 Tests: 1	X

SDG:	160701-114
Job:	H_CELTIC_CDF-175
Client Reference:	Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 368466
Superseded Report:

[illegible]



SDG:	160701-114	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-175	Customer:	Celtic	Report Number:	368466
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases in waters		

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



SDG:	160701-114	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-175	Customer:	Celtic	Report Number:	368466
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	13693606
Customer Sample Ref.	Treated Water
AGS Ref.	
Depth	0.00 - 0.00
Type	LIQUID
Determination of Dissolved Gases	11-Jul-2016



SDG:	160701-114	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-175	Customer:	Celtic	Report Number:	368466
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

ASSOCIATED AQC DATA

Determination of Dissolved Gases

Component	Method Code	QC 1320
Carbon Dioxide Dissolved Raw	TM223	51.2 85.00 : 115.00
Ethane Dissolved Raw	TM223	98.65 96.29 : 102.65
Methane Dissolved Raw	TM223	97.76 92.64 : 110.66
Propane Dissolved Raw	TM223	98.56 91.79 : 106.67

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



SDG: 160701-114
Job: H_CELTIC_CDF-175
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 368466
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. ALcontrol Laboratories 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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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 GCFID/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 GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTX). 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

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 ALcontrol Laboratories (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 ALcontrol Laboratories (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 Almandine	-
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.



Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 27 July 2016
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 160717-2
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 370850

We received 1 sample on Sunday July 17, 2016 and 1 of these samples were scheduled for analysis which was completed on Wednesday July 27, 2016. 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.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	160717-2	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-195	Customer:	Celtic	Report Number:	370850
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
13792199	Treated Water		0.00 - 0.00	13/07/2016

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



SDG: 160717-2
Job: H_CELTIC_CDF-195
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 370850
Superseded Report:

LIQUID**Results Legend**

Test

No Determination
Possible**Lab Sample No(s)**

13792199

**Customer
Sample Reference**

Treated Water

AGS Reference**Depth (m)**

0.00 - 0.00

ContainerVial (ALE297)
H2SO4 (ALE244)
500ml Plastic (ALE2
1000ml glass bottle

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X

Order Number: 76084
Report Number: 370850
Superseded Report:

Page 4 of 8



SDG:	160717-2	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-195	Customer:	Celtic	Report Number:	370850
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis		
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters		
TM099	BS 2690: Part 7:1968 / BS 6068: 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		
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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		

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



SDG:	160717-2	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-195	Customer:	Celtic	Report Number:	370850
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	13792199
Customer Sample Ref.	Treated Water
AGS Ref.	
Depth	0.00 - 0.00
Type	LIQUID

Ammoniacal Nitrogen	22-Jul-2016
COD on Settled Sample	24-Jul-2016
Determination of Dissolved Gases	27-Jul-2016
pH Value	26-Jul-2016
Suspended Solids	26-Jul-2016



SDG: 160717-2
Job: H_CELTIC_CDF-195
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 370850
Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1303
Ammoniacal Nitrogen as N	TM099	102.0 93.43 : 111.07

COD on Settled Sample

Component	Method Code	QC 1348
COD	TM107	101.33 96.99 : 102.87

Determination of Dissolved Gases

Component	Method Code	QC 1304
Carbon Dioxide Dissolved Raw	TM223	49.5 85.00 : 115.00
Ethane Dissolved Raw	TM223	94.97 93.36 : 102.66
Methane Dissolved Raw	TM223	119.54 107.33 : 147.33
Propane Dissolved Raw	TM223	97.61 93.58 : 102.48

pH Value

Component	Method Code	QC 1341
pH	TM256	99.87 99.33 : 102.56

Suspended Solids

Component	Method Code	QC 1331
Total Suspended Solids	TM022	97.61 92.62 : 101.22

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



SDG: 160717-2
Job: H_CELTIC_CDF-195
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 370850
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. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

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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.

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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).

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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 GCFID/GCMS and all subcontracted analysis.

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Sample Deviations

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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 ALcontrol Laboratories (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 ALcontrol Laboratories (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 Almandine	-
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.



Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 23 August 2016
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 160816-69
Your Reference:
Location: Bradford Road, Manchester
Report No: 374717

We received 1 sample on Friday August 12, 2016 and 1 of these samples were scheduled for analysis which was completed on Tuesday August 23, 2016. 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.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

SDG:	160816-69	Location:	Bradford Road, Manchester	Order Number:	
Job:	H_CELTIC_CDF-175	Customer:	Celtic	Report Number:	374717
Client Reference:		Attention:	Ian Wright	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
13979376	DISCHARGE			12/08/2016

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



SDG:160816-69

Job:H_CELTIC_CDF-175

Client Reference:

Location:Bradford Road, Manchester

Customer:Celtic

Attention:Ian Wright

Order Number:

Report Number:374717

Superseded Report:

LIQUID

Results Legend

- X

Test
- N

No Determination Possible

Lab Sample No(s)

13979376

Customer
Sample Reference

DISCHARGE

AGS Reference

Depth (m)

Container

Vial (ALE297)
500ml Plastic (ALE2

Ammoniacal Nitrogen	All	NDPs: 0 Tests: 1	X	
COD on Settled Sample	All	NDPs: 0 Tests: 1	X	
Determination of Dissolved Gases	All	NDPs: 0 Tests: 1		X
pH Value	All	NDPs: 0 Tests: 1	X	
Suspended Solids	All	NDPs: 0 Tests: 1	X	

Order Number:
Report Number: 374717
Superseded Report:

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SDG:	160816-69	Location:	Bradford Road, Manchester	Order Number:	
Job:	H_CELTIC_CDF-175	Customer:	Celtic	Report Number:	374717
Client Reference:		Attention:	Ian Wright	Superseded Report:	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis		
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters		
TM099	BS 2690: Part 7:1968 / BS 6068: 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		
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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		

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



SDG:	160816-69	Location:	Bradford Road, Manchester	Order Number:	
Job:	H_CELTIC_CDF-175	Customer:	Celtic	Report Number:	374717
Client Reference:		Attention:	Ian Wright	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	13979376
Customer Sample Ref.	DISCHARGE
AGS Ref.	
Depth	
Type	LIQUID

Ammoniacal Nitrogen	18-Aug-2016
COD on Settled Sample	19-Aug-2016
Determination of Dissolved Gases	23-Aug-2016
pH Value	19-Aug-2016
Suspended Solids	22-Aug-2016



SDG: 160816-69
Job: H_CELTIC_CDF-175
Client Reference:

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number:
Report Number: 374717
Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1333
Ammoniacal Nitrogen as N	TM099	99.2 93.43 : 111.07

COD on Settled Sample

Component	Method Code	QC 1468
COD	TM107	100.57 96.99 : 102.87

Determination of Dissolved Gases

Component	Method Code	QC 1417
Carbon Dioxide Dissolved Raw	TM223	52.2 85.00 : 115.00
Ethane Dissolved Raw	TM223	98.13 96.29 : 102.65
Methane Dissolved Raw	TM223	122.72 107.33 : 147.33
Propane Dissolved Raw	TM223	99.92 91.79 : 106.67

pH Value

Component	Method Code	QC 1382
pH	TM256	100.94 99.33 : 102.56

Suspended Solids

Component	Method Code	QC 1335
Total Suspended Solids	TM022	97.08 92.62 : 101.22

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



SDG: 160816-69
Job: H_CELTIC_CDF-175
Client Reference:

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number:
Report Number: 374717
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. ALcontrol Laboratories 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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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 GCFID/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 GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTX). 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

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 ALcontrol Laboratories (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 ALcontrol Laboratories (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.



Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 19 September 2016
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 160908-118
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 378533

We received 1 sample on Thursday September 08, 2016 and 1 of these samples were scheduled for analysis which was completed on Monday September 19, 2016. 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 ALcontrol Laboratories Hawarden (Method codes TM) or ALcontrol Laboratories Aberdeen (Method codes S).

Approved By:

Sonia McWhan

Operations Manager





SDG:	160908-118	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-197	Customer:	Celtic	Report Number:	378533
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
14119056	Treated Water		0.00 - 0.00	06/09/2016

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



SDG: 160908-118
Job: H_CELTIC_CDF-197
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 378533
Superseded Report:

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		14119056	
	Customer Sample Reference		Treated Water	
	AGS Reference			
	Depth (m)		0.00 - 0.00	
	Container		Vial (AL E297) Dissolved Metals Preser 500ml Plastic (AL E208) 1000ml glass bottle (AL E	
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 1	X	
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X	
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 1	X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1	X	
Determination of Dissolved Gases	All	NDPs: 0 Tests: 1		X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X	
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X	
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 1	X	
Free Sulphur	All	NDPs: 0 Tests: 1	X	
Mercury Dissolved	All	NDPs: 0 Tests: 1		X
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 1	X	
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 1	X	
pH Value	All	NDPs: 0 Tests: 1		X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X	
Sulphide	All	NDPs: 0 Tests: 1	X	



SDG: 160908-118
Job: H_CELTIC_CDF-197
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 378533
Superseded Report:

LIQUID

Results Legend

X

 Test

N

 No Determination Possible

Lab Sample No(s)	14119056
Customer Sample Reference	Treated Water
AGS Reference	
Depth (m)	0.00 - 0.00
Container	Vial (AL E297) Dissolved Metals Preser 500ml Plastic (AL E208) 1000ml glass bottle (AL E
Suspended Solids	AllNDPs: 0 Tests: 1 X
VOC MS (W)	AllNDPs: 0 Tests: 1 X



SDG: 160908-118
Job: H_CELTIC_CDF-197
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 378533
Superseded Report:

Results Legend		Customer Sample Ref.	Treated Water				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference					
M	mCERTS accredited.		0.00 - 0.00				
aq	Aqueous / settled sample.		Water(GW/SW)				
diss.filt	Dissolved / filtered sample.		06/09/2016				
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted test.		08/09/2016				
**	% 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		160908-118				
(F)	Trigger breach confirmed		14119056				
1-58*\$@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Suspended solids, Total	<2 mg/l	TM022	14	#			
Carbon, Organic (diss.filt)	<3 mg/l	TM090	4.18				
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	0.445	#			
Sulphide	<0.01 mg/l	TM101	0.0136	#			
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120	0.107	#			
Arsenic (diss.filt)	<0.00051 mg/l	TM152	0.00206	#			
Boron (diss.filt)	<0.005 mg/l	TM152	0.00975	#			
Cadmium (diss.filt)	<0.00008 mg/l	TM152	<0.00008	#			
Chromium (diss.filt)	<0.0012 mg/l	TM152	<0.0012	#			
Copper (diss.filt)	<0.00085 mg/l	TM152	<0.00085	#			
Lead (diss.filt)	<0.0001 mg/l	TM152	<0.0001	#			
Nickel (diss.filt)	<0.00044 mg/l	TM152	0.000674	#			
Selenium (diss.filt)	<0.00081 mg/l	TM152	<0.00081	#			
Zinc (diss.filt)	<0.0013 mg/l	TM152	0.029	#			
EPH Range >C10 - C40 (aq)	<0.046 mg/l	TM172	0.543	#			
Mercury (diss.filt)	<0.00001 mg/l	TM183	<0.00001	#			
Sulphate	<2 mg/l	TM184	<2	#			
Chloride	<2 mg/l	TM184	5.7	#			
Methane, dissolved	<0.001 mg/l	TM223	<0.0022				
Cyanide, Total	<0.05 mg/l	TM227	<0.05	#			
Cyanide, Free	<0.05 mg/l	TM227	<0.05	#			
Cyanide, Complex	<0.05 mg/l	TM227	<0.05				
Thiocyanate	<0.05 mg/l	TM227	<0.05	#			
Iron (diss.filt)	<0.019 mg/l	TM228	0.0277	#			
pH	<1 pH Units	TM256	7.41	#			
Resorcinol	<0.01 mg/l	TM259	<0.01	2			
Catechol	<0.01 mg/l	TM259	<0.01	2			
Phenol	<0.002 mg/l	TM259	<0.002	2 #			
Cresols	<0.006 mg/l	TM259	0.02	2 #			
Xylenols	<0.008 mg/l	TM259	<0.008	2 #			
1-Naphthol	<0.01 mg/l	TM259	<0.01	2			
2,3,5-Trimethylphenol	<0.003 mg/l	TM259	<0.003	2 #			

Order Number: 76084
Report Number: 378533
Superseded Report:

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Order Number: 76084
Report Number: 378533
Superseded Report:

Page 7 of 18

Order Number: 76084
Report Number: 378533
Superseded Report:

Page 8 of 18



SDG: 160908-118
Job: H_CELTIC_CDF-197
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 378533
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 1981;BS EN 872	Determination of total suspended solids in waters		
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	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		
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser		
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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		
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		
TM294		Determination of Free Sulphur in liquids 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 ALcontrol Laboratories Hawarden (Method codes TM) or ALcontrol Laboratories Aberdeen (Method codes S).



SDG:	160908-118	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-197	Customer:	Celtic	Report Number:	378533
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	14119056
Customer Sample Ref.	Treated Water
AGS Ref.	
Depth	0.00 - 0.00
Type	LIQUID

Ammoniacal Nitrogen	14-Sep-2016
Anions by Kone (w)	12-Sep-2016
Conductivity (at 20 deg.C)	12-Sep-2016
Cyanide Comp/Free/Total/Thiocyanate	13-Sep-2016
Determination of Dissolved Gases	16-Sep-2016
Dissolved Metals by ICP-MS	16-Sep-2016
Dissolved Organic/Inorganic Carbon	13-Sep-2016
EPH (DRO) (C10-C40) Aqueous (W)	19-Sep-2016
Free Sulphur	16-Sep-2016
Mercury Dissolved	19-Sep-2016
Metals by iCap-OES Dissolved (W)	14-Sep-2016
PAH Spec MS - Aqueous (W)	19-Sep-2016
pH Value	17-Sep-2016
Phenols by HPLC (W)	15-Sep-2016
Sulphide	15-Sep-2016
Suspended Solids	15-Sep-2016
VOC MS (W)	16-Sep-2016



SDG: 160908-118
Job: H_CELTIC_CDF-197
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 378533
Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1497
Ammoniacal Nitrogen as N	TM099	100.0 93.43 : 111.07

Anions by Kone (w)

Component	Method Code	QC 1413
Chloride	TM184	103.0 92.93 : 115.43
Phosphate (Ortho as PO4)	TM184	96.40 : 108.40
Sulphate (soluble)	TM184	105.2 90.53 : 113.03
TON as NO3	TM184	106.0 90.25 : 110.05

Conductivity (at 20 deg.C)

Component	Method Code	QC 1416
Conductivity (at 20 deg.C)	TM120	104.51 98.35 : 107.28

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 1458
Free Cyanide (W)	TM227	101.0 93.25 : 112.75
Thiocyanate (W)	TM227	103.75 97.75 : 109.75
Total Cyanide (W)	TM227	105.75 95.25 : 111.75

Determination of Dissolved Gases

Component	Method Code	QC 1441
Carbon Dioxide Dissolved Raw	TM223	52.4 85.00 : 115.00
Ethane Dissolved Raw	TM223	97.76 95.52 : 104.00
Methane Dissolved Raw	TM223	122.14 68.59 : 131.41
Propane Dissolved Raw	TM223	99.15 95.41 : 102.49

Dissolved Metals by ICP-MS



SDG: 160908-118
Job: H_CELTIC_CDF-197
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 378533
Superseded Report:

Dissolved Metals by ICP-MS

Component	Method Code	QC 1471
Aluminium	TM152	92.33 95.22 : 106.22
Antimony	TM152	103.0 91.83 : 104.86
Arsenic	TM152	98.0 97.20 : 106.46
Barium	TM152	100.0 93.16 : 109.09
Beryllium	TM152	92.67 95.10 : 106.18
Bismuth	TM152	96.67 88.64 : 97.42
Boron	TM152	92.67 95.03 : 107.55
Cadmium	TM152	100.83 92.49 : 100.24
Chromium	TM152	100.33 93.60 : 104.11
Cobalt	TM152	100.17 93.70 : 102.93
Copper	TM152	102.17 89.33 : 98.72
Lead	TM152	98.67 90.04 : 101.39
Lithium	TM152	94.17 98.02 : 106.69
Manganese	TM152	99.33 94.27 : 103.76
Molybdenum	TM152	99.0 98.90 : 107.48
Nickel	TM152	101.33 90.74 : 100.65
Niobium	TM152	96.38 : 128.85
Phosphorus	TM152	96.5 100.07 : 107.49
Selenium	TM152	98.5 92.52 : 103.93
Silver	TM152	100.5 90.04 : 97.49
Strontium	TM152	102.0 96.86 : 106.04
Tellurium	TM152	93.67 68.64 : 103.45
Thallium	TM152	94.5 75.00 : 125.00
Titanium	TM152	95.83 94.78 : 120.64
Tungsten	TM152	100.83 80.07 : 122.86
Uranium	TM152	100.67 97.76 : 108.33



SDG: 160908-118
Job: H_CELTIC_CDF-197
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 378533
Superseded Report:

Dissolved Metals by ICP-MS

		QC 1471
Vanadium	TM152	98.33 93.50 : 111.73
Zinc	TM152	102.0 90.40 : 98.98
Zirconium	TM152	85.51 : 109.42

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 1458
Dissolved Inorganic Carbon	TM090	107.67 92.52 : 110.62
Dissolved Organic Carbon	TM090	104.83 98.77 : 108.17

EPH (DRO) (C10-C40) Aqueous (W)

Component	Method Code	QC 1415
EPH (DRO) (C10-C40)	TM172	81.0 64.20 : 117.80

Mercury Dissolved

Component	Method Code	QC 1436
Mercury Dissolved (CVAf)	TM183	101.0 76.80 : 117.12

Metals by iCap-OES Dissolved (W)

Component	Method Code	QC 1424
Calcium	TM228	91.4 86.23 : 109.99
Iron	TM228	87.33 79.67 : 106.07
Magnesium	TM228	96.3 83.80 : 108.64
Potassium	TM228	95.9 85.81 : 112.03
Sodium	TM228	94.3 84.00 : 111.30

PAH Spec MS - Aqueous (W)



SDG: 160908-118
Job: H_CELTIC_CDF-197
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 378533
Superseded Report:

PAH Spec MS - Aqueous (W)

Component	Method Code	QC 1477
Acenaphthene by GCMS	TM178	100.5 86.55 : 114.15
Acenaphthylene by GCMS	TM178	91.0 85.27 : 110.71
Anthracene by GCMS	TM178	91.5 86.06 : 112.26
Benz(a)anthracene by GCMS	TM178	87.5 79.67 : 116.73
Benzo(a)pyrene by GCMS	TM178	102.5 83.10 : 128.10
Benzo(b)fluoranthene by GCMS	TM178	113.0 86.00 : 131.00
Benzo(ghi)perylene by GCMS	TM178	94.5 79.96 : 107.30
Benzo(k)fluoranthene by GCMS	TM178	114.5 87.50 : 132.50
Chrysene by GCMS	TM178	92.0 86.00 : 114.60
Dibenzo(ah)anthracene by GCMS	TM178	86.5 68.95 : 111.55
Fluoranthene by GCMS	TM178	93.5 81.15 : 116.55
Fluorene by GCMS	TM178	101.0 90.88 : 112.23
Indeno(123cd)pyrene by GCMS	TM178	108.5 82.25 : 114.75
Naphthalene by GCMS	TM178	95.0 87.58 : 110.52
Phenanthrene by GCMS	TM178	96.5 89.55 : 112.75
Pyrene by GCMS	TM178	95.0 82.25 : 116.15

pH Value

Component	Method Code	QC 1422
pH	TM256	101.21 99.33 : 102.56

Phenols by HPLC (W)

Component	Method Code	QC 1410
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	100.0 89.00 : 107.00
2-Isopropyl Phenol by HPLC (W)	TM259	108.0 76.90 : 120.70
Cresols by HPLC (W)	TM259	103.0 88.67 : 106.67
Napthol by HPLC (W)	TM259	99.0 85.60 : 115.60



CERTIFICATE OF ANALYSIS

SDG: 160908-118
Job: H_CELTIC_CDF-197
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 378533
Superseded Report:

Phenols by HPLC (W)

		QC 1410
Phenol by HPLC (W)	TM259	99.0 93.00 : 111.00
Xylenols by HPLC (W)	TM259	98.5 87.83 : 105.83

Sulphide

Component	Method Code	QC 1465
Sulphide	TM101	93.33 89.29 : 110.21

Suspended Solids

Component	Method Code	QC 1417
Total Suspended Solids	TM022	95.23 92.62 : 101.22

VOC MS (W)

Component	Method Code	QC 1493
1,1,1,2-Tetrachloroethane	TM208	104.5 77.50 : 122.50
1,1,1-Trichloroethane	TM208	102.0 77.50 : 122.50
1,1-Dichloroethane	TM208	103.5 77.50 : 122.50
1,2-Dichloroethane	TM208	105.0 77.50 : 122.50
2-Chlorotoluene	TM208	97.5 77.50 : 122.50
4-Chlorotoluene	TM208	98.5 77.50 : 122.50
Benzene	TM208	103.5 77.50 : 122.50
Bromomethane	TM208	109.0 82.65 : 136.89
Carbontetrachloride	TM208	105.5 77.50 : 122.50
Chlorobenzene	TM208	97.5 82.01 : 111.65
Chloroform	TM208	106.5 77.50 : 122.50
Chloromethane	TM208	108.0 69.61 : 144.19
Cis-1,2-Dichloroethene	TM208	102.0 81.72 : 122.18
Dichloromethane	TM208	102.5 81.94 : 125.20



SDG: 160908-118
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Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 378533
Superseded Report:

VOC MS (W)

		QC 1493
Ethylbenzene	TM208	102.0 81.31 : 111.79
Hexachlorobutadiene	TM208	100.5 71.77 : 109.03
o-Xylene	TM208	96.5 79.33 : 110.74
p/m-Xylene	TM208	99.5 74.83 : 118.29
Tert-butyl methyl ether	TM208	100.0 62.50 : 128.86
Tetrachloroethene	TM208	102.0 83.70 : 114.41
Toluene	TM208	101.0 80.95 : 110.35
Trichloroethene	TM208	100.5 83.48 : 109.01
Vinyl Chloride	TM208	112.5 73.93 : 128.95

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



SDG: 160908-118
Job: H_CELTIC_CDF-197
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 378533
Superseded Report:

Chromatogram

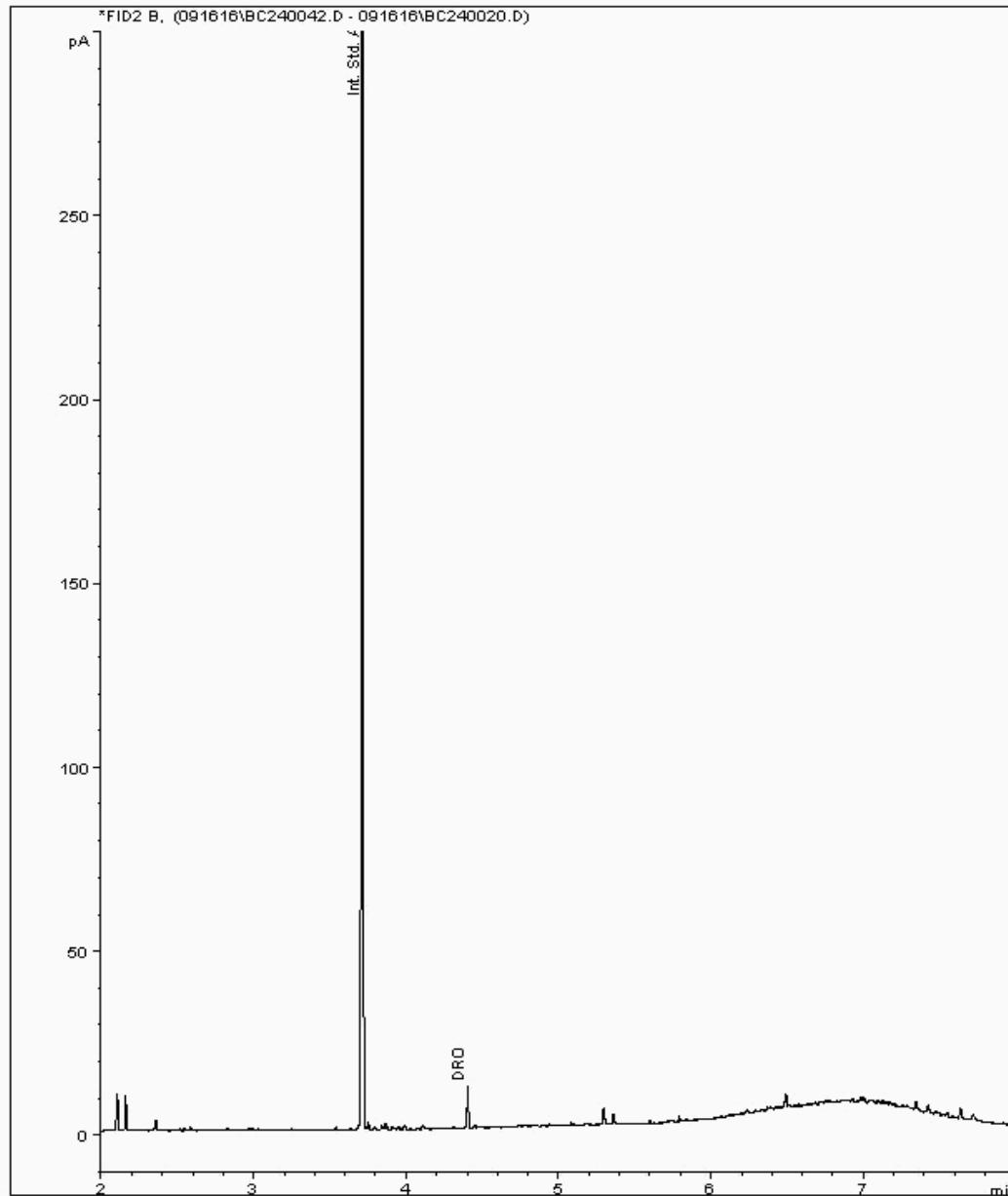
Analysis: EPH (DRO) (C10-C40) Aqueous (W)

Sample No : 14132611
Sample ID : Treated Water

Depth : 0.00 - 0.00

Alcontrol/Geochem Analytical Services
EPH Range Organics (C10 - C40)

Sample Identity: 13265393-
Date Acquired : 17/09/2016 02:40:23 PM
Units : mg/l





SDG: 160908-118
Job: H_CELTIC_CDF-197
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 378533
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. ALcontrol Laboratories 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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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 GCFID/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 GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTX). 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

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 ALcontrol Laboratories (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 ALcontrol Laboratories (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.



Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 09 November 2016
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 161029-38
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 385772

We received 1 sample on Saturday October 29, 2016 and 1 of these samples were scheduled for analysis which was completed on Wednesday November 09, 2016. 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 ALcontrol Laboratories Hawarden (Method codes TM) or ALcontrol Laboratories Aberdeen (Method codes S).

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	161029-38	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-184	Customer:	Celtic	Report Number:	385772
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
14430752	Treated Water		0.00 - 0.00	26/10/2016

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



SDG:	161029-38	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-184	Customer:	Celtic	Report Number:	385772
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

LIQUID
Results Legend

- X

Test
- N

No Determination Possible

Lab Sample No(s)

14430752

Customer
Sample Reference

Treated Water

AGS Reference

Depth (m)

0.00 - 0.00

Container

Vial (AL E297)
1l plastic (AL E221)

Ammoniacal Nitrogen	All	NDPs: 0 Tests: 1	X	
COD on Settled Sample	All	NDPs: 0 Tests: 1	X	
Determination of Dissolved Gases	All	NDPs: 0 Tests: 1		X
pH Value	All	NDPs: 0 Tests: 1	X	
Suspended Solids	All	NDPs: 0 Tests: 1	X	

SDG: 161029-38
Job: H_CELTIC_CDF-184
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 385772
Superseded Report:

[illegible]



SDG:	161029-38	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-184	Customer:	Celtic	Report Number:	385772
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis		
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters		
TM099	BS 2690: Part 7:1968 / BS 6068: 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		
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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		

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.
Chemical testing (unless subcontracted) performed at ALcontrol Laboratories Hawarden (Method codes TM) or ALcontrol Laboratories Aberdeen (Method codes S).



SDG:	161029-38	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-184	Customer:	Celtic	Report Number:	385772
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	14430752
Customer Sample Ref.	Treated Water
AGS Ref.	
Depth	0.00 - 0.00
Type	LIQUID

Ammoniacal Nitrogen	09-Nov-2016
COD on Settled Sample	07-Nov-2016
Determination of Dissolved Gases	08-Nov-2016
pH Value	08-Nov-2016
Suspended Solids	08-Nov-2016



SDG: 161029-38
Job: H_CELTIC_CDF-184
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 385772
Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1461
Ammoniacal Nitrogen as N	TM099	102.4 93.43 : 111.07

COD on Settled Sample

Component	Method Code	QC 1443
COD	TM107	100.57 97.52 : 103.12

Determination of Dissolved Gases

Component	Method Code	QC 1441
Carbon Dioxide Dissolved Raw	TM223	51.4 85.00 : 115.00
Ethane Dissolved Raw	TM223	97.47 95.52 : 104.00
Methane Dissolved Raw	TM223	121.7 68.59 : 131.41
Propane Dissolved Raw	TM223	99.02 95.41 : 102.49

pH Value

Component	Method Code	QC 1475
pH	TM256	100.13 99.41 : 102.03

Suspended Solids

Component	Method Code	QC 1407
Total Suspended Solids	TM022	97.88 94.26 : 101.34

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



SDG: 161029-38
Job: H_CELTIC_CDF-184
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 385772
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. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

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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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

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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 GCFID/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 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

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 ALcontrol Laboratories (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 ALcontrol Laboratories (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.



Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 29 November 2016
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 161119-52
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 388265

We received 5 samples on Saturday November 19, 2016 and 5 of these samples were scheduled for analysis which was completed on Tuesday November 29, 2016. 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 ALcontrol Laboratories Hawarden (Method codes TM) or ALcontrol Laboratories Aberdeen (Method codes S).

Approved By:

Sonia McWhan

Operations Manager





SDG:	161119-52	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-184	Customer:	Celtic	Report Number:	388265
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
14559877	Mid Treatment (2 stage)		0.00 - 0.00	18/11/2016
14559880	Post (2 Stage) Treatment (AM)		0.00 - 0.00	18/11/2016
14559886	Post (1 Stage) Treatment (PM)		0.00 - 0.00	18/11/2016
14559874	Pre Treatment (AM)		0.00 - 0.00	18/11/2016
14559883	Pre Treatment (PM)		0.00 - 0.00	18/11/2016

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



SDG:
Job:
Client Reference:

161119-52
H_CELTIC_CDF-184
Bradford Road No. 2 Gasholder

Location:
Customer:
Attention:

Bradford Road, Manchester
Celtic
Ian Wright

Order Number:
Report Number:
Superseded Report:

76084
388265

LIQUID

Results Legend

X

 Test

N

 No Determination Possible

Lab Sample No(s)	14559863 14559874 14559886 14559880 14559877
Customer Sample Reference	Pre Treatment (PM) Pre Treatment (AM) Post (1 Stage) Treatment (PM) Post (2 Stage) Treatment (PM) Mid Treatment (2 stage)
AGS Reference	
Depth (m)	0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00
Container	Vial (AL E297) Vial (AL E297) Vial (AL E297) 1lit plastic (AL E221) Vial (AL E297) Vial (AL E297)

Ammoniacal Nitrogen	All	NDPs: 0 Tests: 1		X				
COD on Settled Sample	All	NDPs: 0 Tests: 1		X				
Determination of Dissolved Gases	All	NDPs: 0 Tests: 5	X	X	X	X	X	X
pH Value	All	NDPs: 0 Tests: 1		X				
Suspended Solids	All	NDPs: 0 Tests: 1		X				

SDG: 161119-52
Job: H_CELTIC_CDF-184
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 388265
Superseded Report:

[illegible]



SDG:	161119-52	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-184	Customer:	Celtic	Report Number:	388265
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis		
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters		
TM099	BS 2690: Part 7:1968 / BS 6068: 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		
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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		

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.
Chemical testing (unless subcontracted) performed at ALcontrol Laboratories Hawarden (Method codes TM) or ALcontrol Laboratories Aberdeen (Method codes S).



SDG:	161119-52	Location:	Bradford Road, Manchester	Order Number:	76084
Job:	H_CELTIC_CDF-184	Customer:	Celtic	Report Number:	388265
Client Reference:	Bradford Road No. 2 Gasholder	Attention:	Ian Wright	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	14559877	14559880	14559886	14559874	14559883
Customer Sample Ref.	Mid Treatment (2 stage)	Post (2 Stage) Treatment (AM)	Post (1 Stage) Treatment (PM)	Pre Treatment (AM)	Pre Treatment (PM)
AGS Ref.					
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID

Ammoniacal Nitrogen			28-Nov-2016		
COD on Settled Sample			29-Nov-2016		
Determination of Dissolved Gases	29-Nov-2016	29-Nov-2016	29-Nov-2016	29-Nov-2016	29-Nov-2016
pH Value			25-Nov-2016		
Suspended Solids			28-Nov-2016		



SDG: 161119-52
Job: H_CELTIC_CDF-184
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 388265
Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1400
Ammoniacal Nitrogen as N	TM099	101.6 93.47 : 108.25

COD on Settled Sample

Component	Method Code	QC 1444
COD	TM107	100.38 97.52 : 103.12

Determination of Dissolved Gases

Component	Method Code	QC 1404
Carbon Dioxide Dissolved Raw	TM223	48.5 85.00 : 115.00
Ethane Dissolved Raw	TM223	96.86 93.36 : 102.66
Methane Dissolved Raw	TM223	121.14 68.59 : 131.41
Propane Dissolved Raw	TM223	98.7 93.58 : 102.48

pH Value

Component	Method Code	QC 1477
pH	TM256	100.94 99.33 : 102.56

Suspended Solids

Component	Method Code	QC 1467
Total Suspended Solids	TM022	98.67 94.26 : 101.34

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



SDG: 161119-52
Job: H_CELTIC_CDF-184
Client Reference: Bradford Road No. 2 Gasholder

Location: Bradford Road, Manchester
Customer: Celtic
Attention: Ian Wright

Order Number: 76084
Report Number: 388265
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. ALcontrol Laboratories 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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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 GCFID/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 GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTX). 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

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 ALcontrol Laboratories (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 ALcontrol Laboratories (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.



Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
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Website: www.alsenvironmental.co.uk

Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 23 December 2016
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 161213-103
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 391719

We received 2 samples on Tuesday December 13, 2016 and 2 of these samples were scheduled for analysis which was completed on Friday December 23, 2016. 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





CERTIFICATE OF ANALYSIS

Validated

SDG: 161213-103 **Client Reference:** Bradford Road No. 2 Gash **Report Number:** 391719
Location: Bradford Road, Manchester **Order Number:** 76084 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
14703570	Pre Treatment		0.00 - 0.00	09/12/2016
14703556	Treated Water		0.00 - 0.00	09/12/2016

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 161213-103 Client Reference: Bradford Road No. 2 Gash Report Number: 391719
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		14703670	14703656					
	Customer Sample Reference		Pre Treatment	Treated Water					
	AGS Reference								
	Depth (m)		0.00 - 0.00	0.00 - 0.00					
	Container		Vial (ALE297)	ZnAc (ALE246)	Vial (ALE297)	NaOH (ALE245)	H2SO4 (ALE24)	Dissolved Meta	500ml Plastic (A
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 1						X	
Anions by Kone (w)	All	NDPs: 0 Tests: 1						X	
COD on Settled Sample	All	NDPs: 0 Tests: 1						X	
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 1						X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1							X
Determination of Dissolved Gases	All	NDPs: 0 Tests: 2	X						X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1						X	
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1						X	
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 1						X	
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 1						X	
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 1						X	
Free Sulphur	All	NDPs: 0 Tests: 1						X	
GRO by GC-FID (W)	All	NDPs: 0 Tests: 1							X
Mercury Dissolved	All	NDPs: 0 Tests: 1						X	
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 1						X	
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 1						X	



CERTIFICATE OF ANALYSIS

Validated

SDG: 161213-103 Client Reference: Bradford Road No. 2 Gash Report Number: 391719
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		14703570	14703556
	Customer Sample Reference		Pre Treatment	Treated Water
	AGS Reference			
	Depth (m)		0.00 - 0.00	0.00 - 0.00
	Container		Vial (ALE297)	ZnAc (ALE246) Vial (ALE297) NaOH (ALE245) H2SO4 (ALE24 Dissolved Meta 500ml Plastic (A 0.5l glass bottle Vial (ALE297)
pH Value	All	NDPs: 0 Tests: 1	X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1		X
Sulphide	All	NDPs: 0 Tests: 1		X
Suspended Solids	All	NDPs: 0 Tests: 1	X	
TPH CWG (W)	All	NDPs: 0 Tests: 1	X	
VOC MS (W)	All	NDPs: 0 Tests: 1		X



CERTIFICATE OF ANALYSIS

Validated

SDG: 161213-103 Client Reference: Bradford Road No. 2 Gash Report Number: 391719
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

Results Legend		Customer Sample Ref.	Pre Treatment	Treated Water				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
M	mCERTS accredited.		0.00 - 0.00	0.00 - 0.00				
aq	Aqueous / settled sample.		Water(GW/SW)	Water(GW/SW)				
diss.filt	Dissolved / filtered sample.		09/12/2016	09/12/2016				
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		13/12/2016	13/12/2016				
(F)	Trigger breach confirmed		161213-103	161213-103				
1-5&#pound;	Sample deviation (see appendix)		14703570	14703556				
Component	LOD/Units	Method						
Suspended solids, Total	<2 mg/l	TM022		9	#			
Carbon, Organic (diss.filt)	<3 mg/l	TM090		5.16	@			
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099		2.3	#			
Sulphide	<0.01 mg/l	TM101		0.0181	#			
COD, settled	<7 mg/l	TM107		28	#			
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120		0.0878	#			
Arsenic (diss.filt)	<0.00051 mg/l	TM152		0.00167	#			
Boron (diss.filt)	<0.005 mg/l	TM152		0.0211	#			
Cadmium (diss.filt)	<0.00008 mg/l	TM152		<0.00008	#			
Chromium (diss.filt)	<0.0012 mg/l	TM152		<0.0012	#			
Copper (diss.filt)	<0.00085 mg/l	TM152		<0.00085	#			
Lead (diss.filt)	<0.0001 mg/l	TM152		0.000207	#			
Nickel (diss.filt)	<0.00044 mg/l	TM152		0.000513	#			
Selenium (diss.filt)	<0.00081 mg/l	TM152		<0.00081	#			
Zinc (diss.filt)	<0.0013 mg/l	TM152		0.00647	#			
EPH Range >C10 - C40 (aq)	<0.046 mg/l	TM172		0.179	#			
Mercury (diss.filt)	<0.00001 mg/l	TM183		<0.00001	#			
Sulphate	<2 mg/l	TM184		<2	#			
Chloride	<2 mg/l	TM184		5.8	#			
Methane, dissolved	<0.001 mg/l	TM223	0.00298	0.00221				
Cyanide, Total	<0.05 mg/l	TM227		<0.05	#			
Cyanide, Free	<0.05 mg/l	TM227		<0.05	#			
Cyanide, Complex	<0.05 mg/l	TM227		<0.05	#			
Thiocyanate	<0.05 mg/l	TM227		<0.05	#			
Iron (diss.filt)	<0.019 mg/l	TM228		0.0207	#			
pH	<1 pH Units	TM256		7.7	#			
Resorcinol	<0.01 mg/l	TM259		<0.01				
Catechol	<0.01 mg/l	TM259		<0.01				
Phenol	<0.002 mg/l	TM259		<0.002	#			
Cresols	<0.006 mg/l	TM259		<0.006	#			
Xylenols	<0.008 mg/l	TM259		<0.008	#			
1-Naphthol	<0.01 mg/l	TM259		<0.01	#			



CERTIFICATE OF ANALYSIS

Validated

SDG: 161213-103 Client Reference: Bradford Road No. 2 Gash Report Number: 391719
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

TPH CWG (W)

Results Legend		Customer Sample Ref.	Treated Water				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00 Water(GW/SW) 09/12/2016 13/12/2016 161213-103 14703556				
M	mCERTS accredited.						
aq	Aqueous / settled sample.						
diss.filt	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						
1-5&#pound;	Sample deviation (see appendix)						
Component	LOD/Units	Method					
GRO Surrogate % recovery**	%	TM245	80				
GRO >C5-C12	<0.05 mg/l	TM245	<0.05	#			
Methyl tertiary butyl ether (MTBE)	<0.003 mg/l	TM245	<0.003	#			
Benzene	<0.007 mg/l	TM245	<0.007	#			
Toluene	<0.004 mg/l	TM245	<0.004	#			
Ethylbenzene	<0.005 mg/l	TM245	<0.005	#			
m,p-Xylene	<0.008 mg/l	TM245	<0.008	#			
o-Xylene	<0.003 mg/l	TM245	<0.003	#			
Sum of detected Xylenes	<0.011 mg/l	TM245	<0.011				
Sum of detected BTEX	<0.028 mg/l	TM245	<0.028				
Aliphatics >C5-C6	<0.01 mg/l	TM245	<0.01				
Aliphatics >C6-C8	<0.01 mg/l	TM245	<0.01				
Aliphatics >C8-C10	<0.01 mg/l	TM245	<0.01				
Aliphatics >C10-C12	<0.01 mg/l	TM245	<0.01				
Aliphatics >C12-C16 (aq)	<0.01 mg/l	TM174	<0.01				
Aliphatics >C16-C21 (aq)	<0.01 mg/l	TM174	<0.01				
Aliphatics >C21-C35 (aq)	<0.01 mg/l	TM174	<0.01				
Total Aliphatics >C12-C35 (aq)	<0.01 mg/l	TM174	<0.01				
Aromatics >EC5-EC7	<0.01 mg/l	TM245	<0.01				
Aromatics >EC7-EC8	<0.01 mg/l	TM245	<0.01				
Aromatics >EC8-EC10	<0.01 mg/l	TM245	<0.01				
Aromatics >EC10-EC12	<0.01 mg/l	TM245	<0.01				
Aromatics >EC12-EC16 (aq)	<0.01 mg/l	TM174	<0.01				
Aromatics >EC16-EC21 (aq)	<0.01 mg/l	TM174	<0.01				
Aromatics >EC21-EC35 (aq)	<0.01 mg/l	TM174	<0.01				
Total Aromatics >EC12-EC35 (aq)	<0.01 mg/l	TM174	<0.01				
Total Aliphatics & Aromatics >C5-35 (aq)	<0.01 mg/l	TM174	<0.01				



CERTIFICATE OF ANALYSIS

Validated

SDG: 161213-103 Client Reference: Bradford Road No. 2 Gash Report Number: 391719
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis		
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, 1998	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		
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser		
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit		
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters		
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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		
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		
TM294		Determination of Free Sulphur in liquids 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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SDG: 161213-103 Client Reference: Bradford Road No. 2 Gash Report Number: 391719
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

Test Completion Dates

Lab Sample No(s)	14703570	14703556
Customer Sample Ref.	Pre Treatment	Treated Water
AGS Ref.		
Depth	0.00 - 0.00	0.00 - 0.00
Type	LIQUID	LIQUID

Ammoniacal Nitrogen		20-Dec-2016
Anions by Kone (w)		20-Dec-2016
COD on Settled Sample		21-Dec-2016
Conductivity (at 20 deg.C)		20-Dec-2016
Cyanide Comp/Free/Total/Thiocyanate		16-Dec-2016
Determination of Dissolved Gases	23-Dec-2016	23-Dec-2016
Dissolved Metals by ICP-MS		21-Dec-2016
Dissolved Organic/Inorganic Carbon		23-Dec-2016
EPH (DRO) (C10-C40) Aqueous (W)		20-Dec-2016
EPH CWG (Aliphatic) Aqueous GC (W)		20-Dec-2016
EPH CWG (Aromatic) Aqueous GC (W)		20-Dec-2016
Free Sulphur		20-Dec-2016
GRO by GC-FID (W)		20-Dec-2016
Mercury Dissolved		21-Dec-2016
Metals by iCap-OES Dissolved (W)		16-Dec-2016
PAH Spec MS - Aqueous (W)		20-Dec-2016
pH Value		20-Dec-2016
Phenols by HPLC (W)		19-Dec-2016
Sulphide		19-Dec-2016
Suspended Solids		21-Dec-2016
TPH CWG (W)		20-Dec-2016
VOC MS (W)		20-Dec-2016



