ENVIRONMENT
& HEALTH

Graham Laing
Hydro Components UK Ltd
Unit 16, Pantglas Industrial Estate
Bedwas
Caerphilly
CF83 8DR

Dear Graham

SITE PROTECTION AND MONITORING PROGRAMME (SPMP), GROUNDWATER MONITORING, FEBRUARY 2020 (ROUND 32): ENVIRONMENTAL PERMIT REF. BX94551F

Date 27/03/2020

Ramboll
8 Village Way
Tongwynlais
Cardiff
CF15 7NE
United Kingdom

T +44 2920 543 550
www.ramboll.co.uk

Ref L1620009180_01 SPMP Round 32.docx

## BACKGROUND

Hydro Components UK Ltd. (Hydro), (formerly Sapa Extrusions Ltd.) has carried out regular groundwater monitoring at the installation since August 2005. Ramboll UK Ltd (Ramboll) has carried out twenty-eight rounds of monitoring between August 2005 and February 2020; 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_NRW0036189) was issued by Natural Resources Wales (NRW) on 16th January 2020 following an assessment of the previous SPMP monitoring results (Ramboll Report Ref: 1700003424, August 2019). NRW confirmed that groundwater monitoring is required to be carried out on a six-monthly basis going forward. In additional to groundwater sampling and analysis, NRW also commented on the reporting of groundwater levels (in m Above Ordnance Datum); further analysis of the free phase product in BH12 and a possible link between BH1 and BH12; consideration of the potential source of hydrocarbon in the vicinity of BHS4;

and the status of MW2 (silted up). NRW also recommended further consideration of an action plan should the risk-based trigger level for TPH be exceeded in sentry borehole BHS6.

This report details the results of the thirty-second round of groundwater monitoring which was undertaken on 25th February 2020.

## 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 MW2. It was not possible to obtain a sample from MW1 on this monitoring occasion as the borehole is located in an area that has recently been resurfaced, and is presumed lost. Groundwater samples were also collected from boreholes BHS1 and BHS4, located to the north of the main facility, to be analysed for speciated total petroleum hydrocarbons 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 speciated TPH (TPH CWG) to establish whether the type of hydrocarbon previously identified in up-gradient locations is similar to that previously 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 2020 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 2.18m below ground level (bgl) (57.07m above ordnance datum (AOD)) in borehole MW2, to 2.59m bgl (58.18m AOD) in BH12 and show an overall increase in groundwater level since to the previous round of monitoring in July 2019.

