ENVIRONMENT
& HEALTH

Hydro Components UK Ltd
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Dear Ruth

SITE PROTECTION AND MONITORING PROGRAMME (SPMP), GROUNDWATER MONITORING, AUGUST 2018 (ROUND 30): ENVIRONMENTAL PERMIT REF. BX94551F

Date 25/09/2018

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Ref L1700002328_01 SPMP Round 30

Background

Hydro Components UK Ltd. (Hydro), (formerly Sapa Extrusions Ltd.) has carried out regular groundwater monitoring at the installation since August 2005. Ramboll Environment and Health UK Ltd (Ramboll) has carried out twenty-five rounds of monitoring between August 2005 and February 2018; and Mabbett and Associates Ltd (M&A) carried out monitoring on four occasions (between February 2009 and April 2010). In accordance with the SPMP, groundwater monitoring is required in order to assess the nature of any identified groundwater contamination arising from potential identified sources over the longer term; and to confirm improvements in site control and management have reduced the levels of contamination.

The main manufacturing operations at the site ceased in March 2014 and the installation was partially decommissioned, including decontamination works (cleaning of press-pits, removal of oil storage tanks etc.). However, anodising and fabrication activities re-commenced at the site in 2016 and are currently ongoing.

A Compliance Assessment Report (CAR), (Ref: CAR_NRW0020594) was issued by Natural Resources Wales (NRW) on 8th May 2018 following its review of the previous SPMP monitoring results (Ramboll Report Ref: 1700001435, February 2018). NRW made the following comments in the CAR:

- Hydrocarbon concentrations in the sentry borehole (BHS6) have exceeded the risk-based trigger concentration on two consecutive occasions and accordingly, NRW has requested that Hydro considers an action plan.

- Groundwater discolouration has been identified consistently in BH6 and BHS6. NRW recommended checking the borehole construction and also adding magnesium and manganese to the sample analysis suite to further investigate the source of discolouration.

This report details the results of the thirtieth round of groundwater monitoring which was undertaken on 13th August 2018. The monitoring has taken into account the aforementioned comments and recommendations made by NRW.

Scope of Works

Groundwater samples were recovered from the following seven SPMP monitoring wells (shown on Figure 1): BH1, BH4, BH6, BHS6, BH11, BH12, and MW1. It was not possible to obtain a sample from MW2 on this monitoring occasion due to slight silting-up of the standpipe and comparatively low groundwater level across the site. Groundwater samples were also collected from boreholes BHS1 and BHS4, located to the north of the main facility, to be analysed for TPH interpretation only.

At each location, the depth to groundwater was recorded and, where present, the thickness of free product was recorded. Boreholes were purged of three times the well volume prior to sampling.

Groundwater samples collected from the seven SPMP boreholes were analysed for metals (As, B, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn, V, Be,), pH, total cyanide, sulphate, ammonia and Total Petroleum Hydrocarbons (TPH). Additionally, groundwater samples from borehole BHS6; up gradient borehole BH11; and cross gradient boreholes BH4 and BH6 were analysed for total suspended solids (TSS), total dissolved solids (TDS), total organic carbon (TOC), iron, and redox potential, in order to gain further information on the potential source of discolouration of groundwater in monitoring wells BH6 and BHS6.

Samples from BHS1, BHS4, BHS6, and BH6 were analysed for TPH interpretation to establish whether or not the same type of hydrocarbon is present in up-gradient locations as that identified in BHS6.

For continuity, the results have been compared with UK Drinking Water Standards (UK DWS) in the groundwater analysis summary table (attached). However, given the objective of the SPMP, to identify increases in groundwater concentrations which may be attributable to the permitted operations, the UK DWS are presented for benchmarking purposes only. The 2018 concentrations should also be considered against the Reference Data collected in August 2005 (BH1, BH4, BH6, BH11, BH12, MW1, MW2) and February 2009 (BHS6), which is included in the table attached to this letter.

Results

A full set of laboratory certificates, a summary table, and graphical representation of results are attached to this letter and the main findings are summarised below.

Groundwater Monitoring Results

A summary of the key findings of the groundwater monitoring and analysis results are presented below:

- Groundwater levels across the site ranged from 3.20m below ground level (bgl) (MW2) to 4.02m bgl (BHS6) and are slightly lowered, compared to the previous round of monitoring in February 2018.
- Concentrations of TPH ranged from 0.011mg/l in BH6 and BHS6 to 42.7mg/l in BH12. Historically, the highest TPH concentration is found in BH12 with a strong hydrocarbon odour and an oily sheen on the surface of the sample observed. Free product was not detected during the most recent round

of monitoring; however, the sample was noted to have a hydrocarbon odour and a slight oily sheen on the surface consistent with previous findings. The concentration of TPH in BH12 has increased from 34.3mg/l to 42.7ml/l since the last time it was recorded in February 2018. This most recent concentration is greater than the Reference Data concentration of 7.8mg/l; however, it remains below the original significantly elevated concentrations previously recorded at this location.

- Slight increases in the concentration of TPH were recorded in boreholes BH4, BH11, and MW1; however, in each case they are within the range of concentrations previously recorded at each location.
- The groundwater sample recovered from BHS6 (the 'sentry borehole') was coloured black which is consistent with previous monitoring rounds. During the most recent round of monitoring, the recorded TPH concentration has decreased from 0.58mg/l in February 2018 to 0.011mg/l. The August 2018 concentration does not exceed the sentry borehole risk-based trigger concentration of 0.108 mg/l.
- Additional samples were collected from upgradient boreholes BHS1 and BHS4 during the August 2018 monitoring round. Samples from boreholes BHS1 and BHS4, along with samples from boreholes BHS6 and BH6, were submitted to the laboratory for TPH interpretation analysis to establish whether or not the same type of hydrocarbon is present in up-gradient locations as that identified in BHS6.
  - The sample from BHS1 recorded a TPH concentration of 0.037mg/l, which was interpreted by the laboratory as a 'low level Mineral Oil style unresolved complex mixture (UCM) in the range nC16-nC40'.
  - The sample form BHS4 recorded a TPH concentration of 5.25mg/l, which was interpreted by the laboratory as a 'large Mineral Oil style UCM in the range nC14-nC40+'.
  - Samples from boreholes BH6 and BHS6 each recorded TPH concentrations of 0.011mg/l, which was described as an insufficient concentration to interpret an identification.

  The laboratory interpretations suggest that hydrocarbon present in boreholes BHS1 and BHS4 are potentially of a similar likely source. However, it has not been possible on this occasion to ascertain whether the hydrocarbon, previously identified at increased concentrations, in borehole BHS6 is of the same type as is present in up-gradient locations.
- Black/brown coloured groundwater has previously been observed in monitoring wells BH6 and BH5, located adjacent east and west of BHS6. Samples of groundwater from BHS6 and BH6; and BH4, BH11 (across and up gradient monitoring wells) were analysed for TSS, TDS, TOC, iron and redox potential in order to gain further information on the potential source of discolouration of groundwater at locations BHS6, BH6 and BH5. The results are presented in Table 1 and are discussed further in the following section.
- Across the site, pH values ranged from pH 6.5 (BH1 and BH12) to pH 7.7 (BHS6), i.e. all were below the lower limit identified in the Water Supply (Water Quality) Regulations 2000 (i.e. pH 6.5).
- Arsenic, chromium, lead, and mercury were not detected above the laboratory limit of detection (LOD) in any samples analysed during this monitoring round.
- Boron was recorded above the laboratory LOD (10µg/l) in samples from BH1, BH4, BH11, BH12, and MW1 during the most recent round of monitoring; at a maximum concentration of 140µg/l in BH11.

In each case these concentrations are above the relevant Reference Data; however, concentrations remain well below the UK DWS of 1,000µg/l.

- Cadmium was detected above the laboratory LOD (<0.1µg/l) in the sample from MW1 at a concentration of 0.3µg/l, which slightly exceeds the Reference Data; however, remains below the UK DWS of 5µg/l.
- Concentrations of copper were recorded above the laboratory LOD (<1µg/l) in monitoring wells BH6 (52µg/l), BH11 (2µg/l), BHS6 (69µg/l), and MW1 (2µg/l), which do not exceed the UK DWS of 2,000µg/l. The recorded concentrations in BH11, BHS6, and MW1 are within the range of values previously recorded at each location; however, the concentration of copper in BH6 is the highest recorded at this location.
- Concentrations of nickel were recorded above the laboratory LOD (<1µg/l) in monitoring wells BH6 (14µg/l), BH11 (5µg/l), BH12 (5µg/l), and MW1 (1µg/l), which do not exceed the UK DWS of 20µg/l. The recorded concentrations are within the range of values previously recorded at each location.
- Selenium was recorded at concentrations equal to the laboratory LOD (1ug/l) in monitoring wells BH4 and BH11; and at a concentration of 2µg/l in MW1, which are below the UK DWS of 10µg/l.
- Concentrations of zinc ranged from below the laboratory LOD in BH4 to 173µg/l in BH6. An overall decrease in zinc concentrations was observed during the most recent round of monitoring and all detected concentrations do not exceed the UK DWS (5,000µg/l).
- Concentrations of ammonia ranged from below the laboratory LOD (<10µg/l) in BH12 and MW1 to 1,200µg/l in BH11, which exceeds the UK DWS of 500µg/l. Ammonia was not detected above the laboratory LOD the first time it was analysed for in November 2005; however, since then it has been detected at concentrations exceeding the UK DWS on five occasions (September 2012, April 2013, February 2016, and January 2017). The highest recorded concentration of ammonia in borehole BH11 was 2,100µg/l in January 2017.
- Cyanide was below the laboratory LOD (<20µg/l) in all sampled monitoring wells except BH11. The concentration of cyanide in BH11 (20µg/l). This concentration is below the DWS of 50µg/l and is within the range of values previously recorded at this location.
- The concentrations of sulphate in groundwater ranged from 5mg/l in BH12 to 41mg/l in BHS6. Sulphate concentrations do not exceed the UK DWS of 250mg/l at any of the monitoring locations.