CERTIFICATE OF ANALYSIS

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SDG: 161213-103 Client Reference: Bradford Road No. 2 Gash Report Number: 391719
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1452
Ammoniacal Nitrogen as N	TM099	102.0 93.47 : 108.25

Anions by Kone (w)

Component	Method Code	QC 1490
Chloride	TM184	106.0 92.93 : 115.43
Phosphate (Ortho as PO4)	TM184	96.40 : 108.40
Sulphate (soluble)	TM184	101.2 90.53 : 113.03
TON as NO3	TM184	96.26 : 111.21

COD on Settled Sample

Component	Method Code	QC 1491
COD	TM107	99.81 97.52 : 103.12

Conductivity (at 20 deg.C)

Component	Method Code	QC 1432
Conductivity (at 20 deg.C)	TM120	103.01 98.35 : 107.28

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 1427
Free Cyanide (W)	TM227	103.5 93.25 : 112.75
Thiocyanate (W)	TM227	104.0 97.75 : 109.75
Total Cyanide (W)	TM227	108.25 95.25 : 111.75

Determination of Dissolved Gases



CERTIFICATE OF ANALYSIS

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SDG: 161213-103 Client Reference: Bradford Road No. 2 Gash Report Number: 391719
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

Determination of Dissolved Gases

Component	Method Code	QC 1489
Carbon Dioxide Dissolved Raw	TM223	48.0 85.00 : 115.00
Ethane Dissolved Raw	TM223	97.76 93.36 : 102.66
Methane Dissolved Raw	TM223	122.97 68.59 : 131.41
Propane Dissolved Raw	TM223	99.6 93.58 : 102.48

Dissolved Metals by ICP-MS

Component	Method Code	QC 1412
Aluminium	TM152	105.67 0.00 : 0.00
Antimony	TM152	104.33 0.00 : 0.00
Arsenic	TM152	106.17 0.00 : 0.00
Barium	TM152	106.83 0.00 : 0.00
Beryllium	TM152	99.0 0.00 : 0.00
Borate	TM152	97.53 0.00 : 0.00
Boron	TM152	97.67 0.00 : 0.00
Cadmium	TM152	103.33 0.00 : 0.00
Chromium	TM152	103.33 0.00 : 0.00
Cobalt	TM152	101.67 0.00 : 0.00
Copper	TM152	101.5 0.00 : 0.00
Lead	TM152	103.83 0.00 : 0.00
Lithium	TM152	98.67 0.00 : 0.00
Manganese	TM152	103.83 0.00 : 0.00
Molybdenum	TM152	102.17 0.00 : 0.00
Nickel	TM152	101.17 0.00 : 0.00
Phosphorus	TM152	105.33 0.00 : 0.00
Selenium	TM152	106.5 0.00 : 0.00
Strontium	TM152	106.67 0.00 : 0.00
Tellurium	TM152	101.67 0.00 : 0.00
Thallium	TM152	106.17 0.00 : 0.00



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SDG: 161213-103 Client Reference: Bradford Road No. 2 Gash Report Number: 391719
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

Dissolved Metals by ICP-MS

		QC 1412
Titanium	TM152	109.33 0.00 : 0.00
Uranium	TM152	106.0 0.00 : 0.00
Vanadium	TM152	90.83 0.00 : 0.00
Zinc	TM152	101.33 0.00 : 0.00

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 1434
Dissolved Inorganic Carbon	TM090	100.17 90.33 : 114.83
Dissolved Organic Carbon	TM090	102.33 94.18 : 111.18

EPH (DRO) (C10-C40) Aqueous (W)

Component	Method Code	QC 1436
EPH (DRO) (C10-C40)	TM172	88.0 59.47 : 106.15

EPH CWG (Aliphatic) Aqueous GC (W)

Component	Method Code	QC 1469
Total Aliphatics >C12-C35	TM174	95.83 66.67 : 110.42

EPH CWG (Aromatic) Aqueous GC (W)

Component	Method Code	QC 1478
Total Aromatics >EC12-EC35	TM174	99.33 63.00 : 121.00

GRO by GC-FID (W)

Component	Method Code	QC 1405
Benzene by GC	TM245	109.0 76.38 : 121.90
Ethylbenzene by GC	TM245	110.5 74.02 : 123.14



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Validated

SDG: 161213-103 Client Reference: Bradford Road No. 2 Gash Report Number: 391719
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

GRO by GC-FID (W)

		QC 1405
m & p Xylene by GC	TM245	110.5 74.03 : 123.21
MTBE GC-FID	TM245	106.0 76.82 : 121.46
o Xylene by GC	TM245	110.0 74.37 : 122.75
QC	TM245	103.64 69.19 : 113.44
Toluene by GC	TM245	110.0 75.75 : 124.83

Mercury Dissolved

Component	Method Code	QC 1438
Mercury Dissolved (CVAf)	TM183	101.0 73.51 : 120.83

Metals by iCap-OES Dissolved (W)

Component	Method Code	QC 1403
Calcium	TM228	101.0 85.73 : 108.53
Iron	TM228	94.0 81.27 : 106.87
Magnesium	TM228	97.7 85.49 : 107.57
Potassium	TM228	98.1 84.09 : 110.37
Sodium	TM228	98.6 83.66 : 109.52

PAH Spec MS - Aqueous (W)

Component	Method Code	QC 1485
Acenaphthene by GCMS	TM178	99.0 88.30 : 110.50
Acenaphthylene by GCMS	TM178	97.5 84.85 : 108.85
Anthracene by GCMS	TM178	93.0 74.00 : 116.00
Benz(a)anthracene by GCMS	TM178	91.0 83.40 : 113.40
Benzo(a)pyrene by GCMS	TM178	103.0 85.00 : 130.00
Benzo(b)fluoranthene by GCMS	TM178	113.0 89.60 : 137.60
Benzo(ghi)perylene by GCMS	TM178	95.5 81.04 : 111.10
Benzo(k)fluoranthene by GCMS	TM178	109.0 87.50 : 132.50
Chrysene by GCMS	TM178	100.0 89.75 : 115.25



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SDG: 161213-103 Client Reference: Bradford Road No. 2 Gash Report Number: 391719
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

PAH Spec MS - Aqueous (W)

		QC 1485
Dibenzo(ah)anthracene by GCMS	TM178	92.5 72.00 : 109.50
Fluoranthene by GCMS	TM178	95.5 86.30 : 112.40
Fluorene by GCMS	TM178	94.5 89.20 : 111.70
Indeno(123cd)pyrene by GCMS	TM178	100.5 84.94 : 119.98
Naphthalene by GCMS	TM178	100.5 85.80 : 112.80
Phenanthrene by GCMS	TM178	99.0 87.40 : 112.00
Pyrene by GCMS	TM178	92.5 86.35 : 111.85

pH Value

Component	Method Code	QC 1410
pH	TM256	101.08 99.41 : 102.03

Phenols by HPLC (W)

Component	Method Code	QC 1423
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	99.0 87.66 : 106.14
2-Isopropyl Phenol by HPLC (W)	TM259	114.0 54.45 : 143.55
Cresols by HPLC (W)	TM259	99.33 90.12 : 109.54
Napthol by HPLC (W)	TM259	94.0 84.00 : 102.00
Phenol by HPLC (W)	TM259	93.0 90.72 : 107.28
Xylenols by HPLC (W)	TM259	95.83 88.13 : 105.94

Sulphide

Component	Method Code	QC 1412
Sulphide	TM101	102.67 89.29 : 110.21

Suspended Solids



CERTIFICATE OF ANALYSIS

Validated

SDG: 161213-103 Client Reference: Bradford Road No. 2 Gash Report Number: 391719
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

Suspended Solids

Component	Method Code	QC 1405
Total Suspended Solids	TM022	96.29 94.26 : 101.34

VOC MS (W)

Component	Method Code	QC 1415
1,1,1,2-Tetrachloroethane	TM208	97.5 79.47 : 113.27
1,1,1-Trichloroethane	TM208	96.5 83.02 : 113.68
1,1-Dichloroethane	TM208	99.0 77.85 : 123.56
1,2-Dichloroethane	TM208	107.0 76.84 : 121.25
2-Chlorotoluene	TM208	93.5 79.59 : 108.84
4-Chlorotoluene	TM208	95.5 80.71 : 109.93
Benzene	TM208	102.0 83.14 : 116.86
Bromomethane	TM208	105.5 79.04 : 133.13
Carbontetrachloride	TM208	96.5 81.71 : 111.17
Chlorobenzene	TM208	95.0 82.80 : 111.73
Chloroform	TM208	103.0 77.50 : 122.50
Chloromethane	TM208	99.0 64.99 : 145.80
Cis-1,2-Dichloroethene	TM208	102.5 82.62 : 123.81
Dichloromethane	TM208	103.0 80.45 : 125.21
Ethylbenzene	TM208	94.0 78.70 : 114.10
Hexachlorobutadiene	TM208	90.0 77.39 : 115.41
o-Xylene	TM208	94.0 80.90 : 110.89
p/m-Xylene	TM208	94.0 82.30 : 110.23
Tert-butyl methyl ether	TM208	104.5 76.57 : 125.98
Tetrachloroethene	TM208	91.0 81.81 : 116.48
Toluene	TM208	97.0 82.53 : 110.82
Trichloroethene	TM208	96.5 83.36 : 113.06



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Validated

SDG: 161213-103 **Client Reference:** Bradford Road No. 2 Gash **Report Number:** 391719
Location: Bradford Road, Manchester **Order Number:** 76084 **Superseded Report:**

VOC MS (W)

		QC 1415
Vinyl Chloride	TM208	96.5 77.49 : 134.01

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

Validated

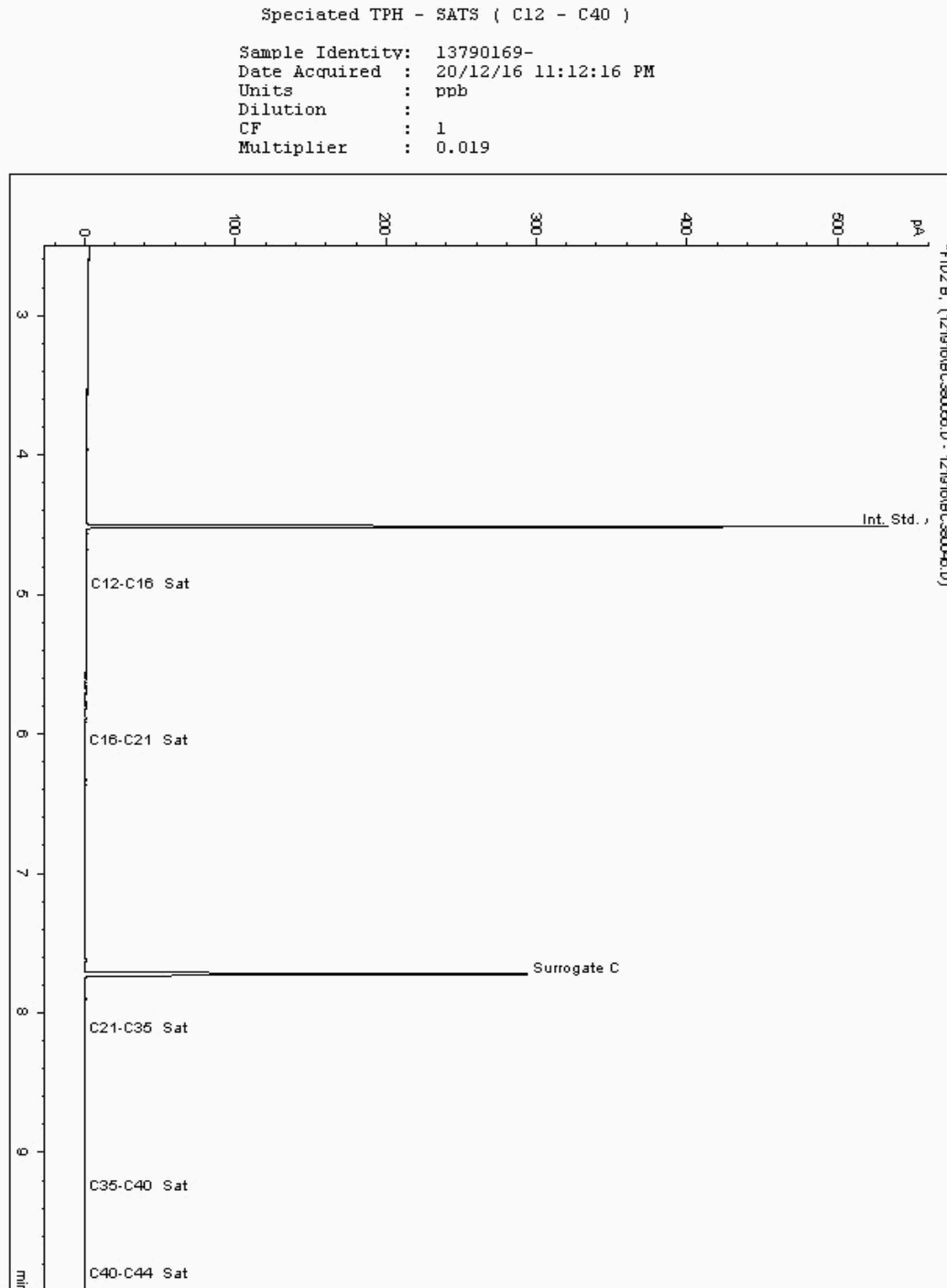
SDG: 161213-103 Client Reference: Bradford Road No. 2 Gash Report Number: 391719
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 14717463
Sample ID : Treated Water

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

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SDG: 161213-103 Client Reference: Bradford Road No. 2 Gash Report Number: 391719
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

Chromatogram

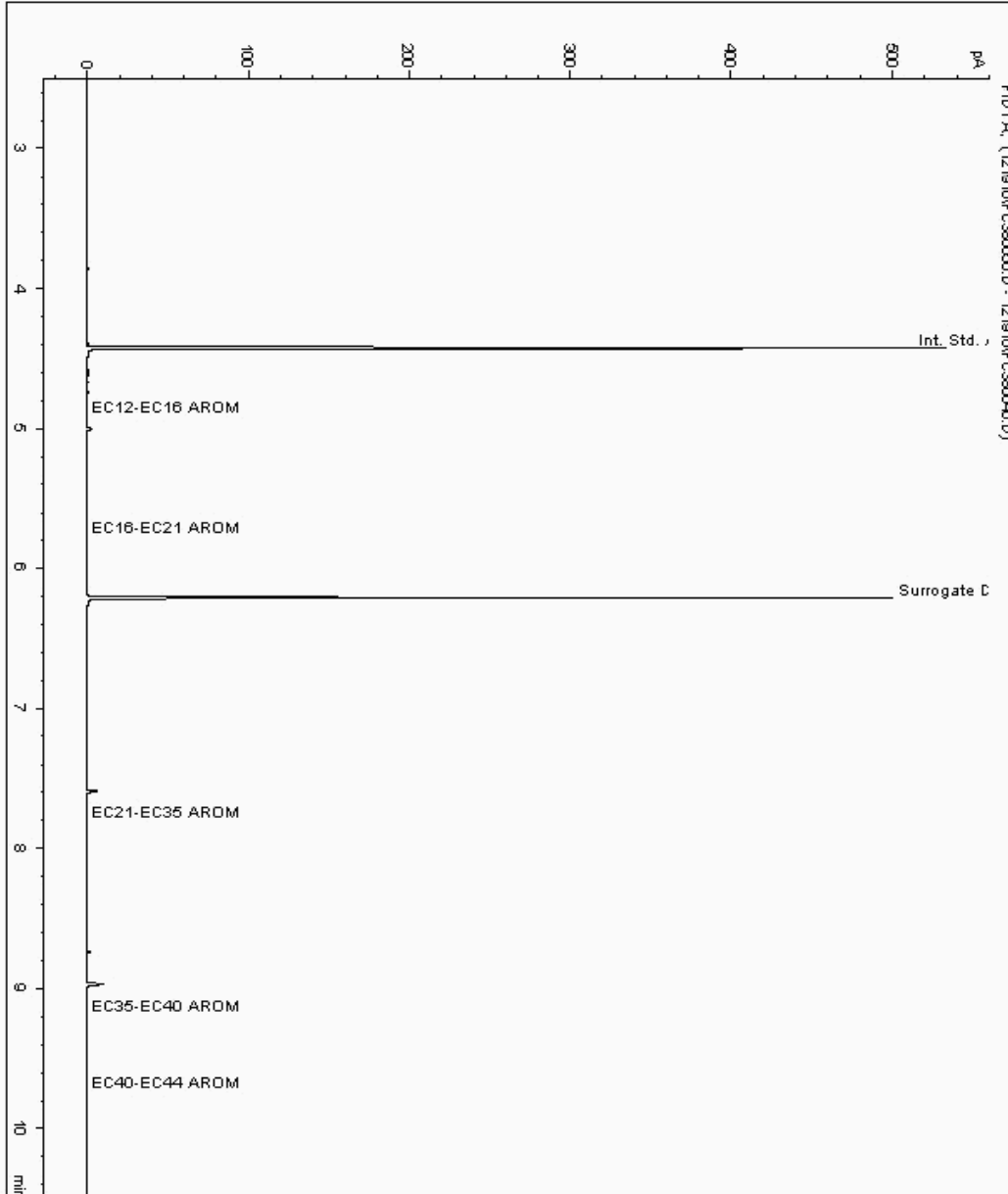
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 14717463
Sample ID : Treated Water

Depth : 0.00 - 0.00

Speciated TPH - AROM (C12 - C40)

Sample Identity: 13790170-
Date Acquired : 20/12/16 11:12:15 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.019





CERTIFICATE OF ANALYSIS

Validated

SDG: 161213-103 Client Reference: Bradford Road No. 2 Gash Report Number: 391719
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

Chromatogram

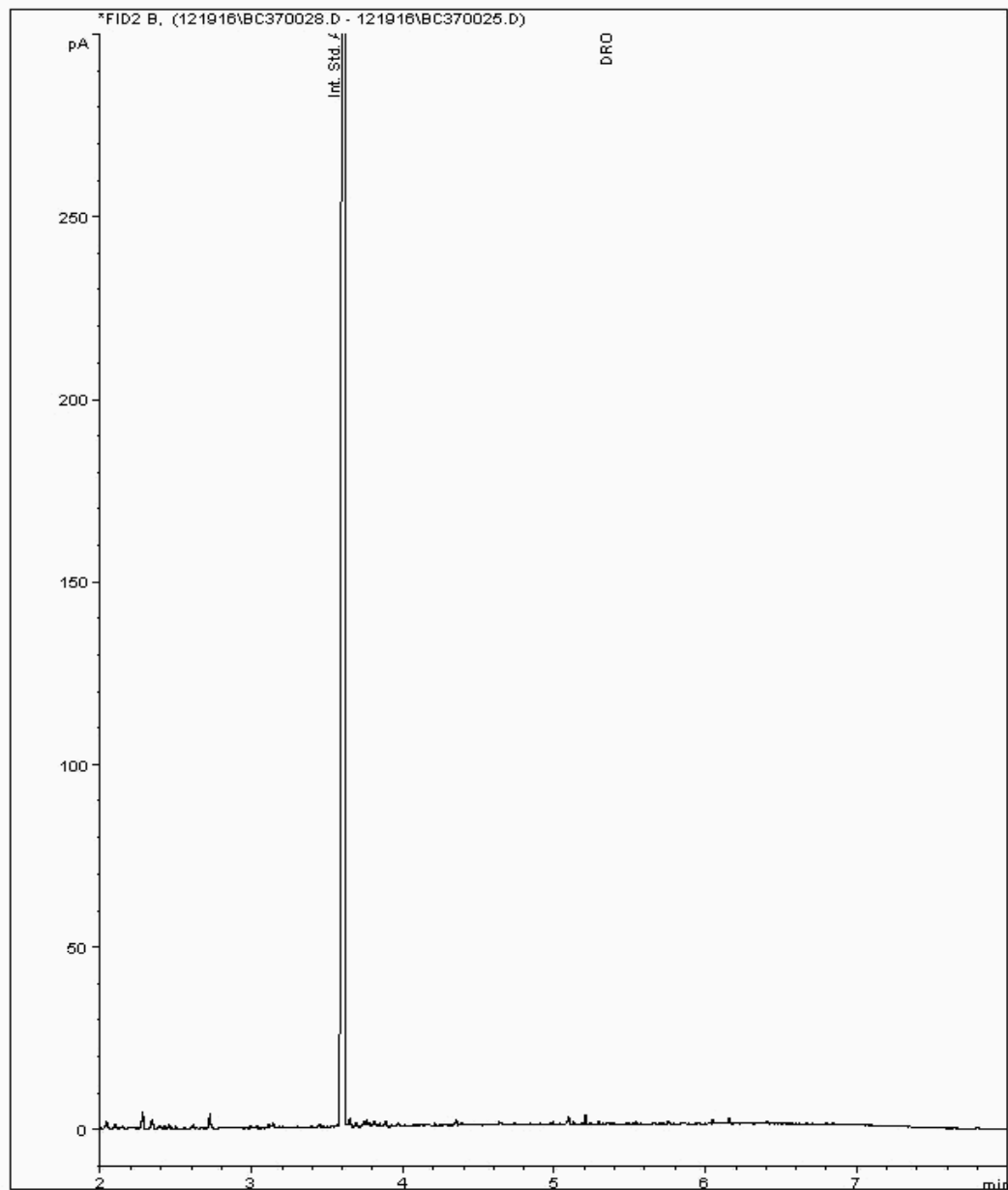
Analysis: EPH (DRO) (C10-C40) Aqueous (W)

Sample No : 14717463
Sample ID : Treated Water

Depth : 0.00 - 0.00

EPH Range Organics (C10 - C40)

Sample Identity: 13790174-
Date Acquired : 20/12/2016 03:22:53 PM
Units : mg/l





CERTIFICATE OF ANALYSIS

Validated

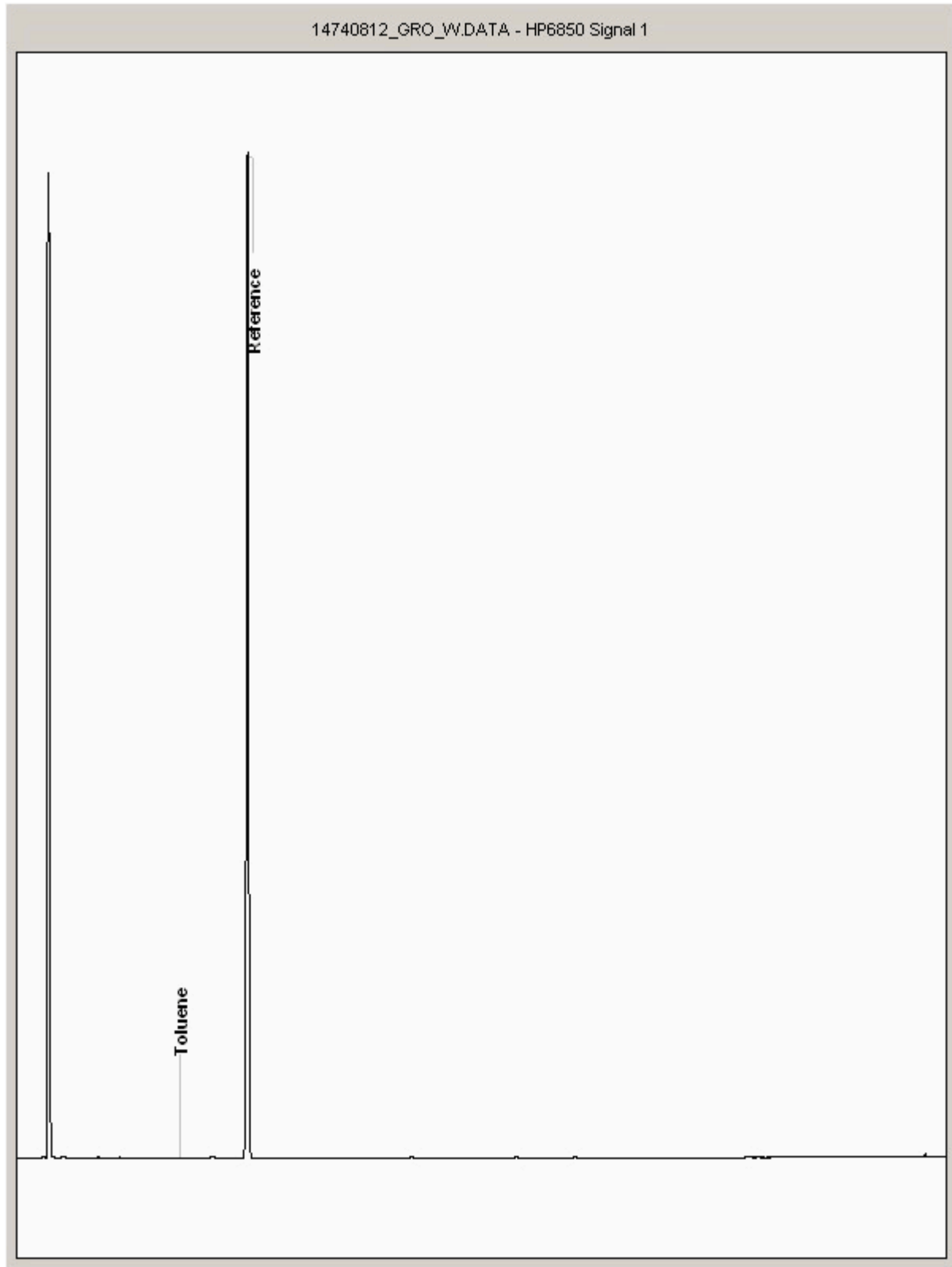
SDG:	161213-103	Client Reference:	Bradford Road No. 2 Gash	Report Number:	391719
Location:	Bradford Road, Manchester	Order Number:	76084	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 14740812
Sample ID : Treated Water

Depth : 0.00 - 0.00





CERTIFICATE OF ANALYSIS

SDG:	161213-103	Client Reference:	Bradford Road No. 2 Gas	Report Number:	391719
Location:	Bradford Road, Manchester	Order Number:	76084	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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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 GCFID/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 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

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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CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 25 January 2017
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 170114-33
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 394949

We received 1 sample on Saturday January 14, 2017 and 1 of these samples were scheduled for analysis which was completed on Wednesday January 25, 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





CERTIFICATE OF ANALYSIS

Validated

SDG: 170114-33 **Client Reference:** Bradford Road No. 2 Gashol **Report Number:** 394949
Location: Bradford Road, Manchester **Order Number:** 76084 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
14830749	Discharge		0.00 - 0.00	12/01/2017

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 170114-33 Client Reference: Bradford Road No. 2 Gashold
Location: Bradford Road, Manchester Order Number: 76084 Report Number: 394949
Superseded Report:

LIQUID Results Legend X Test N No Determination Possible	Lab Sample No(s)		14830749
	Customer Sample Reference		Discharge
	AGS Reference		
	Depth (m)		0.00 - 0.00
	Container		Vial (ALE297) 11 plastic (ALE221)
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 1	X
COD on Settled Sample	All	NDPs: 0 Tests: 1	X
Determination of Dissolved Gases	All	NDPs: 0 Tests: 1	X
pH Value	All	NDPs: 0 Tests: 1	X
Suspended Solids	All	NDPs: 0 Tests: 1	X



CERTIFICATE OF ANALYSIS

Validated

SDG: 170114-33 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 394949
Location: Bradford Road, Manchester **Order Number:** 76084 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis		
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters		
TM099	BS 2690: Part 7:1968 / BS 6068: 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		
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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		

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: 170114-33 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 394949
Location: Bradford Road, Manchester **Order Number:** 76084 **Superseded Report:**

Test Completion Dates

Lab Sample No(s)	14830749
Customer Sample Ref.	Discharge
AGS Ref.	
Depth	0.00 - 0.00
Type	LIQUID

Ammoniacal Nitrogen	21-Jan-2017
COD on Settled Sample	18-Jan-2017
Determination of Dissolved Gases	25-Jan-2017
pH Value	17-Jan-2017
Suspended Solids	18-Jan-2017



CERTIFICATE OF ANALYSIS

Validated

SDG: 170114-33

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Report Number:

394949

Order Number:

76084

Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1442
Ammoniacal Nitrogen as N	TM099	102.8 93.47 : 108.25

COD on Settled Sample

Component	Method Code	QC 1404
COD	TM107	101.33 97.52 : 103.12

Determination of Dissolved Gases

Component	Method Code	QC 1467
Carbon Dioxide Dissolved Raw	TM223	48.5 85.00 : 115.00
Ethane Dissolved Raw	TM223	97.1 93.36 : 102.66
Methane Dissolved Raw	TM223	114.62 68.59 : 131.41
Propane Dissolved Raw	TM223	95.77 93.58 : 102.48

pH Value

Component	Method Code	QC 1424
pH	TM256	101.48 99.41 : 102.03

Suspended Solids

Component	Method Code	QC 1445
Total Suspended Solids	TM022	97.61 94.79 : 101.64

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	170114-33	Client Reference:	Bradford Road No. 2 Gas	Report Number:	394949
Location:	Bradford Road, Manchester	Order Number:	76084	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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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 GCFID/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 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

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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Celtic
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Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 15 March 2017
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 170307-85
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 401173

We received 1 sample on Tuesday March 07, 2017 and 1 of these samples were scheduled for analysis which was completed on Wednesday March 15, 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





CERTIFICATE OF ANALYSIS

Validated

SDG: 170307-85 **Client Reference:** Bradford Road No. 2 Gashol **Report Number:** 401173
Location: Bradford Road, Manchester **Order Number:** 76084 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
15129148	Discharge		0.00 - 0.00	28/02/2017

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 170307-85 Client Reference: Bradford Road No. 2 Gashol Report Number: 401173
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

Trade Effluent (TE) Results Legend X Test N No Determination Possible	Lab Sample No(s)		15129148
	Customer Sample Reference		Discharge
	AGS Reference		
	Depth (m)		0.00 - 0.00
	Container		1 plastic (ALE221) 0.5l glass bottle (ALE227)
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 1	X
COD on Settled Sample	All	NDPs: 0 Tests: 1	X
Determination of Dissolved Gases	All	NDPs: 0 Tests: 1	X
pH Value	All	NDPs: 0 Tests: 1	X
Suspended Solids	All	NDPs: 0 Tests: 1	X



CERTIFICATE OF ANALYSIS

Validated

SDG: 170307-85 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 401173
Location: Bradford Road, Manchester **Order Number:** 76084 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis		
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters		
TM099	BS 2690: Part 7:1968 / BS 6068: 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		
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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		

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: 170307-85 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 401173
Location: Bradford Road, Manchester **Order Number:** 76084 **Superseded Report:**

Test Completion Dates

Lab Sample No(s) 15129148
Customer Sample Ref. Discharge
AGS Ref.
Depth 0.00 - 0.00
Type TRADE_EFFL

Ammoniacal Nitrogen	13-Mar-2017
COD on Settled Sample	11-Mar-2017
Determination of Dissolved Gases	15-Mar-2017
pH Value	15-Mar-2017
Suspended Solids	15-Mar-2017



CERTIFICATE OF ANALYSIS

Validated

SDG: 170307-85

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Order Number: 76084

Report Number:

401173

Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1583
Ammoniacal Nitrogen as N	TM099	99.6 93.47 : 108.25

COD on Settled Sample

Component	Method Code	QC 1504
COD	TM107	100.19 97.52 : 103.12

Determination of Dissolved Gases

Component	Method Code	QC 1504
Carbon Dioxide Dissolved Raw	TM223	50.1 85.00 : 115.00
Ethane Dissolved Raw	TM223	97.07 95.52 : 104.00
Methane Dissolved Raw	TM223	121.74 68.59 : 131.41
Propane Dissolved Raw	TM223	98.99 95.41 : 102.49

pH Value

Component	Method Code	QC 1549
pH	TM256	101.35 100.13 : 102.56

Suspended Solids

Component	Method Code	QC 1515
Total Suspended Solids	TM022	100.27 94.79 : 101.64

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	170307-85	Client Reference:	Bradford Road No. 2 Gas	Report Number:	401173
Location:	Bradford Road, Manchester	Order Number:	76084	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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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 GCFID/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 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

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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Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 24 March 2017
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 170316-96
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 402619

We received 1 sample on Thursday March 16, 2017 and 1 of these samples were scheduled for analysis which was completed on Friday March 24, 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





CERTIFICATE OF ANALYSIS

Validated

SDG:	170316-96	Client Reference:	Bradford Road No. 2 Gash	Report Number:	402619
Location:	Bradford Road, Manchester	Order Number:	76084	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
15189168	Discharge		0.00 - 0.00	13/03/2017

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 170316-96 Client Reference: Bradford Road No. 2 Gash Report Number: 402619
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

Results Legend X Test N No Determination Possible Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		151 89168								
	Customer Sample Reference		Discharge								
	AGS Reference		0.00 - 0.00								
	Depth (m)										
	Container		ZnAc (ALE246)	Vial (ALE297)	NaOH (ALE245)	HNO3 Filtered (ALE204)	H2SO4 (ALE244)	11plastic (ALE221)	1000ml glass bottle (ALE220)		
	Sample Type		TE	TE	TE	TE	TE	TE	TE		
	Ammoniacal Nitrogen	All	NDPs: 0 Tests: 1				X				
Anions by Kone (w)	All	NDPs: 0 Tests: 1		X							
COD on Settled Sample	All	NDPs: 0 Tests: 1		X							
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 1		X							
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1							X		
Determination of Dissolved Gases	All	NDPs: 0 Tests: 1								X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1				X					
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X								
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 1	X								
Free Sulphur	All	NDPs: 0 Tests: 1	X								
Mercury Dissolved	All	NDPs: 0 Tests: 1	X								
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 1				X					
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 1	X								
pH Value	All	NDPs: 0 Tests: 1		X							
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1			X						



CERTIFICATE OF ANALYSIS

Validated

SDG: 170316-96 Client Reference: Bradford Road No. 2 Gash Report Number: 402619
Location: Bradford Road, Manchester Order Number: 76084 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

Lab Sample No(s)

15189168

Customer
Sample Reference

Discharge

AGS Reference

Depth (m)

0.00 - 0.00

Container

1000ml glass
bottle (ALE220)

11plastic
(ALE221)

H2SO4
(ALE244)

HNO3 Filtered
(ALE204)

NaOH (ALE245)

Vial (ALE297)

ZnAc (ALE246)

Sample Type

TE

TE

TE

TE

TE

TE

TE

TE

Sulphide

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X

VOC MS (W)

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 170316-96 Client Reference: Bradford Road No. 2 Gash Report Number: 402619
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

Results Legend		Customer Sample Ref.	Discharge				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00 Trade Effluent (TE) 13/03/2017 16/03/2017 170316-96 15189168				
M	mCERTS accredited.						
aq	Aqueous / settled sample.						
diss.filt	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						
1-58*\$@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Suspended solids, Total	<2 mg/l	TM022	5.5				
			@ M				
Carbon, Organic (diss.filt)	<3 mg/l	TM090	5.5				
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	1.15				
			M				
Sulphide	<0.01 mg/l	TM101	<0.01				
			#				
COD, settled	<7 mg/l	TM107	19.7				
			#				
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120	0.0664				
			M				
Arsenic (diss.filt)	<0.00051 mg/l	TM152	0.00826				
			#				
Boron (diss.filt)	<0.005 mg/l	TM152	0.00725				
			#				
Cadmium (diss.filt)	<0.00008 mg/l	TM152	0.000088				
			#				
Chromium (diss.filt)	<0.0012 mg/l	TM152	<0.0012				
			#				
Copper (diss.filt)	<0.00085 mg/l	TM152	0.00217				
			#				
Lead (diss.filt)	<0.0001 mg/l	TM152	0.00279				
			#				
Nickel (diss.filt)	<0.00044 mg/l	TM152	0.000504				
			#				
Selenium (diss.filt)	<0.00081 mg/l	TM152	<0.00081				
			#				
Zinc (diss.filt)	<0.0013 mg/l	TM152	0.0365				
			#				
EPH Range >C10 - C40 (aq)	<0.046 mg/l	TM172	0.235				
Mercury (diss.filt)	<0.00001 mg/l	TM183	<0.00001				
			#				
Sulphate	<2 mg/l	TM184	<2				
			#				
Chloride	<2 mg/l	TM184	4.7				
			#				
Methane, dissolved	<0.001 mg/l	TM223	<0.00223				
Cyanide, Total	<0.05 mg/l	TM227	<0.05				
			M				
Cyanide, Free	<0.05 mg/l	TM227	<0.05				
			M				
Cyanide, Complex	<0.05 mg/l	TM227	<0.05				
Thiocyanate	<0.05 mg/l	TM227	<0.05				
			M				
Iron (diss.filt)	<0.019 mg/l	TM228	0.857				
			#				
pH	<1 pH Units	TM256	7.33				
			@ M				
Resorcinol	<0.01 mg/l	TM259	<0.01				
Catechol	<0.01 mg/l	TM259	<0.01				
Phenol	<0.002 mg/l	TM259	<0.002				
			#				
Cresols	<0.006 mg/l	TM259	<0.006				
			#				
Xylenols	<0.008 mg/l	TM259	<0.008				
			#				
1-Naphthol	<0.01 mg/l	TM259	<0.01				



CERTIFICATE OF ANALYSIS

Validated

SDG: 170316-96 Client Reference: Bradford Road No. 2 Gash Report Number: 402619
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis		
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, 1998	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		
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser		
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit		
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
TM183	BS EN 23506:2002. (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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		
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		
TM294		Determination of Free Sulphur in liquids 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: 170316-96 **Client Reference:** Bradford Road No. 2 Gash **Report Number:** 402619
Location: Bradford Road, Manchester **Order Number:** 76084 **Superseded Report:**

Test Completion Dates

Lab Sample No(s)	15189168
Customer Sample Ref.	Discharge
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	23-Mar-2017
Anions by Kone (w)	24-Mar-2017
COD on Settled Sample	22-Mar-2017
Conductivity (at 20 deg.C)	23-Mar-2017
Cyanide Comp/Free/Total/Thiocyanate	18-Mar-2017
Determination of Dissolved Gases	24-Mar-2017
Dissolved Metals by ICP-MS	23-Mar-2017
Dissolved Organic/Inorganic Carbon	20-Mar-2017
EPH (DRO) (C10-C40) Aqueous (W)	23-Mar-2017
Free Sulphur	23-Mar-2017
Mercury Dissolved	23-Mar-2017
Metals by iCap-OES Dissolved (W)	24-Mar-2017
PAH Spec MS - Aqueous (W)	23-Mar-2017
pH Value	23-Mar-2017
Phenols by HPLC (W)	20-Mar-2017
Sulphide	23-Mar-2017
Suspended Solids	22-Mar-2017
VOC MS (W)	23-Mar-2017



CERTIFICATE OF ANALYSIS

Validated

SDG: 170316-96 Client Reference: Bradford Road No. 2 Gash Report Number: 402619
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1564
Ammoniacal Nitrogen as N	TM099	101.2 93.47 : 108.25

Anions by Kone (w)

Component	Method Code	QC 1568
Chloride	TM184	107.0 92.93 : 115.43
Phosphate (Ortho as PO4)	TM184	96.40 : 108.40
Sulphate (soluble)	TM184	105.6 90.53 : 113.03
TON as NO3	TM184	108.0 96.26 : 111.21

COD on Settled Sample

Component	Method Code	QC 1516
COD	TM107	99.24 97.52 : 103.12

Conductivity (at 20 deg.C)

Component	Method Code	QC 1514
Conductivity (at 20 deg.C)	TM120	103.76 98.35 : 107.28

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 1568
Free Cyanide (W)	TM227	108.75 93.25 : 112.75
Thiocyanate (W)	TM227	105.5 97.75 : 109.75
Total Cyanide (W)	TM227	106.0 95.25 : 111.75

Determination of Dissolved Gases



CERTIFICATE OF ANALYSIS

Validated

SDG: 170316-96 Client Reference: Bradford Road No. 2 Gash Report Number: 402619
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

Determination of Dissolved Gases

Component	Method Code	QC 1566
Carbon Dioxide Dissolved Raw	TM223	49.5 85.00 : 115.00
Ethane Dissolved Raw	TM223	97.75 95.52 : 104.00
Methane Dissolved Raw	TM223	122.0 68.59 : 131.41
Propane Dissolved Raw	TM223	99.52 95.41 : 102.49

Dissolved Metals by ICP-MS

Component	Method Code	QC 1589
Aluminium	TM152	99.33 95.22 : 106.22
Antimony	TM152	109.83 91.83 : 104.86
Arsenic	TM152	101.5 97.20 : 106.46
Barium	TM152	103.33 93.16 : 109.09
Beryllium	TM152	96.0 95.10 : 106.18
Bismuth	TM152	101.17 88.64 : 97.42
Boron	TM152	94.67 95.03 : 107.55
Cadmium	TM152	101.5 92.49 : 100.24
Chromium	TM152	101.33 93.60 : 104.11
Cobalt	TM152	101.5 93.70 : 102.93
Copper	TM152	102.83 89.33 : 98.72
Lead	TM152	101.83 90.04 : 101.39
Lithium	TM152	97.33 98.02 : 106.69
Manganese	TM152	100.17 94.27 : 103.76
Molybdenum	TM152	100.5 98.90 : 107.48
Nickel	TM152	103.33 90.74 : 100.65
Niobium	TM152	96.38 : 128.85
Phosphorus	TM152	99.67 100.07 : 107.49
Selenium	TM152	99.83 92.52 : 103.93
Silver	TM152	113.0 90.04 : 97.49
Strontium	TM152	101.67 96.86 : 106.04



CERTIFICATE OF ANALYSIS

Validated

SDG: 170316-96 Client Reference: Bradford Road No. 2 Gash Report Number: 402619
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

Dissolved Metals by ICP-MS

		QC 1589
Tellurium	TM152	98.83 68.64 : 103.45
Thallium	TM152	99.17 75.00 : 125.00
Titanium	TM152	101.5 94.78 : 120.64
Tungsten	TM152	102.67 80.07 : 122.86
Uranium	TM152	102.33 97.76 : 108.33
Vanadium	TM152	112.5 93.50 : 111.73
Zinc	TM152	101.67 90.40 : 98.98
Zirconium	TM152	85.51 85.51 : 109.42

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 1508
Dissolved Inorganic Carbon	TM090	102.33 90.33 : 114.83
Dissolved Organic Carbon	TM090	101.67 94.18 : 111.18

EPH (DRO) (C10-C40) Aqueous (W)

Component	Method Code	QC 1525
EPH (DRO) (C10-C40)	TM172	76.0 61.54 : 116.47

Mercury Dissolved

Component	Method Code	QC 1587
Mercury Dissolved (CVAf)	TM183	102.0 73.51 : 120.83

Metals by iCap-OES Dissolved (W)

Component	Method Code	QC 1508	QC 1509
Calcium	TM228	90.6 85.73 : 108.53	93.4 85.73 : 108.53
Iron	TM228	92.67 81.27 : 106.87	94.0 81.27 : 106.87
Magnesium	TM228	90.2 85.49 : 107.57	89.2 85.49 : 107.57



CERTIFICATE OF ANALYSIS

Validated

SDG: 170316-96 Client Reference: Bradford Road No. 2 Gash Report Number: 402619
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

Metals by iCap-OES Dissolved (W)

		QC 1508	QC 1509
Potassium	TM228	94.6 84.09 : 110.37	94.6 84.09 : 110.37
Sodium	TM228	92.7 83.66 : 109.52	93.7 83.66 : 109.52

PAH Spec MS - Aqueous (W)