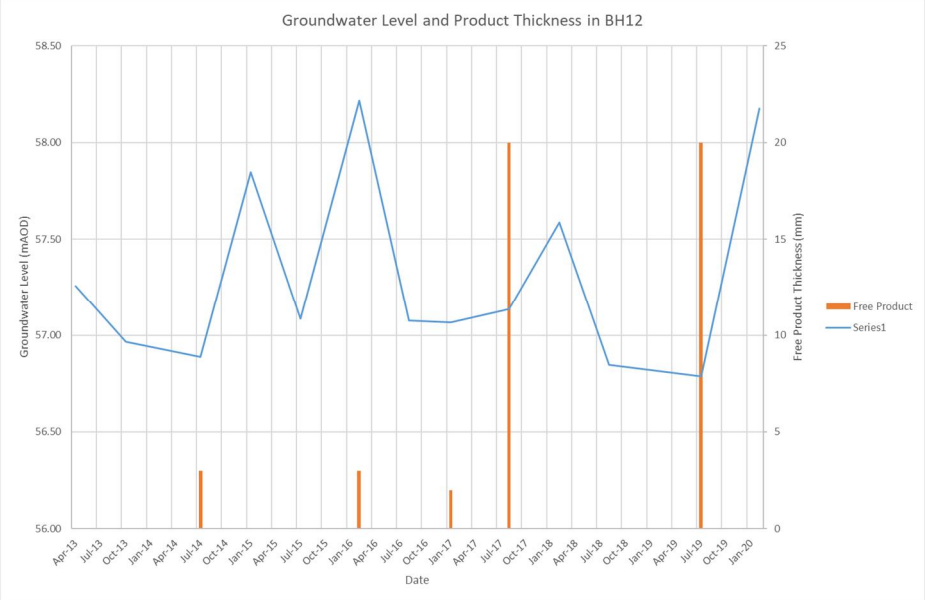
- Concentrations of TPH above the laboratory limit of detection (LOD) were recorded in BH1 (0.45mg/l) and BH12 (2.30mg/l). Historically, recorded TPH concentrations have fluctuated in BH12; with a peak of 1,000mg/l in December 2007. The most recent round of monitoring identified the lowest recorded TPH concentration since monitoring began in August 2005.
- With the exception of BH1 and BH12, TPH concentrations were recorded below the laboratory limit of detection in all other analysed samples.
- The groundwater sample recovered from BHS6 (the 'sentry borehole') was coloured black which is consistent with previous monitoring rounds.
- 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 7.0 (BH12) to pH 7.8 (BHS6), i.e. all were above the lower limit identified in the Water Supply (Water Quality) Regulations 2000 (i.e. pH 6.5).
- The previous monitoring round in July 2019 did not detect arsenic, cadmium, lead or mercury above the laboratory limit of detection (LOD). Detectable concentrations of these determinands were recorded on this monitoring occasion; however, all concentrations were below the UK Drinking Water Standard (UK DWS):
  - Arsenic concentrations ranged from 0.24µg/l (BH4) to 5.47µg/l (BH6).
  - Cadmium concentrations ranged from 0.03µg/l (BH11 and BH12) to 0.36µg/l (BH6).
  - Lead concentrations ranged from 0.2µg/l (BHS6) to 9.8µg/l (BH6).
  - Mercury concentrations ranged from 0.06µg/l (BH6) to 0.528µg/l (BH6).
- Boron was detected in all seven samples during the most recent round of monitoring, at concentrations ranging from 27µg/l (BH4) to 79µg/l (BH1). These concentrations remain below the UK DWS of 1,000µg/l.
- Chromium was detected above the laboratory LOD in four monitoring wells, ranging from 0.3µg/l (MW2) to 1.7µg/l (BH4), this remains below the UK DWS of 50µg/l.
- Copper was detected above the LOD in seven monitoring wells, ranging from 1.3µg/l (BH4) to 26µg/l (BH6), whereas previously in 2019 it was only detected in borehole BHS6 at a concentration of 66µg/l. Concentrations of copper are consistently well below the UK DWS of 2,000µg/l.
- Concentrations of nickel were recorded above the laboratory LOD (0.5µg/l) in six boreholes, five of which ranged from 1.5µg/l (BH11) to 3.5µg/l (MW2). BH6 recorded a concentration of 23µg/l which is slightly above the UK DWS of 20µg/l.
- Selenium was recorded at concentrations at or above the laboratory LOD (0.6µg/l) in seven boreholes, ranging from 0.7µg/l (BH1 and BH12) to 3.3µg/l (BH11). Concentrations of selenium are below the UK DWS of 10µg/l.

- Zinc was recorded at concentrations at or above the laboratory LOD (0.5µg/l) in seven boreholes, ranging from 3.8µg/l (BHS6) to 65µg/l (BH1). These concentrations do not exceed the UK DWS for zinc (5,000 µg/l).
- Concentrations of ammonia were detected above the laboratory LOD in four boreholes, ranging from 26µg/l (BH11) to 330µg/l (MW2), i.e. below the UK DWS of 500µg/l. Previous monitoring rounds have identified occasional elevated concentrations of ammonia.
- Cyanide was not detected above the laboratory LOD (10µg/l) in all sampled monitoring wells.
- The concentrations of sulphate in groundwater ranged from 3.85mg/l (BH12) to 115mg/l (BHS6), these concentrations do not exceed the UK DWS for sulphate of 250mg/l.

TPH in Groundwater

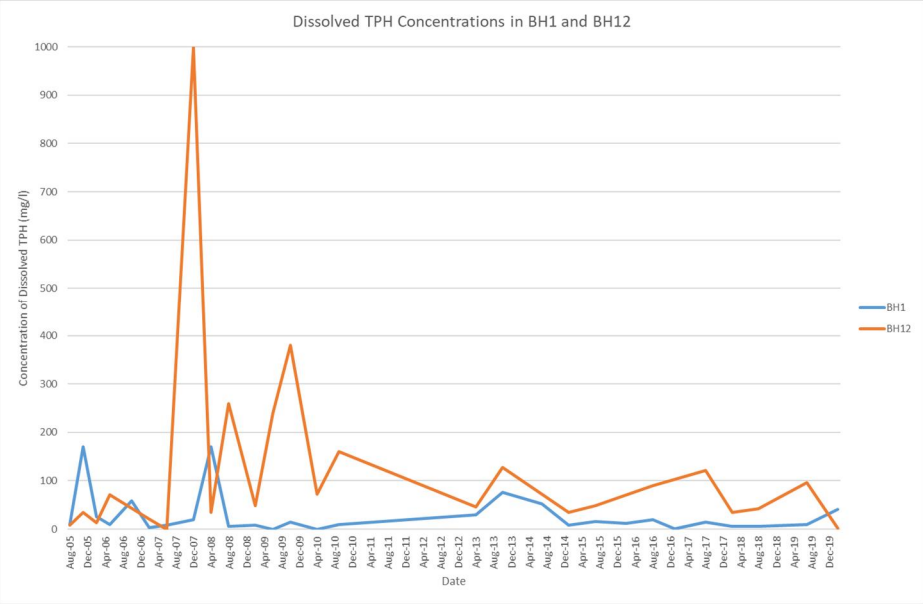
As requested by NRW in CAR_ NRW0036189, groundwater levels have been calculated as elevation in metres above Ordnance Datum (m AOD), to allow comparison of groundwater level between locations to be made. This has been added to the summary table in Appendix 2 of this report.