Groundwater Discolouration

Table 1 below presents the results of additional analysis carried out on groundwater collected from BHS6 and BH6, which have previously been noted as discoloured; and BH4, BH11, which are located up and across gradient of BHS6. Monitoring wells BHS6 and BH6 are located to the south of the main Extrusions Building; BH4 is located across gradient, to the west of BHS6; BH11 is located up hydraulic gradient of BHS6. It was not possible to obtain a sample from MW2, located down hydraulic gradient of BHS6, in the south-east of the site, during the most recent round of monitoring due to further 'silting-up' of the monitoring well and a low groundwater level across the site.

Table 1: Additional Analysis					
Determinand	**BH4**	**BHS6**	**BH6**	**BH11**	**MW2**
Total Suspended Solids (TSS) (mg/l)	250	110	<50	2,930	NS
Total Dissolved Solids (TDS) (mg/l)	240	690	460	490	NS
Total Organic Carbon (TOC) (mg/l)	1.3	68	41	23	NS
Iron (total dissolved) (µg/l)	50	1,220	2,080	90	NS
Magnesium (total dissolved) (µg/l)	11,000	<10,000	<10,000	19,000	NS
Manganese (total dissolved) (µg/l)	11	208	386	668	NS
Redox Potential (mV)	155.9	142.3	146.7	98.0	NS
pH	6.8	7.7	7.0	6.8	NS
Description	Brown, silty. Very dark brown / black at base of well	Black	Dark brown / black	Brown, very silty (due to low volume of water in well)	NS
Notes: Descriptions are based on visual observations at the time of sampling. No hydrocarbon odours or oily sheens were noted during sample collection. NS = Not sampled.					

The results indicate that TDS and TOC were higher in BHS6 (where the most prominent discolouration occurs) than in the other analysed samples. Additionally, dissolved iron concentrations were notably higher in boreholes BH6 and BHS6. The discolouration is therefore likely to be related to the elevated concentration of iron and resultant dissolved solids causing the groundwater to appear black, rather than a hydrocarbon source. Although, during recent monitoring rounds, fluctuations in hydrocarbon concentration have been identified in BHS6 and BH6, the values are not significantly elevated for an industrial site and no oily sheen was observed on groundwater.

At the request of NRW, the concentrations of magnesium and manganese have been assessed in association with the presence of discoloration of groundwater in boreholes BH6 and BHS6. Magnesium was not detected above the laboratory LOD in boreholes BH6 and BHS6 and it is therefore considered unlikely to be contributing to the discolouration of groundwater. Manganese was recorded at elevated concentrations in borehole BH6 and BHS6 when compared to concentrations in borehole BH4; however, even greater concentrations were detected in borehole BH11, which is not affected by groundwater discolouration in the same way as boreholes BH6 and BHS6.

Although redox potential and pH do not appear to correlate strongly with the discolouration, slight increases in dissolved metal concentrations do correlate with the increase in dissolved iron, suggesting that redox potential and TOC may be an influence on the groundwater chemistry in this area of the site.

The iron concentration in BHS6 (1,220µg/l) is slightly elevated above the Environmental Quality Standard (EQS) for inland surface water of 1,000µg/l. The cause of the discolouration and dissolved iron is not known; however, may indicate an area of less oxygenated groundwater in this area of the site. The absence of discolouration in BH4, BH11 and MW2, along with comparatively lower concentrations of iron, indicates that the area of impacted groundwater is restricted to monitoring wells BHS6 and BH6. The absence of discolouration recorded in monitoring wells BH11 and MW2 (during previous monitoring rounds) suggests that on-site or off-site migration of discoloured groundwater or higher dissolved iron contamination is considered unlikely. It is also unlikely that the discolouration is attributable to an operational activity.

Conclusions and Recommendations

The results of the thirtieth (August 2018) round of groundwater monitoring have identified minor variations in TPH concentrations across the site; however, all are within the range of concentrations previously recorded at each monitoring point.

The TPH concentration in the Sentry Borehole (BHS6) did not exceed the risk-based trigger concentration during the most recent round of monitoring. The trigger concentration is designed to be protective of the river from hydrocarbon (including free phase product) contamination in the west of the site; and has been exceeded in the two previous monitoring rounds. TPH identification analysis has been be carried out on samples from BHS1 and BHS4; the results are similar and potentially from the same likely source. However, the TPH concentrations in BHS6 and BH6 were too low for identification analysis to be undertaken, therefore it has not been possible to conclude whether the previous elevated concentrations identified at these locations were from the same source.

An elevated ammonia concentration was identified in BH11 at a similar concentration to that recorded in January 2017. The source of the ammonia has not been attributed to on-site operational activities and is located up-hydraulic gradient from the operational area of the site.

Investigation has continued into the presence of discoloured groundwater in BHS6 and BH6. The discolouration is localised and is considered unlikely to be migrating onto or off the site. The discolouration is unlikely to be attributed to operational activities and the results indicate that redox potential and TOC may be an influence on the groundwater chemistry in this area of the site.

In line with NRWs requirements, Ramboll recommends that monitoring continues on a six monthly basis.

Please do not hesitate to contact us if you wish to discuss any of the above.

Yours sincerely

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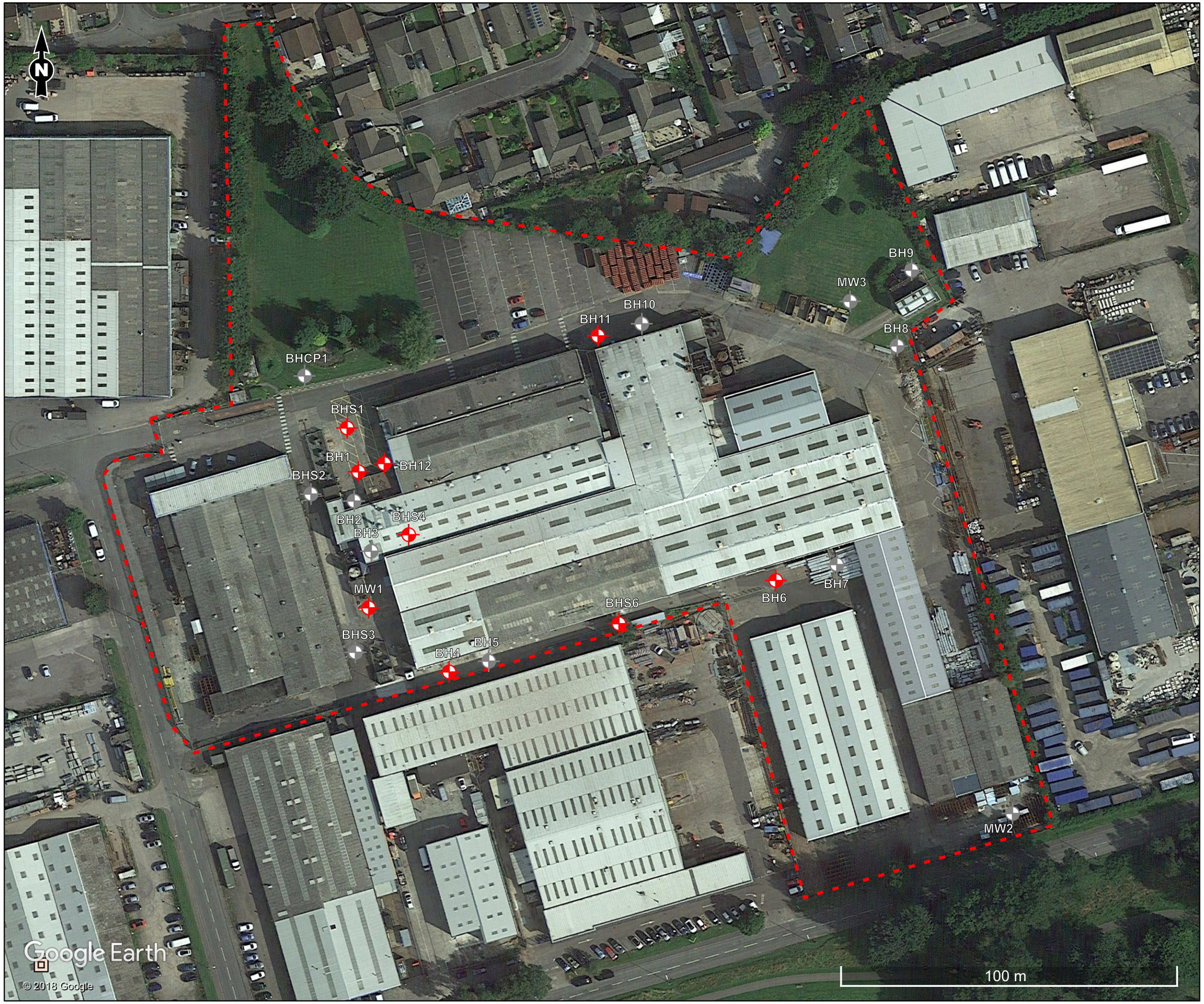
Enc.
Borehole Location Plan
Table of Groundwater Analysis Results
Contaminant Graphs
Laboratory Certificate of Analysis



