ENVIRONMENT
& HEALTH

HPH D Ltd (company incorporated in the Isle of Man under company registration number 009065V)
Forte Anne Douglas
Isle of Man
IM1 5DP

and

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78 Cannon Place
London
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Date 09/11/2020

HYDE PARK HAYES 4 GROUNDWATER SURVEY

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Ref L1700000706JR22_01

Background

Ramboll UK Limited ("Ramboll") was commissioned by Sackville UK PEC6 Hayes Nominee 1 Limited and Sackville UK PEC6 Hayes Nominee 2 Limited ("the Client") to undertake environmental assessment works at Hyde Park Hayes, UK.

The Client acquired the Hyde Park Hayes (HPH) site from Melford Group in November 2015, prior to the successful discharge of all Planning Conditions associated with the HPH5 development.

Following advice from the Environment Agency (EA), the Local Planning Authority (LPA) discharged the outstanding Planning Condition 14 (2) on 28th October 2017.

Extensive soil and groundwater surveys and assessments have been undertaken at the wider Hyde Park Hayes site by Ramboll and others, including a Detailed Quantitative Risk Assessment (DQRA) undertaken by SKM on behalf of Melfords. Information for the HPH4 plot is limited to two (2) boreholes; BH11 in the north of the plot was installed in July 2012 by SKM (acting for Melfords) and REH01 was installed in the south-east of the plot in July 2016 by Ramboll.

Ramboll has conducted a programme of groundwater sampling surveys following the Client's acquisition of the site. Ramboll's recent survey work at the site has included three (3) rounds of groundwater monitoring and sampling surveys over 2018 (April, September, and December).

Ramboll Environment and Health UK Limited
Registered in England
Company No: 2331163
Registered Office:
240 Blackfriars Road
London
SE1 8NW

The most recent groundwater sampling survey was conducted on 29th October 2020 and focussed on the monitoring wells installed within and in the immediate surroundings of HPH3 & HPH4; the findings of this survey are discussed below.

Drawings of the site are presented in Appendix 1, with field data collected by Ramboll presented in Appendices 2 to 5. Laboratory analytical certificates are presented in Appendix 6.

Groundwater Sampling Survey Findings

Groundwater Conditions

Groundwater conditions at the site are summarised below:

- Groundwater depths measured in recent surveys range from 1.46m bgl (BH11, October 2020) to 2.68m bgl (BH11, April 2018).
- Groundwater elevations indicate the presence of a "recharge mound" (an anomaly area of higher groundwater elevation) in the centre-west of the wider HPH site. Mounding of groundwater in this area of the site has been observed throughout the history of intrusive environmental assessments at the site, including SKM Enviros' initial investigation at the site in 2012.
- Groundwater physico-chemical parameters also indicate that a recharge zone exists in the centre-west of the site, with higher oxygenation and oxidising potential conditions in this area. Conversely low oxygenation and reducing potentials observed only at the northern and eastern/south-eastern (down-gradient) site boundaries of the wider HPH site.

Contaminant Assessment (see Appendix 2-6 for further details)

The distribution of contaminants detected in groundwater samples collected in 2020 broadly corresponds to distributions observed previously (2016 to present).

Contaminants of concern (as defined by SKM's DQRA) were not detected at concentrations above the analytical method detection limit (MDL) in the sample collected from BH02, BH11, BH23, BH27 or BH30.

Trichloroethene (TCE) was detected in the sample collected from REH01, consistent with previous sampling surveys at the site. No other chlorinated hydrocarbons were detected in the sample from REH01.

Statistical analysis of the full dataset for REH01 (9 samples collected and analysed in total between August 2016 and October 2020) using GSI's Mann-Kendal Constituent Trend Analysis Toolkit indicates a clear declining trend for TCE, and *cis*-1,2-Dichloroethene with high confidence levels (see Appendix 4 for details).

Monitored Natural Attenuation Assessment

Indicators of natural attenuation (MNA parameters) confirm the likely presence of a recharge zone in the centre-west of the wider HPH site, with little or no evidence of electrochemical evolution of groundwater present in the samples collected in October 2020.

Evidence of conditions conducive for reductive dechlorination of chlorinated hydrocarbons has not been obtained by this analysis. The products of reductive dechlorination of Trichloroethene have been detected in REH01 consistent with detections of TCE; however, due to the absence of observed

conditions conducive to reductive dechlorination processes, the observed reducing contaminant concentrations are likely to have been largely a result of dilution and dispersion effects in the groundwater bearing formation rather than mass destruction via reductive dechlorination of the contaminants.

Conclusions & Recommendations

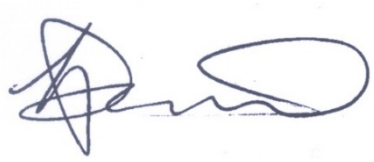
Based on the available data set significant or widespread contamination impacts have not been identified at the HPH4 plot. Residual concentrations of Trichloroethene have been detected in one (1) monitoring well within the HPH4 plot; however, the detected concentration from the October 2020 sample survey is below the remedial target and is consistent with the overall declining trend in TCE concentrations at this location since 2016.

Ramboll makes the following recommendations within the context of the intended future redevelopment of the site:

- Future redevelopment is considered likely to be subject to standard brownfield regeneration Planning Conditions;
- Based on the available dataset Ramboll considers that onerous remedial intervention is unlikely to be required.
- Using the activities undertaken as part of the HPH5 development as a template, remedial interventions required at HPH4 are likely to be limited to:
  - Segregation and removal of impacted soils (if any);
  - Dewatering of excavations (likely only required if development includes construction of a basement); and
  - Inclusion of a vapour impermeable membrane as a precautionary measure to prevent the ingress of any residual volatile compounds present in soil / groundwater into the indoor airspace.

I trust that the above is satisfactory; please do not hesitate to contact us with any comments.

