Jack Espin
Mayer Environmental
Transport Avenue
Brentford
Middlesex
TW8 9HA

t: 020 8847 3637
f: 020 8847 3638
e: Mayer

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-45375

Project / Site name:	ERM Boreham	**Samples received on:**	13/06/2019
Your job number:	73580.001	**Samples instructed on:**	13/06/2019
Your order number:	017805	**Analysis completed by:**	24/06/2019
Report Issue Number:	1	**Report issued on:**	24/06/2019
Samples Analysed:	3 water samples		

Signed:

Zina Abdul Razzak
#REF!
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

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Project / Site name: ERM Boreham

Your Order No: 017805

Lab Sample Number				1243840	1243841	1243842		
Sample Reference				Upstream DP	Downstream DP	Discharge Point		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				13/06/2019	13/06/2019	13/06/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	8.3	8.2	7.4		
Electrical Conductivity at 20 °C	µS/cm	10	ISO 17025	680	650	1500		
Total Cyanide (Low Level)	mg/l	0.001	ISO 17025	< 0.001	< 0.001	< 0.001		
Sulphate as SO_4	µg/l	45	ISO 17025	92500	81100	453000		
Sulphate as SO_4	mg/l	0.045	ISO 17025	92.5	81.1	453		
Sulphide	mg/l	0.005	NONE	< 0.005	< 0.005	< 0.005		
Chloride	mg/l	0.15	ISO 17025	73	74	130		
Total Phosphate as P	mg/l	0.02	ISO 17025	0.30	0.04	0.04		
Ammoniacal Nitrogen as N	mg/l	0.015	ISO 17025	0.033	0.081	4.2		
Ammonia as NH_3	mg/l	0.015	ISO 17025	0.040	0.098	5.141		
Nitrate as N	mg/l	0.01	ISO 17025	1.78	1.64	0.46		
Nitrate as NO_3	mg/l	0.05	ISO 17025	7.87	7.28	2.03		
Alkalinity	mgCaCO3/l	3	ISO 17025	210	220	150		
Chemical Oxygen Demand (Total)	mg/l	2	ISO 17025	37	43	430		
Total Suspended Solids	mg/l	2	ISO 17025	56	36	92		
Total Phenols								
Total Phenols (monohydric)	mg/l	0.01	ISO 17025	< 0.010	< 0.010	0.092		
Heavy Metals / Metalloids								
Arsenic (total)	µg/l	0.15	ISO 17025	4.78	3.14	4.54		
Boron (total)	µg/l	10	ISO 17025	38	61	1300		
Cadmium (total)	µg/l	0.02	ISO 17025	0.15	0.15	1.7		
Chromium (total)	µg/l	0.2	ISO 17025	5.3	0.8	12.7		
Iron (total)	mg/l	0.004	ISO 17025	1.2	0.89	6.2		
Lead (total)	µg/l	0.2	ISO 17025	5.2	11	570		
Manganese (total)	µg/l	0.05	ISO 17025	800	260	520		
Mercury (total)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	0.72		
Nickel (total)	µg/l	0.5	ISO 17025	13	7.2	39		
Selenium (total)	µg/l	0.6	ISO 17025	1.3	1.3	8.1		
Zinc (total)	µg/l	0.5	ISO 17025	17	27	2100		
Arsenic (dissolved)	mg/l	0.00015	ISO 17025	0.0032	0.0031	0.0011		
Boron (dissolved)	mg/l	0.01	ISO 17025	0.04	0.06	1.18		
Cadmium (dissolved)	mg/l	0.00002	ISO 17025	< 0.00002	0.00005	0.0002		
Chromium (dissolved)	mg/l	0.0002	ISO 17025	0.0004	0.0006	0.0022		
Copper (dissolved)	mg/l	0.0005	ISO 17025	0.0030	0.0039	0.0099		
Iron (dissolved)	mg/l	0.004	ISO 17025	0.22	0.46	0.29		
Lead (dissolved)	mg/l	0.0002	ISO 17025	0.0010	0.0054	0.0092		
Manganese (dissolved)	mg/l	0.00005	ISO 17025	0.086	0.076	0.34		
Mercury (dissolved)	mg/l	0.00005	ISO 17025	< 0.0001	< 0.0001	0.0006		
Nickel (dissolved)	mg/l	0.0005	ISO 17025	0.0043	0.0049	0.032		
Selenium (dissolved)	mg/l	0.0006	ISO 17025	0.0011	0.0013	0.0081		
Zinc (dissolved)	mg/l	0.0005	ISO 17025	0.0108	0.0157	0.0560		
Copper (total)	µg/l	0.5	ISO 17025	35	18	140		
Petroleum Hydrocarbons								
Mineral Oil (C10 - C40)	mg/l	0.01	NONE	< 0.01	< 0.01	9.00		

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 19-45375

Project / Site name: ERM Boreham

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Alkalinity in Water (by discreet analyser)	Determination of Alkalinity by discreet analyser (colorimetry). Accredited matrices: SW, PW, GW.	In house method based on MEWAM & USEPA Method 310.2.	L082-PL	W	ISO 17025
Ammonia as NH3 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Ammoniacal Nitrogen as N in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Chemical Oxygen Demand in Water (Total)	Determination of total COD in water by reflux oxidation with acidified K2Cr2O7 followed by colorimetry. Accredited matrices: SW, PW, GW.	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065-PL	W	ISO 17025
Chloride in water	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Electrical conductivity at 20oC of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031-PL	W	ISO 17025
EPH C8-C40 (with Min. Oil by calc.) water	Determination of dichloromethane/hexane extractable hydrocarbons in soil by GC-MS.	In-house method	L070-PL	W	NONE
Low level total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-OES (total)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW (Al, Fe, Cu, Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025

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Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphide in water in mg l	Determination of sulphide in water by ion selective electrode.	In-house method	L029-PL	W	NONE
Suspended solids in water	Determined gravimetrically with GFC filtration papers.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025
Total Phosphate as P in water	Determination of ortho phosphate in water by addition of ammonium molybdate, potassium antimonyl tartrate and ascorbic acid followed by colorimetry.Accredited matrices: SW, PW, GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.