Legend

- Approximate Site Boundary
- Monitoring Well / Borehole Sampled in August 2018
- Monitoring Well / Borehole Not Sampled

Figure Title
Borehole Location Plan

Project Name
SPMP Groundwater Monitoring Round 30

Project Number	Figure No.
1700002328	1
Date	**Prepared By**
August 2018	RH
Scale	**Issue**
See Scalebar	1

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Borehole Location	Date	Analysis															Water Level (m bgl)
		TPH/EPH (mg/l)	Arsenic (µg/l)	Boron (µg/l)	Cadmium (µg/l)	Chromium (µg/l)	Copper (µg/l)	Lead (µg/l)	Mercury (µg/l)	Nickel (µg/l)	Selenium (µg/l)	Zinc (µg/l)	Ammonia as N (µg/l)	Total Cyanide (µg/l)	pH	Sulphate as SO_4 (mg/l)	
BH1	Aug-05	9	9	NA	ND	ND	ND	ND	ND	ND	ND	ND	1200	ND	6.5	10	3.85
	Nov-05	170	8	ND	ND	ND	ND	ND	ND	ND	ND	8	60	ND	6.5	12	2.90
	Feb-06	26	ND	16	ND	ND	ND	ND	ND	5	ND	ND	60	ND	6.4	ND	3.51
	May-06	9.7	ND	17	ND	11	ND	ND	ND	ND	ND	ND	ND	ND	6.5	49	3.36
	Oct-06	58	ND	26	ND	ND	ND	ND	ND	10	ND	7	60	ND	6.5	23	3.56
	Feb-07	3.4	ND	25	ND	ND	ND	ND	ND	ND	ND	ND	70	ND	6.5	ND	2.88
	Jun-07	7.9	ND	24	ND	ND	ND	ND	ND	8	ND	ND	730	ND	6.4	24	3.45
	Dec-07	20	ND	26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.2	ND	3.13
	Apr-08	170	ND	20	ND	ND	ND	ND	ND	ND	ND	8	ND	ND	6.6	ND	3.17
	Aug-08	6	ND	64	ND	7	ND	ND	ND	ND	ND	8	ND	ND	6.6	ND	3.17
	Feb-09	8.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.10
	Jun-09	ND	1.4	39	ND	9.9	ND	ND	ND	2.3	1.3	100	120	ND	6.5	5.1	3.68
	Oct-09	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.55
	Apr-10	ND	0.9	NA	0.03	14	ND	ND	ND	4	0.5	10	NA	NA	6.5	ND	3.12
	Sep-10	9.39	ND	20	ND	6	ND	ND	ND	2	ND	ND	30	ND	6.4	12	3.49
	Apr-11	28.95	ND	20	ND	2	2	ND	ND	2	ND	9	ND	ND	6.6	6	3.72
	Sep-11	76.31	ND	20	ND	7	ND	ND	ND	2	ND	2	50	ND	6.4	8	3.53
	Mar-12	51.97	1	ND	0.1	6	2	3	ND	2	1	6	20	20	7	8	3.60
	Sep-12	7.81	1	40	ND	2	3	4	ND	3	ND	20	70	ND	7.3	11	3.24
	Apr-13	15.75	ND	NA	ND	2	ND	ND	ND	ND	ND	5	20	ND	7.3	7	3.39
	Oct-13	11.7	ND	20	ND	3	ND	ND	ND	2	ND	7	70	ND	6.9	9	3.70
	Jul-14	19.01	ND	20	ND	2	ND	ND	ND	1	ND	3	ND	ND	6.6	6	3.72
	Jan-15	0.98	ND	ND	ND	ND	ND	ND	ND	1	ND	25	110	ND	6.9	7	2.80
	Jul-15	14.4	ND	ND	ND	ND	ND	ND	ND	3	ND	ND	70	ND	7.1	9	3.53
	Feb-16	5.2	ND	30	ND	ND	ND	ND	ND	4	ND	74	130	ND	6.6	13	2.41
	Aug-16	6.11	ND	10	ND	ND	ND	ND	ND	ND	ND	ND	80	ND	6.6	8.6	3.53
	Jan-17	9.03	ND	ND	ND	3	ND	ND	ND	4	ND	5	70	ND	7.1	8.9	3.55
	Aug-17	41	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	50	ND	6.6	10	3.46
	Feb-18	11.9	3	40	ND	ND	ND	ND	ND	5	ND	66	300	ND	6.8	8	3.05
	Aug-18	0.056	ND	20	ND	ND	ND	ND	ND	ND	ND	10	80	ND	6.5	12	3.76
BH4	Aug-05	61	10	NA	ND	ND	ND	ND	ND	ND	ND	ND	110	ND	6.8	34	4.02
	Nov-05	0.11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.6	20	3.10
	Feb-06	0.07	ND	24	ND	10	ND	ND	ND	ND	ND	ND	110	ND	6.8	25	3.73
	May-06	0.02	ND	23	ND	10	ND	ND	ND	ND	ND	ND	ND	ND	6.9	26	3.56
	Oct-06	0.02	ND	30	ND	ND	17	ND	ND	ND	ND	10	ND	ND	6.8	34	3.81
	Feb-07	0.4	ND	27	ND	ND	ND	ND	ND	ND	ND	ND	80	ND	7	21	3.11
	Jun-07	0.15	ND	30	ND	ND	ND	ND	ND	ND	ND	ND	210	ND	6.8	24	3.62
	Dec-07	ND	ND	27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.8	24	3.28
	Apr-08	0.19	ND	25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.1	20	3.39
	Aug-08	ND	ND	36	ND	7	ND	ND	ND	ND	ND	ND	ND	ND	6.8	19	3.30
	Feb-09	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.10
	Jun-09	ND	1.3	33	ND	12	1.3	ND	ND	ND	1.4	7.1	40	ND	7	15	3.80
	Oct-09	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.79
	Apr-10	ND	2	NA	ND	12	ND	ND	ND	3	0.7	5	NA	NA	6.9	17	3.35
	Sep-10	0.01	ND	20	ND	4	ND	ND	ND	ND	ND	ND	20	ND	6.8	15	3.62
	Apr-11	0.03	ND	30	ND	4	2	ND	ND	ND	ND	ND	ND	ND	7	16	3.84
	Sep-11	0.01	ND	20	ND	7	ND	ND	ND	ND	1	ND	30	ND	6.6	18	3.61
	Mar-12	0.03	ND	ND	0.1	6	3	2	ND	ND	2	5	ND	ND	7.3	21	3.75
	Sep-12	ND	ND	20	ND	3	1	ND	ND	ND	1	ND	ND	ND	7.5	19	3.42
	Apr-13	0.02	ND	NA	ND	3	ND	ND	ND	ND	ND	ND	10	ND	7.4	17	3.57
	Oct-13	0.02	ND	20	ND	3	ND	ND	ND	ND	ND	ND	ND	ND	7.2	18	3.80
	Jul-14	ND	ND	20	ND	3	ND	ND	ND	ND	ND	ND	ND	ND	7	14	3.86
	Jan-15	ND	ND	ND	ND	1	ND	ND	ND	ND	ND	ND	ND	ND	7.3	15	2.97
	Jul-15	ND	ND	20	ND	2	ND	ND	ND	ND	ND	ND	20	ND	7.5	16	3.65
	Feb-16	0.02	ND	30	ND	2	ND	ND	ND	ND	ND	21	10	ND	6.8	14	2.50
	Aug-16	0.04	ND	10	ND	ND	ND	ND	ND	ND	ND	2	ND	ND	6.8	17.5	3.69
	Jan-17	0.01	ND	ND	ND	2	ND	ND	ND	ND	ND	2	10	ND	7.4	17.6	3.70
	Aug-17	0.01	ND	ND	ND	1	ND	ND	ND	ND	ND	ND	ND	ND	6.7	17	3.60
	Feb-18	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	150	ND	ND	6.9	19	3.22
	Aug-18	0.016	ND	20	ND	ND	ND	ND	ND	ND	1	ND	30	ND	6.8	18	3.90
BH6	Aug-05	0.03	9	NA	2	ND	ND	ND	ND	48	ND	140	700	ND	5.5	440	3.68
	Nov-05	0.05	8	ND	2	ND	ND	ND	ND	58	ND	200	490	ND	4.5	450	3.07
	Feb-06	0.03	ND	23	2	7	7	ND	ND	45	ND	130	1200	ND	4.6	740	3.45
	May-06	ND	ND	25	2	ND	9	ND	ND	56	ND	160	920	ND	4.5	830	3.29
	Oct-06	0.01	ND	21	1	ND	7	ND	ND	46	ND	130	120	ND	4.5	380	3.41
	Feb-07	ND	ND	29	1	ND	5	ND	ND	36	ND	95	630	ND	4.6	340	2.99
	Jun-07	0.03	ND	27	ND	ND	ND	ND	ND	24	ND	54	470	ND	4.6	230	3.39
	Dec-07	ND	ND	29	ND	ND	ND	ND	ND	13	ND	53	200	ND	4.7	110	3.18
	Apr-08	ND	ND	27	ND	ND	ND	ND	ND	15	ND	39	140	ND	5.0	170	3.27
	Aug-08	ND	ND	31	ND	ND	ND	ND	ND	13	ND	31	140	ND	5.0	130	3.08
	Jun-09	ND	ND	34	ND	ND	ND	ND	ND	6.7	ND	23	160	ND	5.5	97	4.83
	Apr-10	ND	1.1	NA	0.22	3	ND	ND	ND	5	1.1	21	NA	NA	5.6	100	3.28
	Sep-10	ND	ND	20	0.3	2	ND	ND	ND	4	ND	54	20	ND	5.6	58	3.42
	Apr-11	0.59	ND	50	0.2	1	2	ND	ND	3	ND	20	ND	ND	5.6	61	3.60
	Sep-11	0.97	ND	20	0.2	4	ND	ND	ND	5	ND	11	20	ND	5.9	47	3.46
	Mar-12	0.01	ND	ND	0.3	2	ND	2	0.1	1	1	9	ND	ND	6.8	60	3.50
	Sep-12	0.06	ND	20	0.1	ND	ND	2	ND	1	2	12	ND	ND	7	51	3.24
	Apr-13	0.03	ND	NA	0.2	2	ND	ND	ND	1	1	29	ND	ND	7.1	49	3.36
	Oct-13	0.06	ND	20	0.1	2	ND	ND	ND	ND	1	13	ND	ND	6.8	32	3.56
	Jul-14	0.01	ND	20	ND	1	ND	ND	ND	ND	1	3	ND	ND	6.8	35	3.60
	Jan-15	0.08	ND	ND	ND	ND	2	ND	ND	4	ND	4	10	ND	6.9	37	2.95
	Jul-15	0.03	ND	20	ND	ND	ND	ND	ND	1	1	ND	20	ND	7.3	29	3.45
	Feb-16	0.15	1	80	0.2	ND	7	1	ND	8	1	64	20	ND	6.5	43	2.51
	Aug-16	0.02	ND	70	0.1	ND	3	ND	ND	6	ND	98	ND	ND	6.7	32.6	3.43
	Jan-17	0.05	1	ND	0.2	ND	5	ND	ND	7	ND	4	10	ND	7.3	36.2	3.43
	Aug-17	0.02	1	ND	0.1	ND	4	ND	ND	5	1	ND	ND	ND	6.8	38	3.37
	Feb-18	0.29	4	190	0.6	ND	19	4	ND	19	5	248	20	ND	7	44	3.07
	Aug-18	0.011	ND	ND	ND	ND	52	ND	ND	14	ND	173	110	ND	7	39	3.58
BH11	Aug-05	0.06	11	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	7.4	190	3.62
	Nov-05	0.05	6	ND	ND	ND	ND	ND	ND	ND	ND	ND	7	ND	ND	6.8	140	2.79
	Feb-06	0.03	ND	34	ND	10	ND	ND	ND	ND	ND	ND	6	50	ND	7.6	560	3.00
	May-06	0.03	ND	31	ND	ND	ND	ND	ND	ND	ND	ND	ND	400	30	7.1	180	3.27
	Oct-06	0.09	ND	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.9	13	3.33
	Feb-07	ND	ND	34	ND	ND	ND	ND	ND	ND	ND	ND	ND	70	50	6.8	31	2.77
	Jun-07	0.04	ND	32	ND	ND	ND	ND	ND	ND	ND	ND	ND	220	ND	6.8	44	3.21
	Dec-07	ND	ND	31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	6.5	49	3.08
	Apr-08	0.17	ND	21	ND	ND	ND	ND	ND	ND	ND	47	ND	ND	ND	7.0	30	3.00
	Aug-08	0.04	ND	25	ND	6	5	ND	ND	25	ND	94	60	ND	6.8	200	3.10
	Jun-09	ND	ND	ND	ND	ND	1.9	1.8	ND	2.5	ND	24	230	ND	6.7	23	3.50
	Apr-10	ND	1.7	NA	0.04	10	ND	ND	0.05	4	1.8	7	NA	NA	6.5	49	3.05
	Sep-10	0.04	ND	40	ND	3	ND	ND	ND	2	ND	12	80	190	7.0	53	3.36
	Apr-11	0.24	ND	30	ND	2	3	ND	ND	1	ND	5	10	260	7.3	28	3.56
	Sep-11	0.04	ND	20	ND	5	1	ND	ND	1	1	18	10	60	6.5	41	3.48
	Mar-12	0.01	ND	ND	ND	3	ND	ND	ND	ND	2	16	ND	40	7.3	28	3.51
	Sep-12	0.47	ND	20	ND	1	1	2	ND	6	ND	15	800	ND	7.1	18	3.11
	Apr-13	0.04	ND	NA	0.1	2	ND	ND	ND	3	1	10	900	40	7.1	31	3.26
	Oct-13	0.07	ND	30	ND	2	3	ND	ND	2	1	10	70	560	7.5	40	3.60
	Jul-14	0.19	ND	50	ND	1	1	ND	ND	1	ND	7	ND	50	6.8	23	3.64
	Jan-15	0.01	ND	ND	ND	ND	ND	ND	0.3	1	ND	18	30	ND	7.7	26	2.71
	Jul-15	0.03	ND	ND	ND	ND	ND	ND	ND	3	ND	10	20	ND	7.3	12	3.45
	Feb-16	0.01	ND	ND	ND	ND	ND	ND	ND	ND	2	5	590	ND	6.4	36	2.38
	Aug-16	0.09	ND	ND	ND	ND	ND	ND	ND	3	ND	13	30	ND	6.8	27	3.44
	Jan-17	0.09	ND	ND	ND	2	3	3	ND	8	ND	7	2100	ND	7.1	24.8	3.42
	Aug-17	0.08	ND	80	ND	ND	ND	ND	ND	2	ND	11	200	ND	7	39	3.36
	Feb-18	ND	ND	20	ND	ND	ND	ND	ND	ND	3	89	30	30	6.6	35	2.96
	Aug-18	0.056	ND	140	ND	ND	2	ND	ND	5	1	82	1200	20	6.8	39	3.67
UK Drinking Water Standard		0.01mg/l**	10µg/l*	1,000* µg/l	5*µg/l	50*µg/l	2,000* µg/l	25*µg/l	1*µg/l	20*µg/l	10*µg/l	5,000µg/l**	500*µg/l	50*µg/l	6.5-10*	250mg/l*	