Yours sincerely



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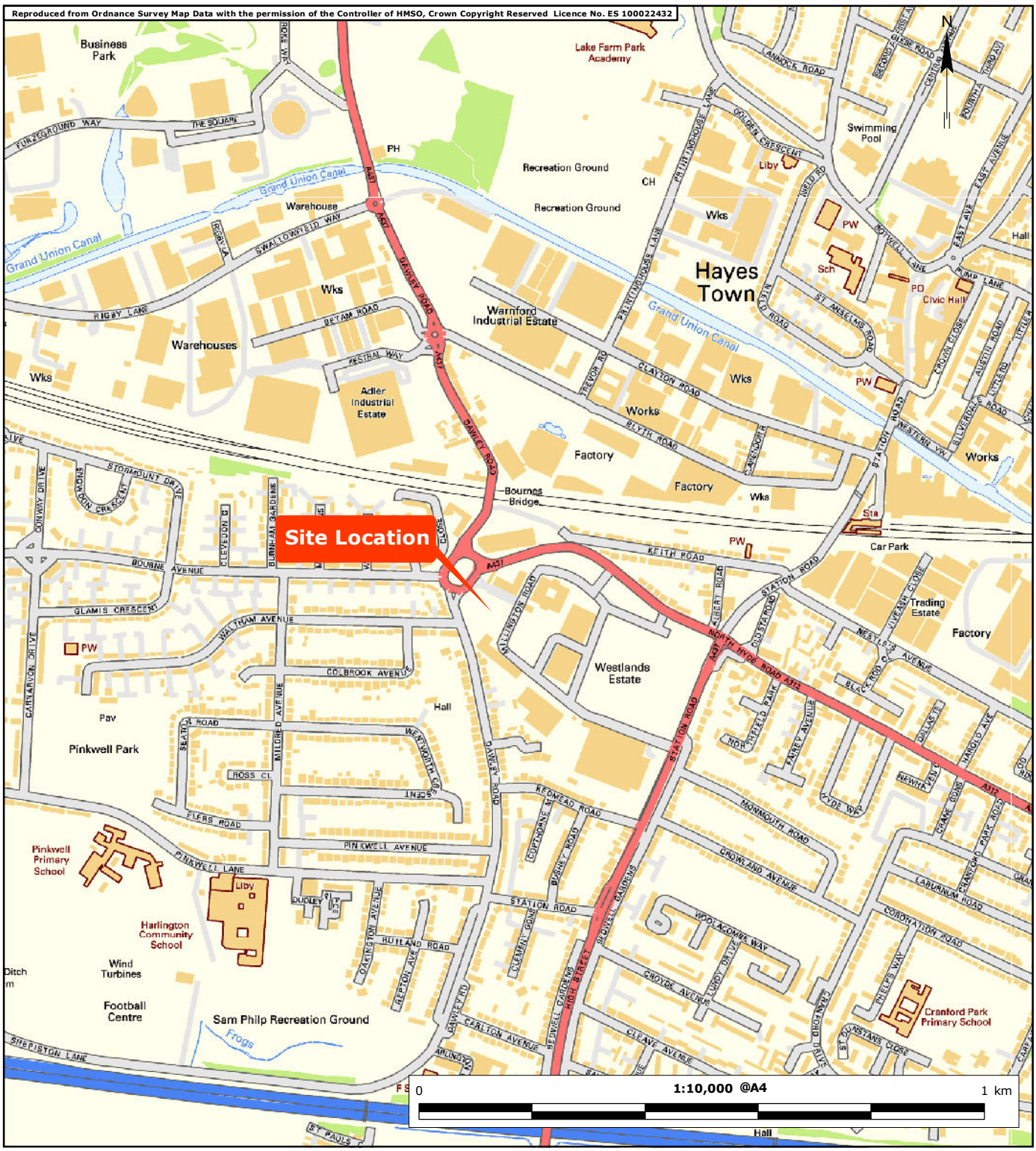
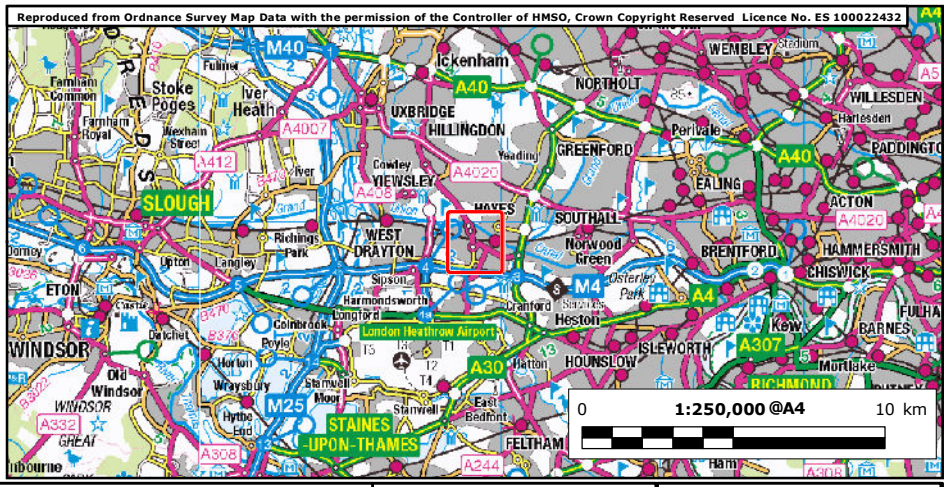
cc Steve Reed, Principal, Ramboll