Component	Method Code	QC 1548
Acenaphthene by GCMS	TM178	99.0 86.55 : 114.15
Acenaphthylene by GCMS	TM178	97.0 85.27 : 110.71
Anthracene by GCMS	TM178	97.0 86.06 : 112.26
Benz(a)anthracene by GCMS	TM178	92.0 79.67 : 116.73
Benzo(a)pyrene by GCMS	TM178	93.0 83.10 : 128.10
Benzo(b)fluoranthene by GCMS	TM178	101.0 86.00 : 131.00
Benzo(ghi)perylene by GCMS	TM178	91.5 79.96 : 107.30
Benzo(k)fluoranthene by GCMS	TM178	107.5 86.51 : 137.15
Chrysene by GCMS	TM178	100.5 86.00 : 114.60
Dibenzo(ah)anthracene by GCMS	TM178	94.5 68.95 : 111.55
Fluoranthene by GCMS	TM178	97.5 81.15 : 116.55
Fluorene by GCMS	TM178	101.5 90.88 : 112.23
Indeno(123cd)pyrene by GCMS	TM178	94.0 82.25 : 114.75
Naphthalene by GCMS	TM178	100.5 87.58 : 110.52
Phenanthrene by GCMS	TM178	100.0 89.55 : 112.75
Pyrene by GCMS	TM178	94.5 82.25 : 116.15

pH Value

Component	Method Code	QC 1505
pH	TM256	100.81 100.13 : 102.56

Phenols by HPLC (W)



CERTIFICATE OF ANALYSIS

Validated

SDG: 170316-96 Client Reference: Bradford Road No. 2 Gash Report Number: 402619
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

Phenols by HPLC (W)

Component	Method Code	QC 1555
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	93.0 89.00 : 113.00
2-Isopropyl Phenol by HPLC (W)	TM259	120.0 98.00 : 134.00
Cresols by HPLC (W)	TM259	99.0 93.33 : 111.33
Napthol by HPLC (W)	TM259	96.0 86.00 : 104.00
Phenol by HPLC (W)	TM259	103.0 89.00 : 107.00
Xylenols by HPLC (W)	TM259	105.67 88.83 : 112.83

Sulphide

Component	Method Code	QC 1519
Sulphide	TM101	95.33 89.29 : 110.21

Suspended Solids

Component	Method Code	QC 1521
Total Suspended Solids	TM022	99.73 94.79 : 101.64

VOC MS (W)

Component	Method Code	QC 1529
1,1,1,2-Tetrachloroethane	TM208	89.5 81.68 : 109.64
1,1,1-Trichloroethane	TM208	91.0 84.67 : 111.97
1,1-Dichloroethane	TM208	93.0 80.19 : 121.45
1,2-Dichloroethane	TM208	101.5 77.68 : 127.05
2-Chlorotoluene	TM208	94.5 82.99 : 106.24
4-Chlorotoluene	TM208	93.5 77.64 : 117.01
Benzene	TM208	98.5 82.30 : 120.49
Bromomethane	TM208	108.0 69.49 : 139.36
Carbontetrachloride	TM208	92.5 82.11 : 114.90
Chlorobenzene	TM208	95.5 80.52 : 109.01



CERTIFICATE OF ANALYSIS

Validated

SDG: 170316-96 Client Reference: Bradford Road No. 2 Gash Report Number: 402619
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

VOC MS (W)

		QC 1529
Chloroform	TM208	95.5 79.28 : 115.84
Chloromethane	TM208	91.0 74.20 : 131.44
Cis-1,2-Dichloroethene	TM208	109.0 82.79 : 125.45
Dichloromethane	TM208	103.5 79.31 : 122.56
Ethylbenzene	TM208	87.5 80.74 : 110.74
Hexachlorobutadiene	TM208	81.0 66.89 : 118.01
o-Xylene	TM208	92.0 77.48 : 109.89
p/m-Xylene	TM208	89.25 80.94 : 113.51
Tert-butyl methyl ether	TM208	97.0 59.77 : 129.51
Tetrachloroethene	TM208	88.0 80.40 : 116.25
Toluene	TM208	91.0 86.02 : 114.04
Trichloroethene	TM208	90.0 83.50 : 113.50
Vinyl Chloride	TM208	90.0 63.71 : 124.88

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

Validated

SDG: 170316-96 Client Reference: Bradford Road No. 2 Gash Report Number: 402619
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

Chromatogram

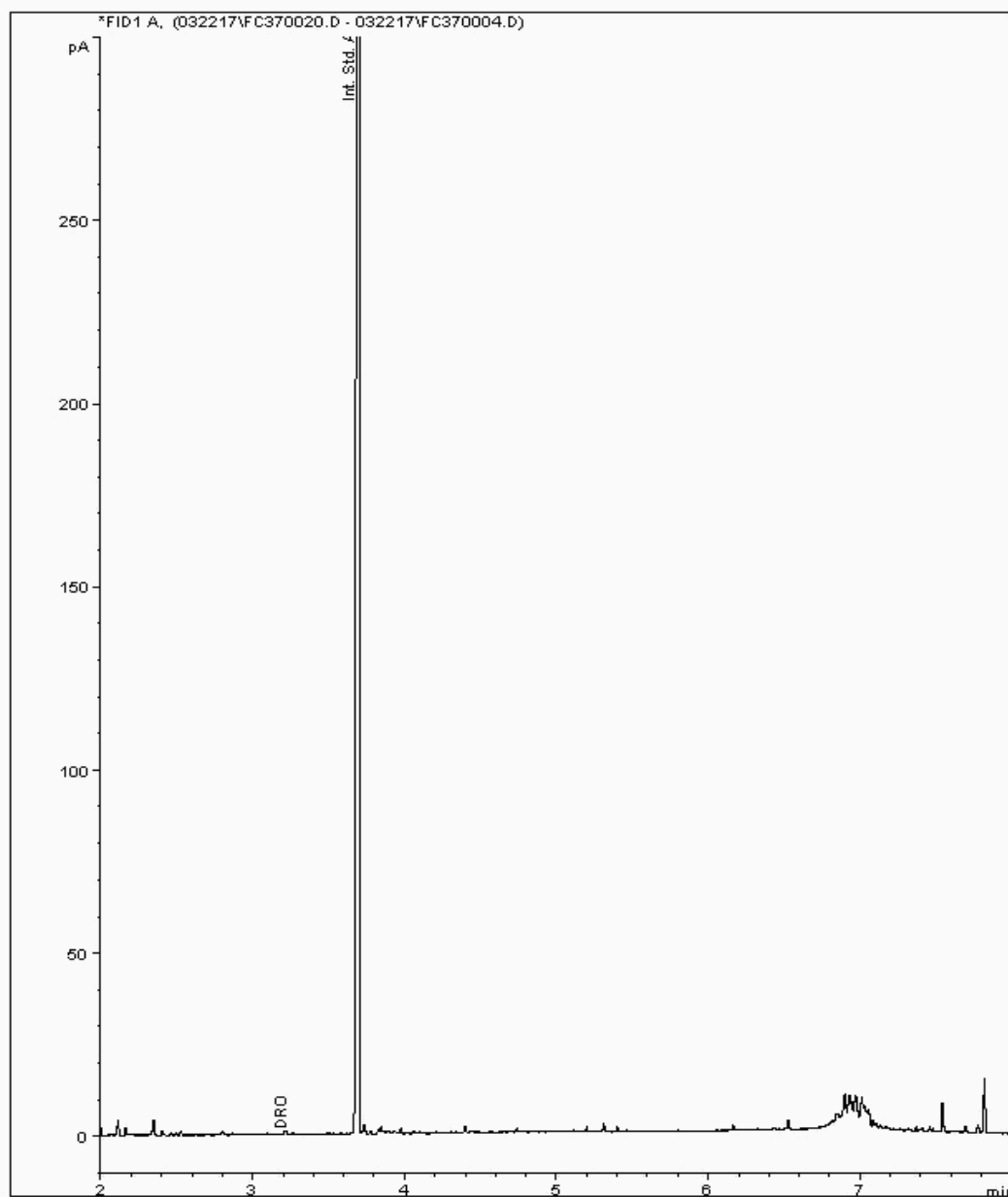
Analysis: EPH (DRO) (C10-C40) Aqueous (W)

Sample No : 15189898
Sample ID : Discharge

Depth : 0.00 - 0.00

EPH Range Organics (C10 - C40)

Sample Identity: 14227363-
Date Acquired : 22/03/2017 23:13:51 PM
Units : mg/l





CERTIFICATE OF ANALYSIS

SDG:	170316-96	Client Reference:	Bradford Road No. 2 Gas	Report Number:	402619
Location:	Bradford Road, Manchester	Order Number:	76084	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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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 GCFID/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 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

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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Celtic
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Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 04 May 2017
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 170425-81
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 407242

We received 2 samples on Tuesday April 25, 2017 and 1 of these samples were scheduled for analysis which was completed on Thursday May 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





CERTIFICATE OF ANALYSIS

Validated

SDG: 170425-81 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 407242
Location: Bradford Road, Manchester **Order Number:** 76084 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
15395107	Discharge		0.00 - 0.00	20/04/2017
15395114	NO ID			

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 170425-81 Client Reference: Bradford Road No. 2 Gashold Report Number: 407242
Location: Bradford Road, Manchester Order Number: 76084 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

Lab Sample No(s)

15395107

Customer Sample Reference

Discharge

AGS Reference

Depth (m)

0.00 - 0.00

Container

1plastic (ALE221)

Vial (ALE297)

Sample Type

TE

TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

SDG: 170425-81 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 407242
Location: Bradford Road, Manchester **Order Number:** 76084 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis		
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters		
TM099	BS 2690: Part 7:1968 / BS 6068: 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		
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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		

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

SDG: 170425-81 Client Reference: Bradford Road No. 2 Gashold Report Number: 407242
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

Test Completion Dates

Lab Sample No(s)	15395107
Customer Sample Ref.	Discharge
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	02-May-2017
COD on Settled Sample	02-May-2017
Determination of Dissolved Gases	04-May-2017
pH Value	03-May-2017
Suspended Solids	02-May-2017



CERTIFICATE OF ANALYSIS

Validated

SDG: 170425-81

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Order Number:

76084

Report Number:

407242

Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1534
Ammoniacal Nitrogen as N	TM099	102.8 93.47 : 108.25

COD on Settled Sample

Component	Method Code	QC 1519
COD	TM107	99.43 97.52 : 103.12

Determination of Dissolved Gases

Component	Method Code	QC 1540
Carbon Dioxide Dissolved Raw	TM223	51.0 93.80 : 109.40
Ethane Dissolved Raw	TM223	96.71 95.28 : 100.22
Methane Dissolved Raw	TM223	119.61 118.42 : 125.48
Propane Dissolved Raw	TM223	99.45 97.26 : 101.66

pH Value

Component	Method Code	QC 1556
pH	TM256	100.54 100.13 : 102.56

Suspended Solids

Component	Method Code	QC 1592
Total Suspended Solids	TM022	99.73 94.79 : 101.64

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	170425-81	Client Reference:	Bradford Road No. 2 Gas	Report Number:	407242
Location:	Bradford Road, Manchester	Order Number:	76084	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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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 GCFID/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 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

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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South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 23 May 2017
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 170513-96
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 409552

We received 1 sample on Saturday May 13, 2017 and 1 of these samples were scheduled for analysis which was completed on Tuesday May 23, 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





CERTIFICATE OF ANALYSIS

Validated

SDG: 170513-96 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 409552
Location: Bradford Road, Manchester **Order Number:** 76084 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
15507831	Discharge		0.00 - 0.00	11/05/2017

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 170513-96 Client Reference: Bradford Road No. 2 Gashold Report Number: 409552
Location: Bradford Road, Manchester Order Number: 76084 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

Lab Sample No(s)

15507831

Customer Sample Reference

Discharge

AGS Reference

Depth (m)

0.00 - 0.00

Container

1plastic (ALE221)

Vial (ALE297)

Sample Type

TE

TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

SDG: 170513-96 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 409552
Location: Bradford Road, Manchester **Order Number:** 76084 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis		
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters		
TM099	BS 2690: Part 7:1968 / BS 6068: 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		
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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		

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

SDG: 170513-96 Client Reference: Bradford Road No. 2 Gashold Report Number: 409552
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

Test Completion Dates

Lab Sample No(s)	15507831
Customer Sample Ref.	Discharge
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	23-May-2017
COD on Settled Sample	16-May-2017
Determination of Dissolved Gases	18-May-2017
pH Value	22-May-2017
Suspended Solids	19-May-2017



CERTIFICATE OF ANALYSIS

Validated

SDG: 170513-96

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Order Number:

76084

Report Number:

409552

Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1564
Ammoniacal Nitrogen as N	TM099	97.6 93.47 : 108.25

COD on Settled Sample

Component	Method Code	QC 1526
COD	TM107	100.76 97.52 : 103.12

Determination of Dissolved Gases

Component	Method Code	QC 1533
Carbon Dioxide Dissolved Raw	TM223	48.6 89.85 : 105.64
Ethane Dissolved Raw	TM223	95.62 90.85 : 102.76
Methane Dissolved Raw	TM223	119.59 111.36 : 130.90
Propane Dissolved Raw	TM223	96.61 90.94 : 104.58

pH Value

Component	Method Code	QC 1580
pH	TM256	100.94 99.87 : 102.29

Suspended Solids

Component	Method Code	QC 1575
Total Suspended Solids	TM022	100.0 94.79 : 101.64

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	170513-96	Client Reference:	Bradford Road No. 2 Gas	Report Number:	409552
Location:	Bradford Road, Manchester	Order Number:	76084	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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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 GCFID/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 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

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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Celtic
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Greenmeadow Springs
Tongwynlais
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CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 10 August 2017
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 170802-10
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 419705

We received 1 sample on Wednesday August 02, 2017 and 1 of these samples were scheduled for analysis which was completed on Thursday August 10, 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





CERTIFICATE OF ANALYSIS

Validated

SDG: 170802-10 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 419705
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
15943299	Discharge		0.00 - 0.00	31/07/2017

Maximum Sample/Coolbox Temperature (°C) :

16

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: 170802-10 Client Reference: Bradford Road No. 2 Gashold Report Number: 419705
Location: Bradford Road, Manchester Order Number: 78511 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

Lab Sample No(s)

15943299

Customer Sample Reference

Discharge

AGS Reference

Depth (m)

0.00 - 0.00

Container

1L Plastic (Microbiology)

Vial (ALE297)

Sample Type

TE

TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 170802-10 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 419705
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis		
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters		
TM099	BS 2690: Part 7:1968 / BS 6068: 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		
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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		

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

SDG:	170802-10	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	419705
Location:	Bradford Road, Manchester	Order Number:	78511	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	15943299
Customer Sample Ref.	Discharge
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	07-Aug-2017
COD on Settled Sample	09-Aug-2017
Determination of Dissolved Gases	10-Aug-2017
pH Value	04-Aug-2017
Suspended Solids	08-Aug-2017



CERTIFICATE OF ANALYSIS

Validated

SDG: 170802-10

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Report Number:

419705

Order Number:

78511

Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1599
Ammoniacal Nitrogen as N	TM099	98.8 93.47 : 108.25

COD on Settled Sample

Component	Method Code	QC 1598
COD	TM107	100.95 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 1570
Carbon Dioxide Dissolved Raw	TM223	50.6 93.80 : 109.40
Ethane Dissolved Raw	TM223	98.18 95.28 : 100.22
Methane Dissolved Raw	TM223	123.18 118.42 : 125.48
Propane Dissolved Raw	TM223	99.65 97.26 : 101.66

pH Value

Component	Method Code	QC 1563
pH	TM256	101.35 99.46 : 102.70

Suspended Solids

Component	Method Code	QC 1510
Total Suspended Solids	TM022	97.35 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	170802-10	Client Reference:	Bradford Road No. 2 Gas	Report Number:	419705
Location:	Bradford Road, Manchester	Order Number:	78511	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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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 (BTX). 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).

Astos 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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Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 02 September 2017
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 170823-104
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 422553

We received 1 sample on Wednesday August 23, 2017 and 1 of these samples were scheduled for analysis which was completed on Friday September 01, 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





CERTIFICATE OF ANALYSIS

Validated

SDG: 170823-104 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 422553
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
16059650	Discharge		0.00 - 0.00	16/08/2017

Maximum Sample/Coolbox Temperature (°C) :

16.4

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 170823-104 Client Reference: Bradford Road No. 2 Gashold Report Number: 422553
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

Results Legend X Test N No Determination Possible Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		16059650	
	Customer Sample Reference		Discharge	
	AGS Reference			
	Depth (m)		0.00 - 0.00	
	Container		11plastic (ALE221)	Vial (ALE297)
	Sample Type		TE	TE
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 1	X	
COD on Settled Sample	All	NDPs: 0 Tests: 1	X	
Determination of Dissolved Gases	All	NDPs: 0 Tests: 1		X
pH Value	All	NDPs: 0 Tests: 1	X	
Suspended Solids	All	NDPs: 0 Tests: 1	X	



CERTIFICATE OF ANALYSIS

SDG: 170823-104 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 422553
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis		
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters		
TM099	BS 2690: Part 7:1968 / BS 6068: 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		
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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		

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

SDG:	170823-104	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	422553
Location:	Bradford Road, Manchester	Order Number:	78511	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	16059650
Customer Sample Ref.	Discharge
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	24-Aug-2017
COD on Settled Sample	30-Aug-2017
Determination of Dissolved Gases	01-Sep-2017
pH Value	24-Aug-2017
Suspended Solids	30-Aug-2017



CERTIFICATE OF ANALYSIS

Validated

SDG: 170823-104

Client Reference:

Bradford Road No. 2 Gashol

Report Number:

422553

Location: Bradford Road, Manchester

Order Number:

78511

Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1676
Ammoniacal Nitrogen as N	TM099	102.8 93.47 : 108.25

COD on Settled Sample

Component	Method Code	QC 1665
COD	TM107	101.52 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 1653
Carbon Dioxide Dissolved Raw	TM223	50.8 93.80 : 109.40
Ethane Dissolved Raw	TM223	98.25 95.28 : 100.22
Methane Dissolved Raw	TM223	123.04 118.42 : 125.48
Propane Dissolved Raw	TM223	99.66 97.26 : 101.66

pH Value

Component	Method Code	QC 1604
pH	TM256	100.4 99.19 : 102.43

Suspended Solids

Component	Method Code	QC 1658
Total Suspended Solids	TM022	99.2 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	170823-104	Client Reference:	Bradford Road No. 2 Gas	Report Number:	422553
Location:	Bradford Road, Manchester	Order Number:	78511	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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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).

Astos 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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Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 26 September 2017
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 170916-10
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 425770

We received 1 sample on Saturday September 16, 2017 and 1 of these samples were scheduled for analysis which was completed on Tuesday September 26, 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





CERTIFICATE OF ANALYSIS

Validated

SDG: 170916-10 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 425770
Location: Bradford Road, Manchester **Order Number:** 76084 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
16196606	Discharge		0.00 - 0.00	14/09/2017

Maximum Sample/Coolbox Temperature (°C) :

12.8

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: 170916-10 Client Reference: Bradford Road No. 2 Gashold Report Number: 425770
Location: Bradford Road, Manchester Order Number: 76084 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

Lab Sample No(s)

16196606

Customer Sample Reference

Discharge

AGS Reference

Depth (m)

0.00 - 0.00

Container

1000ml glass bottle (ALE220)

Vial (ALE297)

Sample Type

TE

TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

Anions by Kone (w)

All

NDPs: 0
Tests: 1

X

Conductivity (at 20 deg.C)

All

NDPs: 0
Tests: 1

X

Cyanide Comp/Free/Total/Thiocyanate

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

Dissolved Metals by ICP-MS

All

NDPs: 0
Tests: 1

X

Dissolved Organic/Inorganic Carbon

All

NDPs: 0
Tests: 1

X

EPH (DRO) (C10-C40) Aqueous (W)

All

NDPs: 0
Tests: 1

X

Free Sulphur

All

NDPs: 0
Tests: 1

X

Mercury Dissolved

All

NDPs: 0
Tests: 1

X

Metals by iCap-OES Dissolved (W)

All

NDPs: 0
Tests: 1

X

PAH Spec MS - Aqueous (W)

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Phenols by HPLC (W)

All

NDPs: 0
Tests: 1

X

Sulphide

All

NDPs: 0
Tests: 1

X



Validated

CERTIFICATE OF ANALYSIS

SDG: 170916-10 Client Reference: Bradford Road No. 2 Gashold
Location: Bradford Road, Manchester Order Number: 76084 Report Number: 425770
Superseded Report:

Results Legend

X Test
N No Determination Possible

Sample Types -

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

Lab Sample No(s)

16196606

Customer
Sample Reference

Discharge

AGS Reference

Depth (m)

0.00 - 0.00

Container

1000ml glass bottle
(ALE220)

Vial (ALE297)

Sample Type

TE TE

Suspended Solids

All

NDPs: 0
Tests: 1

X

VOC MS (W)

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 170916-10 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 425770
Location: Bradford Road, Manchester **Order Number:** 76084 **Superseded Report:**

Results Legend		Customer Sample Ref.	Discharge				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00				
M	mCERTS accredited.		Trade Effluent (TE)				
aq	Aqueous / settled sample.		14/09/2017				
diss.filt	Dissolved / filtered sample.		.				
tot.unfilt	Total / unfiltered sample.		16/09/2017				
*	Subcontracted test.		170916-10				
**	% 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		16196606				
(F)	Trigger breach confirmed						
1-5&+5@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Suspended solids, Total	<2 mg/l	TM022	5	#			
Carbon, Organic (diss.filt)	<3 mg/l	TM090	5.37				
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	1.74	#			
Sulphide	<0.01 mg/l	TM101	0.0302	#			
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120	0.0981	#			
Arsenic (diss.filt)	<0.0005 mg/l	TM152	0.000998	#			
Boron (diss.filt)	<0.005 mg/l	TM152	0.014	#			
Cadmium (diss.filt)	<0.00008 mg/l	TM152	<0.00008	#			
Chromium (diss.filt)	<0.001 mg/l	TM152	<0.001	#			
Copper (diss.filt)	<0.0003 mg/l	TM152	0.000466	#			
Lead (diss.filt)	<0.0002 mg/l	TM152	0.000292	#			
Nickel (diss.filt)	<0.0004 mg/l	TM152	0.00384	#			
Selenium (diss.filt)	<0.0005 mg/l	TM152	<0.0005	#			
Zinc (diss.filt)	<0.001 mg/l	TM152	0.132	#			
EPH Range >C10 - C40 (aq)	<0.1 mg/l	TM172	0.477				
Mercury (diss.filt)	<0.00001 mg/l	TM183	<0.00001	#			
Sulphate	<2 mg/l	TM184	<2	#			
Chloride	<2 mg/l	TM184	5.2	#			
Methane, dissolved	<0.001 mg/l	TM223	<0.00216				
Cyanide, Total	<0.05 mg/l	TM227	<0.05	#			
Cyanide, Free	<0.05 mg/l	TM227	<0.05	#			
Cyanide, Complex	<0.05 mg/l	TM227	<0.05				
Thiocyanate	<0.05 mg/l	TM227	<0.05	#			
Iron (diss.filt)	<0.019 mg/l	TM228	0.0681	#			
pH	<1 pH Units	TM256	7.28	#			
Resorcinol	<0.01 mg/l	TM259	<0.01				
Catechol	<0.01 mg/l	TM259	<0.01				
Phenol	<0.002 mg/l	TM259	<0.002	#			
Cresols	<0.006 mg/l	TM259	<0.006	#			
Xylenols	<0.008 mg/l	TM259	<0.008	#			
1-Naphthol	<0.01 mg/l	TM259	<0.01				
2,3,5-Trimethylphenol	<0.003 mg/l	TM259	<0.003	#			
2-Isopropylphenol	<0.006 mg/l	TM259	<0.006	#			



CERTIFICATE OF ANALYSIS

Validated

SDG: 170916-10 Client Reference: Bradford Road No. 2 Gashold Report Number: 425770
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis		
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, 1998	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		
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser		
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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		
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		
TM294		Determination of Free Sulphur in liquids 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: 170916-10

Client Reference:

Bradford Road No. 2 Gashold

Report Number:

425770

Location: Bradford Road, Manchester

Order Number: 76084

Superseded Report:

Test Completion Dates

Lab Sample No(s)	16196606
Customer Sample Ref.	Discharge
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	20-Sep-2017
Anions by Kone (w)	20-Sep-2017
Conductivity (at 20 deg.C)	19-Sep-2017
Cyanide Comp/Free/Total/Thiocyanate	20-Sep-2017
Determination of Dissolved Gases	26-Sep-2017
Dissolved Metals by ICP-MS	25-Sep-2017
Dissolved Organic/Inorganic Carbon	21-Sep-2017
EPH (DRO) (C10-C40) Aqueous (W)	26-Sep-2017
Free Sulphur	22-Sep-2017
Mercury Dissolved	22-Sep-2017
Metals by iCap-OES Dissolved (W)	25-Sep-2017
PAH Spec MS - Aqueous (W)	20-Sep-2017
pH Value	19-Sep-2017
Phenols by HPLC (W)	20-Sep-2017
Sulphide	26-Sep-2017
Suspended Solids	20-Sep-2017
VOC MS (W)	22-Sep-2017



CERTIFICATE OF ANALYSIS

Validated

SDG: 170916-10

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Order Number:

76084

Report Number:

425770

Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1681
Ammoniacal Nitrogen as N	TM099	100.4 93.47 : 108.25

Anions by Kone (w)

Component	Method Code	QC 1692
Chloride	TM184	107.0 92.93 : 115.43
Phosphate (Ortho as PO4)	TM184	96.40 : 108.40
Sulphate (soluble)	TM184	104.8 90.53 : 113.03
TON as NO3	TM184	96.26 : 111.21

Conductivity (at 20 deg.C)

Component	Method Code	QC 1661
Conductivity (at 20 deg.C)	TM120	103.76 98.50 : 107.52

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 1657
Free Cyanide (W)	TM227	102.25 93.25 : 112.75
Thiocyanate (W)	TM227	101.25 97.75 : 109.75
Total Cyanide (W)	TM227	101.5 95.25 : 111.75

Determination of Dissolved Gases

Component	Method Code	QC 1611
Carbon Dioxide Dissolved Raw	TM223	50.8 93.80 : 109.40
Ethane Dissolved Raw	TM223	98.24 95.28 : 100.22
Methane Dissolved Raw	TM223	122.79 118.42 : 125.48
Propane Dissolved Raw	TM223	99.35 97.26 : 101.66

Dissolved Metals by ICP-MS



CERTIFICATE OF ANALYSIS

Validated

SDG: 170916-10 Client Reference: Bradford Road No. 2 Gashold
Location: Bradford Road, Manchester Order Number: 76084 Report Number: 425770
Superseded Report:

Dissolved Metals by ICP-MS

Component	Method Code	QC 1690
Aluminium	TM152	102.33 89.73 : 114.01
Antimony	TM152	98.17 79.80 : 122.00
Arsenic	TM152	101.33 89.37 : 114.47
Barium	TM152	103.17 87.91 : 119.11
Beryllium	TM152	103.33 86.15 : 118.35
Bismuth	TM152	101.0 83.27 : 112.17
Borate	TM152	101.85 88.00 : 112.00
Boron	TM152	102.0 86.68 : 117.67
Cadmium	TM152	103.5 87.41 : 114.21
Chromium	TM152	101.33 87.58 : 113.01
Cobalt	TM152	102.17 84.39 : 114.26
Copper	TM152	97.67 86.80 : 115.18
Lead	TM152	104.17 85.65 : 113.58
Lithium	TM152	102.83 89.26 : 119.04
Manganese	TM152	102.17 87.27 : 111.92
Molybdenum	TM152	93.83 88.78 : 113.16
Nickel	TM152	101.33 87.66 : 114.95
Phosphorus	TM152	100.83 90.52 : 115.47
Selenium	TM152	103.0 88.44 : 113.86
Silver	TM152	93.33 81.52 : 114.92
Strontium	TM152	99.33 90.72 : 114.82
Tellurium	TM152	97.5 82.93 : 111.24
Thallium	TM152	102.5 80.92 : 114.72
Titanium	TM152	99.67 87.79 : 120.81
Tungsten	TM152	102.33 88.70 : 114.80
Uranium	TM152	103.33 90.58 : 113.28
Vanadium	TM152	103.5 82.24 : 116.92



CERTIFICATE OF ANALYSIS

Validated

SDG: 170916-10 Client Reference: Bradford Road No. 2 Gashold
Location: Bradford Road, Manchester Order Number: 76084 Report Number: 425770
Superseded Report:

Dissolved Metals by ICP-MS

		QC 1690
Zinc	TM152	101.33 86.52 : 115.27

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 1642
Dissolved Inorganic Carbon	TM090	104.33 91.15 : 111.35
Dissolved Organic Carbon	TM090	103.5 94.18 : 111.18

Mercury Dissolved

Component	Method Code	QC 1624
Mercury Dissolved (CVAf)	TM183	101.0 73.51 : 120.83

Metals by iCap-OES Dissolved (W)

Component	Method Code	QC 1669
Calcium	TM228	96.9 83.42 : 110.16
Iron	TM228	93.33 75.85 : 109.97
Magnesium	TM228	93.7 83.80 : 108.64
Potassium	TM228	95.1 85.20 : 109.93
Sodium	TM228	95.1 84.00 : 111.30

PAH Spec MS - Aqueous (W)

Component	Method Code	QC 1667
Acenaphthene by GCMS	TM178	90.8 89.54 : 111.72
Acenaphthylene by GCMS	TM178	90.4 85.27 : 110.71
Anthracene by GCMS	TM178	93.2 86.06 : 112.26
Benz(a)anthracene by GCMS	TM178	92.4 78.22 : 112.99
Benzo(a)pyrene by GCMS	TM178	98.4 81.72 : 127.79
Benzo(b)fluoranthene by GCMS	TM178	91.6 88.70 : 135.23
Benzo(ghi)perylene by GCMS	TM178	96.8 76.87 : 112.02
Benzo(k)fluoranthene by GCMS	TM178	97.6 86.51 : 137.15



CERTIFICATE OF ANALYSIS

Validated

SDG: 170916-10 Client Reference: Bradford Road No. 2 Gashold Report Number: 425770
Location: Bradford Road, Manchester Order Number: 76084 Superseded Report:

PAH Spec MS - Aqueous (W)

		QC 1667
Chrysene by GCMS	TM178	100.8 89.87 : 113.88
Dibenzo(ah)anthracene by GCMS	TM178	84.4 72.59 : 111.05
Fluoranthene by GCMS	TM178	89.6 87.49 : 110.82
Fluorene by GCMS	TM178	94.8 90.88 : 112.23
Indeno(123cd)pyrene by GCMS	TM178	90.8 82.25 : 114.75
Naphthalene by GCMS	TM178	93.6 87.58 : 110.52
Phenanthrene by GCMS	TM178	92.4 88.04 : 111.35
Pyrene by GCMS	TM178	88.8 81.80 : 113.46

pH Value

Component	Method Code	QC 1637
pH	TM256	101.21 99.46 : 102.70

Phenols by HPLC (W)

Component	Method Code	QC 1648
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	102.0 89.00 : 113.00
2-Isopropyl Phenol by HPLC (W)	TM259	108.0 95.00 : 113.00
Cresols by HPLC (W)	TM259	92.0 84.57 : 102.57
Napthol by HPLC (W)	TM259	121.0 108.80 : 126.80
Phenol by HPLC (W)	TM259	103.0 89.00 : 107.00
Xylenols by HPLC (W)	TM259	103.5 88.83 : 112.83

Sulphide

Component	Method Code	QC 1696
Sulphide	TM101	107.33 88.90 : 112.50

Suspended Solids



CERTIFICATE OF ANALYSIS

Validated

SDG: 170916-10 Client Reference: Bradford Road No. 2 Gashold
Location: Bradford Road, Manchester Order Number: 76084 Report Number: 425770
Superseded Report:

Suspended Solids

Component	Method Code	QC 1663
Total Suspended Solids	TM022	98.14 95.69 : 101.90

VOC MS (W)

Component	Method Code	QC 1604
1,1,1,2-Tetrachloroethane	TM208	103.0 78.82 : 115.90
1,1,1-Trichloroethane	TM208	100.5 79.61 : 114.35
1,1-Dichloroethane	TM208	101.0 79.99 : 118.57
1,2-Dichloroethane	TM208	102.0 79.35 : 124.02
2-Chlorotoluene	TM208	101.0 80.04 : 111.63
4-Chlorotoluene	TM208	104.0 80.15 : 113.42
Benzene	TM208	101.5 81.89 : 116.75
Bromomethane	TM208	97.5 78.20 : 133.61
Carbontetrachloride	TM208	100.5 79.73 : 118.91
Chlorobenzene	TM208	101.0 82.01 : 111.65
Chloroform	TM208	100.0 82.31 : 120.71
Chloromethane	TM208	97.0 68.16 : 131.85
Cis-1,2-Dichloroethene	TM208	99.5 79.37 : 123.64
Dichloromethane	TM208	100.5 81.20 : 120.83
Ethylbenzene	TM208	98.0 80.54 : 112.31
Hexachlorobutadiene	TM208	106.0 71.97 : 116.40
o-Xylene	TM208	101.5 79.22 : 112.31
p/m-Xylene	TM208	98.0 79.85 : 111.06
Tert-butyl methyl ether	TM208	101.0 66.94 : 128.50
Tetrachloroethene	TM208	101.5 79.79 : 111.18
Toluene	TM208	100.0 81.59 : 111.56
Trichloroethene	TM208	100.0 79.53 : 112.32



CERTIFICATE OF ANALYSIS

Validated

SDG: 170916-10 **Client Reference:** Bradford Road No. 2 Gashol **Report Number:** 425770
Location: Bradford Road, Manchester **Order Number:** 76084 **Superseded Report:**

VOC MS (W)

		QC 1604
Vinyl Chloride	TM208	97.5 73.93 : 128.95

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

SDG:	170916-10	Client Reference:	Bradford Road No. 2 Gas	Report Number:	425770
Location:	Bradford Road, Manchester	Order Number:	76084	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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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).

Asteststos 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.

ALS

SDG(s): 171013-20
Customer: Englobe (Celtic) Cardiff (5490)
Client Reference / Location: Bradford Road, Manchester
Order no: 78511

Customer Sample ID Discharge
Depth 0.00-0.00
AGS Id
Sample Type DE_EFFLUENT
Sampled Date 11/10/2017
Sample Received Date 13/10/2017
Final Instruction Date 13/10/2017
Report Completed Date 23/10/2017
SDG 171013-20
Lab Sample Number 16351835
Sample Temperature 12
Sample Time

Analysis	Test	Method	Units	LOD	
Inorganics					
	Ammoniacal Nitrogen as N	TM099	mg/l	<0.2	0.485
	pH	TM256	pH Units	<1.00	7.13
	COD, settled	TM107	mg/l	<7	24.3
	Suspended solids, Total	TM022	mg/l	<2	24.2
Dissolved Gases					
	Methane, dissolved	TM223	mg/l	<1	<0.00221



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Website: www.alsenvironmental.co.uk

Celtic
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Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 06 November 2017
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 171026-99
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 431466

We received 1 sample on Thursday October 26, 2017 and 1 of these samples were scheduled for analysis which was completed on Monday November 06, 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





CERTIFICATE OF ANALYSIS

Validated

SDG: 171026-99 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 431466
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
16435048	Discharge		0.00 - 0.00	24/10/2017

Maximum Sample/Coolbox Temperature (°C) :

12.2

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 171026-99 Client Reference: Bradford Road No. 2 Gashol Report Number: 431466
Location: Bradford Road, Manchester Order Number: 78511 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

Lab Sample No(s)

16435048

Customer
Sample Reference

Discharge

AGS Reference

Depth (m)

0.00 - 0.00

Container

11plastic (ALE221)

Vial (ALE297)

Sample Type

TE

TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 171026-99 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 431466
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis		
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters		
TM099	BS 2690: Part 7:1968 / BS 6068: 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		
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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		

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

SDG:	171026-99	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	431466
Location:	Bradford Road, Manchester	Order Number:	78511	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	16435048
Customer Sample Ref.	Discharge
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	01-Nov-2017
COD on Settled Sample	28-Oct-2017
Determination of Dissolved Gases	06-Nov-2017
pH Value	01-Nov-2017
Suspended Solids	27-Oct-2017



CERTIFICATE OF ANALYSIS

Validated

SDG: 171026-99

Client Reference:

Bradford Road No. 2 GasholdReport Number: 431466

Location: Bradford Road, Manchester

Order Number: 78511

Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1633
Ammoniacal Nitrogen as N	TM099	98.0 93.47 : 108.25

COD on Settled Sample

Component	Method Code	QC 1603
COD	TM107	98.86 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 1618
Carbon Dioxide Dissolved Raw	TM223	50.4 93.80 : 109.40
Ethane Dissolved Raw	TM223	96.51 95.28 : 100.22
Methane Dissolved Raw	TM223	94.8 118.42 : 125.48
Propane Dissolved Raw	TM223	95.52 97.26 : 101.66

pH Value

Component	Method Code	QC 1645
pH	TM256	100.67 99.46 : 102.70

Suspended Solids

Component	Method Code	QC 1672
Total Suspended Solids	TM022	97.88 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	171026-99	Client Reference:	Bradford Road No. 2 Gas	Report Number:	431466
Location:	Bradford Road, Manchester	Order Number:	78511	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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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).

Asteststos 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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Website: www.alsenvironmental.co.uk

Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 05 December 2017
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 171122-11
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 435585

We received 1 sample on Wednesday November 22, 2017 and 1 of these samples were scheduled for analysis which was completed on Tuesday December 05, 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





CERTIFICATE OF ANALYSIS

Validated

SDG: 171122-11 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 435585
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
16603651	Discharge		0.00 - 0.00	15/11/2017

Maximum Sample/Coolbox Temperature (°C) :

3.4

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 171122-11 Client Reference: Bradford Road No. 2 Gashold Report Number: 435585
Location: Bradford Road, Manchester Order Number: 78511 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

Lab Sample No(s)

16603651

Customer
Sample Reference

Discharge

AGS Reference

Depth (m)

0.00 - 0.00

Container

11plastic (ALE221)

Vial (ALE297)

Sample Type

TE

TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

SDG: 171122-11 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 435585
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

SDG:	171122-11	Client Reference:	Bradford Road No. 2 Gashol	Report Number:	435585
Location:	Bradford Road, Manchester	Order Number:	78511	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	16603651
Customer Sample Ref.	Discharge
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	24-Nov-2017
COD on Settled Sample	29-Nov-2017
Determination of Dissolved Gases	05-Dec-2017
pH Value	28-Nov-2017
Suspended Solids	29-Nov-2017



CERTIFICATE OF ANALYSIS

Validated

SDG: 171122-11

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Order Number: 78511

Report Number:

435585

Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1678
Ammoniacal Nitrogen as N	TM099	100.0 93.47 : 108.25

COD on Settled Sample

Component	Method Code	QC 1692
COD	TM107	102.66 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 1684
Carbon Dioxide Dissolved Raw	TM223	51.9 93.80 : 109.40
Ethane Dissolved Raw	TM223	97.98 95.28 : 100.22
Methane Dissolved Raw	TM223	92.22 118.42 : 125.48
Propane Dissolved Raw	TM223	96.62 97.26 : 101.66

pH Value

Component	Method Code	QC 1615
pH	TM256	100.13 99.19 : 102.43

Suspended Solids

Component	Method Code	QC 1659
Total Suspended Solids	TM022	99.47 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	171122-11	Client Reference:	Bradford Road No. 2 Gas	Report Number:	435585
Location:	Bradford Road, Manchester	Order Number:	78511	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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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).

Astos 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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Celtic
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CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 19 December 2017
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 171208-19
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 437514

We received 1 sample on Friday December 08, 2017 and 1 of these samples were scheduled for analysis which was completed on Tuesday December 19, 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





CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-19 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 437514
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
16712457	Discharge		0.00 - 0.00	06/12/2017

Maximum Sample/Coolbox Temperature (°C) :

7

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: 171208-19 Client Reference: Bradford Road No. 2 Gashol Report Number: 437514
Location: Bradford Road, Manchester Order Number: 78511 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

Lab Sample No(s)

16712457

Customer
Sample Reference

Discharge

AGS Reference

Depth (m)

0.00 - 0.00

Container

11plastic (ALE221)

Vial (ALE297)

Sample Type

TE

TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

SDG: 171208-19 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 437514
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

SDG:	171208-19	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	437514
Location:	Bradford Road, Manchester	Order Number:	78511	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	16712457
Customer Sample Ref.	Discharge
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	18-Dec-2017
COD on Settled Sample	15-Dec-2017
Determination of Dissolved Gases	19-Dec-2017
pH Value	18-Dec-2017
Suspended Solids	19-Dec-2017



CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-19

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Report Number:

437514

Order Number:

78511

Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1649
Ammoniacal Nitrogen as N	TM099	98.4 93.47 : 108.25

COD on Settled Sample

Component	Method Code	QC 1684
COD	TM107	100.57 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 1695
Carbon Dioxide Dissolved Raw	TM223	51.4 89.85 : 105.64
Ethane Dissolved Raw	TM223	90.19 90.85 : 102.76
Methane Dissolved Raw	TM223	84.82 111.36 : 130.90
Propane Dissolved Raw	TM223	84.91 90.94 : 104.58

pH Value

Component	Method Code	QC 1649
pH	TM256	100.94 99.46 : 102.70

Suspended Solids

Component	Method Code	QC 1658
Total Suspended Solids	TM022	98.67 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	171208-19	Client Reference:	Bradford Road No. 2 Gas	Report Number:	437514
Location:	Bradford Road, Manchester	Order Number:	78511	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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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).