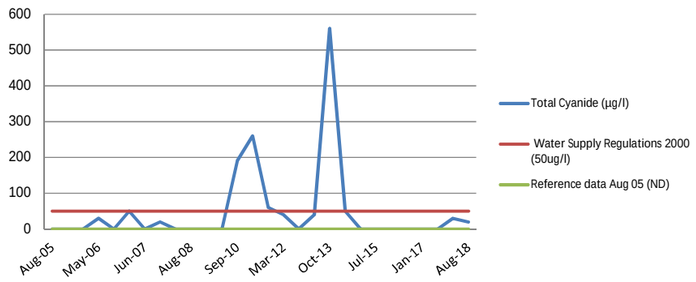
Borehole Location	Date	Analysis															Water Level (m bgl)
		TPH/EPH (mg/l)	Arsenic (µg/l)	Boron (µg/l)	Cadmium (µg/l)	Chromium (µg/l)	Copper (µg/l)	Lead (µg/l)	Mercury (µg/l)	Nickel (µg/l)	Selenium (µg/l)	Zinc (µg/l)	Ammonia as N (µg/l)	Total Cyanide (µg/l)	pH	Sulphate as SO_4 (mg/l)	
BH12	Aug-05	7.8	7	NA	ND	ND	ND	ND	ND	ND	ND	ND	1400	ND	6.6	5	4.00
	Nov-05	34	ND	ND	ND	20	ND	ND	ND	7	ND	9	ND	ND	6.4	22	3.02
	Feb-06	13	ND	16	ND	ND	ND	ND	ND	10	ND	ND	70	ND	6.3	ND	3.64
	May-06	71	ND	15	ND	10	ND	ND	ND	5	ND	ND	ND	ND	6.5	ND	3.51
	Oct-06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	6.5	NS	3.26
	Feb-07	21	ND	23	ND	ND	ND	ND	ND	ND	ND	ND	120	ND	6.5	ND	3.01
	Jun-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	6.4	NS	3.12
	Dec-07	1000	ND	26	ND	ND	ND	ND	ND	7	ND	30	79	ND	6.3	ND	3.23
	Apr-08	34	ND	19	ND	ND	ND	ND	ND	5	ND	ND	ND	ND	6.6	ND	3.33
	Aug-08	260	ND	23	ND	ND	ND	ND	ND	ND	ND	8	ND	ND	6.5	ND	3.28
	Feb-09	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.45	NA	3.11
	Jun-09	240	ND	ND	ND	ND	2	1.5	ND	3.7	ND	15	190	ND	6.4	4.8	3.68
	Oct-09	380	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.45	NA	3.85
	Apr-10	72	1.7	NA	0.04	15	0.9	ND	ND	6	0.9	7	NA	NA	6.5	ND	3.45
	Sep-10	160.7	ND	20	ND	5	ND	ND	ND	2	ND	6	40	ND	6.4	ND	3.71
	Apr-13	45.98	1	NA	ND	2	ND	ND	ND	12	ND	10	10	ND	7.2	8	3.51
	Oct-13	128	ND	10	ND	3	ND	ND	ND	2	ND	8	80	ND	6.9	ND	3.80
	Jul-14	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	3.88
	Jan-15	34.2	ND	ND	ND	ND	ND	ND	ND	1	ND	67	60	ND	6.8	ND	2.92
	Jul-15	49	ND	ND	ND	ND	ND	ND	ND	4	ND	ND	80	ND	6.9	ND	3.68
	Feb-16	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.55
	Aug-16	90.2	ND	10	ND	ND	ND	ND	ND	2	ND	7	40	ND	6.5	ND	3.69
	Jan-17	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	3.70
	Aug-17	121	ND	ND	ND	ND	ND	ND	ND	2	ND	ND	50	ND	6.5	ND	3.63
	Feb-18	34.3	ND	ND	ND	ND	ND	ND	ND	1	ND	11	200	ND	6.7	4	3.18
	Aug-18	42.7	ND	20	ND	ND	ND	ND	ND	5	ND	20	ND	ND	6.5	5	3.92
MW1	Aug-05	0.17	11	NA	ND	ND	ND	ND	ND	ND	ND	32	160	ND	6.6	24	4.01
	Nov-05	0.13	ND	ND	ND	ND	ND	ND	ND	ND	ND	43	ND	ND	6.8	33	3.11
	Feb-06	0.16	ND	22	ND	ND	ND	ND	ND	ND	ND	80	50	ND	6.6	25	3.73
	May-06	0.14	ND	20	ND	8	ND	ND	ND	ND	ND	32	ND	ND	6.8	23	3.58
	Oct-06	0.08	12	20	ND	10	5	ND	ND	ND	ND	24	ND	ND	7.2	22	3.87
	Feb-07	0.58	ND	27	ND	ND	ND	ND	ND	ND	ND	51	230	ND	7	22	3.18
	Jun-07	0.35	ND	27	ND	ND	ND	ND	ND	ND	ND	40	80	ND	6.7	21	3.61
	Dec-07	0.31	ND	29	ND	ND	ND	ND	ND	ND	ND	40	ND	ND	6.5	22	3.29
	Apr-08	2.1	ND	26	ND	ND	ND	ND	ND	ND	ND	37	50	ND	6.8	20	3.41
	Aug-08	0.06	ND	26	ND	ND	ND	ND	ND	ND	ND	56	ND	ND	6.7	18	3.29
	Feb-09	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.44
	Jun-09	ND	ND	ND	ND	ND	10	14	ND	3.4	ND	120	210	ND	7	2.6	3.15
	Oct-09	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.87
	Apr-10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.41
	Sep-10	0.03	ND	20	0.1	4	1	ND	ND	1	ND	86	20	ND	6.6	24	3.64
	Apr-11	0.55	ND	30	0.1	1	5	ND	ND	2	ND	126	ND	ND	6.8	22	3.86
	Sep-11	0.12	ND	50	ND	4	1	ND	ND	1	ND	49	20	ND	6.7	26	3.64
	Mar-12	0.12	ND	ND	0.2	5	3	3	ND	2	1	126	ND	ND	7.1	22	3.75
	Sep-12	0.31	ND	20	ND	2	2	2	ND	1	1	46	ND	ND	7.3	19	3.41
	Apr-13	0.08	ND	NA	0.1	2	ND	ND	ND	2	ND	84	30	ND	7.3	17	3.56
	Oct-13	2.32	ND	20	ND	2	ND	ND	ND	2	1	73	ND	ND	7	22	3.80
	Jul-14	2.42	ND	20	ND	1	1	ND	ND	2	ND	40	ND	ND	6.9	15	3.86
	Jan-15	0.31	ND	ND	ND	ND	ND	ND	ND	ND	ND	36	10	ND	7.2	14	2.95
	Jul-15	0.08	ND	20	ND	ND	ND	ND	ND	1	ND	26	60	ND	7.4	20	3.65
	Feb-16	0.3	ND	ND	ND	ND	1	ND	ND	ND	ND	26	10	ND	6.8	26	2.47
	Aug-16	0.15	ND	10	ND	ND	1	ND	ND	ND	1	14	ND	ND	6.6	19.8	3.67
	Jan-17	0.15	ND	ND	ND	2	1	ND	ND	ND	ND	38	ND	ND	7.2	20.7	3.70
	Aug-17	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	46	ND	ND	6.8	24	3.60
	Feb-18	0.03	ND	80	ND	ND	ND	ND	ND	ND	ND	168	ND	ND	6.9	22	3.20
	Aug-18	0.339	ND	20	0.3	ND	2	ND	ND	1	2	116	ND	ND	6.7	20	3.88
MW2	Aug-05	0.03	6	NA	ND	ND	ND	ND	ND	140	ND	120	95	ND	5.5	370	3.19
	Nov-05	0.1	ND	ND	2	ND	ND	ND	ND	100	ND	100	ND	ND	5.4	380	2.60
	Feb-06	0.27	ND	24	4	6	ND	ND	ND	140	ND	110	70	ND	5.5	480	3.00
	May-06	ND	ND	25	3	ND	ND	ND	ND	120	ND	91	70	ND	5.6	580	2.94
	Oct-06	0.01	ND	27	7	ND	ND	ND	ND	210	ND	200	90	ND	5.8	790	3.04
	Feb-07	ND	ND	33	3	ND	ND	ND	ND	150	ND	110	90	ND	5.6	510	2.69
	Jun-07	0.03	ND	28	5	ND	ND	ND	ND	170	ND	170	240	ND	5.4	510	2.94
	Dec-07	ND	ND	29	3	ND	ND	ND	ND	100	ND	120	88	ND	5.5	350	2.68
	Apr-08	ND	ND	27	2	ND	ND	ND	ND	62	ND	72	ND	ND	5.5	210	2.83
	Aug-08	0.09	ND	30	1	ND	ND	ND	ND	50	ND	76	ND	ND	5.6	170	2.70
	Jun-09	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.95	NA	2.78
	Apr-10	ND	0.5	NA	0.54	8	3.6	ND	ND	10	0.6	170	NA	NA	6.3	100	2.86
	Sep-10	0.04	ND	30	0.8	3	ND	ND	ND	19	ND	121	30	ND	6.1	82	2.94
	Apr-11	11.97	ND	30	0.1	2	2	ND	ND	5	ND	7	ND	ND	7.4	71	3.14
	Sep-11	0.3	ND	40	0.1	5	ND	ND	ND	10	ND	11	60	ND	6.4	71	3.00
	Mar-12	0.2	ND	ND	0.5	2	1	6	ND	12	1	33	ND	ND	7	61	3.09
	Sep-12	0.22	ND	20	0.1	ND	1	5	ND	8	ND	30	ND	ND	7.1	54	2.82
	Apr-13	0.13	ND	NA	0.4	2	ND	ND	ND	5	ND	21	30	ND	7.7	55	2.95
	Oct-13	0.38	ND	20	ND	1	ND	ND	ND	6	ND	17	10	ND	6.7	60	3.12
	Jul-14	0.42	ND	20	ND	ND	ND	ND	ND	4	ND	16	ND	ND	6.6	45	3.18
	Jan-15	0.11	ND	ND	0.1	ND	ND	ND	ND	4	ND	17	50	ND	6.8	44	2.58
	Jul-15	0.18	ND	30	ND	ND	ND	ND	ND	7	ND	21	50	ND	7	43	3.05
	Feb-16	0.06	ND	ND	0.1	ND	ND	ND	ND	2	ND	17	20	ND	6.3	36	2.11
	Aug-16	0.71	ND	ND	ND	ND	ND	ND	ND	2	ND	9	30	ND	6.3	36.4	3.02
	Jan-17	0.12	ND	ND	0.1	1	ND	ND	ND	3	ND	9	10	ND	6.9	39.4	3.04
	Aug-17	0.04	ND	80	ND	ND	ND	ND	ND	2	ND	8	10	ND	6.2	41	2.96
	Feb-18	0.03	ND	ND	ND	ND	ND	ND	ND	2	ND	80	10	ND	6.3	36	2.70
	Aug-18	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	3.20
BHS6 (Sentry Borehole)	Feb-09	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.47
	Jun-09	ND	2.8	ND	ND	ND	13	1.1	ND	4.2	1.8	6.7	310	ND	7.3	NA	4.00
	Oct-09	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.00
	Apr-10	0.74	30	NA	1.8	380	410	41	2.5	51	21	71	NA	NA	7.5	81	3.65
	Sep-10	0.01	ND	30	1	28	1723	11	ND	26	ND	338	300	ND	7.3	46	3.86
	Apr-11	0.04	10	40	0.8	48	85	21	0.4	7	4	37	400	ND	7.8	55	4.03
	Sep-11	0.07	9	ND	1.1	28	81	22	0.2	7	4	24	400	ND	7.5	61	3.90
	Mar-12	0.04	8	ND	0.9	14	66	17	ND	5	3	22	330	ND	7.9	63	3.95
	Sep-12	0.04	8	ND	0.8	38	99	20	0.3	7	3	15	160	ND	8.2	59	3.66
	Apr-13	0.04	ND	NA	10.6	ND	189	ND	ND	ND	ND	515	60800	ND	8.2	60	3.81
	Oct-13	0.02	7	50	0.5	24	62	14	0.2	5	2	20	280	ND	7.5	ND	3.97
	Jul-14	0.05	8	ND	0.5	8	38	4	ND	5	2	11	240	ND	7.9	47	4.02
	Jan-15	0.03	9	ND	0.4	33	119	12	0.2	8	1	9	250	ND	7.7	3	3.30
	Jul-15	0.02	9	ND	0.3	10	66	7	0.2	5	3	8	320	ND	7.8	29	3.85
	Feb-16	0.05	5	30	0.1	10	38	3	0.1	3	2	48	160	ND	7.4	56	2.85
	Aug-16	0.04	8	60	0.3	15	75	7	0.2	5	1	58	180	ND	8.1	63.4	3.86
	Jan-17	0.03	9	ND	0.3	15	81	7	0.1	5	1	19	220	ND	8.2	57.9	3.87
	Sep-17	0.15	8	ND	0.3	15	71	8	ND	7	4	27	180	ND	7.7	55	3.78
	Feb-18	0.58	7	ND	0.2	6	49	4	ND	4	2	102	ND	ND	7.9	41	3.48
	Aug-18	0.011	ND	ND	ND	ND	69	ND	ND	ND	ND	88	200	ND	7.7	41	4.02
UK Drinking Water Standard		0.01mg/l**	10µg/l*	1,000* µg/l	5*µg/l	50*µg/l	2,000* µg/l	25*µg/l	1*µg/l	20*µg/l	10*µg/l	5,000µg/l**	500*µg/l	50*µg/l	6.5-10*	250mg/l*	