Appendix 1

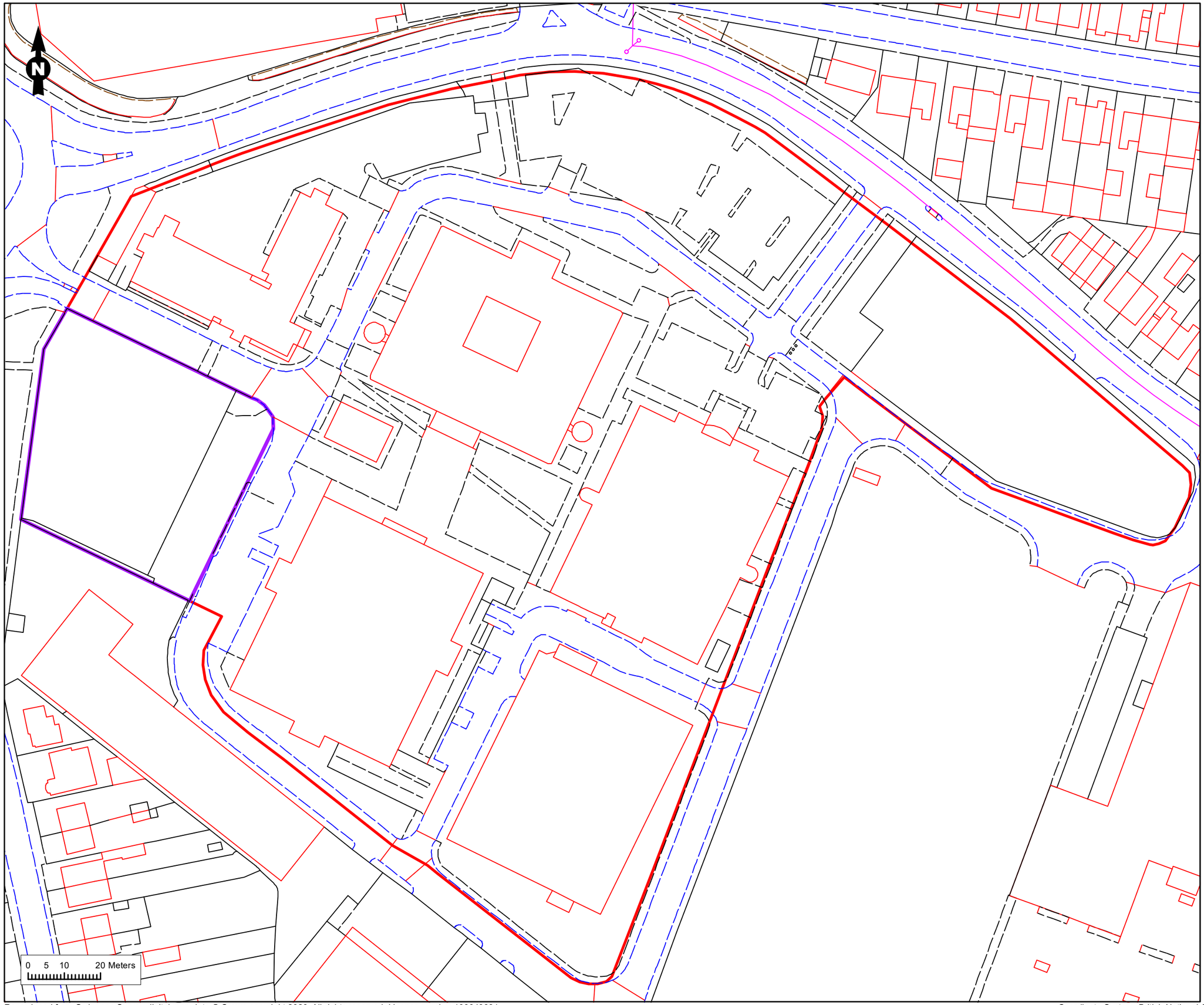
Figures





Title: Figure 1: Site Location	Site: Hyde Park Hayes Plot 4, 11 Millington Road, Hayes, UB3 4AZ	Date: October 2020	
		Scale: As shown	
Project No.: 1620010949	Client: Threadneedle	Issue: 1	Drawn by: MD

RAMBOLL



Legend

- HPH4 Boundary
- HPH Wide Boundary

Figure Title
HPH4 Site Layout

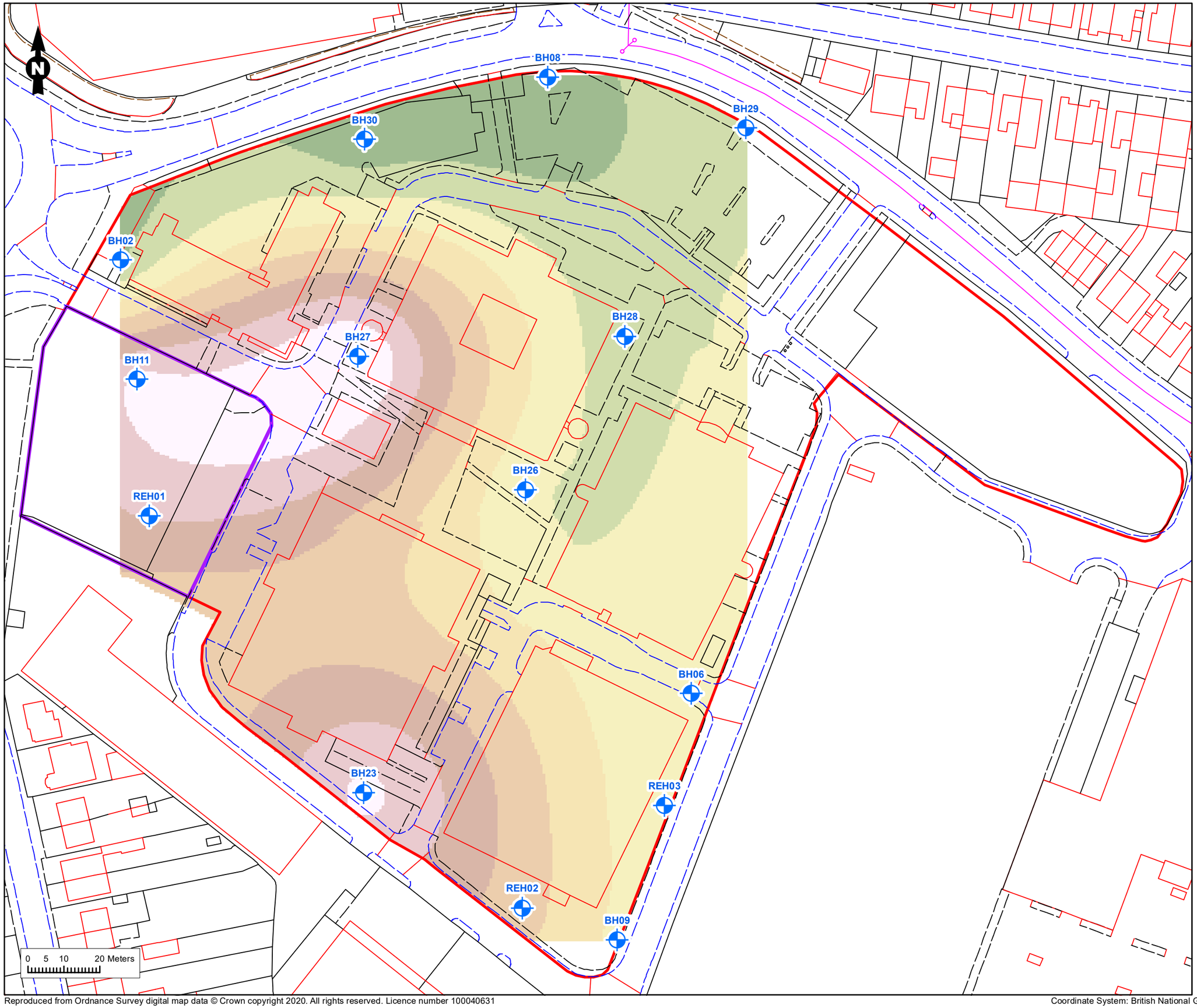
Project Name
Hyde Park Hayes

Project Number	Figure No.
1620010949	2
Date	**Prepared By**
November 2020	JD
Scale	**Issue**
1:1,000 @A3	1

Client
Threadneedle

[redacted]