Asteststos 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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CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 11 January 2018
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 171222-41
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 439779

We received 1 sample on Friday December 22, 2017 and 1 of these samples were scheduled for analysis which was completed on Thursday January 11, 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





CERTIFICATE OF ANALYSIS

Validated

SDG: 171222-41 **Client Reference:** Bradford Road No. 2 Gash **Report Number:** 439779
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
16810485	Discharge		0.00 - 0.00	20/12/2017

Maximum Sample/Coolbox Temperature (°C) : 6.2

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



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SDG: 171222-41 Client Reference: Bradford Road No. 2 Gash Report Number: 439779
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

Results Legend X Test N No Determination Possible Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		16810485							
	Customer Sample Reference		Discharge							
	AGS Reference									
	Depth (m)		0.00 - 0.00							
	Container		1000ml glass bottle (ALE220)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	ZnAc (ALE246)	TE	
	Sample Type		TE	TE	TE	TE	TE	TE	TE	
	Ammoniacal Nitrogen	All	NDPs: 0 Tests: 1			X				
Anions by Kone (w)	All	NDPs: 0 Tests: 1		X						
COD on Settled Sample	All	NDPs: 0 Tests: 1	X							
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 1		X						
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1					X			
Determination of Dissolved Gases	All	NDPs: 0 Tests: 1	X							
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1				X				
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X							
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 1	X							
Free Sulphur	All	NDPs: 0 Tests: 1		X						
Mercury Dissolved	All	NDPs: 0 Tests: 1				X				
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 1				X				
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 1	X							
pH Value	All	NDPs: 0 Tests: 1		X						
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1			X					



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SDG: 171222-41 Client Reference: Bradford Road No. 2 Gash Report Number: 439779
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

Results Legend

- X** Test
N No Determination Possible

Sample Types -

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

	Lab Sample No(s)		16810485					
	Customer Sample Reference		Discharge					
	AGS Reference							
	Depth (m)		0.00 - 0.00					
	Container		1000ml glass bottle (ALE220)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	ZnAc (ALE246)
	Sample Type		TE	TE	TE	TE	TE	TE
Sulphide	All	NDPs: 0 Tests: 1						X
Suspended Solids	All	NDPs: 0 Tests: 1		X				
VOC MS (W)	All	NDPs: 0 Tests: 1	X					



CERTIFICATE OF ANALYSIS

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SDG: 171222-41 **Client Reference:** Bradford Road No. 2 Gash **Report Number:** 439779
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Results Legend		Customer Sample Ref.	Discharge				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00 Trade Effluent (TE) 20/12/2017 . 22/12/2017 171222-41 16810485				
M	mCERTS accredited.						
aq	Aqueous / settled sample.						
diss.filt	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						
1-5&*\$@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Suspended solids, Total	<2 mg/l	TM022	<6	#			
Carbon, Organic (diss.filt)	<3 mg/l	TM090	4.1				
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	1.54	#			
Sulphide	<0.01 mg/l	TM101	<0.01	#			
COD, settled	<7 mg/l	TM107	13.6	#			
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120	0.0733	#			
Arsenic (diss.filt)	<0.0005 mg/l	TM152	0.00266	#			
Boron (diss.filt)	<0.005 mg/l	TM152	0.00796	#			
Cadmium (diss.filt)	<0.00008 mg/l	TM152	<0.00008	#			
Chromium (diss.filt)	<0.001 mg/l	TM152	<0.001	#			
Copper (diss.filt)	<0.0003 mg/l	TM152	0.00438	#			
Lead (diss.filt)	<0.0002 mg/l	TM152	0.000933	#			
Nickel (diss.filt)	<0.0004 mg/l	TM152	0.000556	#			
Selenium (diss.filt)	<0.0005 mg/l	TM152	<0.0005	#			
Zinc (diss.filt)	<0.001 mg/l	TM152	0.04	#			
EPH Range >C10 - C40 (aq)	<0.1 mg/l	TM172	0.205				
Mercury (diss.filt)	<0.00001 mg/l	TM183	<0.00001	◆ #			
Sulphate	<2 mg/l	TM184	<2	#			
Chloride	<2 mg/l	TM184	4.9	#			
Methane, dissolved	<0.001 mg/l	TM223	<0.00217	2			
Cyanide, Total	<0.05 mg/l	TM227	<0.05	#			
Cyanide, Free	<0.05 mg/l	TM227	<0.05	#			
Cyanide, Complex	<0.05 mg/l	TM227	<0.05	#			
Thiocyanate	<0.05 mg/l	TM227	<0.05	#			
Iron (diss.filt)	<0.019 mg/l	TM228	1.31	#			
pH	<1 pH Units	TM256	7.47	#			
Resorcinol	<0.01 mg/l	TM259	<0.01				
Catechol	<0.01 mg/l	TM259	<0.01				
Phenol	<0.002 mg/l	TM259	<0.002	#			
Cresols	<0.006 mg/l	TM259	<0.006	#			
Xylenols	<0.008 mg/l	TM259	<0.008	#			
1-Naphthol	<0.01 mg/l	TM259	<0.01	#			



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SDG: 171222-41 Client Reference: Bradford Road No. 2 Gash Report Number: 439779
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis
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, 1998	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
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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
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
TM294		Determination of Free Sulphur in liquids by HPLC

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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SDG: 171222-41 **Client Reference:** Bradford Road No. 2 Gash **Report Number:** 439779
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Test Completion Dates

Lab Sample No(s)	16810485
Customer Sample Ref.	Discharge
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	04-Jan-2018
Anions by Kone (w)	05-Jan-2018
COD on Settled Sample	30-Dec-2017
Conductivity (at 20 deg.C)	28-Dec-2017
Cyanide Comp/Free/Total/Thiocyanate	03-Jan-2018
Determination of Dissolved Gases	05-Jan-2018
Dissolved Metals by ICP-MS	09-Jan-2018
Dissolved Organic/Inorganic Carbon	28-Dec-2017
EPH (DRO) (C10-C40) Aqueous (W)	03-Jan-2018
Free Sulphur	03-Jan-2018
Mercury Dissolved	11-Jan-2018
Metals by iCap-OES Dissolved (W)	04-Jan-2018
PAH Spec MS - Aqueous (W)	04-Jan-2018
pH Value	29-Dec-2017
Phenols by HPLC (W)	29-Dec-2017
Sulphide	05-Jan-2018
Suspended Solids	29-Dec-2017
VOC MS (W)	02-Jan-2018



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SDG: 171222-41 Client Reference: Bradford Road No. 2 Gash Report Number: 439779
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1643
Ammoniacal Nitrogen as N	TM099	97.6 93.47 : 108.25

Anions by Kone (w)

Component	Method Code	QC 1602
Chloride	TM184	97.3 92.93 : 115.43
Phosphate (Ortho as PO4)	TM184	96.40 : 108.40
Sulphate (soluble)	TM184	105.2 90.53 : 113.03
TON as NO3	TM184	96.26 : 111.21

COD on Settled Sample

Component	Method Code	QC 1654
COD	TM107	101.9 97.45 : 103.77

Conductivity (at 20 deg.C)

Component	Method Code	QC 1611
Conductivity (at 20 deg.C)	TM120	103.76 98.50 : 107.52

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 1653
Free Cyanide (W)	TM227	102.25 93.25 : 112.75
Thiocyanate (W)	TM227	103.0 97.75 : 109.75
Total Cyanide (W)	TM227	102.75 95.25 : 111.75

Determination of Dissolved Gases



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SDG: 171222-41 Client Reference: Bradford Road No. 2 Gash Report Number: 439779
Location: Manchester Order Number: 78511 Superseded Report:

Determination of Dissolved Gases

Component	Method Code	QC 1612
Carbon Dioxide Dissolved Raw	TM223	49.9 93.80 : 109.40
Ethane Dissolved Raw	TM223	96.87 95.28 : 100.22
Methane Dissolved Raw	TM223	91.38 118.42 : 125.48
Propane Dissolved Raw	TM223	95.62 97.26 : 101.66

Dissolved Metals by ICP-MS

Component	Method Code	QC 1695	QC 1677
Aluminium	TM152	96.33 90.09 : 112.69	101.67 90.09 : 112.69
Antimony	TM152	95.5 81.00 : 119.70	95.5 81.00 : 119.70
Arsenic	TM152	96.67 92.40 : 113.00	99.17 92.40 : 113.00
Barium	TM152	95.83 93.11 : 112.81	98.17 93.11 : 112.81
Beryllium	TM152	95.67 88.27 : 113.27	100.5 88.27 : 113.27
Bismuth	TM152	96.33 86.72 : 115.61	102.0 86.72 : 115.61
Boron	TM152	92.33 86.47 : 111.70	101.0 86.47 : 111.70
Cadmium	TM152	96.17 90.28 : 114.48	99.67 90.28 : 114.48
Chromium	TM152	97.17 91.07 : 114.29	101.5 91.07 : 114.29
Cobalt	TM152	96.67 89.58 : 114.68	102.33 89.58 : 114.68
Copper	TM152	96.83 88.45 : 117.93	101.67 88.45 : 117.93
Lead	TM152	96.33 89.25 : 115.12	99.5 89.25 : 115.12
Lithium	TM152	95.67 88.50 : 116.05	101.67 88.50 : 116.05
Manganese	TM152	92.67 91.63 : 112.33	100.0 91.63 : 112.33
Molybdenum	TM152	99.0 91.08 : 111.63	99.67 91.08 : 111.63
Nickel	TM152	96.0 89.60 : 117.38	101.83 89.60 : 117.38
Niobium	TM152	96.38 96.38 : 128.85	96.38 96.38 : 128.85
Phosphorus	TM152	94.83 90.43 : 111.75	103.5 90.43 : 111.75
Selenium	TM152	92.83 88.13 : 108.33	98.0 88.13 : 108.33
Silver	TM152	92.0 90.04 : 97.49	94.5 90.04 : 97.49
Strontium	TM152	92.33 91.27 : 106.32	95.0 91.27 : 106.32



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SDG: 171222-41 Client Reference: Bradford Road No. 2 Gash Report Number: 439779
Location: Manchester Order Number: 78511 Superseded Report:

Dissolved Metals by ICP-MS

		QC 1695	QC 1677
Tellurium	TM152	82.0 81.16 : 111.23	82.33 81.16 : 111.23
Thallium	TM152	91.83 81.70 : 117.09	95.0 81.70 : 117.09
Titanium	TM152	93.0 89.62 : 110.62	97.17 89.62 : 110.62
Tungsten	TM152	97.67 90.13 : 111.33	99.67 90.13 : 111.33
Uranium	TM152	97.0 92.30 : 116.90	101.33 92.30 : 116.90
Vanadium	TM152	96.0 88.22 : 118.55	99.83 88.22 : 118.55
Zinc	TM152	97.33 89.30 : 115.44	100.0 89.30 : 115.44
Zirconium	TM152	85.51 85.51 : 109.42	85.51 85.51 : 109.42

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 1666
Dissolved Inorganic Carbon	TM090	106.17 91.15 : 111.35
Dissolved Organic Carbon	TM090	103.67 94.18 : 111.18

EPH (DRO) (C10-C40) Aqueous (W)

Component	Method Code	QC 1632
EPH (DRO) (C10-C40)	TM172	88.8 64.76 : 115.06

Mercury Dissolved

Component	Method Code	QC 1617
Mercury Dissolved (CVAf)	TM183	99.9 73.51 : 120.83

Metals by iCap-OES Dissolved (W)

Component	Method Code	QC 1658
Calcium	TM228	94.3 86.09 : 109.25
Iron	TM228	88.0 76.27 : 106.14
Magnesium	TM228	94.4 83.74 : 107.11



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SDG: 171222-41 Client Reference: Bradford Road No. 2 Gash Report Number: 439779
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

Metals by iCap-OES Dissolved (W)

		QC 1658
Potassium	TM228	96.4 84.09 : 110.37
Sodium	TM228	96.9 86.73 : 110.48

PAH Spec MS - Aqueous (W)

Component	Method Code	QC 1642
Acenaphthene by GCMS	TM178	102.4 85.86 : 113.34
Acenaphthylene by GCMS	TM178	101.6 85.28 : 115.28
Anthracene by GCMS	TM178	104.4 63.28 : 135.04
Benz(a)anthracene by GCMS	TM178	110.4 62.08 : 133.84
Benzo(a)pyrene by GCMS	TM178	114.4 78.60 : 123.96
Benzo(b)fluoranthene by GCMS	TM178	102.8 83.60 : 123.44
Benzo(ghi)perylene by GCMS	TM178	102.4 79.44 : 113.28
Benzo(k)fluoranthene by GCMS	TM178	101.2 84.60 : 146.28
Chrysene by GCMS	TM178	112.4 79.00 : 124.84
Dibenzo(ah)anthracene by GCMS	TM178	103.2 73.28 : 112.88
Fluoranthene by GCMS	TM178	99.2 77.08 : 123.88
Fluorene by GCMS	TM178	103.2 85.08 : 112.68
Indeno(123cd)pyrene by GCMS	TM178	98.8 77.84 : 104.72
Naphthalene by GCMS	TM178	93.2 83.48 : 122.12
Phenanthrene by GCMS	TM178	106.4 80.12 : 119.96
Pyrene by GCMS	TM178	100.8 76.20 : 128.28

pH Value

Component	Method Code	QC 1629
pH	TM256	101.62 99.46 : 102.70

Phenols by HPLC (W)



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SDG: 171222-41 Client Reference: Bradford Road No. 2 Gash Report Number: 439779
Location: Manchester Order Number: 78511 Superseded Report:

Phenols by HPLC (W)

Component	Method Code	QC 1665
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	101.0 89.00 : 113.00
2-Isopropyl Phenol by HPLC (W)	TM259	107.0 95.00 : 113.00
Cresols by HPLC (W)	TM259	95.67 84.57 : 102.57
Napthol by HPLC (W)	TM259	102.0 90.22 : 121.54
Phenol by HPLC (W)	TM259	105.0 89.00 : 107.00
Xylenols by HPLC (W)	TM259	108.17 88.83 : 112.83

Sulphide

Component	Method Code	QC 1607
Sulphide	TM101	98.67 88.90 : 112.50

Suspended Solids

Component	Method Code	QC 1601
Total Suspended Solids	TM022	96.02 95.69 : 101.90

VOC MS (W)

Component	Method Code	QC 1694
1,1,1,2-Tetrachloroethane	TM208	98.5 79.47 : 113.27
1,1,1-Trichloroethane	TM208	97.5 81.01 : 112.00
1,1-Dichloroethane	TM208	99.0 82.09 : 116.41
1,2-Dichloroethane	TM208	94.5 80.28 : 123.63
2-Chlorotoluene	TM208	97.0 78.99 : 111.63
4-Chlorotoluene	TM208	96.0 79.41 : 112.80
Benzene	TM208	100.5 83.14 : 116.86
Bromomethane	TM208	93.5 78.04 : 129.01
Carbontetrachloride	TM208	98.5 81.73 : 114.22
Chlorobenzene	TM208	99.0 84.54 : 112.32



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SDG: 171222-41 Client Reference: Bradford Road No. 2 Gash Report Number: 439779
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

VOC MS (W)

		QC 1694
Chloroform	TM208	99.0 83.67 : 118.08
Chloromethane	TM208	85.5 57.35 : 135.89
Cis-1,2-Dichloroethene	TM208	105.5 88.44 : 126.72
Dichloromethane	TM208	96.5 81.65 : 120.83
Ethylbenzene	TM208	97.5 78.70 : 114.10
Hexachlorobutadiene	TM208	86.0 71.31 : 113.40
o-Xylene	TM208	95.0 78.40 : 110.68
p/m-Xylene	TM208	97.5 79.66 : 110.44
Tert-butyl methyl ether	TM208	99.0 68.23 : 127.69
Tetrachloroethene	TM208	98.5 81.10 : 112.63
Toluene	TM208	98.0 83.98 : 111.19
Trichloroethene	TM208	96.0 81.17 : 111.80
Vinyl Chloride	TM208	100.0 72.73 : 123.40

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



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SDG:	171222-41	Client Reference:	Bradford Road No. 2 Gash	Report Number:	439779
Location:	Bradford Road, Manchester	Order Number:	78511	Superseded Report:	

Chromatogram

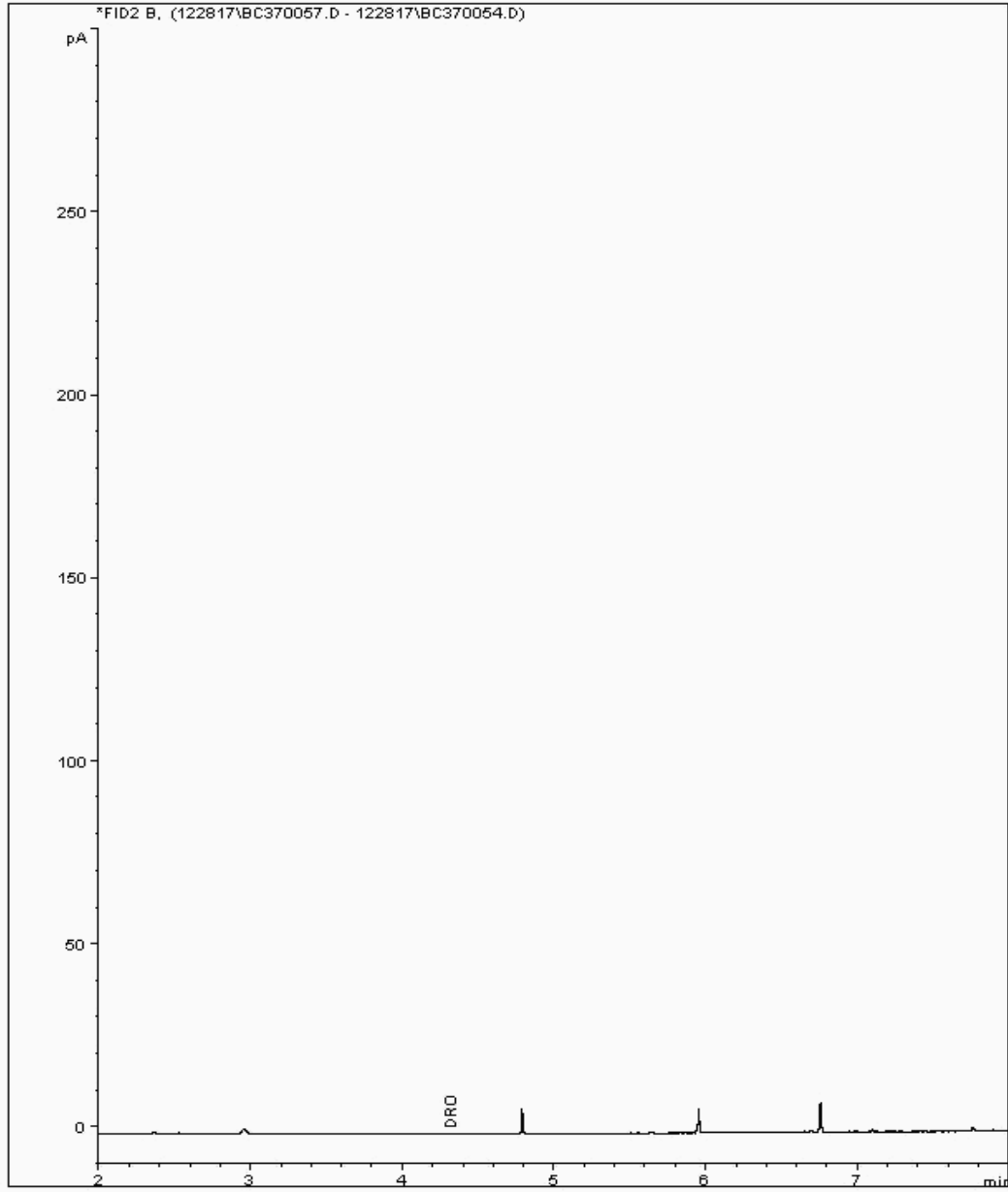
Analysis: EPH (DRO) (C10-C40) Aqueous (W)

Sample No : 16812237
Sample ID : Discharge

Depth : 0.00 - 0.00

EPH Range Organics (C10 - C40)

Sample Identity: 15769219-
Date Acquired : 02/01/2018 08:56:38 PM
Units : mg/l





CERTIFICATE OF ANALYSIS

SDG: 171222-41 Client Reference: Bradford Road No. 2 Gas Report Number: 439779
Location: Bradford Road, Manchester Order Number: 78511 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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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).

Astos 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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Website: www.alsenvironmental.co.uk

Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 16 February 2018
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 180201-25
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 444867

We received 2 samples on Thursday February 01, 2018 and 2 of these samples were scheduled for analysis which was completed on Friday February 16, 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





CERTIFICATE OF ANALYSIS

Validated

SDG: 180201-25 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 444867
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
16970543	Discharge		0.00 - 0.00	30/01/2018
16970553	Influent		0.00 - 0.00	30/01/2018

Maximum Sample/Coolbox Temperature (°C) :

6.2

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 180201-25 Client Reference: Bradford Road No. 2 Gashold
Location: Bradford Road, Manchester Order Number: 78511 Report Number: 444867
Superseded Report:

Results Legend

X Test
N No Determination Possible

Sample Types -

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

	Lab Sample No(s)		16970543		16970553	
	Customer Sample Reference		Discharge		Influent	
	AGS Reference					
	Depth (m)		0.00 - 0.00		0.00 - 0.00	
	Container		1000ml glass bottle (ALE220)	1l plastic (ALE221)	Vial (ALE297)	1l plastic (ALE221)
	Sample Type		TE	TE	TE	TE
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 1	X			
COD on Settled Sample	All	NDPs: 0 Tests: 2		X		X
Determination of Dissolved Gases	All	NDPs: 0 Tests: 2			X	X
pH Value	All	NDPs: 0 Tests: 1		X		
Suspended Solids	All	NDPs: 0 Tests: 1		X		



CERTIFICATE OF ANALYSIS

SDG: 180201-25 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 444867
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

SDG: 180201-25 Client Reference: Bradford Road No. 2 Gashold Report Number: 444867
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

Test Completion Dates

Lab Sample No(s)	16970543	16970553
Customer Sample Ref.	Discharge	Influent
AGS Ref.		
Depth	0.00 - 0.00	0.00 - 0.00
Type	Trade Effluent	Trade Effluent

Ammoniacal Nitrogen	08-Feb-2018	
COD on Settled Sample	08-Feb-2018	12-Feb-2018
Determination of Dissolved Gases	16-Feb-2018	16-Feb-2018
pH Value	02-Feb-2018	
Suspended Solids	08-Feb-2018	



CERTIFICATE OF ANALYSIS

Validated

SDG: 180201-25

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Order Number:

78511

Report Number:

444867

Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1741
Ammoniacal Nitrogen as N	TM099	104.8 93.47 : 108.25

COD on Settled Sample

Component	Method Code	QC 1767	QC 1736
COD	TM107	100.57 97.45 : 103.77	100.95 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 1746
Carbon Dioxide Dissolved Raw	TM223	52.0 93.80 : 109.40
Ethane Dissolved Raw	TM223	98.5 78.64 : 121.36
Methane Dissolved Raw	TM223	92.8 78.08 : 121.92
Propane Dissolved Raw	TM223	97.33 78.63 : 121.37

pH Value

Component	Method Code	QC 1633
pH	TM256	100.54 99.87 : 102.29

Suspended Solids

Component	Method Code	QC 1751
Total Suspended Solids	TM022	99.2 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	180201-25	Client Reference:	Bradford Road No. 2 Gas	Report Number:	444867
Location:	Bradford Road, Manchester	Order Number:	78511	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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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).

Astos 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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Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 09 March 2018
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 180228-6
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 447555

We received 2 samples on Wednesday February 28, 2018 and 2 of these samples were scheduled for analysis which was completed on Friday March 09, 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





CERTIFICATE OF ANALYSIS

Validated

SDG: 180228-6 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 447555
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
17131914	Discharge		0.00 - 0.00	20/02/2018
17131918	Influent		0.00 - 0.00	20/02/2018

Maximum Sample/Coolbox Temperature (°C) :

8.2

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 180228-6 Client Reference: Bradford Road No. 2 Gashol Report Number: 447555
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

Results Legend

X Test
N No Determination Possible

Sample Types -

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

Lab Sample No(s)

17131914
17131918

Customer Sample Reference

Discharge
Influent

AGS Reference

Depth (m)

0.00 - 0.00
0.00 - 0.00

Container

11plastic (ALE221)
Vial (ALE297)
Vial (ALE297)

Sample Type

TE
TE
TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 2

X

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 180228-6 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 447555
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

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: 180228-6 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 447555
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Test Completion Dates

Lab Sample No(s)	17131914	17131918
Customer Sample Ref.	Discharge	Influent
AGS Ref.		
Depth	0.00 - 0.00	0.00 - 0.00
Type	Trade Effluent	Trade Effluent
Ammoniacal Nitrogen	09-Mar-2018	
COD on Settled Sample	06-Mar-2018	
Determination of Dissolved Gases	08-Mar-2018	08-Mar-2018
pH Value	07-Mar-2018	
Suspended Solids	06-Mar-2018	



CERTIFICATE OF ANALYSIS

Validated

SDG: 180228-6

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Order Number: 78511

Report Number:

447555

Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1781
Ammoniacal Nitrogen as N	TM099	102.8 93.47 : 108.25

COD on Settled Sample

Component	Method Code	QC 1735
COD	TM107	101.71 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 1762
Carbon Dioxide Dissolved Raw	TM223	51.5 93.80 : 109.40
Ethane Dissolved Raw	TM223	83.71 78.64 : 121.36
Methane Dissolved Raw	TM223	78.24 70.05 : 104.83
Propane Dissolved Raw	TM223	83.48 78.63 : 121.37

pH Value

Component	Method Code	QC 1738
pH	TM256	100.94 99.87 : 102.29

Suspended Solids

Component	Method Code	QC 1705
Total Suspended Solids	TM022	98.67 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG: 180228-6	Client Reference: Bradford Road No. 2 Gas	Report Number: 447555
Location: Bradford Road, Manchester	Order Number: 78511	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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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).

Astos 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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Website: www.alsenvironmental.co.uk

Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date:	10 April 2018
Customer:	H_CELTIC_CDF
Sample Delivery Group (SDG):	180328-14
Your Reference:	Bradford Road No. 2 Gasholder
Location:	Bradford Road, Manchester
Report No:	451003

We received 2 samples on Thursday March 22, 2018 and 2 of these samples were scheduled for analysis which was completed on Tuesday April 10, 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



CERTIFICATE OF ANALYSIS

Validated

SDG: 180328-14 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 451003
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
17279908	BIG BERTHA EFF			
17279909	BIG BERTHA INF			

Maximum Sample/Coolbox Temperature (°C) :

6.8

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: 180328-14 Client Reference: Bradford Road No. 2 Gashol Report Number: 451003
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

Results Legend

X Test
N No Determination Possible

Sample Types -

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

Lab Sample No(s)

17279908
17279909

Customer Sample Reference

BIG BERTHA EFF
BIG BERTHA INF

AGS Reference

Depth (m)

Container

11plastic (ALE221)
Vial (ALE297)
Vial (ALE297)

Sample Type

UNL
UNL
UNL

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 2

X

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

SDG: 180328-14 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 451003
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 180328-14 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 451003
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Test Completion Dates

Lab Sample No(s)	17279908	17279909
Customer Sample Ref.	BIG BERTHA EFF	BIG BERTHA INF
AGS Ref.		
Depth		
Type	Unspecified Liq	Unspecified Liq
Ammoniacal Nitrogen	10-Apr-2018	
COD on Settled Sample	04-Apr-2018	
Determination of Dissolved Gases	05-Apr-2018	05-Apr-2018
pH Value	05-Apr-2018	
Suspended Solids	05-Apr-2018	



CERTIFICATE OF ANALYSIS

Validated

SDG: 180328-14

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Order Number:

78511

Report Number:

451003

Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1799
Ammoniacal Nitrogen as N	TM099	98.4 93.47 : 108.25

COD on Settled Sample

Component	Method Code	QC 1732
COD	TM107	100.19 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 1745
Carbon Dioxide Dissolved Raw	TM223	51.6 93.80 : 109.40
Ethane Dissolved Raw	TM223	97.45 78.64 : 121.36
Methane Dissolved Raw	TM223	91.93 78.08 : 121.92
Propane Dissolved Raw	TM223	96.06 78.63 : 121.37

pH Value

Component	Method Code	QC 1747
pH	TM256	101.21 99.20 : 102.14

Suspended Solids

Component	Method Code	QC 1712
Total Suspended Solids	TM022	96.55 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	180328-14	Client Reference:	Bradford Road No. 2 Gas	Report Number:	451003
Location:	Bradford Road, Manchester	Order Number:	78511	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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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).

Astos 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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Celtic
Columbus House
Greenmeadow Springs
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South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 30 April 2018
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 180412-6
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 453979

We received 2 samples on Thursday April 12, 2018 and 2 of these samples were scheduled for analysis which was completed on Monday April 30, 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





CERTIFICATE OF ANALYSIS

Validated

SDG: 180412-6 Client Reference: Bradford Road No. 2 Gash Report Number: 453979
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
17349168	Effluent		0.00 - 0.00	04/04/2018
17349179	Influent		0.00 - 0.00	04/04/2018

Maximum Sample/Coolbox Temperature (°C) : 4.4

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 180412-6 Client Reference: Bradford Road No. 2 Gash Report Number: 453979
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

Results Legend

X Test
N No Determination Possible

Sample Types -

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

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	17349168		17349179	
						1000ml glass bottle (ALE220)	11plastic (ALE221)	H2SO4 (ALE244)	Vial (ALE297)
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 1			TE			X	
Anions by Kone (w)	All	NDPs: 0 Tests: 1			TE		X		
COD on Settled Sample	All	NDPs: 0 Tests: 1			TE		X		
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 1			TE		X		
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1			TE		X		
Determination of Dissolved Gases	All	NDPs: 0 Tests: 2			TE			X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1			TE		X		
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1			TE	X			
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 1			TE	X			
Free Sulphur	All	NDPs: 0 Tests: 1			TE	X			
Mercury Dissolved	All	NDPs: 0 Tests: 1			TE		X		
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 1			TE	X			
pH Value	All	NDPs: 0 Tests: 1			TE		X		
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1			TE			X	
Sulphide	All	NDPs: 0 Tests: 1			TE		X		



CERTIFICATE OF ANALYSIS

Validated

SDG: 180412-6 Client Reference: Bradford Road No. 2 Gash Report Number: 453979
Location: Bradford Road, Manchester Order Number: 78511 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

Lab Sample No(s)

17349168

17349179

Customer
Sample Reference

Effluent

Influent

AGS Reference

Depth (m)

0.00 - 0.00

0.00 - 0.00

Container

1000ml glass
bottle (ALE220)

11plastic
(ALE221)

H2SO4
(ALE244)

Vial (ALE297)

Vial (ALE297)

Sample Type

TE

TE

TE

TE

TE

Suspended Solids

All

NDPs: 0
Tests: 1

X

VOC MS (W)

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 180412-6 Client Reference: Bradford Road No. 2 Gash Report Number: 453979
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

Results Legend		Customer Sample Ref.	Effluent	Influent				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00	0.00 - 0.00				
M	mCERTS accredited.		Trade Effluent (TE)	Trade Effluent (TE)				
aq	Aqueous / settled sample.		04/04/2018	04/04/2018				
diss.filt	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		12/04/2018	12/04/2018				
(F)	Trigger breach confirmed		180412-6	180412-6				
1-5&*\$@	Sample deviation (see appendix)		17349168	17349179				
Component	LOD/Units	Method						
Suspended solids, Total	<2 mg/l	TM022	<2 #					
Carbon, Organic (diss.filt)	<3 mg/l	TM090	4.05 @					
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	1.59 #					
Sulphide	<0.01 mg/l	TM101	<0.01 2 #					
COD, settled	<7 mg/l	TM107	14.9 @ #					
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120	0.0782 #					
Arsenic (diss.filt)	<0.0005 mg/l	TM152	<0.003 2 #					
Boron (diss.filt)	<0.01 mg/l	TM152	<0.06 2 #					
Cadmium (diss.filt)	<0.00008 mg/l	TM152	<0.00048 2 #					
Chromium (diss.filt)	<0.001 mg/l	TM152	<0.006 2 #					
Copper (diss.filt)	<0.0003 mg/l	TM152	<0.0018 2 #					
Lead (diss.filt)	<0.0002 mg/l	TM152	<0.0012 2 #					
Nickel (diss.filt)	<0.0004 mg/l	TM152	<0.0024 2 #					
Selenium (diss.filt)	<0.001 mg/l	TM152	<0.006 2 #					
Zinc (diss.filt)	<0.001 mg/l	TM152	<0.006 2 #					
Iron (Dis.Filt)	<0.019 mg/l	TM152	<0.114 2 #					
EPH Range >C10 - C40 (aq)	<0.1 mg/l	TM172	0.284					
Mercury (diss.filt)	<0.00001 mg/l	TM183	<0.00001 2 #					
Sulphate	<2 mg/l	TM184	2 #					
Chloride	<2 mg/l	TM184	5.6 #					
Methane, dissolved	<0.001 mg/l	TM223	<0.00222	0.00504				
Cyanide, Total	<0.05 mg/l	TM227	<0.05 2 #					
Cyanide, Free	<0.05 mg/l	TM227	<0.05 2 #					
Cyanide, Complex	<0.05 mg/l	TM227	<0.05 2					
Thiocyanate	<0.05 mg/l	TM227	<0.05 2 #					
pH	<1 pH Units	TM256	7.61 #					
Resorcinol	<0.01 mg/l	TM259	<0.01					
Catechol	<0.01 mg/l	TM259	<0.01					
Phenol	<0.002 mg/l	TM259	<0.002 #					
Cresols	<0.006 mg/l	TM259	<0.006 #					
Xylenols	<0.008 mg/l	TM259	<0.008 #					
1-Naphthol	<0.01 mg/l	TM259	<0.01					



CERTIFICATE OF ANALYSIS

Validated

SDG: 180412-6 **Client Reference:** Bradford Road No. 2 Gash **Report Number:** 453979
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis
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, 1998	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
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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
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
TM294		Determination of Free Sulphur in liquids 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: 180412-6 **Client Reference:** Bradford Road No. 2 Gash **Report Number:** 453979
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Test Completion Dates

Lab Sample No(s)	17349168	17349179
Customer Sample Ref.	Effluent	Influent
AGS Ref.		
Depth	0.00 - 0.00	0.00 - 0.00
Type	Trade Effluent	Trade Effluent
Ammoniacal Nitrogen	23-Apr-2018	
Anions by Kone (w)	24-Apr-2018	
COD on Settled Sample	23-Apr-2018	
Conductivity (at 20 deg.C)	13-Apr-2018	
Cyanide Comp/Free/Total/Thiocyanate	23-Apr-2018	
Determination of Dissolved Gases	23-Apr-2018	23-Apr-2018
Dissolved Metals by ICP-MS	24-Apr-2018	
Dissolved Organic/Inorganic Carbon	13-Apr-2018	
EPH (DRO) (C10-C40) Aqueous (W)	17-Apr-2018	
Free Sulphur	17-Apr-2018	
Mercury Dissolved	30-Apr-2018	
PAH Spec MS - Aqueous (W)	18-Apr-2018	
pH Value	12-Apr-2018	
Phenols by HPLC (W)	19-Apr-2018	
Sulphide	23-Apr-2018	
Suspended Solids	18-Apr-2018	
VOC MS (W)	21-Apr-2018	



CERTIFICATE OF ANALYSIS

Validated

SDG: 180412-6 Client Reference: Bradford Road No. 2 Gash Report Number: 453979
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1709
Ammoniacal Nitrogen as N	TM099	100.8 93.47 : 108.25

Anions by Kone (w)

Component	Method Code	QC 1747
Chloride	TM184	106.0 92.93 : 115.43
Phosphate (Ortho as PO4)	TM184	96.40 : 108.40
Sulphate (soluble)	TM184	103.6 90.53 : 113.03
TON as NO3	TM184	96.26 : 111.21

COD on Settled Sample

Component	Method Code	QC 1742
COD	TM107	100.95 97.45 : 103.77

Conductivity (at 20 deg.C)

Component	Method Code	QC 1729
Conductivity (at 20 deg.C)	TM120	102.26 100.75 : 105.26

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 1715
Free Cyanide (W)	TM227	106.0 96.00 : 112.50
Thiocyanate (W)	TM227	99.5 95.50 : 107.50
Total Cyanide (W)	TM227	104.25 95.50 : 110.50

Determination of Dissolved Gases



CERTIFICATE OF ANALYSIS

Validated

SDG: 180412-6 Client Reference: Bradford Road No. 2 Gash Report Number: 453979
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

Determination of Dissolved Gases

Component	Method Code	QC 1721
Carbon Dioxide Dissolved Raw	TM223	51.5 93.80 : 109.40
Ethane Dissolved Raw	TM223	97.28 78.64 : 121.36
Methane Dissolved Raw	TM223	91.97 78.08 : 121.92
Propane Dissolved Raw	TM223	95.7 78.63 : 121.37

Dissolved Metals by ICP-MS

Component	Method Code	QC 1796
Aluminium	TM152	99.67 90.09 : 112.69
Antimony	TM152	123.5 81.00 : 119.70
Arsenic	TM152	98.0 92.40 : 113.00
Barium	TM152	96.33 93.11 : 112.81
Beryllium	TM152	103.33 88.27 : 113.27
Bismuth	TM152	103.0 86.72 : 115.61
Boron	TM152	98.0 86.47 : 111.70
Cadmium	TM152	100.83 90.28 : 114.48
Chromium	TM152	97.33 91.07 : 114.29
Cobalt	TM152	89.17 89.58 : 114.68
Copper	TM152	95.17 88.45 : 117.93
Lead	TM152	98.33 89.25 : 115.12
Lithium	TM152	99.5 88.50 : 116.05
Manganese	TM152	97.33 91.63 : 112.33
Molybdenum	TM152	92.83 91.08 : 111.63
Nickel	TM152	94.83 89.60 : 117.38
Niobium	TM152	96.38 96.38 : 128.85
Phosphorus	TM152	98.5 90.43 : 111.75
Selenium	TM152	101.5 88.22 : 113.50
Silver	TM152	88.0 94.00 : 112.00
Strontium	TM152	99.33 91.27 : 106.32



CERTIFICATE OF ANALYSIS

Validated

SDG: 180412-6 Client Reference: Bradford Road No. 2 Gash Report Number: 453979
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

Dissolved Metals by ICP-MS

		QC 1796
Tellurium	TM152	92.33 81.16 : 111.23
Thallium	TM152	98.17 81.70 : 117.09
Titanium	TM152	115.17 89.62 : 110.62
Tungsten	TM152	104.33 90.13 : 111.33
Uranium	TM152	102.0 92.30 : 116.90
Vanadium	TM152	105.17 88.22 : 118.55
Zinc	TM152	99.0 89.30 : 115.44
Zirconium	TM152	85.51 85.51 : 109.42

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 1737
Dissolved Inorganic Carbon	TM090	104.83 91.15 : 111.35
Dissolved Organic Carbon	TM090	103.67 94.18 : 111.18

EPH (DRO) (C10-C40) Aqueous (W)

Component	Method Code	QC 1790
EPH (DRO) (C10-C40)	TM172	99.6 72.06 : 118.25

Mercury Dissolved

Component	Method Code	QC 1741
Mercury Dissolved (CVAF)	TM183	94.7 77.00 : 119.00

PAH Spec MS - Aqueous (W)

Component	Method Code	QC 1700
Acenaphthene by GCMS	TM178	111.2 80.80 : 126.40
Acenaphthylene by GCMS	TM178	109.2 82.80 : 126.00
Anthracene by GCMS	TM178	107.2 86.00 : 119.60



CERTIFICATE OF ANALYSIS

Validated

SDG: 180412-6 Client Reference: Bradford Road No. 2 Gash Report Number: 453979
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

PAH Spec MS - Aqueous (W)

		QC 1700
Benz(a)anthracene by GCMS	TM178	108.0 87.60 : 116.40
Benzo(a)pyrene by GCMS	TM178	109.6 86.00 : 122.00
Benzo(b)fluoranthene by GCMS	TM178	100.8 82.80 : 123.60
Benzo(ghi)perylene by GCMS	TM178	96.8 86.80 : 115.60
Benzo(k)fluoranthene by GCMS	TM178	111.2 90.00 : 126.00
Chrysene by GCMS	TM178	114.4 84.00 : 134.40
Dibenzo(ah)anthracene by GCMS	TM178	97.6 83.60 : 112.40
Fluoranthene by GCMS	TM178	110.0 83.20 : 121.60
Fluorene by GCMS	TM178	110.4 88.00 : 116.80
Indeno(123cd)pyrene by GCMS	TM178	100.4 84.80 : 106.40
Naphthalene by GCMS	TM178	110.4 74.00 : 131.60
Phenanthrene by GCMS	TM178	111.6 90.40 : 119.20
Pyrene by GCMS	TM178	108.4 80.40 : 123.60

pH Value

Component	Method Code	QC 1757
pH	TM256	100.94 99.20 : 102.14

Phenols by HPLC (W)

Component	Method Code	QC 1742
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	92.0 85.30 : 105.52
2-Isopropyl Phenol by HPLC (W)	TM259	101.0 92.33 : 106.85
Cresols by HPLC (W)	TM259	93.67 84.57 : 102.57
Napthol by HPLC (W)	TM259	105.0 90.22 : 121.54
Phenol by HPLC (W)	TM259	98.0 89.00 : 107.00
Xylenols by HPLC (W)	TM259	103.17 88.83 : 112.83

Sulphide



CERTIFICATE OF ANALYSIS

Validated

SDG: 180412-6 Client Reference: Bradford Road No. 2 Gash Report Number: 453979
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

Sulphide

Component	Method Code	QC 1775
Sulphide	TM101	96.0 86.00 : 110.00

Suspended Solids

Component	Method Code	QC 1783
Total Suspended Solids	TM022	98.41 95.69 : 101.90

VOC MS (W)

Component	Method Code	QC 1741
1,1,1,2-Tetrachloroethane	TM208	100.5 78.82 : 115.90
1,1,1-Trichloroethane	TM208	99.0 79.61 : 114.35
1,1-Dichloroethane	TM208	96.5 79.99 : 118.57
1,2-Dichloroethane	TM208	93.5 79.35 : 124.02
2-Chlorotoluene	TM208	103.5 79.67 : 114.74
4-Chlorotoluene	TM208	102.0 80.15 : 113.42
Benzene	TM208	100.0 81.89 : 116.75
Bromomethane	TM208	104.5 75.84 : 123.69
Carbontetrachloride	TM208	103.5 79.73 : 118.91
Chlorobenzene	TM208	100.0 82.01 : 111.65
Chloroform	TM208	97.0 82.31 : 120.71
Chloromethane	TM208	83.0 53.07 : 117.38
Cis-1,2-Dichloroethene	TM208	100.5 84.04 : 126.19
Dichloromethane	TM208	96.0 81.20 : 120.83
Ethylbenzene	TM208	97.0 80.54 : 112.31
Hexachlorobutadiene	TM208	84.0 71.97 : 116.40
o-Xylene	TM208	97.0 79.22 : 112.31



CERTIFICATE OF ANALYSIS

Validated

SDG: 180412-6 Client Reference: Bradford Road No. 2 Gash Report Number: 453979
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

VOC MS (W)

		QC 1741
p/m-Xylene	TM208	96.0 79.85 : 111.06
Tert-butyl methyl ether	TM208	85.0 72.34 : 115.36
Tetrachloroethene	TM208	96.5 79.79 : 111.18
Toluene	TM208	94.0 81.59 : 111.56
Trichloroethene	TM208	95.5 79.53 : 112.32
Vinyl Chloride	TM208	101.5 73.93 : 128.95

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

Validated

SDG:	180412-6	Client Reference:	Bradford Road No. 2 Gash	Report Number:	453979
Location:	Bradford Road, Manchester	Order Number:	78511	Superseded Report:	

Chromatogram

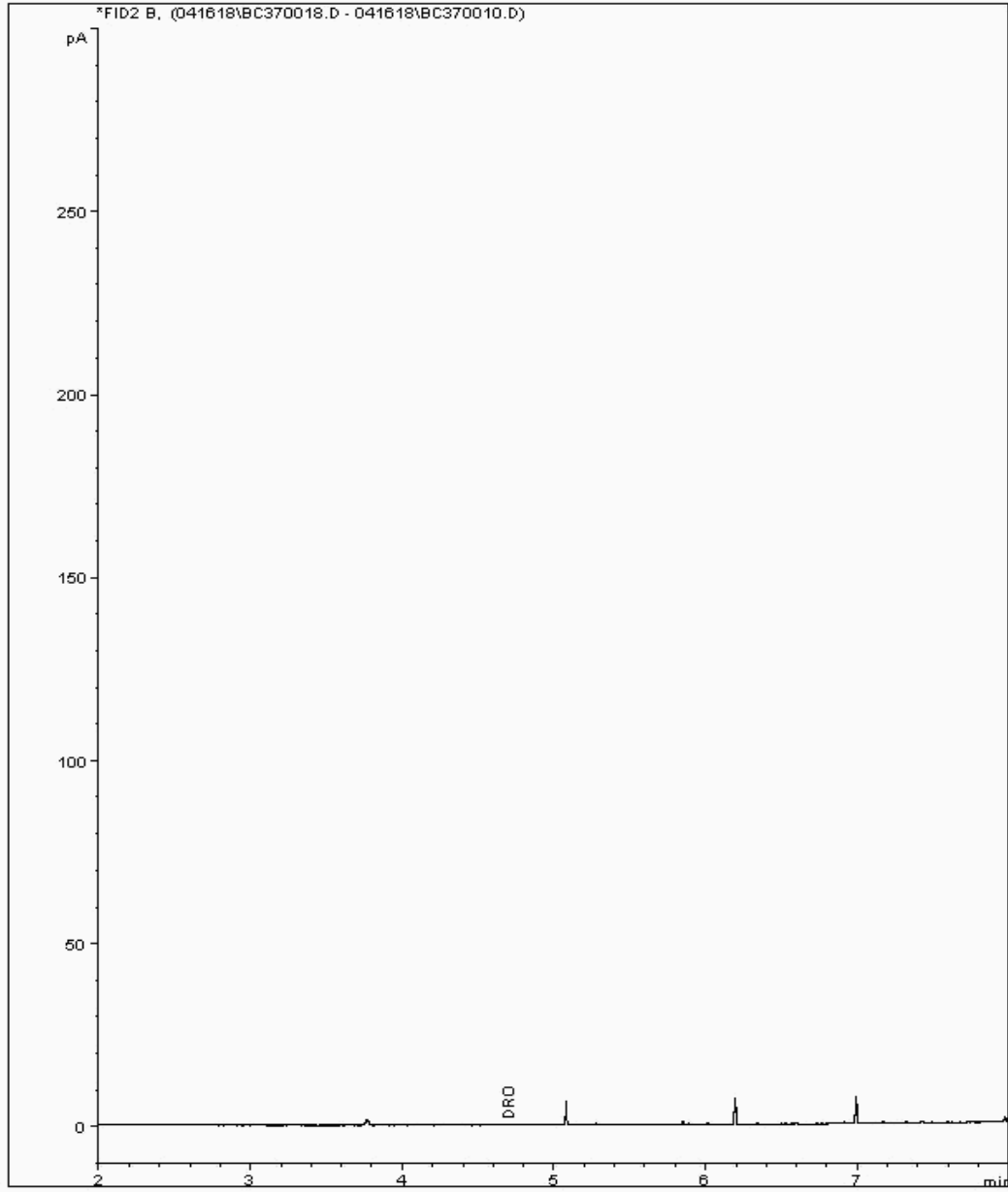
Analysis: EPH (DRO) (C10-C40) Aqueous (W)

Sample No : 17349796
Sample ID : Effluent

Depth : 0.00 - 0.00

EPH Range Organics (C10 - C40)

Sample Identity: 16289252-
Date Acquired : 16/04/2018 22:42:08 PM
Units : mg/l





CERTIFICATE OF ANALYSIS

SDG:	180412-6	Client Reference:	Bradford Road No. 2 Gas	Report Number:	453979
Location:	Bradford Road, Manchester	Order Number:	78511	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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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).