Notes:
The red cells indicate where the concentration exceeds the UK Drinking Water Standard
The yellow cells indicate where laboratory detection limits have been raised due to matrix interference
The green cells indicate rounds of monitoring carried out by Mabbett & Associates Ltd

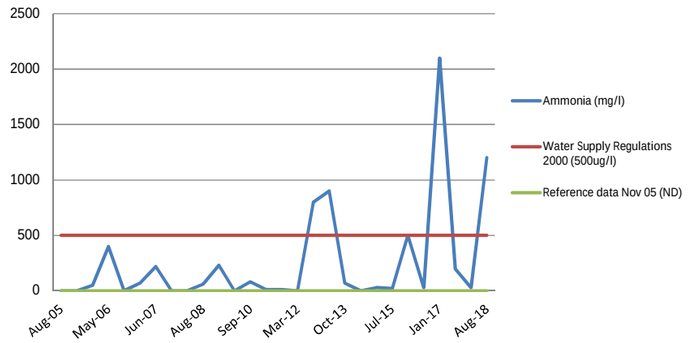
*Water Supply (Water Quality) Regulations 2000
* *The Water Supply (Water Quality) Regulations 1989
No data available but data put in for graphs
Current SPMP monitoring locations

NS = No sample taken - free product present
ND = Not detected above laboratory detection limits
NA = Not analysed