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

- HPH4 Boundary
- HPH Wide Boundary
- Monitoring Well Locations

GW Elevations OCT'20

mAOD

- 30.16 - 30.35
- 29.96 - 30.15
- 29.76 - 29.95
- 29.56 - 29.75
- 29.36 - 29.55
- 29.16 - 29.35
- 28.96 - 29.15
- 28.78 - 28.95

Figure Title
HPH Groundwater Elevation Contours October 2020

Project Name
Hyde Park Hayes

Project Number	Figure No.
1620010949	3
Date	**Prepared By**
November 2020	JD
Scale	**Issue**
1:1,000 @A3	1

Client
Threadneedle

RAMBOLL

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Appendix 2

Groundwater Field Survey Data

Groundwater Field Survey Data & Assessment

Groundwater Elevation Surveys

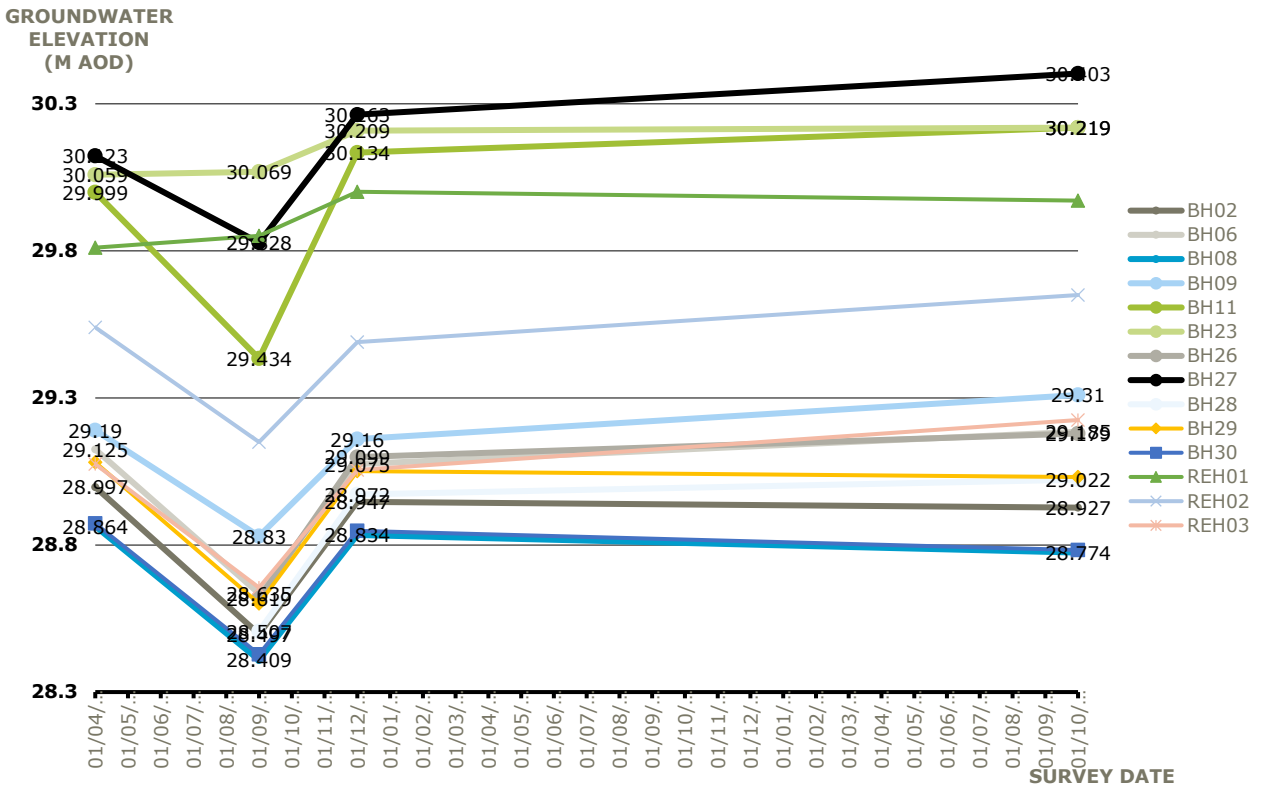
Recorded groundwater elevations are presented in Tables 1 and 2 and Chart 1 below.

Table 1: Groundwater Survey Data: 29th October 2020

Location	Location Elevation (m AOD)	Depth to Groundwater (m BGL)	Groundwater Elevation (m AOD)	Depth to Water (m BGL)
BH30	32.373	3.59	28.783	7.49
BH02	31.757	2.83	28.927	5.27
BH27	32.043	1.64	30.403	5.67
BH23	31.689	1.47	30.219	4.1
BH11	31.679	1.46	30.219	5.14
REH01	31.631	1.66	29.971	5.03
BH08	32.134	3.36	28.774	5.65
BH29	32.701	3.67	29.031	7.32
BH28	32.222	3.2	29.022	4.69
BH26	32.289	3.11	29.179	5.76
BH06	32.035	2.85	29.185	5.45
REH03	32.095	2.87	29.225	6.56
REH02	32.23	2.58	29.65	5.03
BH09	32.18	2.87	29.31	5.88

Table 2: Groundwater Elevation Survey Data 2018 - 2020				
Location /Date	**24 Apr 2018**	**25 Sep 2018**	**11 Dec 2018**	**29 Oct 2020**
BH02	28.997	28.497	28.947	28.927
BH06	29.125	28.635	29.075	29.185
BH08	28.864	28.409	28.834	28.774
BH09	29.19	28.83	29.16	29.31
BH11	28.999	29.434	30.134	30.219
BH23	30.059	30.069	30.209	30.219
BH26	ND	28.619	29.099	29.179
BH27	30.123	29.828	30.263	30.403
BH28	ND	28.507	28.972	29.022
BH29	29.081	28.601	29.051	29.031
BH30	28.873	28.428	28.848	28.783
REH01	29.811	29.851	30.001	29.971
REH02	29.54	29.15	29.49	29.65
REH03	29.075	28.655	29.055	29.225
Notes: ND – No Data All elevations in meters above ordnance datum				

CHART 1: 2018 - 2020 GROUNDWATER ELEVATION SURVEYS



Groundwater Sampling and Field Testing

Groundwater sampling methodology was consistent with previous sampling surveys undertaken at the site (detailed in Ramboll's Groundwater Assessment Report, ref: RUK16-20878_GWA_02, dated 10th October 2017).

Groundwater physico-chemical parameters were measured during sampling, presented in Table 3.