Astos 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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Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 13 June 2018
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 180602-26
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 460035

We received 1 sample on Saturday June 02, 2018 and 1 of these samples were scheduled for analysis which was completed on Wednesday June 13, 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





CERTIFICATE OF ANALYSIS

Validated

SDG: 180602-26 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 460035
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
17670232	Effluent		0.00 - 0.00	31/05/2018

Maximum Sample/Coolbox Temperature (°C) :

20.8

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: 180602-26 Client Reference: Bradford Road No. 2 Gashol Report Number: 460035
Location: Bradford Road, Manchester Order Number: 78511 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

Lab Sample No(s)

17670232

Customer
Sample Reference

Effluent

AGS Reference

Depth (m)

0.00 - 0.00

Container

500ml Plastic
(ALE208)
H2SO4 (ALE244)

Sample Type

TE

TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 1
Tests: 0

N

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 180602-26 **Client Reference:** Bradford Road No. 2 Gashol **Report Number:** 460035
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Notification of NDPs (No determination possible)

Date Received : 02/06/2018 10:49:15

Sample No	Customer Sample Ref.	Depth (m)	Test	Comment
17670232	Effluent	0.00 - 0.00	Determination of Dissolved Gases	Insufficient Sample



CERTIFICATE OF ANALYSIS

Validated

SDG: 180602-26 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 460035
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

SDG:	180602-26	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	460035
Location:	Bradford Road, Manchester	Order Number:	78511	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	17670232
Customer Sample Ref.	Effluent
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	13-Jun-2018
COD on Settled Sample	11-Jun-2018
pH Value	08-Jun-2018
Suspended Solids	07-Jun-2018



CERTIFICATE OF ANALYSIS

Validated

SDG: 180602-26 Client Reference: Bradford Road No. 2 Gashol Report Number: 460035
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1760
Ammoniacal Nitrogen as N	TM099	99.2 96.13 : 103.49

COD on Settled Sample

Component	Method Code	QC 1762
COD	TM107	100.95 97.45 : 103.77

pH Value

Component	Method Code	QC 1705
pH	TM256	100.94 99.20 : 102.14

Suspended Solids

Component	Method Code	QC 1781
Total Suspended Solids	TM022	98.94 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	180602-26	Client Reference:	Bradford Road No. 2 Gas	Report Number:	460035
Location:	Bradford Road, Manchester	Order Number:	78511	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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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).

Astos 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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CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date:	05 July 2018
Customer:	H_CELTIC_CDF
Sample Delivery Group (SDG):	180626-55
Your Reference:	
Location:	Bradford Road, Manchester
Report No:	463115

This report has been revised and directly supersedes 462773 in its entirety.

We received 1 sample on Friday June 22, 2018 and 1 of these samples were scheduled for analysis which was completed on Tuesday July 03, 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



CERTIFICATE OF ANALYSIS

Validated

SDG: 180626-55 Client Reference: Report Number: 463115
Location: Bradford Road, Manche Order Number: 78511 Superseded Report: 462773

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
17818894	INFLUENT		0.00	20/06/2018

Maximum Sample/Coolbox Temperature (°C) :

5

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: 180626-55

Client Reference:

Report Number: 463115

Location: Bradford Road, Manche

Order Number: 78511

Superseded Report: 462773

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

Lab Sample No(s)

17818894

Customer Sample Reference

INFLUENT

AGS Reference

Depth (m)

0.00

Container

1000ml glass bottle (ALE220)

Vial (ALE297)

Sample Type

PW

PW

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

Anions by Kone (w)

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 180626-55

Client Reference:

Report Number: 463115

Location: Bradford Road, Manche

Order Number: 78511

Superseded Report: 462773

Table of Results - Appendix

Method No	Reference	Description
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 180626-55

Client Reference:

Report Number: 463115

Location: Bradford Road, Manche

Order Number: 78511

Superseded Report: 462773

Test Completion Dates

Lab Sample No(s)	17818894
Customer Sample Ref.	INFLUENT
AGS Ref.	
Depth	0.00
Type	Process

Ammoniacal Nitrogen	03-Jul-2018
Anions by Kone (w)	03-Jul-2018
COD on Settled Sample	02-Jul-2018
Determination of Dissolved Gases	03-Jul-2018
Nitrite by Kone (w)	02-Jul-2018
pH Value	02-Jul-2018
Suspended Solids	29-Jun-2018



CERTIFICATE OF ANALYSIS

Validated

SDG: 180626-55

Client Reference:

Report Number: 463115

Location: Bradford Road, Manche

Order Number: 78511

Superseded Report: 462773

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1719
Ammoniacal Nitrogen as N	TM099	102.8 96.13 : 103.49

Anions by Kone (w)

Component	Method Code	QC 1723
Chloride	TM184	107.0 92.93 : 115.43
Phosphate (Ortho as PO4)	TM184	96.40 : 108.40
Sulphate (soluble)	TM184	100.8 90.53 : 113.03
TON as NO3	TM184	102.5 96.26 : 111.21

COD on Settled Sample

Component	Method Code	QC 1729
COD	TM107	101.52 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 1752
Carbon Dioxide Dissolved Raw	TM223	52.4 97.60 : 108.40
Ethane Dissolved Raw	TM223	96.53 94.81 : 100.33
Methane Dissolved Raw	TM223	91.2 89.67 : 94.67
Propane Dissolved Raw	TM223	95.06 94.28 : 98.38

pH Value

Component	Method Code	QC 1763
pH	TM256	101.21 99.19 : 102.43

Suspended Solids



CERTIFICATE OF ANALYSIS

Validated

SDG: 180626-55

Client Reference:

Report Number: 463115

Location: Bradford Road, Manche

Order Number: 78511

Superseded Report: 462773

Suspended Solids

Component	Method Code	QC 1757
Total Suspended Solids	TM022	97.61 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG: 180626-55 Client Reference: Report Number: 463115
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report: 462773

Appendix

General

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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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 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-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.

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
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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Celtic
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Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 07 August 2018
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 180728-16
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 467477

We received 1 sample on Saturday July 28, 2018 and 1 of these samples were scheduled for analysis which was completed on Tuesday August 07, 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





CERTIFICATE OF ANALYSIS

Validated

SDG:	180728-16	Client Reference:	Bradford Road No. 2 Gash	Report Number:	467477
Location:	Bradford Road, Manchester	Order Number:	78511	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18023403	Discharge		0.00 - 0.00	26/07/2018

Maximum Sample/Coolbox Temperature (°C) : 20.4

ISO5667-3 Water quality - Sampling - Part3 -

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

ALS have data which show that a cool box with 4 frozen icepacks is capable of

maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 180728-16 Client Reference: Bradford Road No. 2 Gash Report Number: 467477
Location: Bradford Road, Manchester Order Number: 78511 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

Lab Sample No(s)

18023403

Customer Sample Reference

Discharge

AGS Reference

Depth (m)

0.00 - 0.00

Container

0.5l glass bottle (ALE227)

500ml Plastic (ALE208)

H2SO4 (ALE244)

HNO3 Filtered (ALE204)

NaOH (ALE245)

Vial (ALE297)

ZnAc (ALE246)

Sample Type

TE

TE

TE

TE

TE

TE

TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

Anions by Kone (w)

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Conductivity (at 20 deg.C)

All

NDPs: 0
Tests: 1

X

Cyanide
Comp/Free/Total/Thiocyanate

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

Dissolved Metals by ICP-MS

All

NDPs: 0
Tests: 1

X

Dissolved Organic/Inorganic Carbon

All

NDPs: 0
Tests: 1

X

EPH (DRO) (C10-C40) Aqueous (W)

All

NDPs: 0
Tests: 1

X

Free Sulphur

All

NDPs: 0
Tests: 1

X

Mercury Dissolved

All

NDPs: 0
Tests: 1

X

PAH Spec MS - Aqueous (W)

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Phenols by HPLC (W)

All

NDPs: 0
Tests: 1

X

Sulphide

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 180728-16 Client Reference: Bradford Road No. 2 Gash Report Number: 467477
Location: Bradford Road, Manchester Order Number: 78511 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

Lab Sample No(s)

18023403

Customer Sample Reference

Discharge

AGS Reference

Depth (m)

0.00 - 0.00

Container

0.5l glass bottle (ALE227)

500ml Plastic (ALE208)

H2SO4 (ALE244)

HNO3 Filtered (ALE204)

NaOH (ALE245)

Vial (ALE297)

ZnAc (ALE246)

Sample Type

TE

TE

TE

TE

TE

TE

TE

Suspended Solids

All

NDPs: 0
Tests: 1

X

VOC MS (W)

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 180728-16 Client Reference: Bradford Road No. 2 Gash Report Number: 467477
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

Results Legend		Customer Sample Ref.	Discharge				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00				
M	mCERTS accredited.		Trade Effluent (TE)				
aq	Aqueous / settled sample.		26/07/2018				
diss.filt	Dissolved / filtered sample.		.				
tot.unfilt	Total / unfiltered sample.		28/07/2018				
*	Subcontracted test.		180728-16				
**	% 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		18023403				
(F)	Trigger breach confirmed						
1-5&*\$@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Suspended solids, Total	<2 mg/l	TM022	3.5	#			
Carbon, Organic (diss.filt)	<3 mg/l	TM090	<3				
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	1.99	#			
Sulphide	<0.01 mg/l	TM101	<0.01	#			
COD, settled	<7 mg/l	TM107	22.2	#			
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120	0.103	#			
Arsenic (diss.filt)	<0.0005 mg/l	TM152	0.0015	#			
Boron (diss.filt)	<0.01 mg/l	TM152	<0.01	#			
Cadmium (diss.filt)	<0.00008 mg/l	TM152	<0.00008	#			
Chromium (diss.filt)	<0.001 mg/l	TM152	<0.001	#			
Copper (diss.filt)	<0.0003 mg/l	TM152	<0.0003	#			
Lead (diss.filt)	<0.0002 mg/l	TM152	0.00191	#			
Nickel (diss.filt)	<0.0004 mg/l	TM152	<0.0004	#			
Selenium (diss.filt)	<0.001 mg/l	TM152	<0.001	#			
Zinc (diss.filt)	<0.001 mg/l	TM152	0.395	#			
Iron (Dis.Filt)	<0.019 mg/l	TM152	2.14	#			
EPH Range >C10 - C40 (aq)	<0.1 mg/l	TM172	0.286				
Mercury (diss.filt)	<0.00001 mg/l	TM183	<0.00001	#			
Sulphate	<2 mg/l	TM184	<2	#			
Chloride	<2 mg/l	TM184	5.9	#			
Methane, dissolved	<0.001 mg/l	TM223	<0.00221				
Cyanide, Total	<0.05 mg/l	TM227	<0.05	#			
Cyanide, Free	<0.05 mg/l	TM227	<0.05	#			
Cyanide, Complex	<0.05 mg/l	TM227	<0.05				
Thiocyanate	<0.05 mg/l	TM227	<0.05	#			
pH	<1 pH Units	TM256	7.43	#			
Resorcinol	<0.01 mg/l	TM259	<0.01				
Catechol	<0.01 mg/l	TM259	<0.01				
Phenol	<0.002 mg/l	TM259	<0.002	#			
Cresols	<0.006 mg/l	TM259	<0.006	#			
Xylenols	<0.008 mg/l	TM259	<0.008	#			
1-Naphthol	<0.01 mg/l	TM259	<0.01				



CERTIFICATE OF ANALYSIS

Validated

SDG: 180728-16 Client Reference: Bradford Road No. 2 Gash Report Number: 467477
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis
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, 1998	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
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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
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
TM294		Determination of Free Sulphur in liquids 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: 180728-16 **Client Reference:** Bradford Road No. 2 Gash **Report Number:** 467477
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Test Completion Dates

Lab Sample No(s)	18023403
Customer Sample Ref.	Discharge
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	06-Aug-2018
Anions by Kone (w)	30-Jul-2018
COD on Settled Sample	31-Jul-2018
Conductivity (at 20 deg.C)	02-Aug-2018
Cyanide Comp/Free/Total/Thiocyanate	02-Aug-2018
Determination of Dissolved Gases	06-Aug-2018
Dissolved Metals by ICP-MS	01-Aug-2018
Dissolved Organic/Inorganic Carbon	31-Jul-2018
EPH (DRO) (C10-C40) Aqueous (W)	01-Aug-2018
Free Sulphur	01-Aug-2018
Mercury Dissolved	02-Aug-2018
PAH Spec MS - Aqueous (W)	31-Jul-2018
pH Value	05-Aug-2018
Phenols by HPLC (W)	02-Aug-2018
Sulphide	07-Aug-2018
Suspended Solids	01-Aug-2018
VOC MS (W)	03-Aug-2018



CERTIFICATE OF ANALYSIS

Validated

SDG: 180728-16 Client Reference: Bradford Road No. 2 Gash Report Number: 467477
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1826
Ammoniacal Nitrogen as N	TM099	98.4 95.98 : 104.95

Anions by Kone (w)

Component	Method Code	QC 1808
Chloride	TM184	106.0 92.93 : 115.43
Phosphate (Ortho as PO4)	TM184	96.40 : 108.40
Sulphate (soluble)	TM184	103.2 90.53 : 113.03
TON as NO3	TM184	96.26 : 111.21

COD on Settled Sample

Component	Method Code	QC 1837
COD	TM107	100.76 97.45 : 103.77

Conductivity (at 20 deg.C)

Component	Method Code	QC 1800
Conductivity (at 20 deg.C)	TM120	101.5 100.75 : 105.26

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 1833
Free Cyanide (W)	TM227	100.0 93.25 : 112.75
Thiocyanate (W)	TM227	105.75 97.75 : 109.75
Total Cyanide (W)	TM227	103.75 95.25 : 111.75

Determination of Dissolved Gases



CERTIFICATE OF ANALYSIS

Validated

SDG: 180728-16 Client Reference: Bradford Road No. 2 Gash Report Number: 467477
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

Determination of Dissolved Gases

Component	Method Code	QC 1882
Carbon Dioxide Dissolved Raw	TM223	51.6 97.60 : 108.40
Ethane Dissolved Raw	TM223	96.43 94.81 : 100.33
Methane Dissolved Raw	TM223	91.02 89.67 : 94.67
Propane Dissolved Raw	TM223	95.26 94.28 : 98.38

Dissolved Metals by ICP-MS

Component	Method Code	QC 1808
Aluminium	TM152	101.67 88.00 : 112.00
Antimony	TM152	104.33 88.00 : 112.00
Arsenic	TM152	101.5 88.00 : 112.00
Barium	TM152	105.67 88.00 : 112.00
Beryllium	TM152	106.0 88.00 : 112.00
Bismuth	TM152	101.83 91.90 : 112.20
Borate	TM152	102.47 88.00 : 112.00
Boron	TM152	102.67 88.00 : 112.00
Cadmium	TM152	105.0 88.00 : 112.00
Chromium	TM152	100.33 88.00 : 112.00
Cobalt	TM152	99.5 88.00 : 112.00
Copper	TM152	100.0 85.52 : 115.00
Lead	TM152	100.33 88.00 : 112.00
Lithium	TM152	103.5 88.00 : 112.00
Manganese	TM152	103.5 88.00 : 112.00
Molybdenum	TM152	97.0 88.00 : 112.00
Nickel	TM152	99.17 88.00 : 112.00
Niobium	TM152	 88.00 : 112.00
Phosphorus	TM152	104.33 88.00 : 112.00
Selenium	TM152	103.17 88.00 : 112.00
Silver	TM152	99.0 89.40 : 108.90



CERTIFICATE OF ANALYSIS

Validated

SDG: 180728-16 Client Reference: Bradford Road No. 2 Gash Report Number: 467477
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

Dissolved Metals by ICP-MS

		QC 1808
Strontium	TM152	109.33 88.00 : 112.00
Tellurium	TM152	103.5 93.32 : 114.66
Thallium	TM152	96.33 88.00 : 112.00
Titanium	TM152	102.67 88.00 : 112.00
Tungsten	TM152	99.67 88.00 : 112.00
Uranium	TM152	100.33 88.00 : 112.00
Vanadium	TM152	100.33 88.00 : 112.00
Zinc	TM152	103.67 88.00 : 112.00
Zirconium	TM152	88.00 : 112.00

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 1852
Dissolved Inorganic Carbon	TM090	98.83 94.43 : 110.53
Dissolved Organic Carbon	TM090	101.67 99.25 : 108.95

EPH (DRO) (C10-C40) Aqueous (W)

Component	Method Code	QC 1838
EPH (DRO) (C10-C40)	TM172	94.4 61.35 : 125.96

Mercury Dissolved

Component	Method Code	QC 1885
Mercury Dissolved (CVAf)	TM183	98.5 77.00 : 119.00

PAH Spec MS - Aqueous (W)



CERTIFICATE OF ANALYSIS

Validated

SDG: 180728-16 Client Reference: Bradford Road No. 2 Gash Report Number: 467477
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

PAH Spec MS - Aqueous (W)

Component	Method Code	QC 1845
Acenaphthene by GCMS	TM178	107.2 85.60 : 119.20
Acenaphthylene by GCMS	TM178	104.4 85.28 : 115.28
Anthracene by GCMS	TM178	104.4 63.28 : 135.04
Benz(a)anthracene by GCMS	TM178	105.6 82.80 : 126.00
Benzo(a)pyrene by GCMS	TM178	108.4 89.60 : 125.60
Benzo(b)fluoranthene by GCMS	TM178	107.2 83.60 : 123.44
Benzo(ghi)perylene by GCMS	TM178	109.6 79.48 : 118.12
Benzo(k)fluoranthene by GCMS	TM178	108.0 84.60 : 146.28
Chrysene by GCMS	TM178	110.8 79.00 : 124.84
Dibenzo(ah)anthracene by GCMS	TM178	110.4 80.16 : 119.04
Fluoranthene by GCMS	TM178	108.4 77.08 : 123.88
Fluorene by GCMS	TM178	109.6 83.20 : 124.00
Indeno(123cd)pyrene by GCMS	TM178	107.6 81.60 : 120.00
Naphthalene by GCMS	TM178	110.4 83.48 : 122.12
Phenanthrene by GCMS	TM178	102.4 92.40 : 123.60
Pyrene by GCMS	TM178	110.0 76.20 : 128.28

pH Value

Component	Method Code	QC 1843
pH	TM256	100.27 99.19 : 102.43

Phenols by HPLC (W)

Component	Method Code	QC 1841
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	104.0 93.10 : 108.70
2-Isopropyl Phenol by HPLC (W)	TM259	104.0 92.10 : 114.90
Cresols by HPLC (W)	TM259	101.67 91.13 : 108.53
Napthol by HPLC (W)	TM259	91.0 87.00 : 111.00



CERTIFICATE OF ANALYSIS

Validated

SDG: 180728-16 Client Reference: Bradford Road No. 2 Gash Report Number: 467477
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

Phenols by HPLC (W)

		QC 1841
Phenol by HPLC (W)	TM259	104.0 93.20 : 107.60
Xylenols by HPLC (W)	TM259	102.5 92.83 : 107.73

Sulphide

Component	Method Code	QC 1830
Sulphide	TM101	109.33 88.90 : 112.50

Suspended Solids

Component	Method Code	QC 1885
Total Suspended Solids	TM022	100.0 95.69 : 101.90

VOC MS (W)

Component	Method Code	QC 1890
1,1,1,2-Tetrachloroethane	TM208	96.5 81.85 : 113.65
1,1,1-Trichloroethane	TM208	98.5 81.48 : 111.75
1,1-Dichloroethane	TM208	102.5 79.60 : 118.57
1,2-Dichloroethane	TM208	102.0 77.15 : 121.46
2-Chlorotoluene	TM208	95.5 81.26 : 111.62
4-Chlorotoluene	TM208	96.5 81.39 : 113.40
Benzene	TM208	103.0 81.22 : 118.60
Bromomethane	TM208	99.5 74.68 : 116.91
Carbontetrachloride	TM208	98.5 82.11 : 114.90
Chlorobenzene	TM208	98.5 81.61 : 113.62
Chloroform	TM208	102.0 80.05 : 117.79
Chloromethane	TM208	101.5 58.04 : 120.53
Cis-1,2-Dichloroethene	TM208	101.0 82.23 : 124.89
Dichloromethane	TM208	101.0 78.23 : 120.65



CERTIFICATE OF ANALYSIS

Validated

SDG: 180728-16 Client Reference: Bradford Road No. 2 Gash Report Number: 467477
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

VOC MS (W)

		QC 1890
Ethylbenzene	TM208	94.0 79.55 : 110.51
Hexachlorobutadiene	TM208	85.5 70.94 : 118.10
o-Xylene	TM208	95.5 79.71 : 111.54
p/m-Xylene	TM208	94.25 79.64 : 111.14
Tert-butyl methyl ether	TM208	101.0 70.18 : 125.95
Tetrachloroethene	TM208	93.5 79.34 : 112.46
Toluene	TM208	98.0 79.88 : 116.83
Trichloroethene	TM208	96.5 82.30 : 112.45
Vinyl Chloride	TM208	103.0 74.66 : 118.65

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

Validated

SDG:	180728-16	Client Reference:	Bradford Road No. 2 Gash	Report Number:	467477
Location:	Bradford Road, Manchester	Order Number:	78511	Superseded Report:	

Chromatogram

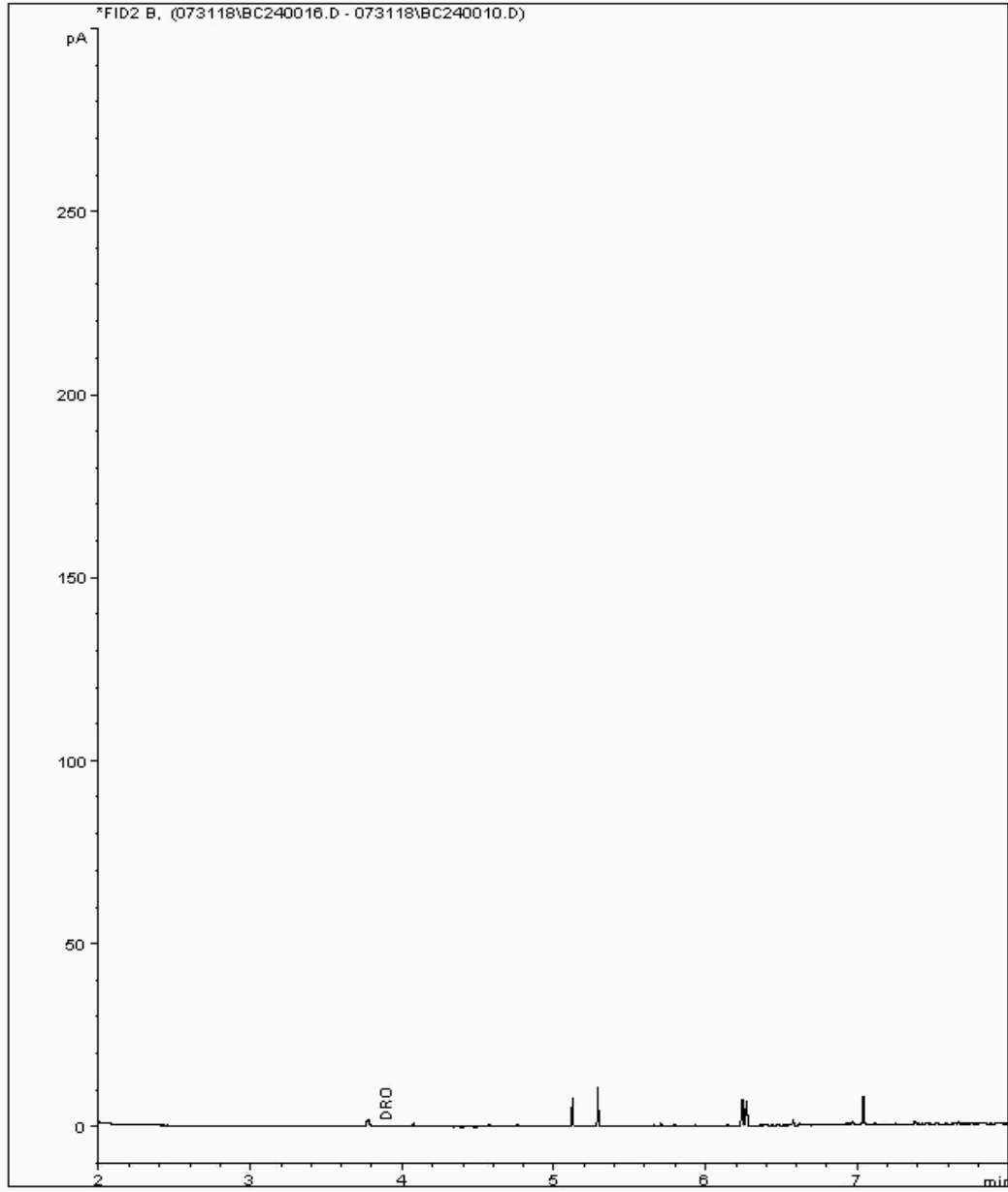
Analysis: EPH (DRO) (C10-C40) Aqueous (W)

Sample No : 18027517
Sample ID : Discharge

Depth : 0.00 - 0.00

EPH Range Organics (C10 - C40)

Sample Identity: 16932266-
Date Acquired : 31/07/2018 20:43:38 PM
Units : mg/l





CERTIFICATE OF ANALYSIS

SDG: 180728-16 Client Reference: Bradford Road No. 2 Gas Report Number: 467477
Location: Bradford Road, Manchester Order Number: 78511 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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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%. 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-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 (BTX). 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
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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Celtic
Columbus House
Greenmeadow Springs
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CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 25 September 2018
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 180914-19
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 473979

We received 1 sample on Friday September 14, 2018 and 1 of these samples were scheduled for analysis which was completed on Tuesday September 25, 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





CERTIFICATE OF ANALYSIS

Validated

SDG: 180914-19 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 473979
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18325516	Effluent		0.00 - 0.00	12/09/2018

Maximum Sample/Coolbox Temperature (°C) :

12.8

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



CERTIFICATE OF ANALYSIS

SDG: 180914-19

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Report Number:

473979

Order Number:

78511

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

Lab Sample No(s)

18325516

Customer
Sample Reference

Effluent

AGS Reference

Depth (m)

0.00 - 0.00

Container

1000ml glass bottle (ALE220)	1l plastic (ALE221)	Vial (ALE297)
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Sample Type

TE	TE	TE
----	----	----

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 180914-19 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 473979
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

SDG:	180914-19	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	473979
Location:	Bradford Road, Manchester	Order Number:	78511	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	18325516
Customer Sample Ref.	Effluent
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	25-Sep-2018
COD on Settled Sample	25-Sep-2018
Determination of Dissolved Gases	25-Sep-2018
pH Value	21-Sep-2018
Suspended Solids	25-Sep-2018



CERTIFICATE OF ANALYSIS

Validated

SDG: 180914-19

Client Reference:

Bradford Road No. 2 Gashol

Report Number:

473979

Location: Bradford Road, Manchester

Order Number:

78511

Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1882
Ammoniacal Nitrogen as N	TM099	97.6 95.98 : 104.95

COD on Settled Sample

Component	Method Code	QC 1878
COD	TM107	100.0 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 1835
Carbon Dioxide Dissolved Raw	TM223	53.2 97.60 : 108.40
Ethane Dissolved Raw	TM223	96.59 94.81 : 100.33
Methane Dissolved Raw	TM223	91.29 89.67 : 94.67
Propane Dissolved Raw	TM223	95.48 94.28 : 98.38

pH Value

Component	Method Code	QC 1830
pH	TM256	101.08 99.73 : 102.16

Suspended Solids

Component	Method Code	QC 1887
Total Suspended Solids	TM022	99.47 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	180914-19	Client Reference:	Bradford Road No. 2 Gas	Report Number:	473979
Location:	Bradford Road, Manchester	Order Number:	78511	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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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%. 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-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 (BTX). 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
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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Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date: 17 October 2018
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 181006-21
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 477193

This report has been revised and directly supersedes 476707 in its entirety.

We received 1 sample on Saturday October 06, 2018 and 1 of these samples were scheduled for analysis which was completed on Wednesday October 17, 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





CERTIFICATE OF ANALYSIS

Validated

SDG:	181006-21	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	477193
Location:	Bradford Road, Manchester	Order Number:	78511	Superseded Report:	476707

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18474512	Effluent		0.00 - 0.00	04/10/2018

Maximum Sample/Coolbox Temperature (°C) :

14.2

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 181006-21 Client Reference: Bradford Road No. 2 Gashol Report Number: 477193
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report: 476707

Results Legend

X Test
N No Determination Possible

Sample Types -

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

Lab Sample No(s)

18474512

Customer Sample Reference

Effluent

AGS Reference

Depth (m)

0.00 - 0.00

Container

1000ml glass bottle (ALE220) Vial (ALE297)

Sample Type

TE TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 181006-21 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 477193
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:** 476707

Table of Results - Appendix

Method No	Reference	Description
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 181006-21 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 477193
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:** 476707

Test Completion Dates

Lab Sample No(s)	18474512
Customer Sample Ref.	Effluent
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	15-Oct-2018
COD on Settled Sample	12-Oct-2018
Determination of Dissolved Gases	17-Oct-2018
pH Value	12-Oct-2018
Suspended Solids	14-Oct-2018



CERTIFICATE OF ANALYSIS

Validated

SDG: 181006-21

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Order Number:

78511

Report Number:

477193

Superseded Report:

476707

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1876
Ammoniacal Nitrogen as N	TM099	101.2 95.98 : 104.95

COD on Settled Sample

Component	Method Code	QC 1829
COD	TM107	99.81 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 1822
Carbon Dioxide Dissolved Raw	TM223	52.4 97.60 : 108.40
Ethane Dissolved Raw	TM223	97.37 94.81 : 100.33
Methane Dissolved Raw	TM223	92.02 89.67 : 94.67
Propane Dissolved Raw	TM223	95.95 94.28 : 98.38

pH Value

Component	Method Code	QC 1852
pH	TM256	100.81 99.73 : 102.16

Suspended Solids

Component	Method Code	QC 1877
Total Suspended Solids	TM022	98.67 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	181006-21	Client Reference:	Bradford Road No. 2 Gas	Report Number:	477193
Location:	Bradford Road, Manchester	Order Number:	78511	Superseded Report:	476707

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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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%. 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-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
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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Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date of report Generation:	28 May 2019
Customer:	H_CELTIC_CDF
Sample Delivery Group (SDG):	181110-54
Your Reference:	Bradford Road No. 2 Gasholder
Location:	Bradford Road, Manchester
Report No:	507513

This report has been revised and directly supersedes 505391 in its entirety.

We received 1 sample on Saturday November 10, 2018 and 1 of these samples were scheduled for analysis which was completed on Thursday November 22, 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).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 181110-54 Client Reference: Bradford Road No. 2 C Report Number: 507513
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 505391

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18709058	Discharge		0.00 - 0.00	08/11/2018

Maximum Sample/Coolbox Temperature (°C) : 10.6

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 181110-54 Client Reference: Bradford Road No. 2 (Report Number: 507513
Location: Bradford Road, Manch Order Number: 79696 Superseded Report: 505391

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

Lab Sample No(s)

18709058

Customer Sample Reference

Discharge

AGS Reference

Depth (m)

0.00 - 0.00

Container

ZnAc (ALE246)
Vial (ALE297)
NaOH (ALE245)
HNO3 Filtered (ALE204)
1 plastic (ALE221)
0.5l glass bottle (ALE227)

Sample Type

TE TE TE TE TE TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

Anions by Kone (w)

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Conductivity (at 20 deg.C)

All

NDPs: 0
Tests: 1

X

Cyanide Comp/Free/Total/Thiocyanate

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

Dissolved Metals by ICP-MS

All

NDPs: 0
Tests: 1

X

Dissolved Organic/Inorganic Carbon

All

NDPs: 0
Tests: 1

X

EPH (DRO) (C10-C40) Aqueous (W)

All

NDPs: 0
Tests: 1

X

Free Sulphur

All

NDPs: 0
Tests: 1

X

Mercury Dissolved

All

NDPs: 0
Tests: 1

X

PAH Spec MS - Aqueous (W)

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Phenols by HPLC (W)

All

NDPs: 0
Tests: 1

X

Sulphide

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 181110-54 Client Reference: Bradford Road No. 2 (Client Reference: 507513
 Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 505391

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

Lab Sample No(s)

18709058

Customer Sample Reference

Discharge

AGS Reference

Depth (m)

0.00 - 0.00

Container

ZnAc (ALE246)
 Vial (ALE297)
 NaOH (ALE245)
 HNO3 Filtered (ALE204)
 1 l plastic (ALE221)
 0.5 l glass bottle (ALE227)

Sample Type

TE TE TE TE TE TE

Suspended Solids

All

NDPs: 0
 Tests: 1

X

VOC MS (W)

All

NDPs: 0
 Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 181110-54 Client Reference: Bradford Road No. 2 (Report Number: 507513
Location: Bradford Road, Manch Order Number: 79696 Superseded Report: 505391

Results Legend		Customer Sample Ref.	Discharge				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00				
M	mCERTS accredited.		Trade Effluent (TE)				
aq	Aqueous / settled sample.		08/11/2018				
diss.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.		10/11/2018				
*	Subcontracted - refer to subcontractor report for accreditation status.		181110-54				
**	% 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		18709058				
(F)	Trigger breach confirmed						
1-3*5@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Suspended solids, Total	<2 mg/l	TM022	4.5				
			#				
Carbon, Organic (diss.filt)	<3 mg/l	TM090	5.2				
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	2.02				
			2 #				
Sulphide	<0.01 mg/l	TM101	<0.01				
			#				
COD, settled	<7 mg/l	TM107	21.7				
			#				
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120	0.0973				
			#				
Arsenic (diss.filt)	<0.0005 mg/l	TM152	0.00327				
Boron (diss.filt)	<0.01 mg/l	TM152	<0.01				
Cadmium (diss.filt)	<0.00008 mg/l	TM152	<0.00008				
Chromium (diss.filt)	<0.001 mg/l	TM152	<0.001				
Copper (diss.filt)	<0.0003 mg/l	TM152	0.000737				
Lead (diss.filt)	<0.0002 mg/l	TM152	0.00105				
Nickel (diss.filt)	<0.0004 mg/l	TM152	0.00881				
Selenium (diss.filt)	<0.001 mg/l	TM152	<0.001				
Zinc (diss.filt)	<0.001 mg/l	TM152	3.54				
Iron (Dis.Filt)	<0.019 mg/l	TM152	1.38				
EPH Range >C10 - C40 (aq)	<0.1 mg/l	TM172	0.332				
Mercury (diss.filt)	<0.00001 mg/l	TM183	<0.00001				
			#				
Sulphate	<2 mg/l	TM184	2.6				
			#				
Chloride	<2 mg/l	TM184	6.5				
			#				
Methane, dissolved	<0.001 mg/l	TM223	<0.00224				
Cyanide, Total	<0.05 mg/l	TM227	<0.05				
			#				
Cyanide, Free	<0.05 mg/l	TM227	<0.05				
			#				
Cyanide, Complex	<0.05 mg/l	TM227	<0.05				
Thiocyanate	<0.05 mg/l	TM227	<0.05				
			#				
pH	<1 pH Units	TM256	7.37				
			#				
Resorcinol	<0.01 mg/l	TM259	<0.01				
			2				
Catechol	<0.01 mg/l	TM259	<0.01				
			2				
Phenol	<0.002 mg/l	TM259	<0.002				
			2 #				
Cresols	<0.006 mg/l	TM259	<0.006				
			2 #				
Xylenols	<0.008 mg/l	TM259	<0.008				
			2 #				
1-Naphthol	<0.01 mg/l	TM259	<0.01				
			2				



CERTIFICATE OF ANALYSIS

Validated

SDG: 181110-54 Client Reference: Bradford Road No. 2 (Report Number: 507513
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 505391

Table of Results - Appendix

Method No	Reference	Description
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis
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, 1998	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
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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
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
TM294		Determination of Free Sulphur in liquids 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:	181110-54	Client Reference:	Bradford Road No. 2 (	Report Number:	507513
Location:	Bradford Road, Manch	Order Number:	79696	Superseded Report:	505391

Test Completion Dates

Lab Sample No(s)	18709058
Customer Sample Ref.	Discharge
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	19-Nov-2018
Anions by Kone (w)	22-Nov-2018
COD on Settled Sample	20-Nov-2018
Conductivity (at 20 deg.C)	15-Nov-2018
Cyanide Comp/Free/Total/Thiocyanate	14-Nov-2018
Determination of Dissolved Gases	20-Nov-2018
Dissolved Metals by ICP-MS	20-Nov-2018
Dissolved Organic/Inorganic Carbon	13-Nov-2018
EPH (DRO) (C10-C40) Aqueous (W)	14-Nov-2018
Free Sulphur	16-Nov-2018
Mercury Dissolved	19-Nov-2018
PAH Spec MS - Aqueous (W)	14-Nov-2018
pH Value	16-Nov-2018
Phenols by HPLC (W)	19-Nov-2018
Sulphide	22-Nov-2018
Suspended Solids	20-Nov-2018
VOC MS (W)	17-Nov-2018



CERTIFICATE OF ANALYSIS

Validated

SDG: 181110-54 Client Reference: Bradford Road No. 2 (Report Number: 507513
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 505391

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1816
Ammoniacal Nitrogen as N	TM099	98.4 95.98 : 104.95

Anions by Kone (w)

Component	Method Code	QC 1805
Chloride	TM184	102.0 92.93 : 115.43
Phosphate (Ortho as PO ₄)	TM184	96.40 : 108.40
Sulphate (soluble)	TM184	100.8 90.53 : 113.03
TON as NO ₃	TM184	96.26 : 111.21

COD on Settled Sample

Component	Method Code	QC 1887
COD	TM107	102.28 97.45 : 103.77

Conductivity (at 20 deg.C)

Component	Method Code	QC 1817
Conductivity (at 20 deg.C)	TM120	103.76 100.75 : 105.26

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 1866
Free Cyanide (W)	TM227	100.75 93.25 : 112.75
Thiocyanate (W)	TM227	107.0 97.75 : 109.75
Total Cyanide (W)	TM227	106.5 92.25 : 111.75

Determination of Dissolved Gases



CERTIFICATE OF ANALYSIS

Validated

SDG: 181110-54 Client Reference: Bradford Road No. 2 (Report Number: 507513
Location: Bradford Road, Manch Order Number: 79696 Superseded Report: 505391

Determination of Dissolved Gases

Component	Method Code	QC 1894
Carbon Dioxide Dissolved Raw	TM223	52.1 97.60 : 108.40
Ethane Dissolved Raw	TM223	96.83 94.81 : 100.33
Methane Dissolved Raw	TM223	90.89 89.67 : 94.67
Propane Dissolved Raw	TM223	96.11 94.28 : 98.38

Dissolved Metals by ICP-MS

Component	Method Code	QC 1894
Aluminium	TM152	102.0 90.09 : 112.69
Antimony	TM152	101.67 81.00 : 119.70
Arsenic	TM152	99.67 90.67 : 112.97
Barium	TM152	101.83 84.74 : 117.25
Beryllium	TM152	103.5 88.27 : 113.27
Bismuth	TM152	92.0 86.72 : 115.61
Boron	TM152	100.0 82.81 : 116.65
Cadmium	TM152	103.0 90.28 : 114.48
Calcium	TM152	100.0 81.38 : 119.09
Chromium	TM152	95.83 89.50 : 108.80
Cobalt	TM152	96.5 89.66 : 112.39
Copper	TM152	98.83 88.45 : 117.93
Iron	TM152	98.67 89.86 : 109.22
Lead	TM152	92.33 89.25 : 115.12
Lithium	TM152	97.67 88.50 : 116.05
Magnesium	TM152	98.0 86.35 : 113.36
Manganese	TM152	98.5 91.63 : 112.33
Molybdenum	TM152	95.67 86.94 : 106.49
Nickel	TM152	98.17 89.60 : 117.38
Niobium	TM152	96.38 96.38 : 128.85
Phosphorus	TM152	98.5 90.43 : 111.75



CERTIFICATE OF ANALYSIS

Validated

SDG: 181110-54 Client Reference: Bradford Road No. 2 (Report Number: 507513
Location: Bradford Road, Manch Order Number: 79696 Superseded Report: 505391

Dissolved Metals by ICP-MS

		QC 1894
Potassium	TM152	100.67 88.02 : 113.59
Selenium	TM152	103.5 88.22 : 113.50
Silver	TM152	99.33 91.29 : 113.29
Sodium	TM152	97.33 89.79 : 109.14
Strontium	TM152	99.33 91.27 : 106.32
Tellurium	TM152	97.0 81.16 : 111.23
Thallium	TM152	92.5 81.70 : 117.09
Tin	TM152	99.5 91.00 : 109.00
Titanium	TM152	94.0 89.62 : 110.62
Tungsten	TM152	98.5 88.98 : 114.68
Uranium	TM152	89.83 92.30 : 116.90
Vanadium	TM152	95.5 88.22 : 118.55
Zinc	TM152	99.67 89.30 : 115.44
Zirconium	TM152	85.51 85.51 : 109.42

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 1813
Dissolved Inorganic Carbon	TM090	111.33 91.15 : 111.35
Dissolved Organic Carbon	TM090	106.5 97.18 : 109.58

EPH (DRO) (C10-C40) Aqueous (W)

Component	Method Code	QC 1855
EPH (DRO) (C10-C40)	TM172	106.6 66.75 : 120.64

Mercury Dissolved



CERTIFICATE OF ANALYSIS

Validated

SDG: 181110-54 Client Reference: Bradford Road No. 2 (Report Number: 507513
Location: Bradford Road, Manch Order Number: 79696 Superseded Report: 505391

Mercury Dissolved

Component	Method Code	QC 1875
Mercury Dissolved (CVAF)	TM183	105.0 75.00 : 111.00

PAH Spec MS - Aqueous (W)

Component	Method Code	QC 1822
Acenaphthene by GCMS	TM178	85.60 : 119.20
Acenaphthylene by GCMS	TM178	85.28 : 115.28
Anthracene by GCMS	TM178	63.28 : 135.04
Benz(a)anthracene by GCMS	TM178	82.80 : 126.00
Benzo(a)pyrene by GCMS	TM178	89.60 : 125.60
Benzo(b)fluoranthene by GCMS	TM178	83.60 : 123.44
Benzo(ghi)perylene by GCMS	TM178	79.48 : 118.12
Benzo(k)fluoranthene by GCMS	TM178	84.60 : 146.28
Chrysene by GCMS	TM178	79.00 : 124.84
Dibenzo(ah)anthracene by GCMS	TM178	80.16 : 119.04
Fluoranthene by GCMS	TM178	77.08 : 123.88
Fluorene by GCMS	TM178	83.20 : 124.00
Indeno(123cd)pyrene by GCMS	TM178	81.60 : 120.00
Naphthalene by GCMS	TM178	83.48 : 122.12
Phenanthrene by GCMS	TM178	92.40 : 123.60
Pyrene by GCMS	TM178	76.20 : 128.28

pH Value

Component	Method Code	QC 1823
pH	TM256	100.94 99.73 : 102.16

Phenols by HPLC (W)