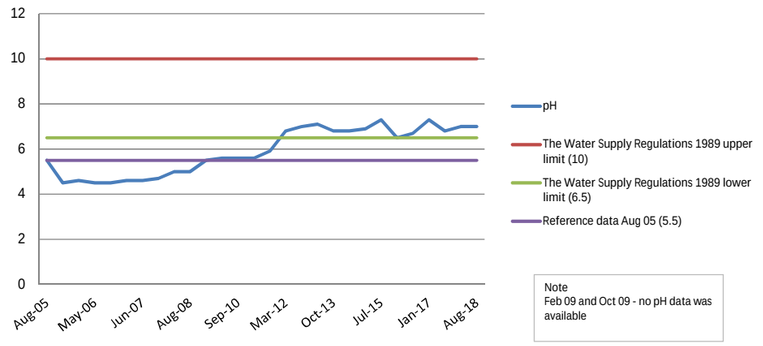
Borehole 11 - Total Cyanide



Borehole 11 - Ammonia

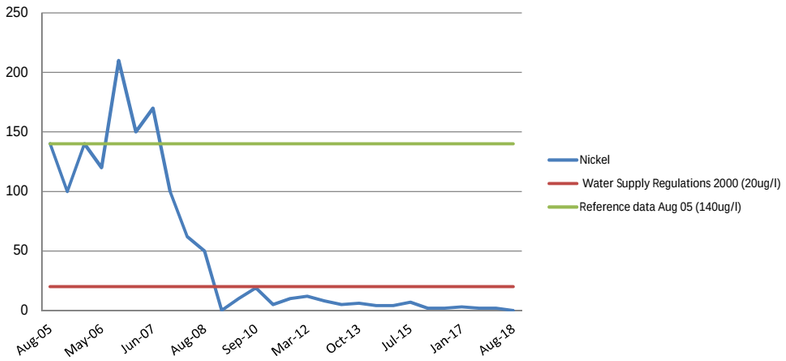


Borehole 6 - pH

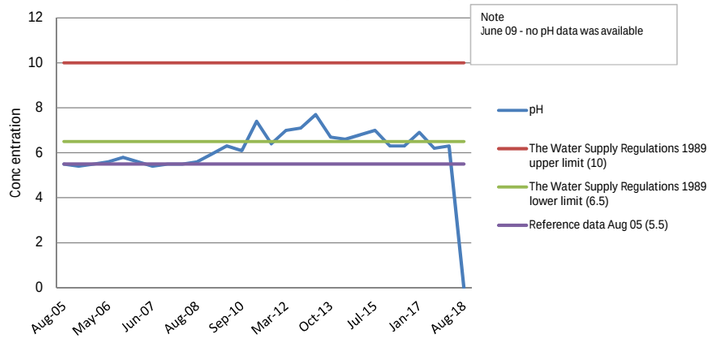


Note
Feb 09 and Oct 09 - no pH data was available

Monitoring Well 2 - Nickel

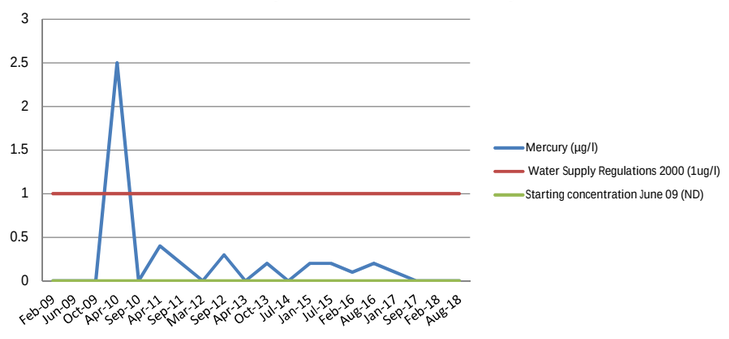


Monitoring Well 2 - pH

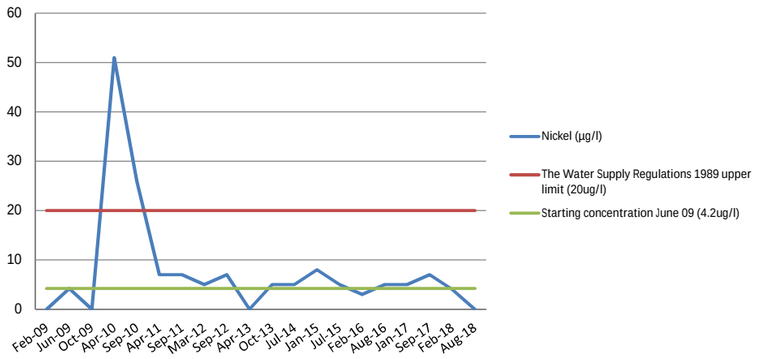


Note
June 09 - no pH data was available

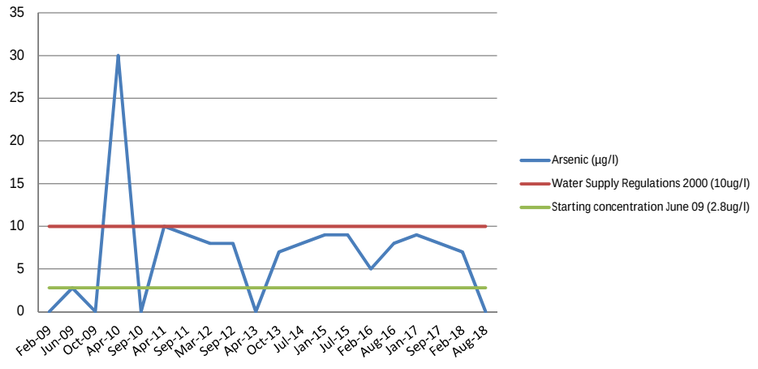
Sentry Borehole 6 - Mercury



Sentry Borehole 6 - Nickel

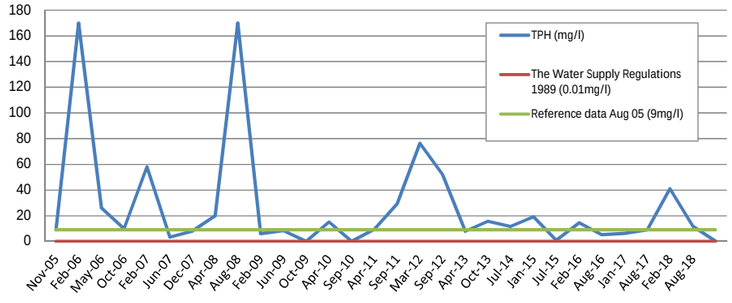


Sentry Borehole 6 - Arsenic

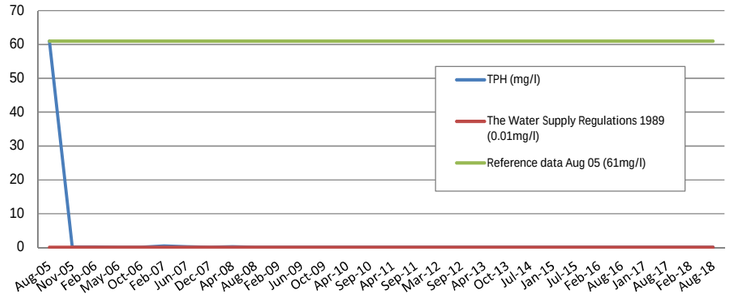


TPH Concentration Graphs

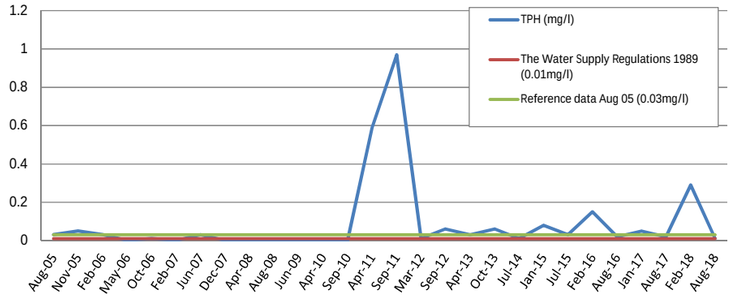
Borehole 1



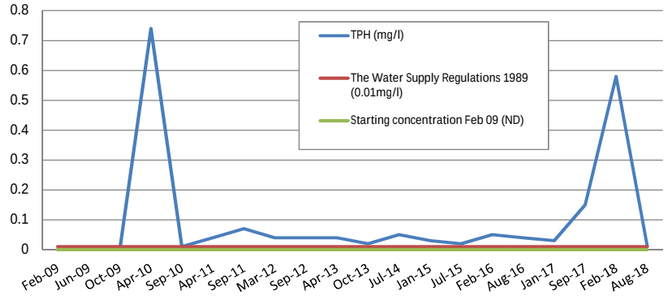
Borehole 4



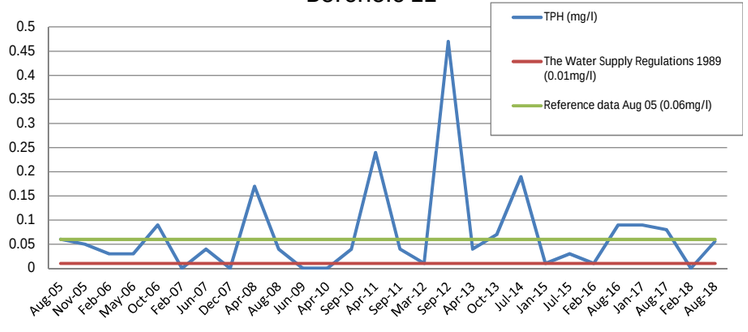
Borehole 6



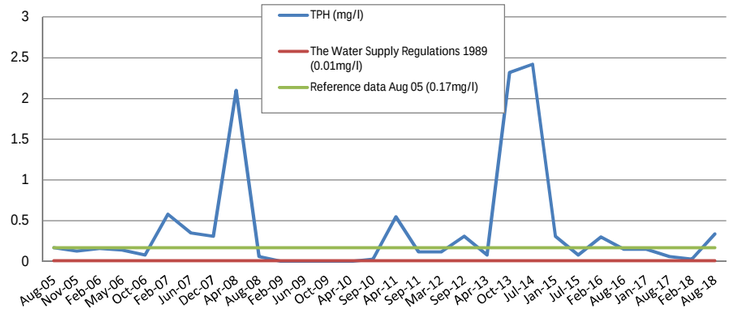
Sentry Borehole 6



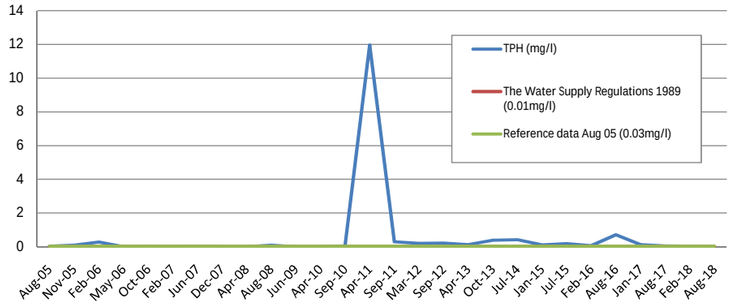
Borehole 11



Monitoring Well 1



Monitoring Well 2



Our Ref: EXR/268022 (Ver. 2)
Your Ref: 1700002328

September 11, 2018

Environmental Chemistry
SOCOTEC UK Limited
Bretby Business Park
Ashby Road
Burton-on-Trent
Staffordshire
DE15 0YZ

Telephone: 01283 554400
Facsimile: 01283 554422

Rob Hodgson
Ramboll Environ
8 Village Way
Cardiff
CF15 7NE

For the attention of Rob Hodgson

Dear Rob Hodgson

Sample Analysis - Hydro SPMP Round 30

Samples from the above site have been analysed in accordance with the schedule supplied.
The sample details and the results of analyses for these samples are given in the appended report.

An invoice for this work will follow under a separate cover.

Please be aware that our policy for the retention of paper based laboratory records and analysis reports is 6 years.

The work was carried out in accordance with SOCOTEC UK Limited (Multi-Sector Services) Standard Terms and Conditions of Contract.

If I can be of any further assistance please do not hesitate to contact me.

Yours sincerely

for SOCOTEC UK Limited

C Lamb
Project Co-ordinator
01283 554463

TEST REPORT

1252

Report No. EXR/268022 (Ver. 2)

Ramboll Environ
8 Village Way
Cardiff
CF15 7NE

Site: Hydro SPMP Round 30

The 9 samples described in this report were registered for analysis by SOCOTEC UK Limited on 15-Aug-2018. This report supersedes any versions previously issued by the laboratory.

The analysis was completed by: 11-Sep-2018

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