The presence and thickness of free product in borehole BH12 (between April 2013 and February 2020) has been plotted along with groundwater elevation to investigate whether groundwater level has an influence on the amount of free product collected within the well, presented below.




The groundwater level in BH12 varies seasonally, with higher groundwater levels recorded during winter months. A measurable layer of free product has typically been recorded in BH12 during summer months, at times of lower groundwater level. An exception to this is January 2015, which recorded 3mm of free product at a time of elevated groundwater level.

The concentration of dissolved TPH in BH12 has fluctuated over recent monitoring visits; at the request of NRW this has been plotted along with concentrations in BH1 (presented below). The recorded concentrations in BH1 and BH12 follow a broadly similar pattern. However, the data for BH12 has several gaps, where samples were not collected due to the presence of free product in the well.




## Groundwater Discolouration

Table 1 below presents the results of additional analyses carried out on groundwater collected from BH11, BH6, BHS6, BH4 and MW2. BHS6 and BH6 located south of the main Extrusions Building were previously noted as discoloured, as well as BH4 and BH11 which are located up and across gradient of BHS6. MW2 located in the south-east of the site down hydraulic gradient of BHS6 was not previously sampled due to it 'silting-up'.

Table 1: Additional Analysis

| Determinand | BH11 | BH6 | BHS6 | BH4 | MW2 |
|---|---|---|---|---|---|
| Total Suspended Solids (TSS) (mg/l) | 250 | 50 | 350 | 790 | 6100 |
| Total Dissolved Solids (TDS) (mg/l) | 950 | 720 | 320 | 70 | 110 |
| Total Organic Carbon (TOC) (mg/l) | 3.32 | 72.9 | 4.85 | 2.07 | 3.39 |
| Iron (total dissolved) (mg/l) | 0.025 | 0.69 | 0.37 | 0.016 | 0.076 |
| Magnesium (total dissolved) (mg/l) | 7.0 | 1.4 | 3.8 | 5.1 | 6.1 |
| Manganese (total dissolved) (µg/l) | 92 | 550 | 79 | 4.3 | 1100 |
| Redox Potential (mV) | 146.70 | 157.60 | 156.20 | 161.10 | 180.10 |
| pH | 7.4 | 7.6 | 7.8 | 7.3 | 7.5 |
| Description | Brown, silty | Pale brown; dark brown / | Black | Pale brown; dark brown / | Brown, silty |

| | | | | | |
|---|---|---|---|---|---|
| | | black at base of well | | black at base of well | |
| Notes:<br>Descriptions are based on visual observations at the time of sampling. No hydrocarbon odours or oily sheens were observed during collection of samples from these boreholes. | | | | | |

The visual observations of the wells above are similar to the previous monitoring round in 2019, with the exception of MW2 which was not sampled previously due to it 'silting-up'. No free phase product was identified in any monitored wells and no TPH was detected in the boreholes above during the most recent monitoring round. This indicates that the discolouration is more likely linked to dissolved iron and solids than TPH concentration.

Comparing the average groundwater level (m AOD) for boreholes BH1, BH4, BH6, BH11, BH12, MW2 and BHS6, the groundwater level at the site has risen on average 1.27m from August 2019 to February 2020. The reduced groundwater level in August 2019 may explain why the borehole MW2 was previously unable to be monitored due to it 'silting-up'.

