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## **Preliminary Report Number : 19-54788**

<b>Project / Site name:</b>	ERM Boreham	<b>Samples received on:</b>	15/08/2019
<b>Your job number:</b>	73580.001	<b>Samples instructed on:</b>	16/08/2019
<b>Your order number:</b>	017931	<b>Analysis completed by:</b>	Not complete
<b>Report Issue Number:</b>	0	<b>Report issued on:</b>	22/08/2019
<b>Samples Analysed:</b>	3 water samples		

**Signed:** 

Zina Abdul Razzak  
Senior Quality Specialist  
**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.

Preliminary reports provided at the request of the client should be considered as incomplete and have not been through the complete quality control procedure.

Results contained in preliminary reports may be subject to change and therefore should not be used as a basis for decision making, except at the risk of the client.

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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The results included within the report are representative of the samples submitted for analysis.

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Analytical Report Number: 19-54788

Project / Site name: ERM Boreham

Your Order No: 017931

Lab Sample Number				1292179	1292180	1292181		
Sample Reference				UPST1	DNST1	DP1		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				15/08/2019	15/08/2019	15/08/2019		
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	8.1	8.1	7.2		
Electrical Conductivity at 20 °C	µS/cm	10	ISO 17025	610	610	750		
Total Cyanide (Low Level)	mg/l	0.001	ISO 17025	< 0.001	< 0.001	0.001		
Sulphate as SO <sub>4</sub>	µg/l	45	ISO 17025	57500	57600	190000		
Sulphate as SO <sub>4</sub>	mg/l	0.045	ISO 17025	57.5	57.6	190		
Sulphide	mg/l	0.005	NONE	< 0.005	< 0.005	< 0.005		
Chloride	mg/l	0.15	ISO 17025	70	70	52		
Total Phosphate as P	mg/l	0.02	ISO 17025	0.06	0.06	< 0.02		
Ammoniacal Nitrogen as N	mg/l	0.015	ISO 17025	0.034	0.045	1.9		
Ammonia as NH <sub>3</sub>	mg/l	0.015	ISO 17025	0.041	0.055	2.291		
Nitrate as N	mg/l	0.01	ISO 17025	1.63	1.64	0.24		
Nitrate as NO <sub>3</sub>	mg/l	0.05	ISO 17025	7.21	7.26	1.07		
Alkalinity	mgCaCO <sub>3</sub> /l	3	ISO 17025	200	190	110		
Chemical Oxygen Demand (Total)	mg/l	2	ISO 17025	35	46	200		
BOD (Biochemical Oxygen Demand) (Total) - PL	mg/l	1	ISO 17025	To follow	To follow	To follow		
Total Suspended Solids	mg/l	2	ISO 17025	110	95	85		

**Total Phenols**

Total Phenols (monohydric)	mg/l	0.01	ISO 17025	< 0.010	< 0.010	< 0.010		
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Your Order No: 017931

Lab Sample Number	1292179			1292180	1292181		
Sample Reference	UPST1			DNST1	DP1		
Sample Number	None Supplied			None Supplied	None Supplied		
Depth (m)	None Supplied			None Supplied	None Supplied		
Date Sampled	15/08/2019			15/08/2019	15/08/2019		
Time Taken	None Supplied			None Supplied	None Supplied		
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status				

**Heavy Metals / Metalloids**

Iron (total)	mg/l	0.004	ISO 17025	1.1	1.1	3.9		
Arsenic (total)	mg/l	0.00015	ISO 17025	0.0043	0.0031	0.0021		
Boron (total)	mg/l	0.01	ISO 17025	0.05	0.06	0.76		
Cadmium (total)	mg/l	0.00002	ISO 17025	0.0002	0.00005	0.0018		
Chromium (total)	mg/l	0.0002	ISO 17025	0.0004	0.0006	0.0056		
Copper (total)	mg/l	0.0005	ISO 17025	0.0074	0.014	0.032		
Mercury (total)	mg/l	0.00005	ISO 17025	< 0.00005	< 0.00005	0.00005		
Manganese (total)	mg/l	0.00005	ISO 17025	240	220	230		
Nickel (total)	mg/l	0.0005	ISO 17025	0.0066	0.0072	0.0304		
Lead (total)	mg/l	0.001	ISO 17025	0.004	0.009	0.25		
Selenium (total)	mg/l	0.004	ISO 17025	< 0.004	< 0.004	< 0.004		
Zinc (total)	mg/l	0.0005	ISO 17025	0.0112	0.0225	1.1438		

**Petroleum Hydrocarbons**

Mineral Oil (C10 - C40)	mg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
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U/S = Unsuitable Sample I/S = Insufficient Sample



**Preliminary Report Number : 19-54788**

**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
Biological oxygen demand (total) of water	Determination of biochemical oxygen demand in water (5 days). Accredited matrices: SW, PW, GW.	In-house method based on standard method 5210B.	L086-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	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices SW, GW, PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS"	L012-UK	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 (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 Wastewater & 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 Wastewater & 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.**