Table 1 Main Analysis Results (Pages 2 to 3)
Table of TPH Interpretations (Page 4)
Analytical and Deviating Sample Overview (Pages 5 to 6)
Table of Additional Report Notes (Page 7)
Table of Method Descriptions (Page 8)
Table of Report Notes (Page 9)
Table of Sample Descriptions (Appendix A Page 1 of 1)

On behalf of
SOCOTEC UK Lim
Tim Barnes — Operations Director
Energy & Waste Services

Date of Issue: 11-Sep-2018

Tests marked '^' have been subcontracted to another laboratory.

Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected. SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Where individual results are flagged see report notes for status.

		Units :	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
		Method Codes :	Calc_CR3	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSWT	ICPWATVAR	ICPWATVAR	ICPWATVAR	ICPWATVAR
		Method Reporting Limits :	0.003	0.001	0.0001	0.001	0.001	0.001	0.002	0.0001	0.001	0.001	0.002	0.001	0.01	0.01	1	3	
		UKAS Accredited :	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
LAB ID Number EX/	**Client Sample Description**	**Sample Date**	**Chromium (III)**	**Arsenic as As (Dissolved)**	**Cadmium as Cd (Dissolved)**	**Chromium as Cr (Dissolved)**	**Copper as Cu (Dissolved)**	**Lead as Pb (Dissolved)**	**Manganese as Mn (Dissolved)**	**Mercury as Hg (Dissolved)**	**Nickel as Ni (Dissolved)**	**Selenium as Se (Dissolved)**	**Zinc as Zn (Dissolved)**	**Chromium as Cr (Total)**	**Boron as B (Dissolved) a**	**Iron as Fe (Dissolved) a**	**Magnesium as Mg (Dissolved) a**	**Total Sulphur as SO4 (Dissolved) a**	
1908859	BH11	14-Aug-18	>0.094	<0.001	<0.0001	<0.001	0.002	<0.001	0.668	<0.0001	0.005	0.001	0.082	0.097	0.14	0.09	19	39	
1908860	BH6	14-Aug-18	<0.03	<0.01	<0.001	<0.01	0.052	<0.01	0.386	<0.001	0.014	<0.01	0.173	0.006	<0.1	2.08	<10	39	
1908861	BHS6	14-Aug-18	<0.03	<0.01	<0.001	<0.01	0.069	<0.01	0.208	<0.001	<0.01	<0.01	0.088	0.021	<0.1	1.22	<10	41	
1908862	BH4	14-Aug-18	>0.012	<0.001	<0.0001	<0.001	<0.001	<0.001	0.011	<0.0001	<0.001	0.001	<0.002	0.015	0.02	0.05	11	18	
1908863	MW1	14-Aug-18		<0.001	0.0003	<0.001	0.002	<0.001	0.055	<0.0001	0.001	0.002	0.116	<0.001	0.02	0.06	13	20	
1908864	BHS4	14-Aug-18																	
1908865	BH1	14-Aug-18	<0.003	<0.001	<0.0001	<0.001	<0.001	<0.001		<0.0001	<0.001	<0.001	0.01	<0.001	0.02			12	
1908866	BH12	14-Aug-18	>0.003	<0.001	<0.0001	<0.001	<0.001	<0.001		<0.0001	0.005	<0.001	0.02	0.006	0.02			5	
1908867	BHS1	14-Aug-18																	