The iron concentration during the August 2019 monitoring round ranged from 0.29 mg/l (BH6) to 2.56 mg/l (BHS6). The concentration recorded in borehole BHS6 exceeded the Environmental Quality Standard (EQS) for inland surface water of 1mg/l. However, iron concentrations recorded in the latest monitoring round are reduced in comparison, ranging from 0.016 mg/l (BH4) to 0.69 mg/l (BH6), none exceeding the EQS. 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 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 concentrations of dissolved iron is considered unlikely. It is also unlikely that the discolouration is attributable to an operational activity.

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.

## CONCLUSIONS AND RECOMMENDATIONS

The results of the thirty-second (February 2020) round of groundwater monitoring have identified reduced concentrations of TPH across the site, identified above the laboratory LOD in only BH1 (0.45mg/l) and BH12 (2.3mg/l). No free phase product was noted in any of the boreholes monitored, where previously approximately 20mm of free product was recorded in borehole BH12. A previous investigation by Ramboll (2008) concluded, (following forensic analysis of the product in BH12), that the contamination is historical and is therefore not associated with activities carried out under the Permit.

The former P16 press pit which contained waste hydraulic oil may be the source of contamination in BHS4. Although the source of potential contamination has been removed; residual contamination may be present beneath the ground slab of the building which is slowly migrating to the south-east.

TPH was not detected in the Sentry Borehole (BHS6) during the most recent round of monitoring and therefore did not exceed the risk-based trigger concentration (0.108mg/l). 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 three previous monitoring rounds (2010, 2017 and 2018). It is recommended going forward, that if the trigger concentration is exceeded, a follow up sample should be collected from BHS6; and MW2 (proposed to be re-drilled, see below). MW2 is located down gradient of BHS6 and is positioned between the manufacturing areas of the site and the river. Should elevated concentrations be identified in MW2, some localised pumping (and removal off-site) may be required. However, given that there is currently no bulk storage of fuels or oils on-site, and the source has been assessed previously as historical, it is considered unlikely that significant increases in concentrations will be identified at these locations going forward.

TPH identification analysis has previously been carried out on samples from BH6, BHS1, BHS4 and BHS6. The laboratory interpretations suggested that hydrocarbons present in boreholes BHS1 and BHS4 are potentially of the same source; and the hydrocarbons in boreholes BH6 and BHS6 are potentially of the same type as is present in up-gradient locations. However, TPH was not recorded above the laboratory LOD in any of these samples during the February 2020 monitoring round.

Investigation has continued into the presence of discoloured groundwater in BHS6 and BH6. However, the previous conclusion that discolouration is localised and is considered unlikely to be migrating onto or off the site remains. 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.

Given that since the previous round of monitoring, borehole MW1 has been lost to resurfacing work in the area to the west of the main Extrusion Building; and it is only possible to sample borehole MW2 during periods of high groundwater level, it is recommended that these monitoring wells are replaced prior to the next scheduled round of SPMP groundwater monitoring. Ramboll has agreed to provide Hydro with a quote for replacement boreholes to be drilled at these locations and installed as 50mm diameter monitoring wells; this will be provided under separate cover.

Ramboll understands that the current activities carried out under the Permit do not involve bulk storage of fuels or oils. Accordingly, the previous TPH fluctuations identified at some monitoring locations are considered likely to be associated with historical activities. Going forward, NRW may consider a reduced monitoring frequency given current site activities; however, the sentry borehole (BHS6) remains key in monitoring the potential risk to the river and six-monthly monitoring may be required to continue.