Table 3: Groundwater Physico-Chemical Parameter Field Data

Location	Barometer (kPA)	Specific Conductance (uS/cm)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (%)	ORP (mV)	pH (Units)	Temperature (°C)
BH02	100.71	640	8.19	80.1	219.7	7.43	14.2
BH11	100.75	840	3.77	37.1	257.4	7.15	14.5
BH23	100.73	1042	3.01	30.2	252.7	7.13	15.3
BH27	100.69	926	5.67	56.6	213.2	6.96	15.1
BH30	100.7	412.5	4.32	43.5	246.5	6.63	15.7
REH01	100.76	1091	2.56	25.6	260.3	6.66	15.4

Groundwater physico-chemical data for October 2020 can be summarised as follows:

- Dissolved oxygen values indicate oxygenated conditions (>1.5mg/l), with highest dissolved oxygen concentrations detected at BH02 and BH27 (consistent with observations of a recharge mound from field groundwater measurements in the vicinity);
- Redox potential values indicate that oxidising conditions (>100mV) dominate most of the site, except for wells in the east of the site (BH06, BH09, BH29, REH02 and REH03) which exhibit reducing conditions. A maximum redox value of 199.5mV was detected in BH23, a minimum redox value of 24.9mV was detected in REH02, with a range of 174.6mV and an arithmetic mean average value of 127.99mV;
- Temperature and pH are within an acceptable range.

Appendix 3

Groundwater Analytical Data Assessment

2018 Groundwater Analytical Data Assessment

Analytical data for samples collected in 2018 are presented and discussed below with full laboratory analytical certificates presented in Appendix 6.

1,1,1 Trichloroethane

1,1,1 Trichloroethane was not detected at concentrations above the laboratory method detection limit (MDL) in any of the samples from monitoring wells within and surrounding HPH3/HPH4.

Table 3.1: 1,1,1 Trichloroethane Groundwater Analyses

Location/Date	24 Apr 2018	25 Sep 2018	11 Dec 2018	29 Oct 2020
BH02	< 2	< 2	< 2	< 2
BH11	< 2	< 2	< 2	< 2
BH23	< 2	< 2	< 2	< 2
BH27	< 2	< 2	< 2	< 2
BH30	< 2	< 2	< 2	< 2
REH01	< 2	< 2	< 2	< 2
Remedial Target: 4,100µg/l				

Trichloroethene

Trichloroethene was detected at concentrations above the laboratory MDL in samples from one (1) monitoring well within and surrounding HPH3/HPH4. (REH01). The detected concentration of TCE in the sample from REH01 recovered in September 2018 exceeds the remedial target.

Table 3.2: Trichloroethene Groundwater Analyses

Location/Date	24 Apr 2018	25 Sep 2018	11 Dec 2018	29 Oct 2020
BH02	< 3	< 3	< 3	< 3
BH11	< 3	< 3	< 3	< 3
BH23	< 3	< 3	< 3	< 3
BH27	< 3	< 3	< 3	< 3
BH30	< 3	< 3	< 3	< 3
REH01	10	**179**	12	26
Remedial Target: 86.1µg/l (exceedances in **bold**)				

1,1 Dichloroethane

1,1 Dichloroethane was not detected at concentrations above the laboratory MDL in any of the samples from monitoring wells within and surrounding HPH3/HPH4.

Table 3.3: 1,1 Dichloroethane Groundwater Analyses

Sample Location/Date	24 Apr 2018	25 Sep 2018	11 Dec 2018	29 Oct 2020
BH02	< 3	< 3	< 3	< 3
BH11	< 3	< 3	< 3	< 3
BH23	< 3	< 3	< 3	< 3
BH27	< 3	< 3	< 3	< 3
BH30	< 3	< 3	< 3	< 3
REH01	< 3	< 3	< 3	< 3
Remedial Target: None				

1,1 Dichloroethene

1,1 Dichloroethene was not detected at concentrations above the laboratory method detection limit (MDL) in any of the samples from monitoring wells within and surrounding HPH3/HPH4.

Table 3.4: 1,1 Dichloroethene Groundwater Analyses

Sample Location	24 Apr 2018	25 Sep 2018	11 Dec 2018	29 Oct 2020
BH02	< 3	< 3	< 3	< 3
BH11	< 3	< 3	< 3	< 3
BH23	< 3	< 3	< 3	< 3
BH27	< 3	< 3	< 3	< 3
BH30	< 3	< 3	< 3	< 3
REH01	< 3	< 3	< 3	< 3
Remedial Target: 12.1µg/l (exceedances in **bold**)				

Cis-1,2-Dichloroethene

Cis-1,2 Dichloroethene was detected at concentrations above the laboratory MDL in one (1) sample from REH01 (September 2018) only.

The detected concentration of *cis*-1,2-Dichloroethene in the sample from REH01 recovered in September 2018 exceeds the remedial target.

Table 3.5: Cis-1,2-Dichloroethene Groundwater Analyses

Location/Date	24 Apr 2018	25 Sep 2018	11 Dec 2018	29 Oct 2020
BH02	< 3	< 3	< 3	< 3
BH11	< 3	< 3	< 3	< 3
BH23	< 3	< 3	< 3	< 3
BH27	< 3	< 3	< 3	< 3
BH30	< 3	< 3	< 3	< 3
REH01	< 3	27	< 3	< 3
Remedial Target 201µg/l (exceedances in **bold**)				

Vinyl Chloride

Vinyl chloride was detected at concentrations above the laboratory MDL in one (1) sample from REH01 (September 2018) only.

The detected concentration of Vinyl chloride in the sample from REH01 recovered in September 2018 exceeds the remedial target.

Table 3.6: Vinyl Chloride Groundwater Analyses

Location/Date	24 Apr 2018	25 Sep 2018	11 Dec 2018	29 Oct 2020
BH02	< 0.1	< 0.1	< 0.1	< 0.1
BH11	< 0.1	< 0.1	< 0.1	< 0.1
BH23	< 0.1	< 0.1	< 0.1	< 0.1
BH27	< 0.1	< 0.1	< 0.1	< 0.1
BH30	< 0.1	< 0.1	< 0.1	< 0.1
REH01	< 0.1	0.1	< 0.1	< 0.1
Remedial Target 13.6µg/l (exceedances in **bold**)				

Appendix 4

Mann-Kendall Contaminant Trend Analyses

Mann-Kendall Contaminant Trend Analyses

Contaminant Trend Analysis

Ramboll has used GSI Inc's[1] Mann Kendall Toolkit for Contaminant Trend Analysis to assess the statistical significance of trends observed in the analytical data for key contaminants of concern over the period of August 2016 to October 2020 (9 sets of sample data). Results of the Contaminant Trend Analysis are provided in full and summarised below:

- Trichloroethene:
  - REH01 – Decreasing Trend (97.8% Confidence Factor);
- 1,1 Dichloroethene
  - REH01 – Stable Trend (58.0% Confidence Factor);
- *Cis*-1,2 Dichloroethene
  - REH01 – Decreasing Trend (97.0% Confidence Factor);
- Vinyl Chloride
  - REH01 – No Trend (58.0% Confidence Factor).