CERTIFICATE OF ANALYSIS

Validated

SDG: 181110-54 Client Reference: Bradford Road No. 2 (C) Report Number: 507513
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 505391

Phenols by HPLC (W)

Component	Method Code	QC 1808
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	100.0 92.00 : 110.00
2-Isopropyl Phenol by HPLC (W)	TM259	100.0 84.00 : 138.00
Cresols by HPLC (W)	TM259	97.0 88.33 : 106.33
Napthol by HPLC (W)	TM259	105.0 84.00 : 108.00
Phenol by HPLC (W)	TM259	98.0 93.00 : 111.00
Xylenols by HPLC (W)	TM259	102.83 90.50 : 113.50

Sulphide

Component	Method Code	QC 1874
Sulphide	TM101	105.33 88.90 : 112.50

Suspended Solids

Component	Method Code	QC 1841
Total Suspended Solids	TM022	99.2 95.69 : 101.90

VOC MS (W)

Component	Method Code	QC 1801
1,1,1,2-Tetrachloroethane	TM208	101.5 78.82 : 115.90
1,1,1-Trichloroethane	TM208	100.0 79.61 : 114.35
1,1-Dichloroethane	TM208	101.0 79.99 : 118.57
1,2-Dichloroethane	TM208	98.0 79.35 : 124.02
2-Chlorotoluene	TM208	102.5 79.67 : 114.74
4-Chlorotoluene	TM208	101.0 80.15 : 113.42
Benzene	TM208	101.5 84.37 : 119.68
Bromomethane	TM208	82.5 68.41 : 115.99
Carbontetrachloride	TM208	102.0 79.73 : 118.91
Chlorobenzene	TM208	102.5 82.01 : 111.65



CERTIFICATE OF ANALYSIS

Validated

SDG: 181110-54 Client Reference: Bradford Road No. 2 C Report Number: 507513
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 505391

VOC MS (W)

		QC 1801
Chloroform	TM208	100.5 82.31 : 120.71
Chloromethane	TM208	104.5 62.46 : 124.98
Cis-1,2-Dichloroethene	TM208	97.5 84.04 : 126.19
Dichloromethane	TM208	96.5 81.20 : 120.83
Ethylbenzene	TM208	99.5 80.54 : 112.31
Hexachlorobutadiene	TM208	99.5 59.76 : 107.25
o-Xylene	TM208	101.5 79.22 : 112.31
p/m-Xylene	TM208	100.5 79.85 : 111.06
Tert-butyl methyl ether	TM208	103.5 70.94 : 119.66
Tetrachloroethene	TM208	99.5 79.79 : 111.18
Toluene	TM208	100.0 81.59 : 111.56
Trichloroethene	TM208	98.5 79.53 : 112.32
Vinyl Chloride	TM208	93.5 73.29 : 120.15

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

Validated

SDG:	181110-54	Client Reference:	Bradford Road No. 2 (	Report Number:	507513
Location:	Bradford Road, Manch	Order Number:	79696	Superseded Report:	505391

Chromatogram

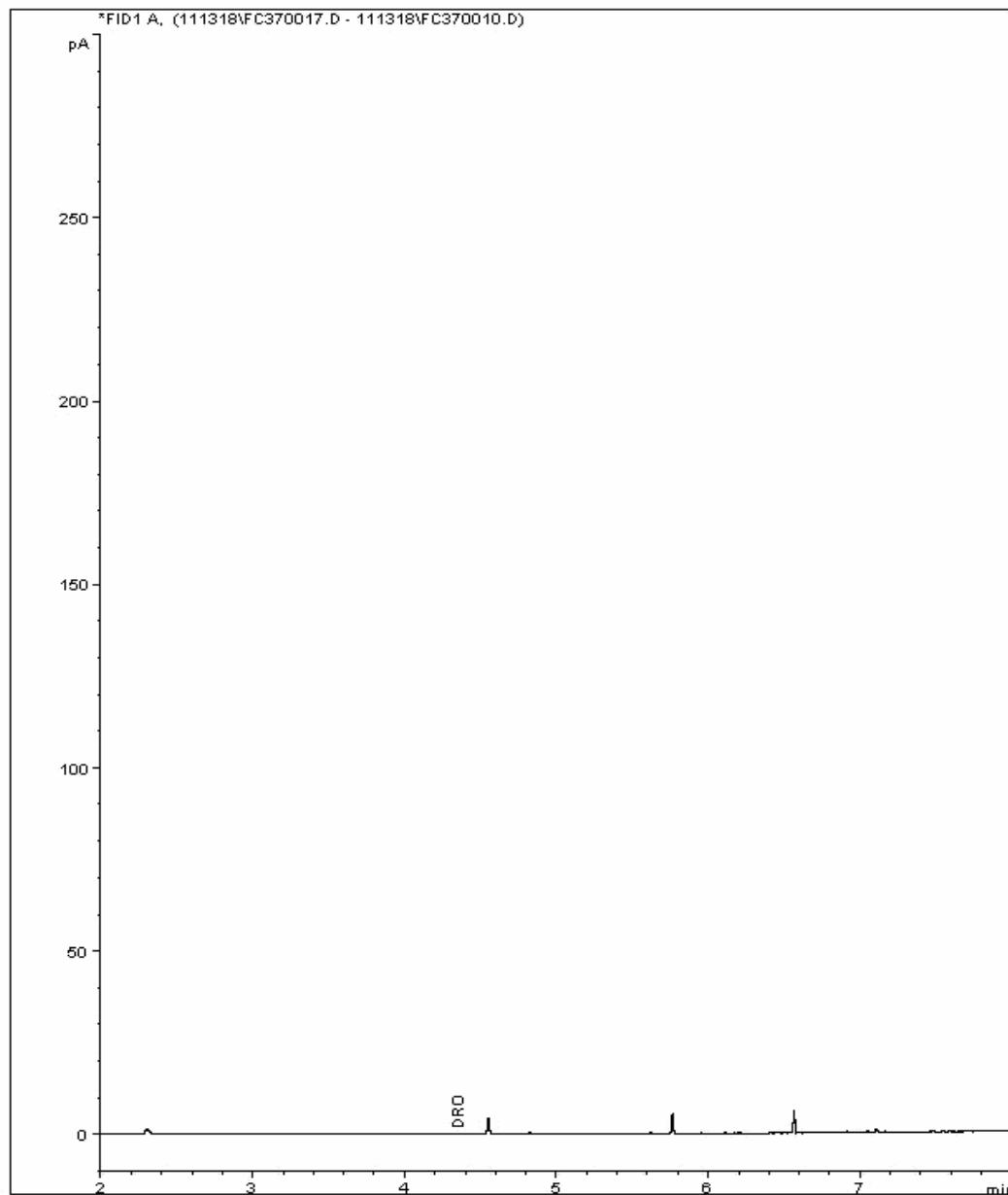
Analysis: EPH (DRO) (C10-C40) Aqueous (W)

Sample No : 18713677
Sample ID : Discharge

Depth : 0.00 - 0.00

EPH Range Organics (C10 - C40)

Sample Identity: 17574988-
Date Acquired : 13/11/2018 20:35:26 PM
Units : ppm





CERTIFICATE OF ANALYSIS

SDG: 181110-54 Client Reference: Bradford Road No. 2 Report Number: 507513
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 505391

Appendix

General

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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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%. 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-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.

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
§	Sampled on date not provided
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples

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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Website: www.alsenvironmental.co.uk

Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date of report Generation: 15 January 2019
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 181219-115
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 488583

We received 1 sample on Wednesday December 19, 2018 and 1 of these samples were scheduled for analysis which was completed on Tuesday January 15, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 181219-115 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 488583
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
19003831	Effluent		0.00 - 0.00	14/12/2018

Maximum Sample/Coolbox Temperature (°C) :

7.2

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 181219-115 Client Reference: Bradford Road No. 2 Gashol Report Number: 488583
Location: Bradford Road, Manchester Order Number: 78511 Superseded Report:

Results Legend

X Test
N No Determination Possible

Sample Types -

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

Lab Sample No(s)

19003831

Customer Sample Reference

Effluent

AGS Reference

Depth (m)

0.00 - 0.00

Container

11 plastic (ALE221)

Vial (ALE297)

Sample Type

TE

TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



Validated

CERTIFICATE OF ANALYSIS

SDG:	181219-115	Client Reference:	Bradford Road No. 2 Gashol	Report Number:	488583
Location:	Bradford Road, Manchester	Order Number:	78511	Superseded Report:	



CERTIFICATE OF ANALYSIS

SDG: 181219-115 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 488583
Location: Bradford Road, Manchester **Order Number:** 78511 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

SDG:	181219-115	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	488583
Location:	Bradford Road, Manchester	Order Number:	78511	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	19003831
Customer Sample Ref.	Effluent
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	31-Dec-2018
COD on Settled Sample	04-Jan-2019
Determination of Dissolved Gases	15-Jan-2019
pH Value	31-Dec-2018
Suspended Solids	02-Jan-2019



CERTIFICATE OF ANALYSIS

Validated

SDG: 181219-115

Client Reference:

Bradford Road No. 2 Gashold

Report Number: 488583

Location: Bradford Road, Manchester

Order Number: 78511

Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1948
Ammoniacal Nitrogen as N	TM099	102.0 95.98 : 104.95

COD on Settled Sample

Component	Method Code	QC 1929
COD	TM107	101.33 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 1928
Carbon Dioxide Dissolved Raw	TM223	52.0 101.00 : 108.20
Ethane Dissolved Raw	TM223	96.9 95.19 : 98.23
Methane Dissolved Raw	TM223	91.78 89.76 : 93.14
Propane Dissolved Raw	TM223	95.32 93.54 : 97.20

pH Value

Component	Method Code	QC 1928
pH	TM256	101.35 99.73 : 102.16

Suspended Solids

Component	Method Code	QC 1902
Total Suspended Solids	TM022	97.61 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	181219-115	Client Reference:	Bradford Road No. 2 Gas	Report Number:	488583
Location:	Bradford Road, Manchester	Order Number:	78511	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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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%. 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-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).

Astos 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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CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date of report Generation: 06 February 2019
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 190127-6
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 491536

This report has been revised and directly supersedes 491064 in its entirety.

We received 1 sample on Sunday January 27, 2019 and 1 of these samples were scheduled for analysis which was completed on Wednesday February 06, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	190127-6	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	491536
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	491064

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
19210131	Effluent		0.00 - 0.00	25/01/2019

Maximum Sample/Coolbox Temperature (°C) :

4.6

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 190127-6 Client Reference: Bradford Road No. 2 Gashol Report Number: 491536
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 491064

Results Legend

X Test
N No Determination Possible

Sample Types -

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

Lab Sample No(s)

19210131

Customer Sample Reference

Effluent

AGS Reference

Depth (m)

0.00 - 0.00

Container

11plastic (ALE221)
Vial (ALE297)

Sample Type

TE TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 190127-6 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 491536
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:** 491064

Table of Results - Appendix

Method No	Reference	Description
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 190127-6 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 491536
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:** 491064

Test Completion Dates

Lab Sample No(s) 19210131
Customer Sample Ref. Effluent
AGS Ref.
Depth 0.00 - 0.00
Type Trade Effluent

Ammoniacal Nitrogen	04-Feb-2019
COD on Settled Sample	04-Feb-2019
Determination of Dissolved Gases	06-Feb-2019
pH Value	04-Feb-2019
Suspended Solids	29-Jan-2019



CERTIFICATE OF ANALYSIS

Validated

SDG: 190127-6

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Order Number:

79696

Report Number:

491536

Superseded Report:

491064

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1962
Ammoniacal Nitrogen as N	TM099	99.2 93.14 : 108.60

COD on Settled Sample

Component	Method Code	QC 1952
COD	TM107	101.71 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 1988
Carbon Dioxide Dissolved Raw	TM223	52.3 101.00 : 108.20
Ethane Dissolved Raw	TM223	96.91 95.19 : 98.23
Methane Dissolved Raw	TM223	91.46 89.76 : 93.14
Propane Dissolved Raw	TM223	95.04 93.54 : 97.20

pH Value

Component	Method Code	QC 1924
pH	TM256	100.54 99.73 : 102.16

Suspended Solids

Component	Method Code	QC 1951
Total Suspended Solids	TM022	97.08 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	190127-6	Client Reference:	Bradford Road No. 2 Gas	Report Number:	491536
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	491064

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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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%. 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-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 (BTX). 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
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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Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date of report Generation: 06 February 2019
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 190127-6
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 491536

This report has been revised and directly supersedes 491064 in its entirety.

We received 1 sample on Sunday January 27, 2019 and 1 of these samples were scheduled for analysis which was completed on Wednesday February 06, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	190127-6	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	491536
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	491064

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
19210131	Effluent		0.00 - 0.00	25/01/2019

Maximum Sample/Coolbox Temperature (°C) :

4.6

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 190127-6 Client Reference: Bradford Road No. 2 Gashol Report Number: 491536
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 491064

Results Legend

X Test
N No Determination Possible

Sample Types -

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

Lab Sample No(s)

19210131

Customer Sample Reference

Effluent

AGS Reference

Depth (m)

0.00 - 0.00

Container

11plastic (ALE221)
Vial (ALE297)

Sample Type

TE TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 190127-6 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 491536
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:** 491064

Table of Results - Appendix

Method No	Reference	Description
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

SDG:	190127-6	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	491536
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	491064

Test Completion Dates

Lab Sample No(s)	19210131
Customer Sample Ref.	Effluent
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	04-Feb-2019
COD on Settled Sample	04-Feb-2019
Determination of Dissolved Gases	06-Feb-2019
pH Value	04-Feb-2019
Suspended Solids	29-Jan-2019



CERTIFICATE OF ANALYSIS

Validated

SDG: 190127-6

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Order Number:

79696

Report Number:

491536

Superseded Report:

491064

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1962
Ammoniacal Nitrogen as N	TM099	99.2 93.14 : 108.60

COD on Settled Sample

Component	Method Code	QC 1952
COD	TM107	101.71 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 1988
Carbon Dioxide Dissolved Raw	TM223	52.3 101.00 : 108.20
Ethane Dissolved Raw	TM223	96.91 95.19 : 98.23
Methane Dissolved Raw	TM223	91.46 89.76 : 93.14
Propane Dissolved Raw	TM223	95.04 93.54 : 97.20

pH Value

Component	Method Code	QC 1924
pH	TM256	100.54 99.73 : 102.16

Suspended Solids

Component	Method Code	QC 1951
Total Suspended Solids	TM022	97.08 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	190127-6	Client Reference:	Bradford Road No. 2 Gas	Report Number:	491536
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	491064

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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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%. 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-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 (BTX). 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
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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Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date of report Generation: 11 March 2019
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 190219-54
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 496323

This report has been revised and directly supersedes 494224 in its entirety.

We received 1 sample on Tuesday February 19, 2019 and 1 of these samples were scheduled for analysis which was completed on Monday March 11, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	190219-54	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	496323
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	494224

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
19386762	Effluent		0.00 - 0.00	15/02/2019

Maximum Sample/Coolbox Temperature (°C) :

5.8

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 190219-54 Client Reference: Bradford Road No. 2 Gashol Report Number: 496323
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 494224

Results Legend

X Test
N No Determination Possible

Sample Types -

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

Lab Sample No(s)

19386762

Customer Sample Reference

Effluent

AGS Reference

Depth (m)

0.00 - 0.00

Container

11plastic (ALE221)

Vial (ALE297)

Sample Type

TE

TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

SDG:	190219-54	Client Reference:	Bradford Road No. 2 Gashol	Report Number:	496323
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	494224

Table of Results - Appendix

Method No	Reference	Description
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

SDG:	190219-54	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	496323
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	494224

Test Completion Dates

Lab Sample No(s)	19386762
Customer Sample Ref.	Effluent
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	26-Feb-2019
COD on Settled Sample	23-Feb-2019
Determination of Dissolved Gases	11-Mar-2019
pH Value	25-Feb-2019
Suspended Solids	21-Feb-2019



CERTIFICATE OF ANALYSIS

Validated

SDG: 190219-54

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Order Number:

79696

Report Number:

496323

Superseded Report:

494224

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1964
Ammoniacal Nitrogen as N	TM099	102.0 93.14 : 108.60

COD on Settled Sample

Component	Method Code	QC 1976
COD	TM107	99.62 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 1978
Carbon Dioxide Dissolved Raw	TM223	53.3 101.00 : 108.20
Ethane Dissolved Raw	TM223	97.76 95.19 : 98.23
Methane Dissolved Raw	TM223	91.64 89.76 : 93.14
Propane Dissolved Raw	TM223	96.98 93.54 : 97.20

pH Value

Component	Method Code	QC 1940
pH	TM256	102.02 99.33 : 102.56

Suspended Solids

Component	Method Code	QC 1975
Total Suspended Solids	TM022	98.94 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	190219-54	Client Reference:	Bradford Road No. 2 Gas	Report Number:	496323
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	494224

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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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%. 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-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
§	Sampled on date not provided
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples

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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Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date of report Generation: 08 April 2019
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 190323-102
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 500159

We received 1 sample on Saturday March 23, 2019 and 1 of these samples were scheduled for analysis which was completed on Monday April 08, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	190323-102	Client Reference:	Bradford Road No. 2 Gash	Report Number:	500159
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
19615269	Discharge		0.00 - 0.00	21/03/2019

Maximum Sample/Coolbox Temperature (°C) : 8.8

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: 190323-102 Client Reference: Bradford Road No. 2 Gash Report Number: 500159
Location: Bradford Road, Manchester Order Number: 79696 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

Lab Sample No(s)

19615269

Customer Sample Reference

Discharge

AGS Reference

Depth (m)

0.00 - 0.00

Container

0.5l glass bottle (ALE227)

1l plastic (ALE221)

H2SO4 (ALE244)

NaOH (ALE245)

Vial (ALE297)

ZnAc (ALE246)

Sample Type

TE

TE

TE

TE

TE

TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

Anions by Kone (w)

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Conductivity (at 20 deg.C)

All

NDPs: 0
Tests: 1

X

Cyanide
Comp/Free/Total/Thiocyanate

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

Dissolved Metals by ICP-MS

All

NDPs: 0
Tests: 1

X

Dissolved Organic/Inorganic Carbon

All

NDPs: 0
Tests: 1

X

EPH (DRO) (C10-C40) Aqueous (W)

All

NDPs: 0
Tests: 1

X

Free Sulphur

All

NDPs: 0
Tests: 1

X

Mercury Dissolved

All

NDPs: 0
Tests: 1

X

PAH Spec MS - Aqueous (W)

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Phenols by HPLC (W)

All

NDPs: 0
Tests: 1

X

Sulphide

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 190323-102 Client Reference: Bradford Road No. 2 Gash Report Number: 500159
Location: Bradford Road, Manchester Order Number: 79696 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

Lab Sample No(s)

19615269

Customer Sample Reference

Discharge

AGS Reference

Depth (m)

0.00 - 0.00

Container

0.5l glass bottle
(ALE227)

1l plastic
(ALE221)

H2SO4
(ALE244)

NaOH (ALE245)

Vial (ALE297)

ZnAc (ALE246)

Sample Type

TE

TE

TE

TE

TE

TE

Suspended Solids

All

NDPs: 0
Tests: 1

X

VOC MS (W)

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 190323-102 **Client Reference:** Bradford Road No. 2 Gash **Report Number:** 500159
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:**

Results Legend		Customer Sample Ref.	Discharge				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00				
M	mCERTS accredited.		Trade Effluent (TE)				
aq	Aqueous / settled sample.		21/03/2019				
diss.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted - refer to subcontractor report for accreditation status.						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		23/03/2019				
(F)	Trigger breach confirmed		190323-102				
1-3+5@	Sample deviation (see appendix)		19615269				
Component	LOD/Units	Method					
Suspended solids, Total	<2 mg/l	TM022	30	#			
Carbon, Organic (diss.filt)	<3 mg/l	TM090	4.66				
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	0.972	#			
Sulphide	<0.01 mg/l	TM101	<0.01	#			
COD, settled	<7 mg/l	TM107	20.1	#			
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120	0.0881	#			
Arsenic (diss.filt)	<0.0005 mg/l	TM152	0.00105	2			
Boron (diss.filt)	<0.01 mg/l	TM152	<0.01	2			
Cadmium (diss.filt)	<0.00008 mg/l	TM152	<0.00008	2			
Chromium (diss.filt)	<0.001 mg/l	TM152	<0.001	2			
Copper (diss.filt)	<0.0003 mg/l	TM152	0.00169	2			
Lead (diss.filt)	<0.0002 mg/l	TM152	<0.0002	2			
Nickel (diss.filt)	<0.0004 mg/l	TM152	0.00559	2			
Selenium (diss.filt)	<0.001 mg/l	TM152	<0.001	2			
Zinc (diss.filt)	<0.001 mg/l	TM152	1.32	2			
Iron (Dis.Filt)	<0.019 mg/l	TM152	0.0538	2			
EPH Range >C10 - C40 (aq)	<0.1 mg/l	TM172	0.235				
Mercury (diss.filt)	<0.00001 mg/l	TM183	<0.00001	2 #			
Sulphate	<2 mg/l	TM184	<2	#			
Chloride	<2 mg/l	TM184	6	#			
Methane, dissolved	<0.001 mg/l	TM223	0.0011				
Cyanide, Total	<0.05 mg/l	TM227	<0.05	#			
Cyanide, Free	<0.05 mg/l	TM227	<0.05	#			
Cyanide, Complex	<0.05 mg/l	TM227	<0.05				
Thiocyanate	<0.05 mg/l	TM227	<0.05	#			
pH	<1 pH Units	TM256	7.2	#			
Resorcinol	<0.01 mg/l	TM259	<0.01				
Catechol	<0.01 mg/l	TM259	<0.01				
Phenol	<0.002 mg/l	TM259	<0.002	#			
Cresols	<0.006 mg/l	TM259	<0.006	#			
Xylenols	<0.008 mg/l	TM259	<0.008	#			
1-Naphthol	<0.01 mg/l	TM259	<0.01				



CERTIFICATE OF ANALYSIS

Validated

SDG: 190323-102 **Client Reference:** Bradford Road No. 2 Gash **Report Number:** 500159
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis
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, 1998	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
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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
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
TM294		Determination of Free Sulphur in liquids 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:	190323-102	Client Reference:	Bradford Road No. 2 Gash	Report Number:	500159
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	19615269
Customer Sample Ref.	Discharge
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	29-Mar-2019
Anions by Kone (w)	02-Apr-2019
COD on Settled Sample	26-Mar-2019
Conductivity (at 20 deg.C)	27-Mar-2019
Cyanide Comp/Free/Total/Thiocyanate	28-Mar-2019
Determination of Dissolved Gases	08-Apr-2019
Dissolved Metals by ICP-MS	01-Apr-2019
Dissolved Organic/Inorganic Carbon	27-Mar-2019
EPH (DRO) (C10-C40) Aqueous (W)	02-Apr-2019
Free Sulphur	02-Apr-2019
Mercury Dissolved	27-Mar-2019
PAH Spec MS - Aqueous (W)	02-Apr-2019
pH Value	26-Mar-2019
Phenols by HPLC (W)	30-Mar-2019
Sulphide	26-Mar-2019
Suspended Solids	27-Mar-2019
VOC MS (W)	30-Mar-2019



CERTIFICATE OF ANALYSIS

Validated

SDG: 190323-102 Client Reference: Bradford Road No. 2 Gash Report Number: 500159
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1981
Ammoniacal Nitrogen as N	TM099	98.8 93.14 : 108.60

Anions by Kone (w)

Component	Method Code	QC 1991
Chloride	TM184	103.0 92.93 : 115.43
Phosphate (Ortho as PO4)	TM184	96.40 : 108.40
Sulphate (soluble)	TM184	103.6 90.53 : 113.03
TON as NO3	TM184	96.26 : 111.21

COD on Settled Sample

Component	Method Code	QC 1925
COD	TM107	99.24 97.45 : 103.77

Conductivity (at 20 deg.C)

Component	Method Code	QC 1962
Conductivity (at 20 deg.C)	TM120	103.01 100.75 : 105.26

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 1909
Free Cyanide (W)	TM227	103.25 93.25 : 112.75
Thiocyanate (W)	TM227	107.25 96.25 : 111.25
Total Cyanide (W)	TM227	101.0 92.25 : 111.75

Determination of Dissolved Gases



CERTIFICATE OF ANALYSIS

Validated

SDG: 190323-102 Client Reference: Bradford Road No. 2 Gash Report Number: 500159
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report:

Determination of Dissolved Gases

Component	Method Code	QC 1987
Carbon Dioxide Dissolved Raw	TM223	91.3 101.00 : 108.20
Ethane Dissolved Raw	TM223	98.92 89.48 : 93.82
Methane Dissolved Raw	TM223	92.37 89.76 : 93.14
Propane Dissolved Raw	TM223	98.24 93.54 : 97.20

Dissolved Metals by ICP-MS

Component	Method Code	QC 1912
Aluminium	TM152	101.67 94.19 : 114.31
Antimony	TM152	106.83 79.80 : 122.00
Arsenic	TM152	106.17 90.42 : 111.32
Barium	TM152	106.0 90.79 : 113.16
Beryllium	TM152	100.0 93.25 : 120.04
Bismuth	TM152	106.67 94.65 : 117.05
Borate	TM152	94.44 88.00 : 112.00
Boron	TM152	94.33 86.68 : 117.67
Cadmium	TM152	107.17 94.60 : 112.40
Calcium	TM152	106.0 83.40 : 121.11
Chromium	TM152	103.0 93.28 : 110.91
Cobalt	TM152	103.5 84.39 : 114.26
Copper	TM152	104.5 88.86 : 118.72
Iron	TM152	103.33 92.00 : 113.00
Lead	TM152	104.83 89.25 : 115.12
Lithium	TM152	96.5 89.26 : 119.04
Magnesium	TM152	105.33 86.35 : 113.36
Manganese	TM152	103.33 94.24 : 112.74
Molybdenum	TM152	104.17 87.00 : 108.89
Nickel	TM152	104.5 92.11 : 110.56
Phosphorus	TM152	106.83 90.52 : 115.47



CERTIFICATE OF ANALYSIS

Validated

SDG: 190323-102 Client Reference: Bradford Road No. 2 Gash Report Number: 500159
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report:

Dissolved Metals by ICP-MS

		QC 1912
Potassium	TM152	105.33 98.63 : 110.48
Selenium	TM152	107.5 88.44 : 113.86
Silver	TM152	106.5 94.40 : 114.74
Sodium	TM152	105.33 97.63 : 110.31
Strontium	TM152	105.67 90.72 : 114.82
Tellurium	TM152	107.0 90.72 : 112.62
Thallium	TM152	107.17 86.08 : 122.48
Tin	TM152	104.83 91.00 : 109.00
Titanium	TM152	94.83 91.87 : 102.47
Tungsten	TM152	102.5 78.12 : 132.82
Uranium	TM152	104.17 90.58 : 113.28
Vanadium	TM152	99.83 88.43 : 114.30
Zinc	TM152	106.0 86.52 : 115.27

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 1948
Dissolved Inorganic Carbon	TM090	108.0 91.15 : 111.35
Dissolved Organic Carbon	TM090	108.0 97.18 : 109.58

EPH (DRO) (C10-C40) Aqueous (W)

Component	Method Code	QC 1911
EPH (DRO) (C10-C40)	TM172	87.6 65.52 : 121.02

Mercury Dissolved

Component	Method Code	QC 1968
Mercury Dissolved (CVAF)	TM183	117.0 76.80 : 117.12



CERTIFICATE OF ANALYSIS

Validated

SDG: 190323-102 Client Reference: Bradford Road No. 2 Gash Report Number: 500159
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report:

PAH Spec MS - Aqueous (W)

Component	Method Code	QC 1916
Acenaphthene by GCMS	TM178	105.6 97.20 : 118.80
Acenaphthylene by GCMS	TM178	106.0 89.20 : 118.00
Anthracene by GCMS	TM178	108.4 92.40 : 114.00
Benz(a)anthracene by GCMS	TM178	106.4 92.40 : 114.00
Benzo(a)pyrene by GCMS	TM178	110.4 94.00 : 118.00
Benzo(b)fluoranthene by GCMS	TM178	111.2 90.80 : 117.20
Benzo(ghi)perylene by GCMS	TM178	108.4 93.20 : 114.80
Benzo(k)fluoranthene by GCMS	TM178	109.6 96.00 : 120.00
Chrysene by GCMS	TM178	106.4 98.40 : 120.00
Dibenzo(ah)anthracene by GCMS	TM178	104.8 89.20 : 118.00
Fluoranthene by GCMS	TM178	110.8 97.20 : 116.40
Fluorene by GCMS	TM178	107.6 98.40 : 120.00
Indeno(123cd)pyrene by GCMS	TM178	103.2 93.20 : 117.20
Naphthalene by GCMS	TM178	109.2 98.00 : 117.20
Phenanthrene by GCMS	TM178	109.6 93.60 : 112.80
Pyrene by GCMS	TM178	108.8 98.00 : 117.20

pH Value

Component	Method Code	QC 1994
pH	TM256	101.89 99.73 : 102.16

Phenols by HPLC (W)

Component	Method Code	QC 1957
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	100.0 93.10 : 108.70
2-Isopropyl Phenol by HPLC (W)	TM259	102.0 83.72 : 106.28
Cresols by HPLC (W)	TM259	114.33 90.02 : 130.15
Napthol by HPLC (W)	TM259	114.0 101.61 : 116.04



CERTIFICATE OF ANALYSIS

Validated

SDG: 190323-102 Client Reference: Bradford Road No. 2 Gash Report Number: 500159
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report:

Phenols by HPLC (W)

		QC 1957
Phenol by HPLC (W)	TM259	113.0 95.00 : 119.00
Xylenols by HPLC (W)	TM259	104.33 98.67 : 108.67

Sulphide

Component	Method Code	QC 1993
Sulphide	TM101	104.67 88.90 : 112.50

Suspended Solids

Component	Method Code	QC 1986
Total Suspended Solids	TM022	98.67 95.69 : 101.90

VOC MS (W)

Component	Method Code	QC 1922
1,1,1,2-Tetrachloroethane	TM208	104.5 78.82 : 115.90
1,1,1-Trichloroethane	TM208	97.5 79.61 : 114.35
1,1-Dichloroethane	TM208	99.5 79.99 : 118.57
1,2-Dichloroethane	TM208	103.5 79.35 : 124.02
2-Chlorotoluene	TM208	105.0 79.67 : 114.74
4-Chlorotoluene	TM208	105.5 80.15 : 113.42
Benzene	TM208	98.5 84.37 : 119.68
Bromomethane	TM208	105.0 68.41 : 115.99
Carbontetrachloride	TM208	99.5 79.73 : 118.91
Chlorobenzene	TM208	109.0 89.49 : 115.83
Chloroform	TM208	100.0 82.31 : 120.71
Chloromethane	TM208	115.0 62.46 : 124.98
Cis-1,2-Dichloroethene	TM208	103.5 84.04 : 126.19
Dichloromethane	TM208	103.5 81.20 : 120.83



CERTIFICATE OF ANALYSIS

Validated

SDG: 190323-102 Client Reference: Bradford Road No. 2 Gash Report Number: 500159
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report:

VOC MS (W)

		QC 1922
Ethylbenzene	TM208	98.0 80.54 : 112.31
Hexachlorobutadiene	TM208	85.0 59.76 : 107.25
o-Xylene	TM208	106.0 79.22 : 112.31
p/m-Xylene	TM208	100.75 79.85 : 111.06
Tert-butyl methyl ether	TM208	90.5 70.94 : 119.66
Tetrachloroethene	TM208	100.5 87.13 : 116.26
Toluene	TM208	101.5 81.59 : 111.56
Trichloroethene	TM208	103.0 79.53 : 112.32
Vinyl Chloride	TM208	99.5 68.68 : 119.35

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

Validated

SDG:	190323-102	Client Reference:	Bradford Road No. 2 Gash	Report Number:	500159
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	

Chromatogram

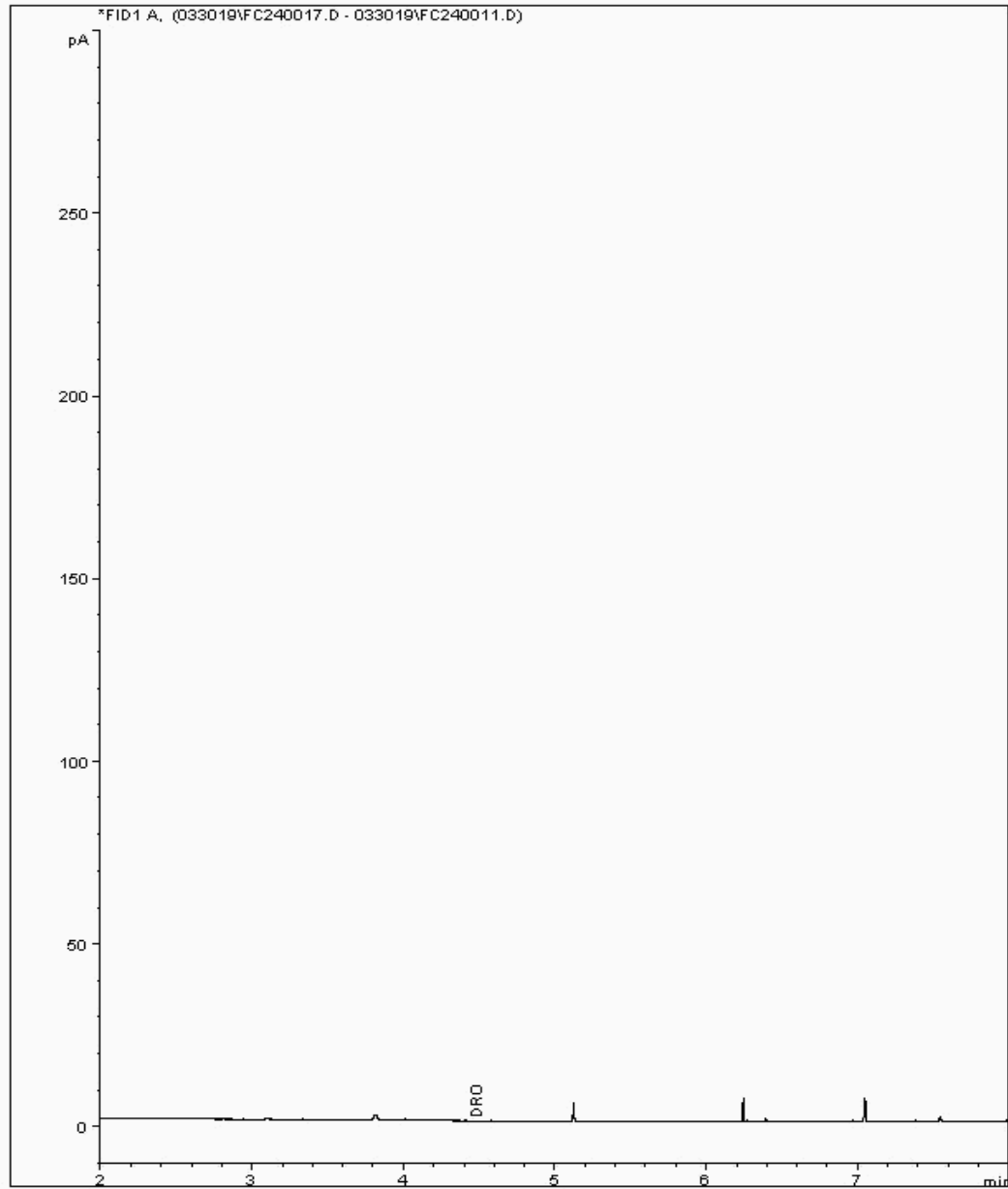
Analysis: EPH (DRO) (C10-C40) Aqueous (W)

Sample No : 19616822
Sample ID : Discharge

Depth : 0.00 - 0.00

EPH Range Organics (C10 - C40)

Sample Identity: 18432339-
Date Acquired : 30/03/2019 19:08:57 PM
Units : ppm





CERTIFICATE OF ANALYSIS

SDG:	190323-102	Client Reference:	Bradford Road No. 2 Gas	Report Number:	500159
Location:	Bradford Road, Manchester	Order Number:	79696	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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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%. 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-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
§	Sampled on date not provided
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples

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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Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date of report Generation: 18 April 2019
Customer: H_CELTIC_CDF
Sample Delivery Group (SDG): 190409-8
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 501857

This report has been revised and directly supersedes 500567 in its entirety.

We received 1 sample on Tuesday April 09, 2019 and 1 of these samples were scheduled for analysis which was completed on Thursday April 18, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	190409-8	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	501857
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	500567

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
19737726	Effluent		0.00 - 0.00	08/04/2019

Maximum Sample/Coolbox Temperature (°C) :

8.4

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 190409-8 Client Reference: Bradford Road No. 2 Gashol Report Number: 501857
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 500567

Results Legend

X Test
N No Determination Possible

Sample Types -

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

Lab Sample No(s)

19737726

Customer Sample Reference

Effluent

AGS Reference

Depth (m)

0.00 - 0.00

Container

0.5l glass bottle (ALE227)
1l plastic (ALE221)
Vial (ALE297)

Sample Type

TE TE TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 190409-8 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 501857
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:** 500567

Table of Results - Appendix

Method No	Reference	Description
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 190409-8 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 501857
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:** 500567

Test Completion Dates

Lab Sample No(s) 19737726
Customer Sample Ref. Effluent
AGS Ref.
Depth 0.00 - 0.00
Type Trade Effluent

Ammoniacal Nitrogen	10-Apr-2019
COD on Settled Sample	18-Apr-2019
Determination of Dissolved Gases	18-Apr-2019
pH Value	15-Apr-2019
Suspended Solids	10-Apr-2019



CERTIFICATE OF ANALYSIS

Validated

SDG: 190409-8

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Order Number:

79696

Report Number:

501857

Superseded Report:

500567

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1926
Ammoniacal Nitrogen as N	TM099	98.0 93.14 : 108.60

COD on Settled Sample

Component	Method Code	QC 1904
COD	TM107	100.57 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 1934
Carbon Dioxide Dissolved Raw	TM223	101.00 : 108.20
Ethane Dissolved Raw	TM223	96.39 89.48 : 93.82
Methane Dissolved Raw	TM223	90.86 89.76 : 93.14
Propane Dissolved Raw	TM223	95.82 93.54 : 97.20

pH Value

Component	Method Code	QC 1930
pH	TM256	101.48 99.73 : 102.16

Suspended Solids

Component	Method Code	QC 1980
Total Suspended Solids	TM022	96.82 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	190409-8	Client Reference:	Bradford Road No. 2 Gas	Report Number:	501857
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	500567

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.

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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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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%. 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-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
§	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples

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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Celtic
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Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date of report Generation: 29 May 2019
Customer: Celtic
Sample Delivery Group (SDG): 190517-138
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 507859

This report has been revised and directly supersedes 506321 in its entirety.

We received 1 sample on Friday May 17, 2019 and 1 of these samples were scheduled for analysis which was completed on Wednesday May 29, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	190517-138	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	507859
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	506321

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
19977857	Effluent		0.00 - 0.00	15/05/2019

Maximum Sample/Coolbox Temperature (°C) :

10.8

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: 190517-138 Client Reference: Bradford Road No. 2 Gashol Report Number: 507859
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 506321

Results Legend

X Test
N No Determination Possible

Sample Types -

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

Lab Sample No(s)

19977857

Customer Sample Reference

Effluent

AGS Reference

Depth (m)

0.00 - 0.00

Container

Vial (ALE297)
11plastic (ALE221)

Sample Type

TE TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

SDG:	190517-138	Client Reference:	Bradford Road No. 2 Gashol	Report Number:	507859
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	506321

Table of Results - Appendix

Method No	Reference	Description
PM095	Standard Methods for the examination of waters and wastewaters 16th Edition, APHA, Washington DC, USA. ISBN 0-87553-131-8.	Preparation of Water Samples for Analysis
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 190517-138

Client Reference: Bradford Road No. 2 Gashold

Report Number: 507859

Location: Bradford Road, Manchester

Order Number: 79696

Superseded Report: 506321

Test Completion Dates

Lab Sample No(s) 19977857

Customer Sample Ref. Effluent

AGS Ref.

Depth 0.00 - 0.00

Type Trade Effluent

Ammoniacal Nitrogen	20-May-2019
COD on Settled Sample	23-May-2019
Determination of Dissolved Gases	29-May-2019
pH Value	23-May-2019
Suspended Solids	22-May-2019



CERTIFICATE OF ANALYSIS

Validated

SDG: 190517-138

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Order Number:

79696

Report Number:

507859

Superseded Report:

506321

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 1998
Ammoniacal Nitrogen as N	TM099	101.2 93.14 : 108.60

COD on Settled Sample

Component	Method Code	QC 2009
COD	TM107	101.71 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 2090
Carbon Dioxide Dissolved Raw	TM223	51.2 101.00 : 108.20
Ethane Dissolved Raw	TM223	96.99 89.48 : 93.82
Methane Dissolved Raw	TM223	91.45 89.76 : 93.14
Propane Dissolved Raw	TM223	95.39 93.54 : 97.20

pH Value

Component	Method Code	QC 2022
pH	TM256	101.48 99.73 : 102.97

Suspended Solids

Component	Method Code	QC 2019
Total Suspended Solids	TM022	100.0 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	190517-138	Client Reference:	Bradford Road No. 2 Gas	Report Number:	507859
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	506321

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 ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of 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%. 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-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
§	Sampled on date not provided
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples

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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CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date of report Generation: 01 July 2019
Customer: Celtic
Sample Delivery Group (SDG): 190620-102
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 512558

This report has been revised and directly supersedes 511544 in its entirety.

We received 1 sample on Thursday June 20, 2019 and 1 of these samples were scheduled for analysis which was completed on Monday July 01, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	190620-102	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	512558
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	511544

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
20193179	Effluent		0.00 - 0.00	12/06/2019

Maximum Sample/Coolbox Temperature (°C) :

12.8

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: 190620-102 Client Reference: Bradford Road No. 2 Gashol Report Number: 512558
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 511544

Results Legend

X Test
N No Determination Possible

Sample Types -

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

Lab Sample No(s)

20193179

Customer Sample Reference

Effluent

AGS Reference

Depth (m)

0.00 - 0.00

Container

1000ml glass bottle (ALE220)
1l plastic (ALE221)
Vial (ALE297)

Sample Type

TE TE TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

SDG:	190620-102	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	512558
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	511544

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 190620-102 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 512558
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:** 511544

Test Completion Dates

Lab Sample No(s) 20193179
Customer Sample Ref. Effluent
AGS Ref.
Depth 0.00 - 0.00
Type Trade Effluent

Ammoniacal Nitrogen	24-Jun-2019
COD on Settled Sample	25-Jun-2019
Determination of Dissolved Gases	01-Jul-2019
pH Value	21-Jun-2019
Suspended Solids	21-Jun-2019



CERTIFICATE OF ANALYSIS

Validated

SDG: 190620-102

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Order Number:

79696

Report Number:

512558

Superseded Report:

511544

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 2043
Ammoniacal Nitrogen as N	TM099	100.4 93.14 : 108.60

COD on Settled Sample

Component	Method Code	QC 2018
COD	TM107	100.57 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 2001
Carbon Dioxide Dissolved Raw	TM223	51.1 101.00 : 108.20
Ethane Dissolved Raw	TM223	97.39 89.48 : 93.82
Methane Dissolved Raw	TM223	91.7 89.76 : 93.14
Propane Dissolved Raw	TM223	95.95 93.54 : 97.20

pH Value

Component	Method Code	QC 2010
pH	TM256	100.94 99.73 : 102.16

Suspended Solids

Component	Method Code	QC 2068
Total Suspended Solids	TM022	99.73 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	190620-102	Client Reference:	Bradford Road No. 2 Gas	Report Number:	512558
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	511544

Appendix

General

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

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

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

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

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

7. Results relate only to the items tested.

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

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

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

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

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

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

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

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

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

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

18. Sample Deviations

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

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

19. Asbestos

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

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2107).