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

Yours sincerely

Robert Hodgson
Consultant
Environment and Health

D +44 (0)2920 543556
M +44 (0)7885 999674
rhodgson@ramboll.com

Lucy Cleverley
Managing Consultant
Environment and Health

D +44 (0)2920 543557
M +44 (0)7713 311202
lcleverley@ramboll.com

Encl. Appendix 1, Borehole Location Plan

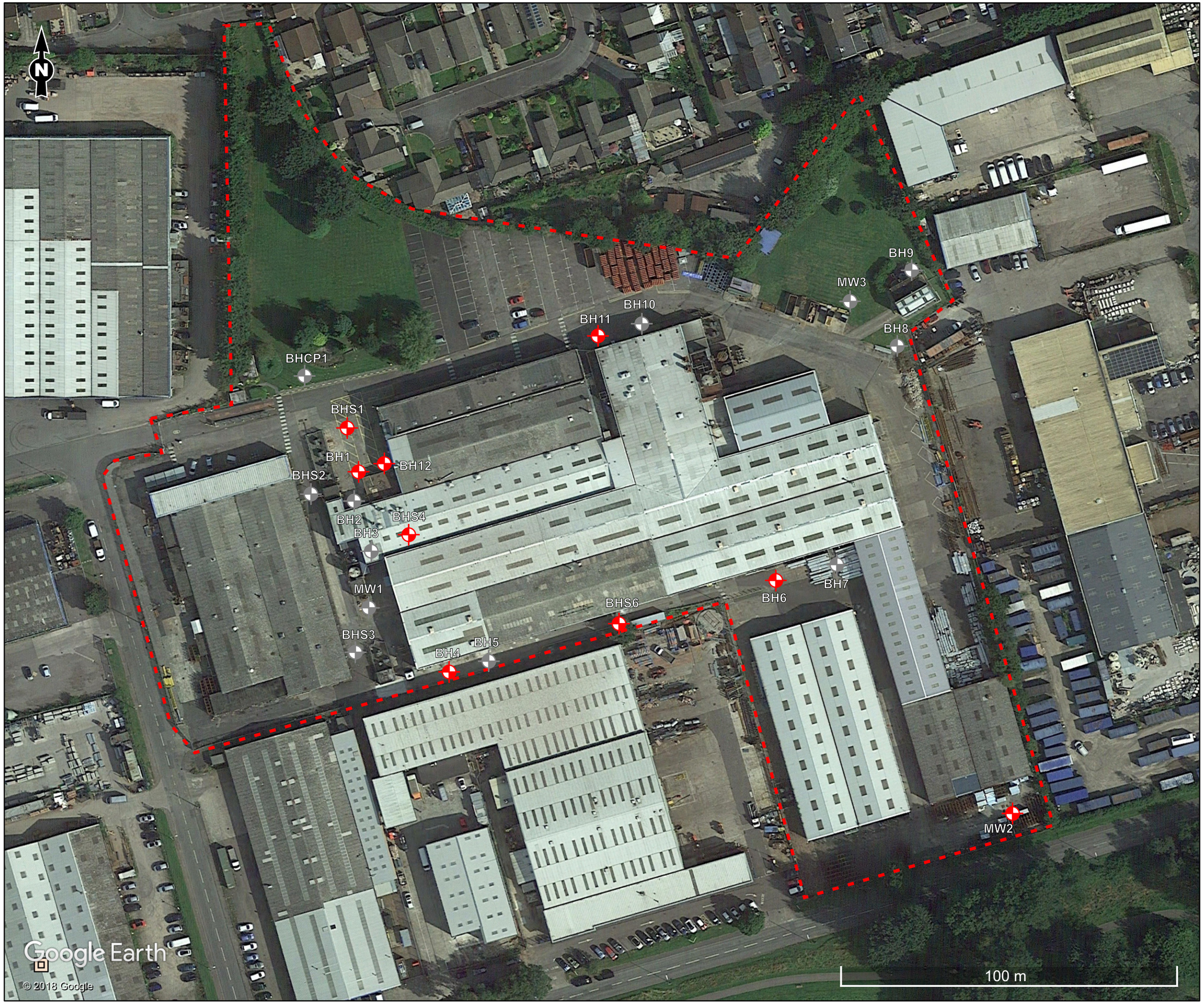
Appendix 2, Groundwater Analytical Results Summary Table

Appendix 3, Contaminant Graphs

Appendix 4, Laboratory Certificate of Analysis

Appendix 1

Borehole Location Plan




## Legend

- Approximate Site Boundary
- Monitoring Well / Borehole Sampled in February 2020
- Monitoring Well / Borehole Not Sampled

Figure Title
Borehole Location Plan

Project Name
SPMP Groundwater Monitoring Round 32

| Project Number | Figure No. |
|---|---|
| 1620009180 | 1 |
| **Date** | **Prepared By** |
| February 2020 | RH |
| **Scale** | **Issue** |
| See Scalebar | 1 |