[1] www.gsi-net.com

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	05-Nov-20	Job ID:	1620010949
Facility Name:	Hyde Park Hayes	Constituent:	Trichloroethene
Conducted By:	Jesse Davies	Concentration Units:	ug/L

Sampling Point ID: REH01

Sampling Event	Sampling Date	TRICHLOROETHENE CONCENTRATION (ug/L)
1	1-Aug-16	1762
2	1-Sep-16	827
3	1-Dec-16	83
4	1-Jan-17	34
5	1-Mar-17	17
6	26-Apr-18	10
7	25-Sep-18	179
8	11-Dec-18	12
9	29-Oct-20	26
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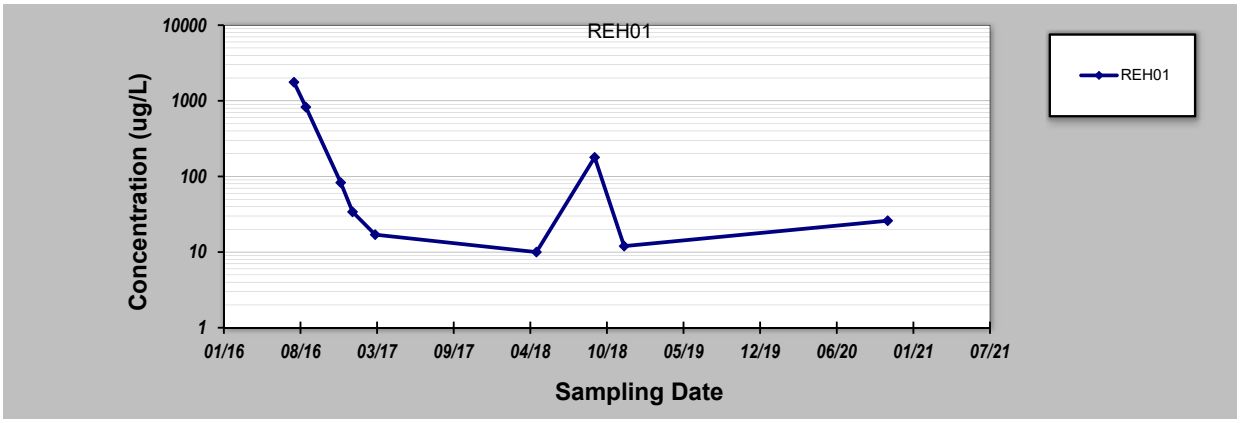
20		
Coefficient of Variation:		1.83
Mann-Kendall Statistic (S):		-20
Confidence Factor:		97.8%
Concentration Trend:		Decreasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	05-Nov-20	Job ID:	1620010949
Facility Name:	Hyde Park Hayes	Constituent:	Cis-1,2-Dichloroethene
Conducted By:	Jesse Davies	Concentration Units:	ug/L

Sampling Point ID: REH01

Sampling Event	Sampling Date	CIS-1,2-DICHLOROETHENE CONCENTRATION (ug/L)
1	1-Aug-16	441
2	1-Sep-16	147
3	1-Dec-16	14
4	1-Jan-17	7
5	1-Mar-17	1.5
6	26-Apr-18	3
7	25-Sep-18	27
8	11-Dec-18	3
9	29-Oct-20	3
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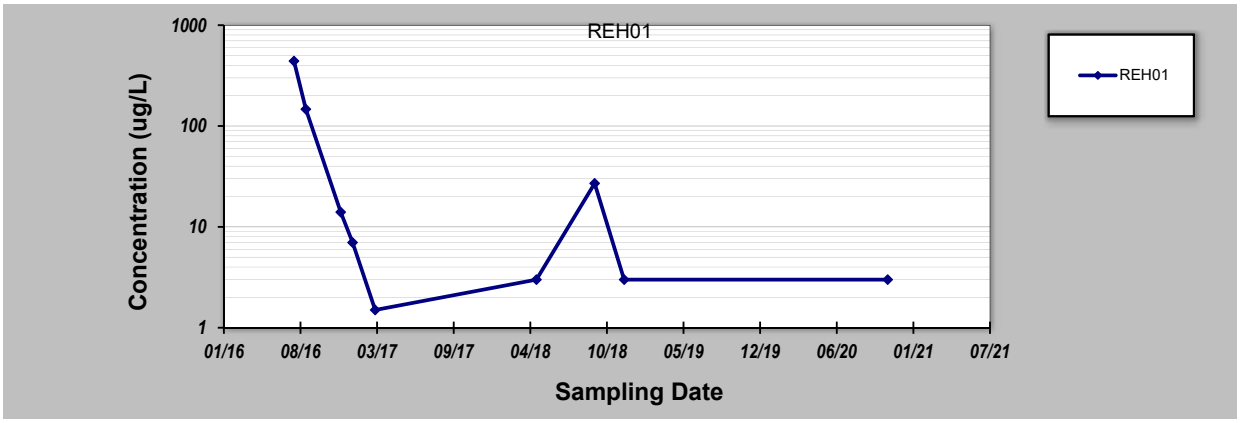
Coefficient of Variation:		2.03
Mann-Kendall Statistic (S):		-19
Confidence Factor:		97.0%
Concentration Trend:		Decreasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	05-Nov-20	Job ID:	1620010949
Facility Name:	Hyde Park Hayes	Constituent:	1,1-Dichloroethene
Conducted By:	Jesse Davies	Concentration Units:	ug/L