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

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



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Celtic
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South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date of report Generation: 16 July 2019
Customer: Celtic
Sample Delivery Group (SDG): 190706-15
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 514452

This report has been revised and directly supersedes 513803 in its entirety.

We received 1 sample on Saturday July 06, 2019 and 1 of these samples were scheduled for analysis which was completed on Tuesday July 16, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	190706-15	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	514452
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	513803

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
20284373	Effluent		0.00 - 0.00	04/07/2019

Maximum Sample/Coolbox Temperature (°C) :

9.6

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 190706-15 Client Reference: Bradford Road No. 2 Gashol Report Number: 514452
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 513803

Results Legend

X Test
N No Determination Possible

Sample Types -

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

Lab Sample No(s)

20284373

Customer Sample Reference

Effluent

AGS Reference

Depth (m)

0.00 - 0.00

Container

40ml Glass Vial
(ALE297)
11plastic (ALE221)

Sample Type

TE TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

SDG:	190706-15	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	514452
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	513803

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 190706-15 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 514452
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:** 513803

Test Completion Dates

Lab Sample No(s) 20284373
Customer Sample Ref. Effluent
AGS Ref.
Depth 0.00 - 0.00
Type Trade Effluent

Ammoniacal Nitrogen	16-Jul-2019
COD on Settled Sample	11-Jul-2019
Determination of Dissolved Gases	16-Jul-2019
pH Value	11-Jul-2019
Suspended Solids	10-Jul-2019



CERTIFICATE OF ANALYSIS

Validated

SDG: 190706-15

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Order Number:

79696

Report Number:

514452

Superseded Report:

513803

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 2031
Ammoniacal Nitrogen as N	TM099	98.8 93.14 : 108.60

COD on Settled Sample

Component	Method Code	QC 2063
COD	TM107	102.09 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 2039
Carbon Dioxide Dissolved Raw	TM223	53.3 101.00 : 108.20
Ethane Dissolved Raw	TM223	96.79 89.48 : 93.82
Methane Dissolved Raw	TM223	91.49 89.76 : 93.14
Propane Dissolved Raw	TM223	95.05 93.54 : 97.20

pH Value

Component	Method Code	QC 2089
pH	TM256	100.67 99.73 : 102.16

Suspended Solids

Component	Method Code	QC 2039
Total Suspended Solids	TM022	98.14 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	190706-15	Client Reference:	Bradford Road No. 2 Gas	Report Number:	514452
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	513803

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

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

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

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

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

7. Results relate only to the items tested.

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

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

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

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

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

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

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

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

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

General

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

18. Sample Deviations

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

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

19. Asbestos

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

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2107).

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

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



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Celtic
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Greenmeadow Springs
Tongwynlais
Cardiff
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CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date of report Generation: 06 August 2019
Customer: Celtic
Sample Delivery Group (SDG): 190729-36
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 516991

This report has been revised and directly supersedes 516355 in its entirety.

We received 1 sample on Monday July 29, 2019 and 1 of these samples were scheduled for analysis which was completed on Tuesday August 06, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	190729-36	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	516991
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	516355

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
20420288	Effluent		0.00 - 0.00	26/07/2019

Maximum Sample/Coolbox Temperature (°C) :

18.2

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 190729-36 Client Reference: Bradford Road No. 2 Gashol Report Number: 516991
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 516355

Results Legend

X Test
N No Determination Possible

Sample Types -

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

Lab Sample No(s)

20420288

Customer Sample Reference

Effluent

AGS Reference

Depth (m)

0.00 - 0.00

Container

Vial (ALE297)
11 plastic (ALE221)

Sample Type

TE TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

SDG:	190729-36	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	516991
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	516355

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

SDG:	190729-36	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	516991
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	516355

Test Completion Dates

Lab Sample No(s)	20420288
Customer Sample Ref.	Effluent
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	31-Jul-2019
COD on Settled Sample	04-Aug-2019
Determination of Dissolved Gases	06-Aug-2019
pH Value	05-Aug-2019
Suspended Solids	31-Jul-2019



CERTIFICATE OF ANALYSIS

Validated

SDG: 190729-36

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Order Number:

79696

Report Number:

516991

Superseded Report:

516355

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 2018
Ammoniacal Nitrogen as N	TM099	100.0 93.14 : 108.60

COD on Settled Sample

Component	Method Code	QC 2053
COD	TM107	100.0 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 2066
Carbon Dioxide Dissolved Raw	TM223	50.9 101.00 : 108.20
Ethane Dissolved Raw	TM223	97.1 89.48 : 93.82
Methane Dissolved Raw	TM223	91.49 89.76 : 93.14
Propane Dissolved Raw	TM223	95.78 93.54 : 97.20

pH Value

Component	Method Code	QC 2055
pH	TM256	101.21 100.00 : 102.43

Suspended Solids

Component	Method Code	QC 2055
Total Suspended Solids	TM022	100.27 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	190729-36	Client Reference:	Bradford Road No. 2 Gas	Report Number:	516991
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	516355

Appendix

General

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

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

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

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

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

7. Results relate only to the items tested.

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

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

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

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

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

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

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

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

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

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

18. Sample Deviations

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

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

19. Asbestos

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

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2107).

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

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



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Website: www.alsenvironmental.co.uk

Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date of report Generation: 08 September 2019
Customer: Celtic
Sample Delivery Group (SDG): 190829-101
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 520657

This report has been revised and directly supersedes 520394 in its entirety.

We received 1 sample on Thursday August 29, 2019 and 1 of these samples were scheduled for analysis which was completed on Sunday September 08, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	190829-101	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	520657
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	520394

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
20609842	Effluent		0.00 - 0.00	27/08/2019

Maximum Sample/Coolbox Temperature (°C) :

16.8

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: 190829-101

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Order Number:

79696

Report Number:

520657

Superseded Report:

520394

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

Lab Sample No(s)

20609842

Customer
Sample Reference

Effluent

AGS Reference

Depth (m)

0.00 - 0.00

Container

1 (plastic (ALE221))

Vial (ALE297)

Sample Type

TE

TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 190829-101 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 520657
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:** 520394

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 190829-101

Client Reference: Bradford Road No. 2 Gashold

Report Number: 520657

Location: Bradford Road, Manchester

Order Number: 79696

Superseded Report: 520394

Test Completion Dates

Lab Sample No(s) 20609842
Customer Sample Ref. Effluent

AGS Ref.
Depth 0.00 - 0.00
Type Trade Effluent

Ammoniacal Nitrogen	05-Sep-2019
COD on Settled Sample	06-Sep-2019
Determination of Dissolved Gases	06-Sep-2019
pH Value	06-Sep-2019
Suspended Solids	08-Sep-2019



CERTIFICATE OF ANALYSIS

Validated

SDG: 190829-101

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Order Number:

79696

Report Number:

520657

Superseded Report:

520394

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 2086
Ammoniacal Nitrogen as N	TM099	102.8 93.14 : 108.60

COD on Settled Sample

Component	Method Code	QC 2024
COD	TM107	100.76 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 2062
Carbon Dioxide Dissolved Raw	TM223	52.4 93.80 : 109.40
Ethane Dissolved Raw	TM223	97.05 80.04 : 105.85
Methane Dissolved Raw	TM223	93.19 70.05 : 104.83
Propane Dissolved Raw	TM223	95.55 76.90 : 105.07

pH Value

Component	Method Code	QC 2073
pH	TM256	102.29 99.73 : 102.97

Suspended Solids

Component	Method Code	QC 2091
Total Suspended Solids	TM022	100.53 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	190829-101	Client Reference:	Bradford Road No. 2 Gas	Report Number:	520657
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	520394

Appendix

General

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

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

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

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

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

7. Results relate only to the items tested.

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

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

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

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

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

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

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

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

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

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

18. Sample Deviations

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

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

19. Asbestos

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

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2107).

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

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



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Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date of report Generation:	01 October 2019
Customer:	Celtic
Sample Delivery Group (SDG):	190917-41
Your Reference:	Bradford Road No. 2 Gasholder
Location:	Bradford Road, Manchester
Report No:	523714

We received 1 sample on Tuesday September 17, 2019 and 1 of these samples were scheduled for analysis which was completed on Tuesday October 01, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 190917-41 **Client Reference:** Bradford Road No. 2 Gash **Report Number:** 523714
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
20737501	Discharge		0.00 - 0.00	13/09/2019

Maximum Sample/Coolbox Temperature (°C) : 15.6

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 190917-41 Client Reference: Bradford Road No. 2 Gash Report Number: 523714
Location: Bradford Road, Manchester Order Number: 79696 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

Lab Sample No(s)

20737501

Customer Sample Reference

Discharge

AGS Reference

Depth (m)

0.00 - 0.00

Container

0.5l glass bottle (ALE227)

500ml Plastic (ALE208)

H2SO4 (ALE244)

NaOH (ALE245)

Vial (ALE297)

ZnAc (ALE246)

Sample Type

TE

TE

TE

TE

TE

TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

Anions by Kone (w)

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Conductivity (at 20 deg.C)

All

NDPs: 0
Tests: 1

X

Cyanide
Comp/Free/Total/Thiocyanate

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

Dissolved Metals by ICP-MS

All

NDPs: 0
Tests: 1

X

Dissolved Organic/Inorganic Carbon

All

NDPs: 0
Tests: 1

X

EPH (DRO) (C10-C40) Aqueous (W)

All

NDPs: 0
Tests: 1

X

Free Sulphur

All

NDPs: 0
Tests: 1

X

Mercury Dissolved

All

NDPs: 0
Tests: 1

X

PAH Spec MS - Aqueous (W)

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Phenols by HPLC (W)

All

NDPs: 0
Tests: 1

X

Sulphide

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 190917-41 Client Reference: Bradford Road No. 2 Gash Report Number: 523714
Location: Bradford Road, Manchester Order Number: 79696 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

Lab Sample No(s)

20737501

Customer Sample Reference

Discharge

AGS Reference

Depth (m)

0.00 - 0.00

Container

0.5l glass bottle (ALE227)

500ml Plastic (ALE208)

H2SO4 (ALE244)

NaOH (ALE245)

Vial (ALE297)

ZnAc (ALE246)

Sample Type

TE

TE

TE

TE

TE

TE

Suspended Solids

All

NDPs: 0
Tests: 1

X

VOC MS (W)

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 190917-41 Client Reference: Bradford Road No. 2 Gash Report Number: 523714
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report:

Results Legend			Customer Sample Ref.	Discharge				
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00				
M	mCERTS accredited.			Trade Effluent (TE)				
aq	Aqueous / settled sample.			13/09/2019				
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.			17/09/2019				
*	Subcontracted - refer to subcontractor report for accreditation status.			190917-41				
**	% 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			20737501				
(F)	Trigger breach confirmed							
1-3+5@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Suspended solids, Total	<2 mg/l	TM022	8.5	#				
Carbon, Organic (diss.filt)	<3 mg/l	TM090	3.65					
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	1.77	#				
Sulphide	<0.01 mg/l	TM101	<0.01	#				
COD, settled	<7 mg/l	TM107	18.2	@ #				
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120	0.0812	#				
Arsenic (diss.filt)	<0.0005 mg/l	TM152	0.00119	2				
Boron (diss.filt)	<0.01 mg/l	TM152	<0.01	2				
Cadmium (diss.filt)	<0.00008 mg/l	TM152	<0.00008	2				
Chromium (diss.filt)	<0.001 mg/l	TM152	<0.001	2				
Copper (diss.filt)	<0.0003 mg/l	TM152	0.00506	2				
Lead (diss.filt)	<0.0002 mg/l	TM152	<0.0002	2				
Nickel (diss.filt)	<0.0004 mg/l	TM152	0.00656	2				
Selenium (diss.filt)	<0.001 mg/l	TM152	<0.001	2				
Zinc (diss.filt)	<0.001 mg/l	TM152	0.381	2				
Iron (Dis.Filt)	<0.019 mg/l	TM152	0.039	2				
EPH Range >C10 - C40 (aq)	<0.1 mg/l	TM172	0.437					
Mercury (diss.filt)	<0.00001 mg/l	TM183	<0.00001	2 #				
Sulphate	<2 mg/l	TM184	<2	#				
Chloride	<2 mg/l	TM184	5.3	#				
Methane, dissolved	<0.001 mg/l	TM223	<0.00217					
Cyanide, Total	<0.05 mg/l	TM227	<0.05	@ #				
Cyanide, Free	<0.05 mg/l	TM227	<0.05	@ #				
Cyanide, Complex	<0.05 mg/l	TM227	<0.05	@				
Thiocyanate	<0.05 mg/l	TM227	<0.05	@ #				
pH	<1 pH Units	TM256	7.64	#				
Resorcinol	<0.01 mg/l	TM259	<0.01					
Catechol	<0.01 mg/l	TM259	<0.01					
Phenol	<0.002 mg/l	TM259	<0.002	#				
Cresols	<0.006 mg/l	TM259	<0.006	#				
Xylenols	<0.008 mg/l	TM259	<0.008	#				
1-Naphthol	<0.01 mg/l	TM259	<0.01					



CERTIFICATE OF ANALYSIS

Validated

SDG: 190917-41 **Client Reference:** Bradford Road No. 2 Gash **Report Number:** 523714
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
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
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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
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
TM294		Determination of Free Sulphur in liquids 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: 190917-41 **Client Reference:** Bradford Road No. 2 Gash **Report Number:** 523714
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:**

Test Completion Dates

Lab Sample No(s)	20737501
Customer Sample Ref.	Discharge
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	26-Sep-2019
Anions by Kone (w)	27-Sep-2019
COD on Settled Sample	27-Sep-2019
Conductivity (at 20 deg.C)	26-Sep-2019
Cyanide Comp/Free/Total/Thiocyanate	30-Sep-2019
Determination of Dissolved Gases	27-Sep-2019
Dissolved Metals by ICP-MS	30-Sep-2019
Dissolved Organic/Inorganic Carbon	23-Sep-2019
EPH (DRO) (C10-C40) Aqueous (W)	01-Oct-2019
Free Sulphur	19-Sep-2019
Mercury Dissolved	19-Sep-2019
PAH Spec MS - Aqueous (W)	01-Oct-2019
pH Value	25-Sep-2019
Phenols by HPLC (W)	27-Sep-2019
Sulphide	20-Sep-2019
Suspended Solids	27-Sep-2019
VOC MS (W)	27-Sep-2019



CERTIFICATE OF ANALYSIS

Validated

SDG: 190917-41 Client Reference: Bradford Road No. 2 Gash Report Number: 523714
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 2025
Ammoniacal Nitrogen as N	TM099	100.8 93.14 : 108.60

Anions by Kone (w)

Component	Method Code	QC 2061
Chloride	TM184	97.6 94.04 : 108.61
Sulphate (soluble)	TM184	100.0 91.99 : 109.30

COD on Settled Sample

Component	Method Code	QC 2064
COD	TM107	101.9 97.45 : 103.77

Conductivity (at 20 deg.C)

Component	Method Code	QC 2040
Conductivity (at 20 deg.C)	TM120	103.01 100.75 : 105.26

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2040
Free Cyanide (W)	TM227	105.0 93.25 : 112.75
Thiocyanate (W)	TM227	107.0 96.25 : 111.25
Total Cyanide (W)	TM227	101.5 92.25 : 111.75

Determination of Dissolved Gases

Component	Method Code	QC 2066
Carbon Dioxide Dissolved Raw	TM223	51.4 101.00 : 108.20
Ethane Dissolved Raw	TM223	96.61 89.48 : 93.82



CERTIFICATE OF ANALYSIS

Validated

SDG: 190917-41 Client Reference: Bradford Road No. 2 Gash Report Number: 523714
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report:

Determination of Dissolved Gases

		QC 2066
Methane Dissolved Raw	TM223	91.3 89.76 : 93.14
Propane Dissolved Raw	TM223	95.47 93.54 : 97.20

Dissolved Metals by ICP-MS

Component	Method Code	QC 2003
Aluminium	TM152	106.0 93.15 : 113.42
Antimony	TM152	112.67 88.37 : 130.57
Arsenic	TM152	107.33 92.62 : 113.52
Barium	TM152	109.67 93.15 : 115.52
Beryllium	TM152	107.67 85.23 : 107.63
Bismuth	TM152	114.33 92.62 : 115.02
Boron	TM152	105.33 82.59 : 113.58
Cadmium	TM152	107.67 93.85 : 111.65
Calcium	TM152	110.67 89.20 : 126.91
Chromium	TM152	106.33 92.22 : 109.85
Cobalt	TM152	104.67 85.01 : 114.87
Copper	TM152	108.67 89.87 : 119.73
Iron	TM152	108.67 93.02 : 113.86
Lead	TM152	113.67 91.11 : 116.98
Lithium	TM152	109.0 86.01 : 115.79
Magnesium	TM152	108.0 89.60 : 116.61
Manganese	TM152	109.83 93.97 : 112.46
Molybdenum	TM152	98.67 89.07 : 110.96
Nickel	TM152	107.83 93.70 : 112.15
Phosphorus	TM152	109.33 89.24 : 114.18
Potassium	TM152	113.33 97.98 : 117.40
Selenium	TM152	109.33 91.69 : 117.12
Silver	TM152	106.67 96.95 : 117.30



CERTIFICATE OF ANALYSIS

Validated

SDG: 190917-41 Client Reference: Bradford Road No. 2 Gash Report Number: 523714
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report:

Dissolved Metals by ICP-MS

		QC 2003
Sodium	TM152	106.67 92.42 : 113.24
Strontium	TM152	107.0 92.14 : 116.24
Tellurium	TM152	105.17 89.88 : 111.78
Thallium	TM152	104.83 86.08 : 122.48
Tin	TM152	112.33 91.00 : 109.00
Titanium	TM152	102.0 86.17 : 105.17
Tungsten	TM152	107.0 77.61 : 132.31
Uranium	TM152	107.5 86.97 : 115.76
Vanadium	TM152	104.0 89.61 : 115.48
Zinc	TM152	109.0 87.51 : 116.26

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2017
Dissolved Inorganic Carbon	TM090	101.17 91.27 : 109.87
Dissolved Organic Carbon	TM090	101.0 97.87 : 108.77

EPH (DRO) (C10-C40) Aqueous (W)

Component	Method Code	QC 2059
EPH (DRO) (C10-C40)	TM172	68.4 65.52 : 121.02

Mercury Dissolved

Component	Method Code	QC 2061
Mercury Dissolved (CVAf)	TM183	87.6 76.80 : 117.12

PAH Spec MS - Aqueous (W)



CERTIFICATE OF ANALYSIS

Validated

SDG: 190917-41 Client Reference: Bradford Road No. 2 Gash Report Number: 523714
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report:

PAH Spec MS - Aqueous (W)

Component	Method Code	QC 2096
Acenaphthene by GCMS	TM178	110.4 97.20 : 118.80
Acenaphthylene by GCMS	TM178	110.8 91.60 : 120.40
Anthracene by GCMS	TM178	107.2 92.40 : 114.00
Benz(a)anthracene by GCMS	TM178	111.2 92.40 : 114.00
Benzo(a)pyrene by GCMS	TM178	112.0 94.00 : 118.00
Benzo(b)fluoranthene by GCMS	TM178	114.8 90.80 : 117.20
Benzo(ghi)perylene by GCMS	TM178	99.6 93.20 : 114.80
Benzo(k)fluoranthene by GCMS	TM178	115.6 96.00 : 120.00
Chrysene by GCMS	TM178	112.0 98.40 : 120.00
Dibenzo(ah)anthracene by GCMS	TM178	100.4 89.20 : 118.00
Fluoranthene by GCMS	TM178	102.4 98.80 : 120.40
Fluorene by GCMS	TM178	112.0 98.40 : 120.00
Indeno(123cd)pyrene by GCMS	TM178	110.4 93.20 : 117.20
Naphthalene by GCMS	TM178	111.6 97.60 : 124.00
Phenanthrene by GCMS	TM178	109.6 96.40 : 118.00
Pyrene by GCMS	TM178	104.4 98.00 : 117.20

pH Value

Component	Method Code	QC 2057
pH	TM256	101.35 100.00 : 102.43

Phenols by HPLC (W)

Component	Method Code	QC 2015
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	104.0 93.10 : 108.70
2-Isopropyl Phenol by HPLC (W)	TM259	108.0 90.00 : 114.00
Cresols by HPLC (W)	TM259	107.67 90.02 : 130.15
Napthol by HPLC (W)	TM259	110.0 94.72 : 118.72



CERTIFICATE OF ANALYSIS

Validated

SDG: 190917-41 Client Reference: Bradford Road No. 2 Gash Report Number: 523714
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report:

Phenols by HPLC (W)

		QC 2015
Phenol by HPLC (W)	TM259	105.0 85.89 : 109.89
Xylenols by HPLC (W)	TM259	106.17 98.67 : 108.67

Sulphide

Component	Method Code	QC 2084
Sulphide	TM101	92.67 88.90 : 112.50

Suspended Solids

Component	Method Code	QC 2062
Total Suspended Solids	TM022	98.14 95.69 : 101.90

VOC MS (W)

Component	Method Code	QC 2012
1,1,1,2-Tetrachloroethane	TM208	95.0 81.85 : 113.65
1,1,1-Trichloroethane	TM208	91.5 85.82 : 113.33
1,1-Dichloroethane	TM208	92.0 79.60 : 118.57
1,2-Dichloroethane	TM208	89.5 77.72 : 133.33
2-Chlorotoluene	TM208	95.0 82.89 : 116.61
4-Chlorotoluene	TM208	97.0 79.46 : 115.88
Benzene	TM208	91.5 81.22 : 118.60
Bromomethane	TM208	91.0 79.31 : 116.90
Carbontetrachloride	TM208	93.0 86.16 : 119.10
Chlorobenzene	TM208	97.0 87.25 : 116.65
Chloroform	TM208	92.0 83.01 : 121.64
Chloromethane	TM208	91.5 65.28 : 130.05
Cis-1,2-Dichloroethene	TM208	89.0 85.03 : 112.75
Dichloromethane	TM208	87.0 78.23 : 120.65



CERTIFICATE OF ANALYSIS

Validated

SDG: 190917-41 **Client Reference:** Bradford Road No. 2 Gash **Report Number:** 523714
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:**

VOC MS (W)

		QC 2012
Ethylbenzene	TM208	92.0 79.55 : 110.51
Hexachlorobutadiene	TM208	88.5 67.63 : 111.28
o-Xylene	TM208	95.5 85.06 : 114.91
p/m-Xylene	TM208	93.5 84.45 : 113.50
Tert-butyl methyl ether	TM208	84.0 70.18 : 125.95
Tetrachloroethene	TM208	95.5 80.43 : 115.53
Toluene	TM208	93.5 79.88 : 116.83
Trichloroethene	TM208	91.0 82.30 : 112.45
Vinyl Chloride	TM208	93.0 71.34 : 122.34

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

Validated

SDG: 190917-41 Client Reference: Bradford Road No. 2 Gash Report Number: 523714
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report:

Chromatogram

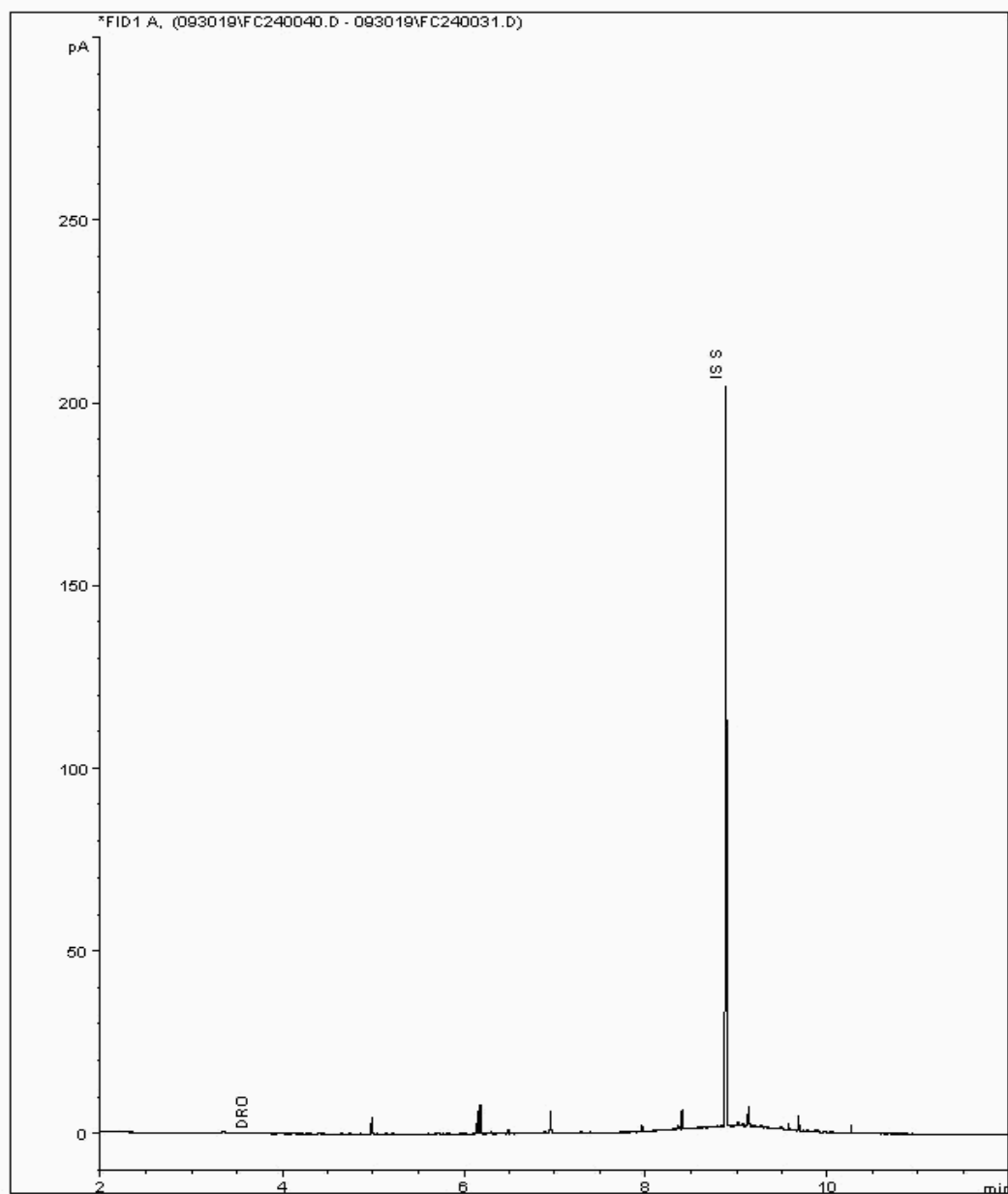
Analysis: EPH (DRO) (C10-C40) Aqueous (W)

Sample No : 20748492
Sample ID : Discharge

Depth : 0.00 - 0.00

EPH Range Organics (C10 - C40)

Sample Identity: 19491196-
Date Acquired : 01/10/2019 06:12:05 PM
Units : ppm





CERTIFICATE OF ANALYSIS

SDG:	190917-41	Client Reference:	Bradford Road No. 2 Gas	Report Number:	523714
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	

Appendix

General

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

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

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

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

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

7. Results relate only to the items tested.

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

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

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

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

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

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

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

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

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

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

18. Sample Deviations

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

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

19. Asbestos

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

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2107)*.

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

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



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Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date of report Generation:	12 November 2019
Customer:	Celtic
Sample Delivery Group (SDG):	191101-25
Your Reference:	Bradford Road No. 2 Gasholder
Location:	Bradford Road, Manchester
Report No:	529382

This report has been revised and directly supersedes 528590 in its entirety.

We received 1 sample on Friday November 01, 2019 and 1 of these samples were scheduled for analysis which was completed on Tuesday November 12, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	191101-25	Client Reference:	Bradford Road No. 2 Gashol	Report Number:	529382
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	528590

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21059874	Effluent		0.00 - 0.00	30/10/2019

Maximum Sample/Coolbox Temperature (°C) :

10.2

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 191101-25 Client Reference: Bradford Road No. 2 Gashol Report Number: 529382
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 528590

Results Legend

X Test
N No Determination Possible

Sample Types -

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

Lab Sample No(s)

21059874

Customer Sample Reference

Effluent

AGS Reference

Depth (m)

0.00 - 0.00

Container

500ml Plastic (ALE208)

Vial (ALE297)

Sample Type

TE

TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 191101-25 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 529382
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:** 528590

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 191101-25 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 529382
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:** 528590

Test Completion Dates

Lab Sample No(s) 21059874
Customer Sample Ref. Effluent
AGS Ref.
Depth 0.00 - 0.00
Type Trade Effluent

Ammoniacal Nitrogen	06-Nov-2019
COD on Settled Sample	09-Nov-2019
Determination of Dissolved Gases	12-Nov-2019
pH Value	12-Nov-2019
Suspended Solids	12-Nov-2019



CERTIFICATE OF ANALYSIS

Validated

SDG: 191101-25

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Order Number:

79696

Report Number:

529382

Superseded Report:

528590

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 2196
Ammoniacal Nitrogen as N	TM099	103.2 93.14 : 108.60

COD on Settled Sample

Component	Method Code	QC 2189
COD	TM107	99.81 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 2122
Carbon Dioxide Dissolved Raw	TM223	51.3 93.80 : 109.40
Ethane Dissolved Raw	TM223	91.0 80.04 : 105.85
Methane Dissolved Raw	TM223	86.89 70.05 : 104.83
Propane Dissolved Raw	TM223	89.63 76.90 : 105.07

pH Value

Component	Method Code	QC 2101
pH	TM256	100.94 100.00 : 102.43

Suspended Solids

Component	Method Code	QC 2173
Total Suspended Solids	TM022	100.0 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	191101-25	Client Reference:	Bradford Road No. 2 Gas	Report Number:	529382
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	528590

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

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

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

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

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

7. Results relate only to the items tested.

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

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

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

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

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

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

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

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

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

General

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

18. Sample Deviations

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

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

19. Asbestos

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

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2107).

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

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



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Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date of report Generation: 26 November 2019
Customer: Celtic
Sample Delivery Group (SDG): 191116-79
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 531437

This report has been revised and directly supersedes 531431 in its entirety.

We received 1 sample on Saturday November 16, 2019 and 1 of these samples were scheduled for analysis which was completed on Tuesday November 26, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	191116-79	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	531437
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	531431

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21160437	Effluent		0.00 - 0.00	14/11/2019

Maximum Sample/Coolbox Temperature (°C) :

10.8

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: 191116-79 Client Reference: Bradford Road No. 2 Gashol Report Number: 531437
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 531431

Results Legend

X Test
N No Determination Possible

Sample Types -

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

Lab Sample No(s)

21160437

Customer Sample Reference

Effluent

AGS Reference

Depth (m)

0.00 - 0.00

Container

11 plastic (ALE221)
Vial (ALE297)

Sample Type

TE TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 191116-79 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 531437
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:** 531431

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

SDG:	191116-79	Client Reference:	Bradford Road No. 2 Gashold	Report Number:	531437
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	531431

Test Completion Dates

Lab Sample No(s)	21160437
Customer Sample Ref.	Effluent
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	26-Nov-2019
COD on Settled Sample	26-Nov-2019
Determination of Dissolved Gases	26-Nov-2019
pH Value	26-Nov-2019
Suspended Solids	26-Nov-2019



CERTIFICATE OF ANALYSIS

Validated

SDG: 191116-79

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Order Number:

79696

Report Number:

531437

Superseded Report:

531431

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 2190
Ammoniacal Nitrogen as N	TM099	103.6 93.14 : 108.60

COD on Settled Sample

Component	Method Code	QC 2134
COD	TM107	98.86 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 2153
Carbon Dioxide Dissolved Raw	TM223	52.6 101.00 : 108.20
Ethane Dissolved Raw	TM223	97.88 89.48 : 93.82
Methane Dissolved Raw	TM223	96.91 89.76 : 93.14
Propane Dissolved Raw	TM223	101.21 93.54 : 97.20

pH Value

Component	Method Code	QC 2177
pH	TM256	101.21 99.87 : 102.29

Suspended Solids

Component	Method Code	QC 2137
Total Suspended Solids	TM022	97.88 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	191116-79	Client Reference:	Bradford Road No. 2 Gas	Report Number:	531437
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	531431

Appendix

General

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

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

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

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

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

7. Results relate only to the items tested.

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

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

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

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

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

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

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

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

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

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

18. Sample Deviations

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

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

19. Asbestos

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

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2107)*.

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

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



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Celtic
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Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date of report Generation:	17 December 2019
Customer:	Celtic
Sample Delivery Group (SDG):	191205-122
Your Reference:	Bradford Road No. 2 Gasholder
Location:	Bradford Road, Manchester
Report No:	534502

We received 1 sample on Thursday December 05, 2019 and 1 of these samples were scheduled for analysis which was completed on Tuesday December 17, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 191205-122 **Client Reference:** Bradford Road No. 2 Gashold **Report Number:** 534502
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21298515	Effluent		0.00 - 0.00	03/12/2019

Maximum Sample/Coolbox Temperature (°C) :

1.8

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: 191205-122 Client Reference: Bradford Road No. 2 Gashol Report Number: 534502
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report:

Results Legend

X Test
N No Determination Possible

Sample Types -

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

Lab Sample No(s)

21298515

Customer Sample Reference

Effluent

AGS Reference

Depth (m)

0.00 - 0.00

Container

Tiplastic (ALE221)
Vial (ALE297)

Sample Type

TE TE

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 191205-122

Client Reference: Bradford Road No. 2 Gashold

Report Number: 534502

Location: Bradford Road, Manchester

Order Number: 79696

Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 191205-122

Client Reference: Bradford Road No. 2 Gashold

Report Number: 534502

Location: Bradford Road, Manchester

Order Number: 79696

Superseded Report:

Test Completion Dates

Lab Sample No(s) 21298515
Customer Sample Ref. Effluent

AGS Ref.
Depth 0.00 - 0.00
Type Trade Effluent

COD on Settled Sample	17-Dec-2019
Determination of Dissolved Gases	17-Dec-2019
pH Value	16-Dec-2019
Suspended Solids	17-Dec-2019



CERTIFICATE OF ANALYSIS

Validated

SDG: 191205-122

Location: Bradford Road, Manchester

Client Reference:

Bradford Road No. 2 Gashol

Report Number:

534502

Order Number:

79696

Superseded Report:

ASSOCIATED AQC DATA

COD on Settled Sample

Component	Method Code	QC 2160
COD	TM107	99.81 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 2144
Carbon Dioxide Dissolved Raw	TM223	52.4 101.00 : 108.20
Ethane Dissolved Raw	TM223	98.54 89.48 : 93.82
Methane Dissolved Raw	TM223	97.6 89.76 : 93.14
Propane Dissolved Raw	TM223	101.44 93.54 : 97.20

pH Value

Component	Method Code	QC 2125
pH	TM256	101.21 100.00 : 102.43

Suspended Solids

Component	Method Code	QC 2123
Total Suspended Solids	TM022	101.06 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	191205-122	Client Reference:	Bradford Road No. 2 Gas	Report Number:	534502
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	

Appendix

General

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

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

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

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

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

7. Results relate only to the items tested.

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

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

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

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

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

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

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

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

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

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

18. Sample Deviations

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

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

19. Asbestos

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

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2107).

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

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



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Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date of report Generation:	20 January 2020
Customer:	Celtic
Sample Delivery Group (SDG):	200113-20
Your Reference:	Bradford Road No. 2 Gasholder
Location:	Bradford Road, Manchester
Report No:	537770

We received 1 sample on Monday January 13, 2020 and 1 of these samples were scheduled for analysis which was completed on Monday January 20, 2020. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	200113-20	Client Reference:	Bradford Road No. 2 Gash	Report Number:	537770
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21479146	Discharge		0.00 - 0.00	09/01/2020

Maximum Sample/Coolbox Temperature (°C) : 7.4

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 200113-20 Client Reference: Bradford Road No. 2 Gash Report Number: 537770
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report:

Results Legend

X Test
N No Determination Possible

Sample Types -

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

	Lab Sample No(s)		21479146					
	Customer Sample Reference		Discharge					
	AGS Reference							
	Depth (m)		0.00 - 0.00					
	Container		0.5l glass bottle (ALE227)	1l plastic (ALE221)	H2SO4 (ALE244)	NaOH (ALE245)	Vial (ALE297)	ZnAc (ALE246)
	Sample Type		TE	TE	TE	TE	TE	TE
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 1			X			
Anions by Kone (w)	All	NDPs: 0 Tests: 1		X				
COD on Settled Sample	All	NDPs: 0 Tests: 1		X				
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 1		X				
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1				X		
Determination of Dissolved Gases	All	NDPs: 0 Tests: 1					X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1		X				
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X					
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 1	X					
Free Sulphur	All	NDPs: 0 Tests: 1	X					
Mercury Dissolved	All	NDPs: 0 Tests: 1		X				
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 1	X					
pH Value	All	NDPs: 0 Tests: 1		X				
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1			X			
Sulphide	All	NDPs: 0 Tests: 1						X



CERTIFICATE OF ANALYSIS

Validated

SDG: 200113-20 Client Reference: Bradford Road No. 2 Gash Report Number: 537770
Location: Bradford Road, Manchester Order Number: 79696 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

Lab Sample No(s)

21479146

Customer
Sample Reference

Discharge

AGS Reference

Depth (m)

0.00 - 0.00

Container

0.5l glass bottle
(ALE227)

1l plastic
(ALE221)

H2SO4
(ALE244)

NaOH (ALE245)

Vial (ALE297)

ZnAc (ALE246)

Sample Type

TE

TE

TE

TE

TE

TE

Suspended Solids

All

NDPs: 0
Tests: 1

X

VOC MS (W)

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 200113-20 **Client Reference:** Bradford Road No. 2 Gash **Report Number:** 537770
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:**

Results Legend		Customer Sample Ref.	Discharge					
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00 Trade Effluent (TE) 09/01/2020 13/01/2020 200113-20 21479146					
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-3+5@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Suspended solids, Total	<2 mg/l	TM022	10	#				
Carbon, Organic (diss.filt)	<3 mg/l	TM090	3.55					
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	1.72	#				
Sulphide	<0.01 mg/l	TM101	<0.01	#				
COD, settled	<7 mg/l	TM107	31.8	#				
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120	0.0832	#				
Arsenic (diss.filt)	<0.0005 mg/l	TM152	0.000788	2				
Boron (diss.filt)	<0.01 mg/l	TM152	<0.01	2				
Cadmium (diss.filt)	<0.00008 mg/l	TM152	<0.00008	2				
Chromium (diss.filt)	<0.001 mg/l	TM152	<0.001	2				
Copper (diss.filt)	<0.0003 mg/l	TM152	0.00365	2				
Lead (diss.filt)	<0.0002 mg/l	TM152	<0.0002	2				
Nickel (diss.filt)	<0.0004 mg/l	TM152	0.00405	2				
Selenium (diss.filt)	<0.001 mg/l	TM152	<0.001	2				
Zinc (diss.filt)	<0.001 mg/l	TM152	1.25	2				
Iron (Dis.Filt)	<0.019 mg/l	TM152	0.0205	2				
EPH Range >C10 - C40 (aq)	<0.1 mg/l	TM172	0.227					
Mercury (diss.filt)	<0.00001 mg/l	TM183	<0.00001	2 #				
Sulphate	<2 mg/l	TM184	<2	#				
Chloride	<2 mg/l	TM184	5.3	#				
Methane, dissolved	<0.001 mg/l	TM223	<0.001					
Cyanide, Total	<0.05 mg/l	TM227	0.05	#				
Cyanide, Free	<0.05 mg/l	TM227	<0.05	#				
Cyanide, Complex	<0.05 mg/l	TM227	0.05					
Thiocyanate	<0.05 mg/l	TM227	<0.05	#				
pH	<1 pH Units	TM256	7.33	#				
Resorcinol	<0.01 mg/l	TM259	<0.01					
Catechol	<0.01 mg/l	TM259	<0.01					
Phenol	<0.002 mg/l	TM259	<0.002	#				
Cresols	<0.006 mg/l	TM259	<0.006	#				
Xylenols	<0.008 mg/l	TM259	<0.008	#				
1-Naphthol	<0.01 mg/l	TM259	<0.01					



CERTIFICATE OF ANALYSIS

Validated

SDG: 200113-20 **Client Reference:** Bradford Road No. 2 Gash **Report Number:** 537770
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
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
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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
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
TM294		Determination of Free Sulphur in liquids 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: 200113-20 **Client Reference:** Bradford Road No. 2 Gash **Report Number:** 537770
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:**

Test Completion Dates

Lab Sample No(s)	21479146
Customer Sample Ref.	Discharge
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	14-Jan-2020
Anions by Kone (w)	15-Jan-2020
COD on Settled Sample	16-Jan-2020
Conductivity (at 20 deg.C)	15-Jan-2020
Cyanide Comp/Free/Total/Thiocyanate	20-Jan-2020
Determination of Dissolved Gases	16-Jan-2020
Dissolved Metals by ICP-MS	18-Jan-2020
Dissolved Organic/Inorganic Carbon	14-Jan-2020
EPH (DRO) (C10-C40) Aqueous (W)	17-Jan-2020
Free Sulphur	20-Jan-2020
Mercury Dissolved	14-Jan-2020
PAH Spec MS - Aqueous (W)	20-Jan-2020
pH Value	14-Jan-2020
Phenols by HPLC (W)	15-Jan-2020
Sulphide	20-Jan-2020
Suspended Solids	16-Jan-2020
VOC MS (W)	14-Jan-2020



CERTIFICATE OF ANALYSIS

Validated

SDG: 200113-20 Client Reference: Bradford Road No. 2 Gash Report Number: 537770
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report:

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 2164
Ammoniacal Nitrogen as N	TM099	102.0 93.14 : 108.60

Anions by Kone (w)

Component	Method Code	QC 2119
Chloride	TM184	106.0 92.93 : 115.43
Sulphate (soluble)	TM184	109.2 90.53 : 113.03

COD on Settled Sample

Component	Method Code	QC 2147
COD	TM107	98.86 97.45 : 103.77

Conductivity (at 20 deg.C)

Component	Method Code	QC 2195
Conductivity (at 20 deg.C)	TM120	102.26 100.75 : 105.26

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2130
Free Cyanide (W)	TM227	99.0 92.00 : 113.00
Thiocyanate (W)	TM227	99.5 95.50 : 107.50
Total Cyanide (W)	TM227	96.25 91.75 : 112.75

Determination of Dissolved Gases

Component	Method Code	QC 2116
Carbon Dioxide Dissolved Raw	TM223	51.6 93.80 : 109.40
Ethane Dissolved Raw	TM223	90.36 80.04 : 105.85



CERTIFICATE OF ANALYSIS

Validated

SDG: 200113-20 Client Reference: Bradford Road No. 2 Gash Report Number: 537770
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report:

Determination of Dissolved Gases

		QC 2116
Methane Dissolved Raw	TM223	89.53 70.05 : 104.83
Propane Dissolved Raw	TM223	94.74 76.90 : 105.07

Dissolved Metals by ICP-MS

Component	Method Code	QC 2161
Aluminium	TM152	103.67 95.37 : 118.13
Antimony	TM152	106.33 88.37 : 130.57
Arsenic	TM152	100.17 92.62 : 113.52
Barium	TM152	100.17 93.15 : 115.52
Beryllium	TM152	103.83 89.98 : 116.88
Bismuth	TM152	102.0 92.62 : 115.02
Boron	TM152	104.67 86.31 : 120.88
Cadmium	TM152	102.83 93.85 : 111.65
Calcium	TM152	100.0 89.20 : 126.91
Chromium	TM152	98.33 92.22 : 109.85
Cobalt	TM152	96.67 85.01 : 114.87
Copper	TM152	99.83 89.87 : 119.73
Iron	TM152	98.0 93.02 : 113.86
Lead	TM152	103.33 91.11 : 116.98
Lithium	TM152	103.5 91.30 : 123.00
Magnesium	TM152	99.33 89.60 : 116.61
Manganese	TM152	97.0 93.97 : 112.46
Molybdenum	TM152	98.33 89.07 : 110.96
Nickel	TM152	96.67 93.70 : 112.15
Phosphorus	TM152	93.17 89.24 : 114.18
Potassium	TM152	98.0 97.98 : 117.40
Selenium	TM152	101.67 91.69 : 117.12
Silver	TM152	101.17 96.95 : 117.30