Client
Hydro Components UK Ltd

RAMBOLL

Appendix 2

Groundwater Analytical Results Summary Table

| Borehole Location | Date | 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) | Water Level (m bgl) | Water Level (m AOD) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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* | | |
| BH1 | Aug-05 | 9 | 9 | NA | ND | ND | ND | ND | ND | ND | ND | ND | 1200 | ND | 6.5 | 10 | 3.85 | 56.78 |
| | Nov-05 | 170 | 8 | ND | ND | ND | ND | ND | ND | ND | ND | 8 | 60 | ND | 6.5 | 12 | 2.90 | 57.73 |
| | Feb-06 | 26 | ND | 16 | ND | ND | ND | ND | ND | 5 | ND | ND | 60 | ND | 6.4 | ND | 3.51 | 57.11 |
| | May-06 | 9.7 | ND | 17 | ND | 11 | ND | ND | ND | ND | ND | ND | ND | ND | 6.5 | 49 | 3.36 | 57.26 |
| | Oct-06 | 58 | ND | 26 | ND | ND | ND | ND | ND | 10 | ND | 7 | 60 | ND | 6.5 | 23 | 3.56 | 57.06 |
| | Feb-07 | 3.4 | ND | 25 | ND | ND | ND | ND | ND | ND | ND | ND | 70 | ND | 6.5 | ND | 2.88 | 57.74 |
| | Jun-07 | 7.9 | ND | 24 | ND | ND | ND | ND | ND | 8 | ND | ND | 730 | ND | 6.4 | 24 | 3.45 | 57.17 |
| | Dec-07 | 20 | ND | 26 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 6.2 | ND | 3.13 | 57.49 |
| | Apr-08 | 170 | ND | 20 | ND | ND | ND | ND | ND | ND | ND | 8 | ND | ND | 6.6 | ND | 3.17 | 57.45 |
| | Aug-08 | 6 | ND | 64 | ND | 7 | ND | ND | ND | ND | ND | 8 | ND | ND | 6.6 | ND | 3.17 | 57.45 |
| | Feb-09 | 8.3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 3.10 | 57.52 |
| | 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 | 56.94 |
| | Oct-09 | 15 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 3.55 | 57.07 |
| | Apr-10 | ND | 0.9 | NA | 0.03 | 14 | ND | ND | ND | 4 | 0.5 | 10 | NA | NA | 6.5 | ND | 3.12 | 57.50 |
| | Sep-10 | 9.39 | ND | 20 | ND | 6 | ND | ND | ND | 2 | ND | ND | 30 | ND | 6.4 | 12 | 3.49 | 57.13 |
| | Apr-11 | 28.95 | ND | 20 | ND | 2 | 2 | ND | ND | 2 | ND | 9 | ND | ND | 6.6 | 6 | 3.72 | 56.90 |
| | Sep-11 | 76.31 | ND | 20 | ND | 7 | ND | ND | ND | 2 | ND | 2 | 50 | ND | 6.4 | 8 | 3.53 | 57.09 |
| | Mar-12 | 51.97 | 1 | ND | 0.1 | 6 | 2 | 3 | ND | 2 | 1 | 6 | 20 | 20 | 7 | 8 | 3.60 | 57.02 |
| | Sep-12 | 7.81 | 1 | 40 | ND | 2 | 3 | 4 | ND | 3 | ND | 20 | 70 | ND | 7.3 | 11 | 3.24 | 57.38 |
| | Apr-13 | 15.75 | ND | NA | ND | 2 | ND | ND | ND | ND | ND | 5 | 20 | ND | 7.3 | 7 | 3.39 | 57.23 |
| | Oct-13 | 11.7 | ND | 20 | ND | 3 | ND | ND | ND | 2 | ND | 7 | 70 | ND | 6.9 | 9 | 3.70 | 56.92 |
| | Jul-14 | 19.01 | ND | 20 | ND | 2 | ND | ND | ND | 1 | ND | 3 | ND | ND | 6.6 | 6 | 3.72 | 56.90 |
| | Jan-15 | 0.98 | ND | ND | ND | ND | ND | ND | ND | 1 | ND | 25 | 110 | ND | 6.9 | 7 | 2.80 | 57.82 |
| | Jul-15 | 14.4 | ND | ND | ND | ND | ND | ND | ND | 3 | ND | ND | 70 | ND | 7.1 | 9 | 3.53 | 57.09 |
| | Feb-16 | 5.2 | ND | 30 | ND | ND | ND | ND | ND | 4 | ND | 74 | 130 | ND | 6.6 | 13 | 2.41 | 58.21 |