Sampling Point ID: REH01

Sampling Event	Sampling Date	1,1-DICHLOROETHENE CONCENTRATION (ug/L)
1	1-Aug-16	11
2	1-Sep-16	4
3	1-Dec-16	1.5
4	1-Jan-17	1.5
5	1-Mar-17	1.5
6	26-Apr-18	3
7	25-Sep-18	3
8	11-Dec-18	3
9	29-Oct-20	3
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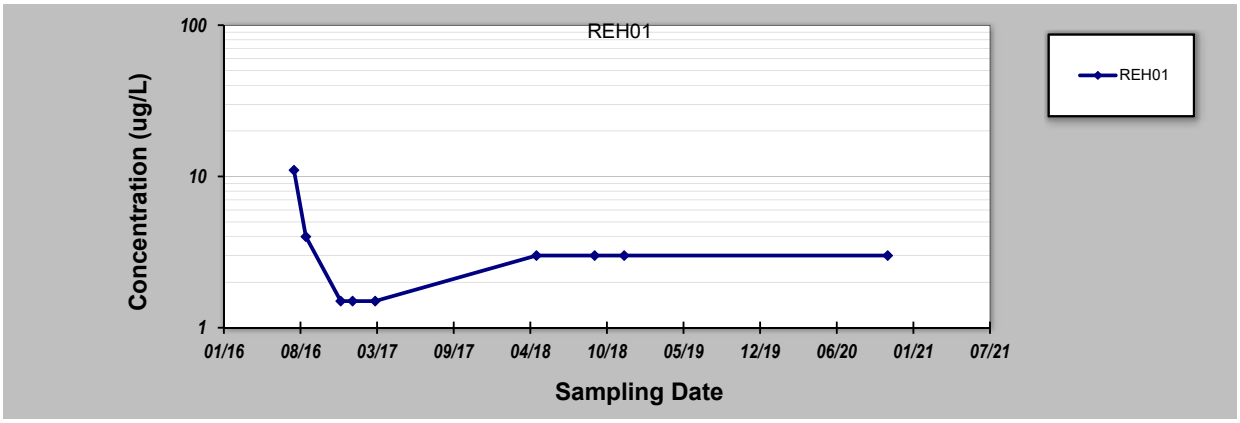
20		
Coefficient of Variation:		0.84
Mann-Kendall Statistic (S):		-3
Confidence Factor:		58.0%
Concentration Trend:		Stable



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	05-Nov-20	Job ID:	1620010949
Facility Name:	Hyde Park Hayes	Constituent:	Vinyl Chloride
Conducted By:	Jesse Davies	Concentration Units:	ug/L

Sampling Point ID: REH01

Sampling Event	Sampling Date	VINYL CHLORIDE CONCENTRATION (ug/L)
1	1-Aug-16	2.8
2	1-Sep-16	1.1
3	1-Dec-16	0.05
4	1-Jan-17	0.05
5	1-Mar-17	0.05
6	26-Apr-18	0.1
7	25-Sep-18	0.1
8	11-Dec-18	0.1
9	29-Oct-20	0.1
10		
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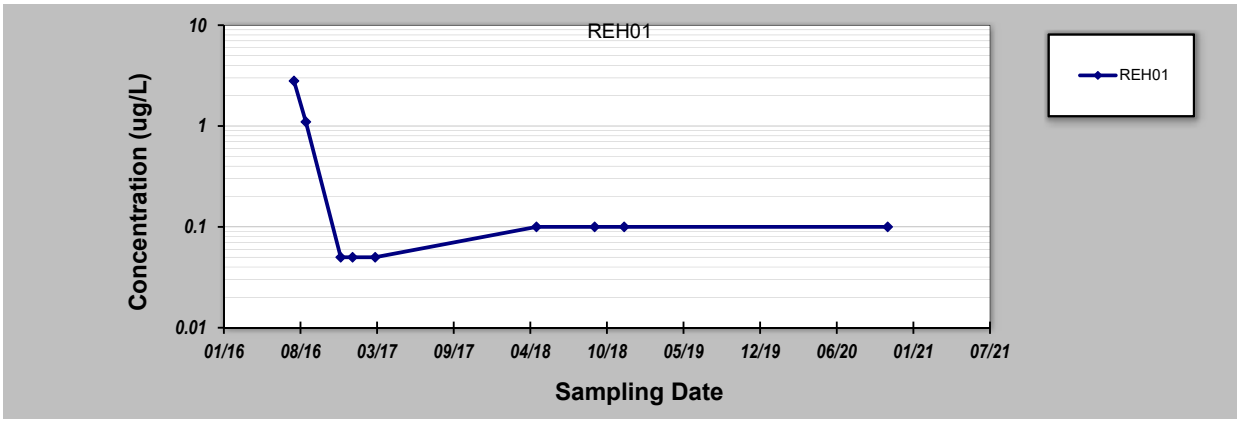
19		
20		
Coefficient of Variation:		1.88
Mann-Kendall Statistic (S):		-3
Confidence Factor:		58.0%
Concentration Trend:		No Trend



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

Appendix 5

MNA Parameter Assessment

MNA Parameter & Molar Fraction Assessment

Monitored Natural Attenuation (MNA) Parameters

In addition to the field testing of physico-chemical parameters (indicators of groundwater conditions from which the potential for the occurrence of natural attenuation processes can be inferred) additional chemical analytical testing has been undertaken for determinands relevant to oxidation-reduction activity in groundwater systems.

Results are summarised below for each of the sequential microbially mediated reduction processes characteristic of the electrochemical evolution of groundwater:

- **Nitrate Reduction:** nitrate (NO_3^{2-}, the oxidised form) is reduced to NO_2^-, the reduced form). No evidence of nitrate reduction is observed in the form of detected dissolved nitrite is observed in the October 2020 sample data; nitrate was detected in all samples analysed at varying concentrations while nitrite was not detected above the laboratory method detection limit (MDL).
- **Manganese Reduction:** the presence of dissolved Manganese is indicative of Manganese reduction (as the reduced Mn^{2+} is the soluble form); dissolved Manganese was detected above the laboratory MDL in only 2 samples (BH30 and REH01) both at modest concentrations slightly exceeding the laboratory MDL.
- **Iron Reduction:** Ferric Iron (Fe^{3+}, the oxidised form) is reduced to ferrous Iron (Fe^{2+}, the reduced form). Neither Ferrous or Ferric Iron were detected in any of the samples above the laboratory MDL.
- **Sulphate Reduction:** Sulphate (SO_4^{2-}, the oxidised form) is reduced to Sulphide (S^{2-}). Sulphide was not detected in any of the samples analysed; however, as sulphide is readily mineralised by other redox processes in groundwater it is not frequently observed in the dissolved phase. Detected concentrations of sulphate do not indicate a consistent or observable pattern of sulphate depletion.

Dissolved gases ethene, ethane are the terminal degradation "daughter" product of the various reductive degradation pathways of chlorinated alkenes and alkanes. Methane is the product of fermentation of a variety of hydrocarbon compounds. Dissolved gases were not detected in any of the samples above the laboratory MDL.