CERTIFICATE OF ANALYSIS

Validated

SDG: 200113-20 Client Reference: Bradford Road No. 2 Gash Report Number: 537770
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report:

Dissolved Metals by ICP-MS

		QC 2161
Sodium	TM152	98.0 92.42 : 113.24
Strontium	TM152	100.0 92.14 : 116.24
Tellurium	TM152	97.17 89.88 : 111.78
Thallium	TM152	98.5 86.08 : 122.48
Tin	TM152	105.67 91.00 : 109.00
Titanium	TM152	103.33 90.29 : 115.23
Tungsten	TM152	102.5 77.61 : 132.31
Uranium	TM152	100.83 86.97 : 115.76
Vanadium	TM152	100.83 89.61 : 115.48
Zinc	TM152	105.0 87.51 : 116.26

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2120
Dissolved Inorganic Carbon	TM090	98.67 93.58 : 112.28
Dissolved Organic Carbon	TM090	103.0 96.28 : 110.58

EPH (DRO) (C10-C40) Aqueous (W)

Component	Method Code	QC 2194
EPH (DRO) (C10-C40)	TM172	89.6 61.35 : 125.96

Mercury Dissolved

Component	Method Code	QC 2170
Mercury Dissolved (CVAf)	TM183	102.0 76.80 : 117.12

PAH Spec MS - Aqueous (W)



CERTIFICATE OF ANALYSIS

Validated

SDG: 200113-20 Client Reference: Bradford Road No. 2 Gash Report Number: 537770
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report:

PAH Spec MS - Aqueous (W)

Component	Method Code	QC 2103
Acenaphthene by GCMS	TM178	110.4 90.45 : 118.63
Acenaphthylene by GCMS	TM178	108.4 90.13 : 116.27
Anthracene by GCMS	TM178	101.2 92.40 : 114.00
Benz(a)anthracene by GCMS	TM178	106.0 89.51 : 117.69
Benzo(a)pyrene by GCMS	TM178	106.8 89.43 : 118.57
Benzo(b)fluoranthene by GCMS	TM178	108.0 87.80 : 121.80
Benzo(ghi)perylene by GCMS	TM178	109.2 87.10 : 119.30
Benzo(k)fluoranthene by GCMS	TM178	113.6 93.23 : 123.57
Chrysene by GCMS	TM178	104.4 88.68 : 116.92
Dibenzo(ah)anthracene by GCMS	TM178	107.6 86.24 : 118.56
Fluoranthene by GCMS	TM178	108.4 86.04 : 121.96
Fluorene by GCMS	TM178	111.2 90.76 : 121.24
Indeno(123cd)pyrene by GCMS	TM178	112.4 88.39 : 119.61
Naphthalene by GCMS	TM178	110.0 89.40 : 121.80
Phenanthrene by GCMS	TM178	108.4 90.41 : 119.19
Pyrene by GCMS	TM178	109.6 91.00 : 120.20

pH Value

Component	Method Code	QC 2190
pH	TM256	101.35 99.87 : 102.29

Phenols by HPLC (W)

Component	Method Code	QC 2126
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	101.0 91.00 : 109.00
2-Isopropyl Phenol by HPLC (W)	TM259	100.0 90.00 : 114.00
Cresols by HPLC (W)	TM259	104.33 90.02 : 130.15
Napthol by HPLC (W)	TM259	105.0 86.00 : 128.00



CERTIFICATE OF ANALYSIS

Validated

SDG: 200113-20 Client Reference: Bradford Road No. 2 Gash Report Number: 537770
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report:

Phenols by HPLC (W)

		QC 2126
Phenol by HPLC (W)	TM259	105.0 85.89 : 109.89
Xylenols by HPLC (W)	TM259	103.17 93.33 : 107.33

Sulphide

Component	Method Code	QC 2140
Sulphide	TM101	108.0 88.90 : 112.50

Suspended Solids

Component	Method Code	QC 2199
Total Suspended Solids	TM022	99.73 95.69 : 101.90

VOC MS (W)

Component	Method Code	QC 2125
1,1,1,2-Tetrachloroethane	TM208	97.0 79.47 : 113.27
1,1,1-Trichloroethane	TM208	101.0 81.01 : 112.00
1,1-Dichloroethane	TM208	101.5 82.09 : 116.41
1,2-Dichloroethane	TM208	105.5 80.28 : 123.63
2-Chlorotoluene	TM208	93.0 87.20 : 110.84
4-Chlorotoluene	TM208	92.0 87.70 : 111.10
Benzene	TM208	103.5 87.46 : 118.30
Bromomethane	TM208	103.5 76.99 : 118.39
Carbontetrachloride	TM208	101.0 81.73 : 114.22
Chlorobenzene	TM208	99.0 90.45 : 114.03
Chloroform	TM208	102.0 83.67 : 118.08
Chloromethane	TM208	108.0 60.45 : 118.08
Cis-1,2-Dichloroethene	TM208	101.5 83.95 : 112.60
Dichloromethane	TM208	102.5 81.65 : 120.83



CERTIFICATE OF ANALYSIS

Validated

SDG: 200113-20 Client Reference: Bradford Road No. 2 Gash Report Number: 537770
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report:

VOC MS (W)

		QC 2125
Ethylbenzene	TM208	96.0 85.59 : 106.44
Hexachlorobutadiene	TM208	95.5 66.83 : 108.27
o-Xylene	TM208	95.0 78.40 : 110.68
p/m-Xylene	TM208	94.5 82.64 : 112.12
Tert-butyl methyl ether	TM208	98.5 68.23 : 127.69
Tetrachloroethene	TM208	97.5 81.10 : 112.63
Toluene	TM208	101.5 87.40 : 109.78
Trichloroethene	TM208	100.5 81.17 : 111.80
Vinyl Chloride	TM208	104.0 72.73 : 123.40

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

Validated

SDG:	200113-20	Client Reference:	Bradford Road No. 2 Gash	Report Number:	537770
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	

Chromatogram

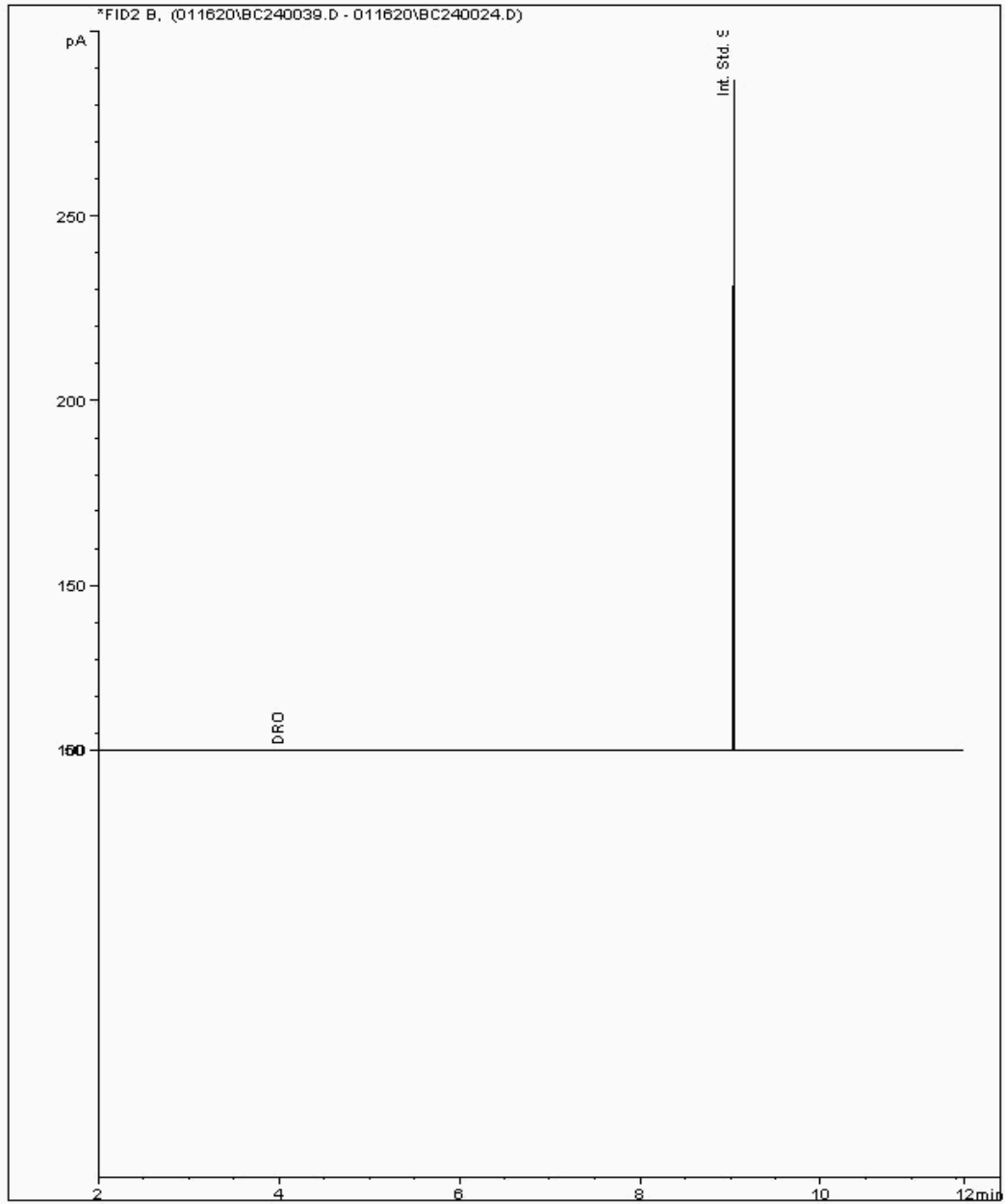
Analysis: EPH (DRO) (C10-C40) Aqueous (W)

Sample No : 21479484
Sample ID : Discharge

Depth : 0.00 - 0.00

EPH Range Organics (C10 - C40)

Sample Identity: 20169891-
Date Acquired : 17/01/2020 01:41:55 PM
Units : mg/l





CERTIFICATE OF ANALYSIS

SDG:	200113-20	Client Reference:	Bradford Road No. 2 Gas	Report Number:	537770
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	

Appendix

General

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

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

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

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

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

7. Results relate only to the items tested.

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

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

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

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

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

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

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

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

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

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

18. Sample Deviations

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

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

19. Asbestos

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

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2107).

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

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



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Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date of report Generation: 11 March 2020
Customer: Celtic
Sample Delivery Group (SDG): 200228-18
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 545089

This report has been revised and directly supersedes 543972 in its entirety.

We received 1 sample on Friday February 28, 2020 and 1 of these samples were scheduled for analysis which was completed on Wednesday March 11, 2020. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	200228-18	Client Reference:	Bradford Road No. 2 Gashol	Report Number:	545089
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	543972

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21782481	Effluent		0.00 - 0.00	26/02/2020

Maximum Sample/Coolbox Temperature (°C) :

4.4

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 200228-18 Client Reference: Bradford Road No. 2 Gashol Report Number: 545089
 Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 543972

Results Legend

X Test
N No Determination Possible

Sample Types -

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

Lab Sample No(s)

21782481

Customer Sample Reference

Effluent

AGS Reference

Depth (m)

0.00 - 0.00

Container

11plastic (ALE221)

Vial (ALE297)

Sample Type

TE

TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 200228-18 **Client Reference:** Bradford Road No. 2 Gashol **Report Number:** 545089
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:** 543972

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 200228-18 **Client Reference:** Bradford Road No. 2 Gashol **Report Number:** 545089
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:** 543972

Test Completion Dates

Lab Sample No(s) 21782481
Customer Sample Ref. Effluent
AGS Ref.
Depth 0.00 - 0.00
Type Trade Effluent

Ammoniacal Nitrogen	03-Mar-2020
COD on Settled Sample	09-Mar-2020
Determination of Dissolved Gases	11-Mar-2020
pH Value	10-Mar-2020
Suspended Solids	06-Mar-2020



CERTIFICATE OF ANALYSIS

Validated

SDG: 200228-18

Client Reference:

Bradford Road No. 2 Gashol

Report Number:

545089

Location:

Bradford Road, Manchester

Order Number:

79696

Superseded Report:

543972

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 2196
Ammoniacal Nitrogen as N	TM099	99.2 93.14 : 108.60

COD on Settled Sample

Component	Method Code	QC 2166
COD	TM107	100.38 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 2168
Carbon Dioxide Dissolved Raw	TM223	104.4 101.00 : 108.20
Ethane Dissolved Raw	TM223	99.49 77.96 : 120.30
Methane Dissolved Raw	TM223	98.31 70.05 : 119.89
Propane Dissolved Raw	TM223	102.57 76.59 : 118.21

pH Value

Component	Method Code	QC 2108
pH	TM256	101.08 100.00 : 102.43

Suspended Solids

Component	Method Code	QC 2165
Total Suspended Solids	TM022	99.2 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	200228-18	Client Reference:	Bradford Road No. 2 Gas	Report Number:	545089
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	543972

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

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

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

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

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

7. Results relate only to the items tested.

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

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

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

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

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

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

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

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

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

General

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

18. Sample Deviations

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

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

19. Asbestos

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

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2107).

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

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



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Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date of report Generation: 29 March 2020
Customer: Celtic
Sample Delivery Group (SDG): 200319-128
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 547783

This report has been revised and directly supersedes 547126 in its entirety.

We received 1 sample on Thursday March 19, 2020 and 1 of these samples were scheduled for analysis which was completed on Sunday March 29, 2020. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	200319-128	Client Reference:	Bradford Road No. 2 Gashol	Report Number:	547783
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	547126

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21923079	Effluent		0.00 - 0.00	17/03/2020

Maximum Sample/Coolbox Temperature (°C) :

6.2

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 200319-128 Client Reference: Bradford Road No. 2 Gashol Report Number: 547783
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 547126

Results Legend

X Test
N No Determination Possible

Sample Types -

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

Lab Sample No(s)

21923079

Customer Sample Reference

Effluent

AGS Reference

Depth (m)

0.00 - 0.00

Container

11plastic (ALE221)

H2SO4 (ALE244)

Vial (ALE297)

Sample Type

TE

TE

TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Suspended Solids

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG:	200319-128	Client Reference:	Bradford Road No. 2 Gashol	Report Number:	547783
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	547126

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 200319-128 **Client Reference:** Bradford Road No. 2 Gashol **Report Number:** 547783
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:** 547126

Test Completion Dates

Lab Sample No(s) 21923079
Customer Sample Ref. Effluent
AGS Ref.
Depth 0.00 - 0.00
Type Trade Effluent

Ammoniacal Nitrogen	24-Mar-2020
COD on Settled Sample	28-Mar-2020
Determination of Dissolved Gases	29-Mar-2020
pH Value	25-Mar-2020
Suspended Solids	27-Mar-2020



CERTIFICATE OF ANALYSIS

Validated

SDG: 200319-128

Client Reference:

Bradford Road No. 2 Gashol

Report Number:

547783

Location:

Bradford Road, Manchester

Order Number:

79696

Superseded Report:

547126

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 2101
Ammoniacal Nitrogen as N	TM099	96.4 93.14 : 108.60

COD on Settled Sample

Component	Method Code	QC 2166
COD	TM107	99.62 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 2108
Ethane Dissolved Raw	TM223	99.61 77.96 : 120.30
Methane Dissolved Raw	TM223	97.89 70.05 : 104.83
Propane Dissolved Raw	TM223	103.28 76.59 : 118.21

pH Value

Component	Method Code	QC 2121
pH	TM256	100.81 99.16 : 103.84

Suspended Solids

Component	Method Code	QC 2181
Total Suspended Solids	TM022	100.8 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

SDG:	200319-128	Client Reference:	Bradford Road No. 2 Gas	Report Number:	547783
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	547126

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

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

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

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

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

7. Results relate only to the items tested.

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

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

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

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

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

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

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

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

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

General

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

18. Sample Deviations

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

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

19. Asbestos

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

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2107).

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

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



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Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
South Glamorgan
CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date of report Generation: 27 April 2020
Customer: Celtic
Sample Delivery Group (SDG): 200416-21
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 550415

This report has been revised and directly supersedes 550076 in its entirety.

We received 1 sample on Thursday April 16, 2020 and 1 of these samples were scheduled for analysis which was completed on Monday April 27, 2020. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	200416-21	Client Reference:	Bradford Road No. 2 Gashol	Report Number:	550415
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	550076

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
22031312	Effluent		0.00 - 0.00	14/04/2020

Maximum Sample/Coolbox Temperature (°C) :

5.6

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 200416-21 Client Reference: Bradford Road No. 2 Gashol Report Number: 550415
 Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 550076

Results Legend

X Test
N No Determination Possible

Sample Types -

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

Lab Sample No(s)

22031312

Customer Sample Reference

Effluent

AGS Reference

Depth (m)

0.00 - 0.00

Container

11plastic (ALE221)

H2SO4 (ALE244)

Via (ALE297)

Sample Type

TE

TE

TE

Ammoniacal Nitrogen

All

NDPs: 0
 Tests: 1

X

COD on Settled Sample

All

NDPs: 0
 Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
 Tests: 1

X

pH Value

All

NDPs: 0
 Tests: 1

X

Suspended Solids

All

NDPs: 0
 Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 200416-21 **Client Reference:** Bradford Road No. 2 Gashol **Report Number:** 550415
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:** 550076

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 200416-21 **Client Reference:** Bradford Road No. 2 Gashol **Report Number:** 550415
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:** 550076

Test Completion Dates

Lab Sample No(s) 22031312
Customer Sample Ref. Effluent
AGS Ref.
Depth 0.00 - 0.00
Type Trade Effluent

Ammoniacal Nitrogen	22-Apr-2020
COD on Settled Sample	24-Apr-2020
Determination of Dissolved Gases	23-Apr-2020
pH Value	22-Apr-2020
Suspended Solids	27-Apr-2020



CERTIFICATE OF ANALYSIS

Validated

SDG: 200416-21 Client Reference: Bradford Road No. 2 Gashol Report Number: 550415
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 550076

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 2273
Ammoniacal Nitrogen as N	TM099	102.0 93.14 : 108.60

COD on Settled Sample

Component	Method Code	QC 2228
COD	TM107	100.38 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 2239
Ethane Dissolved Raw	TM223	95.44 77.96 : 120.30
Methane Dissolved Raw	TM223	93.7 70.05 : 104.83
Propane Dissolved Raw	TM223	99.54 76.59 : 118.21

pH Value

Component	Method Code	QC 2258
pH	TM256	100.4 99.87 : 102.29

Suspended Solids

Component	Method Code	QC 2232
Total Suspended Solids	TM022	100.0 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

SDG:	200416-21	Client Reference:	Bradford Road No. 2 Gas	Report Number:	550415
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	550076

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

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

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

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

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

7. Results relate only to the items tested.

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

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

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

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

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

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

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

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

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

General

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

18. Sample Deviations

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

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

19. Asbestos

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

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.
Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

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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Celtic
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
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CF15 7NE

Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date of report Generation: 29 May 2020
Customer: Celtic
Sample Delivery Group (SDG): 200514-23
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 553577

This report has been revised and directly supersedes 553146 in its entirety.

We received 1 sample on Thursday May 14, 2020 and 1 of these samples were scheduled for analysis which was completed on Friday May 29, 2020. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	200514-23	Client Reference:	Bradford Road No. 2 Gash	Report Number:	553577
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	553146

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
22142393	Discharge		0.00 - 0.00	12/05/2020

Maximum Sample/Coolbox Temperature (°C) : **6.0**

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: 200514-23 Client Reference: Bradford Road No. 2 Gash Report Number: 553577
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 553146

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

Lab Sample No(s)

22142393

Customer Sample Reference

Discharge

AGS Reference

Depth (m)

0.00 - 0.00

Container

0.5l glass bottle (ALE227)

500ml Plastic (ALE208)

H2SO4 (ALE244)

NaOH (ALE245)

Vial (ALE297)

ZnAc (ALE246)

Sample Type

TE

TE

TE

TE

TE

TE

Ammoniacal Nitrogen

All

NDPs: 0
Tests: 1

X

Anions by Kone (w)

All

NDPs: 0
Tests: 1

X

COD on Settled Sample

All

NDPs: 0
Tests: 1

X

Conductivity (at 20 deg.C)

All

NDPs: 0
Tests: 1

X

Cyanide Comp/Free/Total/Thiocyanate

All

NDPs: 0
Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
Tests: 1

X

Dissolved Metals by ICP-MS

All

NDPs: 0
Tests: 1

X

Dissolved Organic/Inorganic Carbon

All

NDPs: 0
Tests: 1

X

EPH (DRO) (C10-C40) Aqueous (W)

All

NDPs: 0
Tests: 1

X

Free Sulphur

All

NDPs: 0
Tests: 1

X

Mercury Dissolved

All

NDPs: 0
Tests: 1

X

PAH Spec MS - Aqueous (W)

All

NDPs: 0
Tests: 1

X

pH Value

All

NDPs: 0
Tests: 1

X

Phenols by HPLC (W)

All

NDPs: 0
Tests: 1

X

Sulphide

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 200514-23 Client Reference: Bradford Road No. 2 Gash Report Number: 553577
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 553146

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

Lab Sample No(s)

22142393

Customer Sample Reference

Discharge

AGS Reference

Depth (m)

0.00 - 0.00

Container

ZnAc (ALE246)
Vial (ALE297)
NaOH (ALE245)
H2SO4 (ALE244)
500ml Plastic (ALE208)
0.5l glass bottle (ALE227)

Sample Type

TE TE TE TE TE TE

Suspended Solids

All

NDPs: 0
Tests: 1

X

VOC MS (W)

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 200514-23 **Client Reference:** Bradford Road No. 2 Gash **Report Number:** 553577
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:** 553146

Results Legend		Customer Sample Ref.	Discharge				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00 Trade Effluent (TE) 12/05/2020 14/05/2020 200514-23 22142393				
M	mCERTS accredited.						
aq	Aqueous / settled sample.						
diss.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted - refer to subcontractor report for accreditation status.						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery						
(F)	Trigger breach confirmed						
1-3+5@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Suspended solids, Total	<2 mg/l	TM022	7 #				
Carbon, Organic (diss.filt)	<3 mg/l	TM090	3.35				
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	1.74 #				
Sulphide	<0.01 mg/l	TM101	<0.01 #				
COD, settled	<7 mg/l	TM107	24.2 #				
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120	0.0872 #				
Arsenic (diss.filt)	<0.0005 mg/l	TM152	0.00115				
Boron (diss.filt)	<0.01 mg/l	TM152	<0.01				
Cadmium (diss.filt)	<0.00008 mg/l	TM152	<0.00008				
Chromium (diss.filt)	<0.001 mg/l	TM152	<0.001				
Copper (diss.filt)	<0.0003 mg/l	TM152	0.00101				
Lead (diss.filt)	<0.0002 mg/l	TM152	<0.0002				
Nickel (diss.filt)	<0.0004 mg/l	TM152	0.000473				
Selenium (diss.filt)	<0.001 mg/l	TM152	<0.001				
Zinc (diss.filt)	<0.001 mg/l	TM152	0.00313				
Iron (Dis.Filt)	<0.019 mg/l	TM152	0.0632				
EPH Range >C10 - C40 (aq)	<0.1 mg/l	TM172	0.258 #				
Mercury (diss.filt)	<0.00001 mg/l	TM183	<0.00001 #				
Sulphate	<2 mg/l	TM184	2.6 #				
Chloride	<2 mg/l	TM184	5.1 #				
Methane, dissolved	<0.001 mg/l	TM223	<0.001				
Cyanide, Total	<0.05 mg/l	TM227	0.05 #				
Cyanide, Free	<0.05 mg/l	TM227	<0.05 #				
Cyanide, Complex	<0.05 mg/l	TM227	0.05				
Thiocyanate	<0.05 mg/l	TM227	<0.05 #				
pH	<1 pH Units	TM256	7.56 #				
Resorcinol	<0.01 mg/l	TM259	<0.01				
Catechol	<0.01 mg/l	TM259	<0.01				
Phenol	<0.002 mg/l	TM259	<0.002 #				
Cresols	<0.006 mg/l	TM259	<0.006 #				
Xylenols	<0.008 mg/l	TM259	<0.008 #				
1-Naphthol	<0.01 mg/l	TM259	<0.01				



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Validated

SDG: 200514-23 **Client Reference:** Bradford Road No. 2 Gash **Report Number:** 553577
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:** 553146

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
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
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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
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
TM294		Determination of Free Sulphur in liquids by HPLC

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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SDG:	200514-23	Client Reference:	Bradford Road No. 2 Gash	Report Number:	553577
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	553146

Test Completion Dates

Lab Sample No(s)	22142393
Customer Sample Ref.	Discharge
AGS Ref.	
Depth	0.00 - 0.00
Type	Trade Effluent

Ammoniacal Nitrogen	18-May-2020
Anions by Kone (w)	18-May-2020
COD on Settled Sample	24-May-2020
Conductivity (at 20 deg.C)	21-May-2020
Cyanide Comp/Free/Total/Thiocyanate	19-May-2020
Determination of Dissolved Gases	21-May-2020
Dissolved Metals by ICP-MS	28-May-2020
Dissolved Organic/Inorganic Carbon	21-May-2020
EPH (DRO) (C10-C40) Aqueous (W)	22-May-2020
Free Sulphur	19-May-2020
Mercury Dissolved	29-May-2020
PAH Spec MS - Aqueous (W)	26-May-2020
pH Value	18-May-2020
Phenols by HPLC (W)	19-May-2020
Sulphide	18-May-2020
Suspended Solids	23-May-2020
VOC MS (W)	20-May-2020



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Validated

SDG: 200514-23 Client Reference: Bradford Road No. 2 Gash Report Number: 553577
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 553146

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 2285
Ammoniacal Nitrogen as N	TM099	101.6 93.14 : 108.60

Anions by Kone (w)

Component	Method Code	QC 2232
Chloride	TM184	100.0 92.93 : 115.43
Sulphate (soluble)	TM184	100.4 90.53 : 113.03

COD on Settled Sample

Component	Method Code	QC 2295
COD	TM107	100.57 97.45 : 103.77

Conductivity (at 20 deg.C)

Component	Method Code	QC 2286
Conductivity (at 20 deg.C)	TM120	102.26 100.75 : 105.26

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2259
Free Cyanide (W)	TM227	100.75 90.50 : 114.50
Thiocyanate (W)	TM227	104.25 95.50 : 107.50
Total Cyanide (W)	TM227	100.5 91.75 : 112.75

Determination of Dissolved Gases

Component	Method Code	QC 2204
Ethane Dissolved Raw	TM223	98.84 77.96 : 120.30
Methane Dissolved Raw	TM223	97.28 70.05 : 104.83
Propane Dissolved Raw	TM223	102.85 76.59 : 118.21



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Validated

SDG:	200514-23	Client Reference:	Bradford Road No. 2 Gash	Report Number:	553577
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	553146

Dissolved Metals by ICP-MS

Component	Method Code	QC 2242	QC 2266	QC 2278
Aluminium	TM152	74.67 91.36 : 108.58	100.0 91.36 : 108.58	102.67 91.36 : 108.58
Antimony	TM152	74.0 88.37 : 130.57	88.67 88.37 : 130.57	97.33 88.37 : 130.57
Arsenic	TM152	76.17 92.62 : 113.52	91.5 92.62 : 113.52	100.0 92.62 : 113.52
Barium	TM152	76.33 88.14 : 108.73	86.33 88.14 : 108.73	99.0 88.14 : 108.73
Beryllium	TM152	71.0 89.98 : 116.88	99.17 89.98 : 116.88	103.0 89.98 : 116.88
Bismuth	TM152	72.5 92.62 : 115.02	90.17 92.62 : 115.02	99.0 92.62 : 115.02
Boron	TM152	67.33 86.31 : 120.88	105.33 86.31 : 120.88	108.33 86.31 : 120.88
Cadmium	TM152	72.83 93.85 : 111.65	94.0 93.85 : 111.65	99.83 93.85 : 111.65
Calcium	TM152	76.67 89.20 : 126.91	97.33 89.20 : 126.91	103.33 89.20 : 126.91
Chromium	TM152	76.83 92.22 : 109.85	98.17 92.22 : 109.85	99.33 92.22 : 109.85
Cobalt	TM152	75.5 85.01 : 114.87	96.5 85.01 : 114.87	98.67 85.01 : 114.87
Copper	TM152	76.33 89.87 : 119.73	96.67 89.87 : 119.73	98.67 89.87 : 119.73
Iron	TM152	75.33 93.02 : 113.86	100.0 93.02 : 113.86	101.33 93.02 : 113.86
Lead	TM152	71.67 91.11 : 116.98	91.83 91.11 : 116.98	99.67 91.11 : 116.98
Lithium	TM152	65.67 91.30 : 123.00	101.33 91.30 : 123.00	104.5 91.30 : 123.00
Magnesium	TM152	71.33 89.60 : 116.61	109.33 89.60 : 116.61	106.0 89.60 : 116.61
Manganese	TM152	77.67 93.97 : 112.46	101.5 93.97 : 112.46	103.5 93.97 : 112.46
Molybdenum	TM152	72.5 89.07 : 110.96	91.33 89.07 : 110.96	97.5 89.07 : 110.96
Nickel	TM152	77.33 93.70 : 112.15	97.33 93.70 : 112.15	100.0 93.70 : 112.15
Phosphorus	TM152	73.67 89.24 : 114.18	92.5 89.24 : 114.18	100.0 89.24 : 114.18
Potassium	TM152	72.0 93.20 : 115.55	96.0 93.20 : 115.55	103.33 93.20 : 115.55
Selenium	TM152	71.5 91.69 : 117.12	89.0 91.69 : 117.12	100.5 91.69 : 117.12
Silver	TM152	75.5 90.93 : 121.73	100.67 90.93 : 121.73	107.67 90.93 : 121.73
Sodium	TM152	67.33 92.42 : 113.24	109.33 92.42 : 113.24	106.0 92.42 : 113.24
Strontium	TM152	75.67 92.14 : 116.24	88.0 92.14 : 116.24	98.0 92.14 : 116.24
Tellurium	TM152	71.0 89.88 : 111.78	81.67 89.88 : 111.78	95.5 89.88 : 111.78
Thallium	TM152	68.67 82.43 : 113.83	83.83 82.43 : 113.83	91.17 82.43 : 113.83



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SDG: 200514-23 Client Reference: Bradford Road No. 2 Gash Report Number: 553577
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 553146

Dissolved Metals by ICP-MS

		QC 2242	QC 2266	QC 2278
Tin	TM152	74.0 94.62 : 107.79	89.33 94.62 : 107.79	98.17 94.62 : 107.79
Titanium	TM152	74.17 90.29 : 115.23	95.33 90.29 : 115.23	104.0 90.29 : 115.23
Tungsten	TM152	68.67 77.61 : 132.31	90.0 77.61 : 132.31	96.33 77.61 : 132.31
Uranium	TM152	68.67 86.97 : 115.76	89.67 86.97 : 115.76	98.0 86.97 : 115.76
Vanadium	TM152	78.5 89.61 : 115.48	87.5 89.61 : 115.48	94.67 89.61 : 115.48
Zinc	TM152	75.67 87.51 : 116.26	99.33 87.51 : 116.26	101.0 87.51 : 116.26

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2242
Dissolved Inorganic Carbon	TM090	100.5 93.58 : 112.28
Dissolved Organic Carbon	TM090	102.5 96.28 : 110.58

EPH (DRO) (C10-C40) Aqueous (W)

Component	Method Code	QC 2218
EPH (DRO) (C10-C40)	TM172	104.8 65.52 : 121.02

Mercury Dissolved

Component	Method Code	QC 2264
Mercury Dissolved (CVAF)	TM183	103.0 76.80 : 117.12

PAH Spec MS - Aqueous (W)

Component	Method Code	QC 2287
Acenaphthene by GCMS	TM178	109.2 90.45 : 118.63
Acenaphthylene by GCMS	TM178	108.4 90.13 : 116.27
Anthracene by GCMS	TM178	105.2 92.40 : 114.00
Benz(a)anthracene by GCMS	TM178	104.8 89.51 : 117.69
Benzo(a)pyrene by GCMS	TM178	109.6 89.43 : 118.57



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Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 553146

PAH Spec MS - Aqueous (W)

		QC 2287
Benzo(b)fluoranthene by GCMS	TM178	102.4 87.80 : 121.80
Benzo(ghi)perylene by GCMS	TM178	103.2 87.10 : 119.30
Benzo(k)fluoranthene by GCMS	TM178	112.0 93.23 : 123.57
Chrysene by GCMS	TM178	107.2 88.68 : 116.92
Dibenzo(ah)anthracene by GCMS	TM178	98.4 86.24 : 118.56
Fluoranthene by GCMS	TM178	104.0 86.04 : 121.96
Fluorene by GCMS	TM178	108.0 90.76 : 121.24
Indeno(123cd)pyrene by GCMS	TM178	107.6 88.39 : 119.61
Naphthalene by GCMS	TM178	108.8 89.40 : 121.80
Phenanthrene by GCMS	TM178	108.4 90.41 : 119.19
Pyrene by GCMS	TM178	102.0 91.00 : 120.20

pH Value

Component	Method Code	QC 2277
pH	TM256	101.62 99.16 : 103.84

Phenols by HPLC (W)

Component	Method Code	QC 2295
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	103.0 91.00 : 109.00
2-Isopropyl Phenol by HPLC (W)	TM259	98.0 90.00 : 114.00
Cresols by HPLC (W)	TM259	106.0 90.02 : 130.15
Napthol by HPLC (W)	TM259	106.0 86.00 : 128.00
Phenol by HPLC (W)	TM259	105.0 85.89 : 109.89
Xylenols by HPLC (W)	TM259	103.0 93.33 : 107.33

Sulphide



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SDG: 200514-23 Client Reference: Bradford Road No. 2 Gash Report Number: 553577
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 553146

Sulphide

Component	Method Code	QC 2263
Sulphide	TM101	105.33 88.90 : 112.50

Suspended Solids

Component	Method Code	QC 2276
Total Suspended Solids	TM022	99.47 95.69 : 101.90

VOC MS (W)

Component	Method Code	QC 2246
1,1,1,2-Tetrachloroethane	TM208	99.5 78.82 : 115.90
1,1,1-Trichloroethane	TM208	97.0 86.83 : 113.41
1,1-Dichloroethane	TM208	97.0 79.99 : 118.57
1,2-Dichloroethane	TM208	98.5 79.35 : 124.02
2-Chlorotoluene	TM208	98.5 79.67 : 114.74
4-Chlorotoluene	TM208	99.0 80.15 : 113.42
Benzene	TM208	94.0 84.37 : 119.68
Bromomethane	TM208	88.0 78.77 : 123.20
Carbon tetrachloride	TM208	99.0 79.73 : 118.91
Chlorobenzene	TM208	97.5 88.28 : 110.81
Chloroform	TM208	99.0 82.31 : 120.71
Chloromethane	TM208	85.0 62.46 : 124.98
Cis-1,2-Dichloroethene	TM208	97.5 83.75 : 118.91
Dichloromethane	TM208	96.5 81.20 : 120.83
Ethylbenzene	TM208	94.0 80.54 : 112.31
Hexachlorobutadiene	TM208	106.5 72.23 : 110.63
o-Xylene	TM208	96.0 86.17 : 109.69



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SDG: 200514-23 Client Reference: Bradford Road No. 2 Gash Report Number: 553577
Location: Bradford Road, Manchester Order Number: 79696 Superseded Report: 553146

VOC MS (W)

		QC 2246
p/m-Xylene	TM208	95.25 83.09 : 113.86
Tert-butyl methyl ether	TM208	104.0 70.94 : 119.66
Tetrachloroethene	TM208	97.5 84.41 : 112.73
Toluene	TM208	96.5 81.59 : 111.56
Trichloroethene	TM208	96.0 79.53 : 112.32
Vinyl Chloride	TM208	88.5 68.68 : 119.35

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



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SDG:	200514-23	Client Reference:	Bradford Road No. 2 Gash	Report Number:	553577
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	553146

Chromatogram

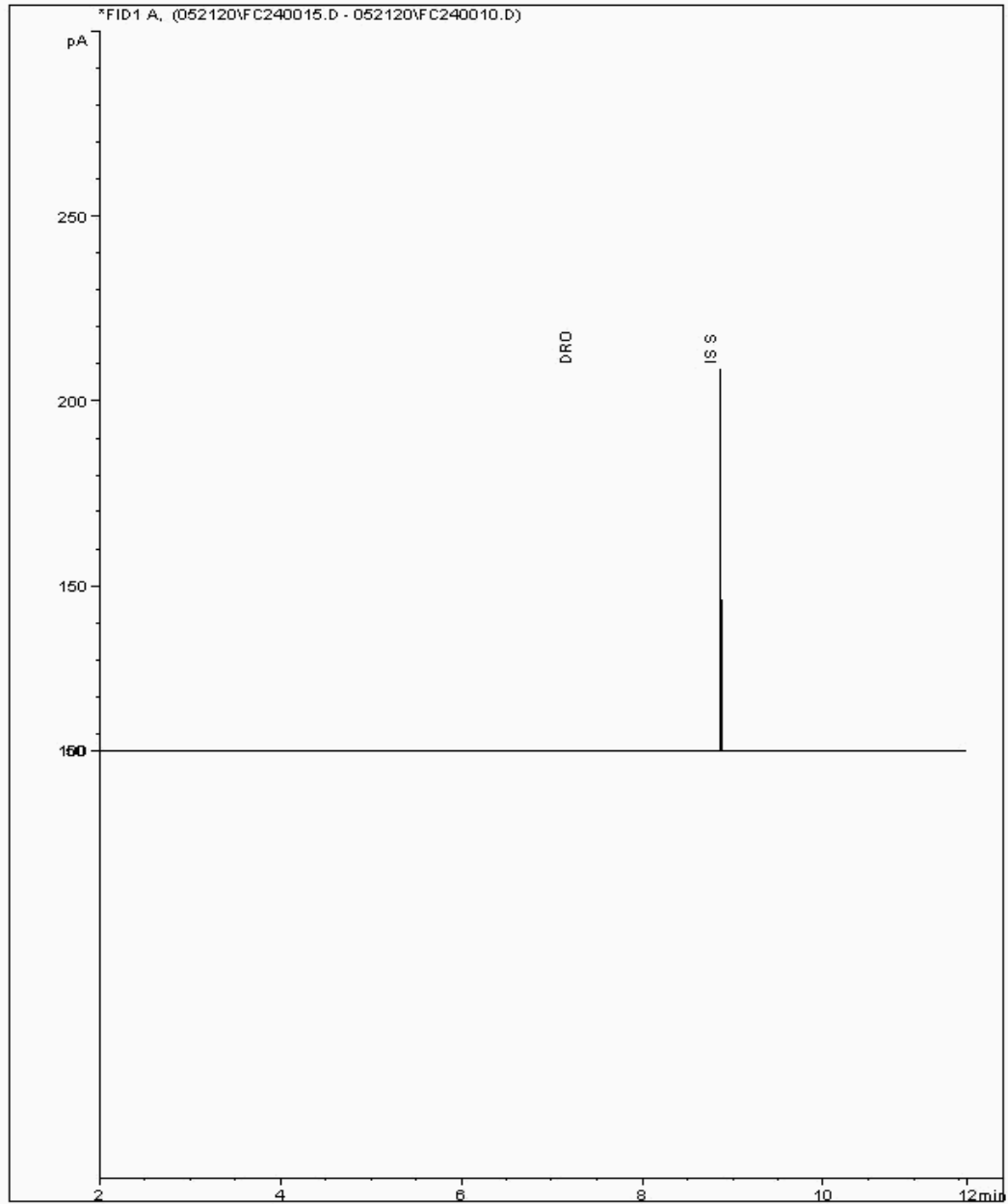
Analysis: EPH (DRO) (C10-C40) Aqueous (W)

Sample No : 22150582
Sample ID : Discharge

Depth : 0.00 - 0.00

EPH Range Organics (C10 - C40)

Sample Identity: 20796626-
Date Acquired : 21/05/2020 19:53:34 PM
Units : ppm





CERTIFICATE OF ANALYSIS

SDG:	200514-23	Client Reference:	Bradford Road No. 2 Gas	Report Number:	553577
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	553146

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

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

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

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

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

7. Results relate only to the items tested.

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

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

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

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

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

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

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

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

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

General

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

18. Sample Deviations

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

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

19. Asbestos

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

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.
Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

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

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



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Attention: Ian Wright

CERTIFICATE OF ANALYSIS

Date of report Generation: 08 July 2020
Customer: Celtic
Sample Delivery Group (SDG): 200626-26
Your Reference: Bradford Road No. 2 Gasholder
Location: Bradford Road, Manchester
Report No: 558124

This report has been revised and directly supersedes 556846 in its entirety.

We received 1 sample on Friday June 26, 2020 and 1 of these samples were scheduled for analysis which was completed on Tuesday July 07, 2020. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	200626-26	Client Reference:	Bradford Road No. 2 Gashol	Report Number:	558124
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	556846

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
22376154	Effluent		0.00 - 0.00	24/06/2020

Maximum Sample/Coolbox Temperature (°C) :

21.6

ISO5667-3 Water quality - Sampling - Part3 -

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 200626-26 **Client Reference:** Bradford Road No. 2 Gashol **Report Number:** 558124
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:** 556846

Results Legend

X Test
N No Determination Possible

Sample Types -

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

Lab Sample No(s)

22376154

Customer Sample Reference

Effluent

AGS Reference

Depth (m)

0.00 - 0.00

Container

1 plastic (ALE221)
 Vial (ALE297)

Sample Type

TE TE

Ammoniacal Nitrogen

All

NDPs: 0
 Tests: 1

X

COD on Settled Sample

All

NDPs: 0
 Tests: 1

X

Determination of Dissolved Gases

All

NDPs: 0
 Tests: 1

X

pH Value

All

NDPs: 0
 Tests: 1

X

Suspended Solids

All

NDPs: 0
 Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG:	200626-26	Client Reference:	Bradford Road No. 2 Gashol	Report Number:	558124
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	556846

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM099	BS 2690: Part 7:1968 / BS 6068: 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
TM223	ASTM D-1945-91	Determination of Dissolved C1-7 Hydrocarbon gases 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

NA = not applicable.

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 200626-26 **Client Reference:** Bradford Road No. 2 Gashol **Report Number:** 558124
Location: Bradford Road, Manchester **Order Number:** 79696 **Superseded Report:** 556846

Test Completion Dates

Lab Sample No(s) 22376154
Customer Sample Ref. Effluent
AGS Ref.
Depth 0.00 - 0.00
Type Trade Effluent

Ammoniacal Nitrogen	27-Jun-2020
COD on Settled Sample	05-Jul-2020
Determination of Dissolved Gases	06-Jul-2020
pH Value	01-Jul-2020
Suspended Solids	07-Jul-2020



CERTIFICATE OF ANALYSIS

Validated

SDG: 200626-26

Client Reference:

Bradford Road No. 2 Gashol

Report Number:

558124

Location:

Bradford Road, Manchester

Order Number:

79696

Superseded Report:

556846

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 2269
Ammoniacal Nitrogen as N	TM099	100.4 93.14 : 108.60

COD on Settled Sample

Component	Method Code	QC 2262
COD	TM107	101.9 97.45 : 103.77

Determination of Dissolved Gases

Component	Method Code	QC 2226
Carbon Dioxide Dissolved Raw	TM223	101.8 85.00 : 115.00
Ethane Dissolved Raw	TM223	98.5 77.96 : 120.30
Methane Dissolved Raw	TM223	97.13 70.05 : 104.83
Propane Dissolved Raw	TM223	102.14 76.59 : 118.21

pH Value

Component	Method Code	QC 2290
pH	TM256	102.16 100.13 : 103.37

Suspended Solids

Component	Method Code	QC 2228
Total Suspended Solids	TM022	98.94 95.69 : 101.90

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	200626-26	Client Reference:	Bradford Road No. 2 Gas	Report Number:	558124
Location:	Bradford Road, Manchester	Order Number:	79696	Superseded Report:	556846

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

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

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

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

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

7. Results relate only to the items tested.

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

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

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

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

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

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

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

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

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

General

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

18. Sample Deviations

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

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

19. Asbestos

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

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

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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.