| | Aug-16 | 6.11 | ND | 10 | ND | ND | ND | ND | ND | ND | ND | ND | 80 | ND | 6.6 | 8.6 | 3.53 | 57.09 |
| | Jan-17 | 9.03 | ND | ND | ND | 3 | ND | ND | ND | 4 | ND | 5 | 70 | ND | 7.1 | 8.9 | 3.55 | 57.07 |
| | Aug-17 | 41 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 2 | 50 | ND | 6.6 | 10 | 3.46 | 57.16 |
| | Feb-18 | 11.9 | 3 | 40 | ND | ND | ND | ND | ND | 5 | ND | 66 | 300 | ND | 6.8 | 8 | 3.05 | 57.57 |
| | Aug-18 | 0.056 | ND | 20 | ND | ND | ND | ND | ND | ND | ND | 10 | 80 | ND | 6.5 | 12 | 3.76 | 56.86 |
| | Jul-19 | 38.3 | ND | 20 | ND | ND | ND | ND | ND | 1 | ND | 10 | 300 | ND | 6.8 | 21 | 3.86 | 56.76 |
| | Feb-20 | 0.45 | 0.48 | 79 | ND | ND | 4.8 | 0.3 | 0.14 | 2.2 | 0.7 | 65 | 150 | ND | 7.2 | 17 | 2.45 | 58.17 |
| BH4 | Aug-05 | 61 | 10 | NA | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | 6.8 | 34 | 4.02 | 56.62 |
| | Nov-05 | 0.11 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 6.6 | 20 | 3.10 | 57.54 |
| | Feb-06 | 0.07 | ND | 24 | ND | 10 | ND | ND | ND | ND | ND | ND | 110 | ND | 6.8 | 25 | 3.73 | 56.91 |
| | May-06 | 0.02 | ND | 23 | ND | 10 | ND | ND | ND | ND | ND | ND | ND | ND | 6.9 | 26 | 3.56 | 57.08 |
| | Oct-06 | 0.02 | ND | 30 | ND | ND | 17 | ND | ND | ND | ND | 10 | ND | ND | 6.8 | 34 | 3.81 | 56.83 |
| | Feb-07 | 0.4 | ND | 27 | ND | ND | ND | ND | ND | ND | ND | ND | 80 | ND | 7 | 21 | 3.11 | 57.53 |
| | Jun-07 | 0.15 | ND | 30 | ND | ND | ND | ND | ND | ND | ND | ND | 210 | ND | 6.8 | 24 | 3.62 | 57.02 |
| | Dec-07 | ND | ND | 27 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 6.8 | 24 | 3.28 | 57.36 |
| | Apr-08 | 0.19 | ND | 25 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 7.1 | 20 | 3.39 | 57.25 |
| | Aug-08 | ND | ND | 36 | ND | 7 | ND | ND | ND | ND | ND | ND | ND | ND | 6.8 | 19 | 3.30 | 57.34 |
| | Feb-09 | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 3.10 | 57.54 |
| | Jun-09 | ND | 1.3 | 33 | ND | 12 | 1.3 | ND | ND | ND | 1.4 | 7.1 | 40 | ND | 7 | 15 | 3.80 | 56.84 |
| | Oct-09 | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 3.79 | 56.85 |
| | Apr-10 | ND | 2 | NA | ND | 12 | ND | ND | ND | 3 | 0.7 | 5 | NA | NA | 6.9 | 17 | 3.35 | 57.29 |
| | Sep-10 | 0.01 | ND | 20 | ND | 4 | ND | ND | ND | ND | ND | ND | 20 | ND | 6.8 | 15 | 3.62 | 57.02 |
| | Apr-11 | 0.03 | ND | 30 | ND | 4 | 2 | ND | ND | ND | ND | ND | ND | ND | 7 | 16 | 3.84 | 56.80 |
| | Sep-11 | 0.01 | ND | 20 | ND | 7 | ND | ND | ND | ND | 1 | ND | 30 | ND | 6.6 | 18 | 3.61 | 57.03 |
| | Mar-12 | 0.03 | ND | ND | 0.1 | 6 | 3 | 2 | ND | ND | 2 | 5 | ND | ND | 7.3 | 21 | 3.75 | 56.89 |
| | Sep-12 | ND | ND | 20 | ND | 3 | 1 | ND | ND | ND | 1 | ND | ND | ND | 7.5 | 19 | 3.42 | 57.22 |
| | Apr-13 | 0.02 | ND | NA | ND | 3 | ND | ND | ND | ND | ND | ND | 10 | ND | 7.4 | 17 | 3.57 | 57.07 |