The MNA parameters demonstrate very little evidence that the groundwater at the site has been subject to electrochemical evolution; this finding provides an additional line of evidence for the presence of groundwater recharge in the vicinity. Evidence of conditions conducive for reductive dechlorination of chlorinated hydrocarbons has not been obtained by this analysis. The products of reductive dechlorination of Trichloroethene have been detected in REH01 consistent with detections of TCE; however, due to the absence of strong indications of conditions conducive to reductive dechlorination, the observed reducing contaminant concentrations are likely to have been largely a result of dilution and dispersion effects in the groundwater bearing formation rather than mass destruction via reductive dechlorination of the contaminants.

No groundwater monitoring wells are available immediately downgradient of REH01 to provide an assessment of the potential dilution and dispersion effects (i.e. plume assessment).

Appendix 6

Laboratory Analytical Certificates

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

Ramboll
1 Broad Gate
The Headrow
Leeds
LS1 8EQ

Attention :	Jesse Davies
Date :	4th November, 2020
Your reference :	HPH
Our reference :	Test Report 20/15049 Batch 1
Location :	
Date samples received :	31st October, 2020
Status :	Final report
Issue :	1

Six samples were received for analysis on 31st October, 2020 of which six were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Paul Boden BSc
Senior Project Manager

Client Name: Ramboll
Reference: HPH
Location:
Contact: Jesse Davies
EMT Job No: 20/15049

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-7	8-14	15-21	22-28	29-35	36-42					LOD/LOR	Units	Method No.
Sample ID	BH02_291020	BH30_291020	BH27_291020	BH23_291020	BH11_291020	REH01_291020							
Depth													
COC No / misc													
Containers	V H Z P G	V H Z P G	V H Z P G	V H Z P G	V H Z P G	V H Z P G							
Sample Date	29/10/2020	29/10/2020	29/10/2020	29/10/2020	29/10/2020	29/10/2020							
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water							
Batch Number	1	1	1	1	1	1							
Date of Receipt	31/10/2020	31/10/2020	31/10/2020	31/10/2020	31/10/2020	31/10/2020							
Dissolved Manganese #	<2	3	<2	<2	<2	5					<2	ug/l	TM30/PM14
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM15/PM10
Toluene #	<5	<5	<5	<5	<5	<5					<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1	<1	<1	<1					<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1	<1	<1	<1					<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	85	87	79	95	96	96					<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	103	95	80	101	103	105					<0	%	TM15/PM10
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5	<5	<5	<5	<5					<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/TM36/PM12/PM16/PM30
Aromatics													
>C5-EC7 #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5	<5	<5	<5	<5					<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/TM36/PM12/PM16/PM30
Sulphate as SO4 #	33.4	125.5	124.0	103.8	253.0	380.6					<0.5	mg/l	TM38/PM0
Chloride #	56.4	575.7	83.6	89.5	13.2	11.1					<0.3	mg/l	TM38/PM0
Nitrate as N #	3.36	4.43	12.12	0.68	1.05	1.79					<0.05	mg/l	TM38/PM0
Nitrite as N #	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006					<0.006	mg/l	TM38/PM0
Ammoniacal Nitrogen as NH4 #	<0.03	<0.03	<0.03	<0.03	<0.03	0.04					<0.03	mg/l	TM38/PM0
Dissolved Methane #	<1	<1	<1	<1	<1	<1					<1	ug/l	TM25/PM0
Dissolved Ethene #	<1	<1	<1	<1	<1	<1					<1	ug/l	TM25/PM0
Dissolved Ethane #	<1	<1	<1	<1	<1	<1					<1	ug/l	TM25/PM0
Sulphide	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01					<0.01	mg/l	TM107/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll
Reference: HPH
Location:
Contact: Jesse Davies
EMT Job No: 20/15049

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-7	8-14	15-21	22-28	29-35	36-42					LOD/LOR	Units	Method No.
Sample ID	BH02_291020	BH30_291020	BH27_291020	BH23_291020	BH11_291020	REH01_291020							
Depth													
COC No / misc													
Containers	V H Z P G	V H Z P G	V H Z P G	V H Z P G	V H Z P G	V H Z P G							
Sample Date	29/10/2020	29/10/2020	29/10/2020	29/10/2020	29/10/2020	29/10/2020							
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water							
Batch Number	1	1	1	1	1	1							
Date of Receipt	31/10/2020	31/10/2020	31/10/2020	31/10/2020	31/10/2020	31/10/2020							
Dissolved Iron II	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02					<0.02	mg/l	TM48/PM0
Dissolved Iron III	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02					<0.02	mg/l	TM30/TM48/PM0
pH #	7.86	7.17	7.35	7.67	7.38	7.01					<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ramboll
Reference: HPH
Location:
Contact: Jesse Davies
EMT Job No: 20/15049

VOC Report : **Liquid**

EMT Sample No.	1-7	8-14	15-21	22-28	29-35	36-42					LOD/LOR	Units	Method No.
Sample ID	BH02_291020	BH30_291020	BH27_291020	BH23_291020	BH11_291020	REH01_291020							
Depth													
COC No / misc													
Containers	V H Z P G	V H Z P G	V H Z P G	V H Z P G	V H Z P G	V H Z P G							
Sample Date	29/10/2020	29/10/2020	29/10/2020	29/10/2020	29/10/2020	29/10/2020							
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water							
Batch Number	1	1	1	1	1	1							
Date of Receipt	31/10/2020	31/10/2020	31/10/2020	31/10/2020	31/10/2020	31/10/2020							
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1	<1	<1	<1	<1					<1	ug/l	TM15/PM10
Chloroethane #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<5	<5	<5	<5	<5	<5					<5	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1	<1	<1	<1	<1					<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
Chloroform #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3	<3	<3	26					<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
Toluene #	<5	<5	<5	<5	<5	<5					<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
Dibromochloromethane #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1	<1	<1	<1					<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1	<1	<1	<1					<1	ug/l	TM15/PM10
Styrene	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
Bromoform #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4	<4	<4	<4	<4					<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
Naphthalene	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	85	87	79	95	96	96					<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	103	95	80	101	103	105					<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ramboll
Reference: HPH
Location:
Contact: Jesse Davies

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 20/15049						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 20/15049

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

EMT Job No: 20/15049

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM25	Determintaion of Dissolved Methane, Ethane and Ethene by Headspace GC-FID	PM0	No preparation is required.	Yes			
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM30/TM48	Calculation of Fe (III) based on Iron and Fe(II)	PM0	No preparation is required.				
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993 (comparabl	PM0	No preparation is required.	Yes			
TM48	Determination of Ferrous Iron by reaction with Sodium Carbonate and Morfamquat Sulphate which is analysed spectrophotometrically.	PM0	No preparation is required.				

EMT Job No: 20/15049

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM0	No preparation is required.				