SOCOTEC

Bretby Business Park, Ashby Road

Burton-on-Trent, Staffordshire, DE15 0YZ

Tel +44 (0) 1283 554400

Fax +44 (0) 1283 554422

Client Name	**Ramboll Environ**
Contact	Rob Hodgson

Hydro SPMP Round 30

Sample Analysis

Date Printed	**11-Sep-2018**
Report Number	**EXR/268022**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mV	mg/l	pH units							
Method Codes :			KONENS	KONENS	SFAPI	TPHFID	WSLM10	WSLM13	WSLM25	WSLM27	WSLM3							
Method Reporting Limits :			0.01	0.003	0.02	0.01	5	0.2		5								
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes							
LAB ID Number EXR	**Client Sample Description**	**Sample Date**	**Ammoniacal Nitrogen as N**	**Chromium VI as Cr**	**Cyanide (Total) as CN**	**TPH GC**	**Suspended Solids w**	**Total Organic Carbon w**	**Redox Potential mV w**	**Total Dissolved Solids w**	**pH units w**							
1908859	BH11	14-Aug-18	1.2	<0.003	0.02	0.056	2930	23	98.0	490	6.8							
1908860	BH6	14-Aug-18	0.11	<0.03	<0.02	0.011	<50	41	146.7	460	7							
1908861	BHS6	14-Aug-18	0.2	<0.03	<0.02	0.011	110	68	142.3	690	7.7							
1908862	BH4	14-Aug-18	0.03	<0.003	<0.02	0.016	250	1.3	155.9	240	6.8							
1908863	MW1	14-Aug-18	<0.01		<0.02	0.339					6.7							
1908864	BHS4	14-Aug-18				5.25												
1908865	BH1	14-Aug-18	0.08	<0.003	<0.02	0.056					6.5							
1908866	BH12	14-Aug-18	<0.01	<0.003	<0.02	42.7					6.5							
1908867	BHS1	14-Aug-18				0.037												

SOCOTEC

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Client Name **Ramboll Environ**

Contact Rob Hodgson

Hydro SPMP Round 30

Sample Analysis

Date Printed	**11-Sep-2018**
Report Number	**EXR/268022**
Table Number	**1**

Where individual results are flagged see report notes for status.

Interpretation of GC/FID Chromatographic Data

Client:	Ramboll Environ
Site:	Hydro SPMP Round 30
Report Number:	W/268022
Date:	11-09-18

Assessment Type	Standard Interpretation
Assessor:	AW
Analysis:	TPH by GC-FID

Sample ID	Client Description	Interpretation
EX/1908860	BH6	Lean extract, insufficient for ID.
EX/1908861	BHS6	Lean extract, insufficient for ID.
EX/1908864	BHS4	Large Mineral Oil style UCM in the range nC14-nC40+. Suggest GC-MS for better I.D.
EX/1908867	BHS1	Low level Mineral Oil style UCM in the range nC16-nC40. Suggest GC-MS for better I.D.

Where individual results are flagged see report notes for status.

Sample Analysis

SOCOTEC UK Ltd Environmental Chemistry
Analytical and Deviating Sample Overview

W268022

Customer **Ramboll Environ**
Site **Hydro SPMP Round 30**
Report No **W268022**

Consignment No W141888
Date Logged 15-Aug-2018
In-House Report Due 12-Sep-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	Matrix Type	Sampled	MethodID	Calc_CR3	CUSTSERV	ICPMSW										ICPMSWT	ICPWATVAR					KONENS
					Chromium (III) (CALC)	Report A	Nickel as Ni MS (Dissolved)	Chromium as Cr MS (Dissolved)	Cadmium as Cd MS (Dissolved)	Copper as Cu MS (Dissolved)	Lead as Pb MS (Dissolved)	Zinc as Zn MS (Dissolved)	Manganese as Mn MS (Dissolved)	Arsenic as As MS (Dissolved)	Mercury as Hg MS (Dissolved)	Selenium as Se MS (Dissolved)	Chromium as Cr MS (Total)	Total Sulphur as SO4 (Diss) VAR	Magnesium as Mg (Dissolved) VAR	Iron as Fe (Dissolved) VAR	Boron as B (Dissolved) VAR	Ammoniacal Nitrogen (Kone)
					✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
EX/1908859	BH11	Groundwater	14-08-18																			
EX/1908860	BH6	Groundwater	14-08-18																			
EX/1908861	BHS6	Groundwater	14-08-18																			
EX/1908862	BH4	Groundwater	14-08-18																			
EX/1908863	MW1	Groundwater	14-08-18																			
EX/1908864	BHS4	Groundwater	14-08-18																			
EX/1908865	BH1	Groundwater	14-08-18																			
EX/1908866	BH12	Groundwater	14-08-18																			
EX/1908867	BHS1	Groundwater	14-08-18																			

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Where individual results are flagged see report notes for status.

Sample Analysis

SOCOTEC UK Ltd Environmental Chemistry
Analytical and Deviating Sample Overview

W268022

Customer **Ramboll Environ**
Site **Hydro SPMP Round 30**
Report No **W268022**

Consignment No W141888
Date Logged 15-Aug-2018
In-House Report Due 12-Sep-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	Matrix Type	Sampled	MethodID	KONENS	SFAPI	TPHFID		WSLM10	WSLM13	WSLM25	WSLM27	WSLM3
					Chromium VI. as Cr (Kone)	Cyanide (Total) as CN SFA	TPH GC	TPH Interpretation	Suspended Solids	Total Organic Carbon	Redox Potential mV	Total Dissolved Solids	pH units
					✓	✓	✓		✓	✓			✓
EX/1908859	BH11	Groundwater	14-08-18				E						
EX/1908860	BH6	Groundwater	14-08-18				E	E					
EX/1908861	BHS6	Groundwater	14-08-18				E	E					
EX/1908862	BH4	Groundwater	14-08-18				E						
EX/1908863	MW1	Groundwater	14-08-18				E						
EX/1908864	BHS4	Groundwater	14-08-18				E	E					
EX/1908865	BH1	Groundwater	14-08-18				E						
EX/1908866	BH12	Groundwater	14-08-18				E						
EX/1908867	BHS1	Groundwater	14-08-18				E	E					

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Where individual results are flagged see report notes for status.

Report Number : W/EXR/268022

Additional Report Notes

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
WSLM10	EX/1908859	Due to the level of Suspended Solid in the sample, the wash procedure was omitted in order to complete the filtration process and the volume of sample was lowered.
WSLM10	EX/1908860 & 8861	Due to the sample matrix, the volume of sample analysed was lowered to complete the filtration process. As a result the detection limit has been raised.

Where individual results are flagged see report notes for status.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Water	Calc_CR3	As Received	Calculation of Chromium III from Total Chromium and Chromium VI
Water	ICPMSW	As Received	Direct quantitative determination of Metals in water samples using ICPMS
Water	ICPMSWT	As Received	Determination of Total Metals in water samples using nitric acid digestion and ICPMS quantitation
Water	ICPWATVAR	As Received	Direct determination of Metals and Sulphate in water samples using ICPOES
Water	KONENS	As Received	Direct analysis using discrete colorimetric analysis
Water	SFAPI	As Received	Segmented flow analysis with colorimetric detection
Water	TPHFID	As Received	Determination of pentane extractable hydrocarbons in water by GCFID
Water	WSLM10	As Received	Determination of Suspended Solids in waters by gravimetry
Water	WSLM13	As Received	Instrumental analysis using acid/persulphate digestion and non-dispersive IR detection
Water	WSLM25	As Received	Direct determination using Redox Potential Probe
Water	WSLM27	As Received	Gravimetric Determination
Water	WSLM3	As Received	Determination of the pH of water samples by pH probe

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15^{o}C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile **TR** Denotes Tremolite
CR Denotes Crocidolite **AC** Denotes Actinolite
AM Denotes Amosite **AN** Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined **N.Det** Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : Ramboll Environ

Site : Hydro SPMP Round 30

Report Number : W26_8022

Lab ID Number	Client ID	Description
EX/1908859	BH11	Groundwater
EX/1908860	BH6	Groundwater
EX/1908861	BHS6	Groundwater
EX/1908862	BH4	Groundwater
EX/1908863	MW1	Groundwater
EX/1908864	BHS4	Groundwater
EX/1908865	BH1	Groundwater
EX/1908866	BH12	Groundwater
EX/1908867	BHS1	Groundwater