| | Oct-13 | 0.02 | ND | 20 | ND | 3 | ND | ND | ND | ND | ND | ND | ND | ND | 7.2 | 18 | 3.80 | 56.84 |
| | Jul-14 | ND | ND | 20 | ND | 3 | ND | ND | ND | ND | ND | ND | ND | ND | 7 | 14 | 3.86 | 56.78 |
| | Jan-15 | ND | ND | ND | ND | 1 | ND | ND | ND | ND | ND | ND | ND | ND | 7.3 | 15 | 2.97 | 57.67 |
| | Jul-15 | ND | ND | 20 | ND | 2 | ND | ND | ND | ND | ND | ND | 20 | ND | 7.5 | 16 | 3.65 | 56.99 |
| | Feb-16 | 0.02 | ND | 30 | ND | 2 | ND | ND | ND | ND | ND | 21 | 10 | ND | 6.8 | 14 | 2.50 | 58.14 |
| | Aug-16 | 0.04 | ND | 10 | ND | ND | ND | ND | ND | ND | ND | 2 | ND | ND | 6.8 | 17.5 | 3.69 | 56.95 |
| | Jan-17 | 0.01 | ND | ND | ND | 2 | ND | ND | ND | ND | ND | 2 | 10 | ND | 7.4 | 17.6 | 3.70 | 56.94 |
| | Aug-17 | 0.01 | ND | ND | ND | 1 | ND | ND | ND | ND | ND | ND | ND | ND | 6.7 | 17 | 3.60 | 57.04 |
| | Feb-18 | 0.01 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 150 | ND | ND | 6.9 | 19 | 3.22 | 57.42 |
| | Aug-18 | 0.016 | ND | 20 | ND | ND | ND | ND | ND | ND | 1 | ND | 30 | ND | 6.8 | 18 | 3.90 | 56.74 |
| | Jul-19 | 0.047 | ND | 30 | ND | ND | ND | ND | ND | ND | 1 | ND | 190 | ND | 6.8 | 22 | 4.00 | 56.64 |
| | Feb-20 | ND | 0.24 | 27 | ND | 1.7 | 1.3 | ND | 0.11 | ND | 1.3 | 4.1 | ND | ND | 7.3 | 15.9 | 2.55 | 58.09 |
| BH6 | Aug-05 | 0.03 | 9 | NA | 2 | ND | ND | ND | ND | 48 | ND | 140 | 700 | ND | 5.5 | 440 | 3.68 | 56.96 |
| | Nov-05 | 0.05 | 8 | ND | 2 | ND | ND | ND | ND | 58 | ND | 200 | 490 | ND | 4.5 | 450 | 3.07 | 57.57 |
| | Feb-06 | 0.03 | ND | 23 | 2 | 7 | 7 | ND | ND | 45 | ND | 130 | 1200 | ND | 4.6 | 740 | 3.45 | 57.19 |
| | May-06 | ND | ND | 25 | 2 | ND | 9 | ND | ND | 56 | ND | 160 | 920 | ND | 4.5 | 830 | 3.29 | 57.35 |
| | Oct-06 | 0.01 | ND | 21 | 1 | ND | 7 | ND | ND | 46 | ND | 130 | 120 | ND | 4.5 | 380 | 3.41 | 57.23 |
| | Feb-07 | ND | ND | 29 | 1 | ND | 5 | ND | ND | 36 | ND | 95 | 630 | ND | 4.6 | 340 | 2.99 | 57.65 |
| | Jun-07 | 0.03 | ND | 27 | ND | ND | ND | ND | ND | 24 | ND | 54 | 470 | ND | 4.6 | 230 | 3.39 | 57.25 |
| | Dec-07 | ND | ND | 29 | ND | ND | ND | ND | ND | 13 | ND | 53 | 200 | ND | 4.7 | 110 | 3.18 | 57.46 |
| | Apr-08 | ND | ND | 27 | ND | ND | ND | ND | ND | 15 | ND | 39 | 140 | ND | 5.0 | 170 | 3.27 | 57.37 |
| | Aug-08 | ND | ND | 31 | ND | ND | ND | ND | ND | 13 | ND | 31 | 140 | ND | 5.0 | 130 | 3.08 | 57.56 |
| | Jun-09 | ND | ND | 34 | ND | ND | ND | ND | ND | 6.7 | ND | 23 | 160 | ND | 5.5 | 97 | 4.83 | 55.81 |
| | Apr-10 | ND | 1.1 | NA | 0.22 | 3 | ND | ND | ND | 5 | 1.1 | 21 | NA | NA | 5.6 | 100 | 3.28 | 57.36 |
| | Sep-10 | ND | ND | 20 | 0.3 | 2 | ND | ND | ND | 4 | ND | 54 | 20 | ND | 5.6 | 58 | 3.42 | 57.22 |
| | Apr-11 | 0.59 | ND | 50 | 0.2 | 1 | 2 | ND | ND | 3 | ND | 20 | ND | ND | 5.6 | 61 | 3.60 | 57.04 |
| | Sep-11 | 0.97 | ND | 20 | 0.2 | 4 | ND | ND | ND | 5 | ND | 11 | 20 | ND | 5.9 | 47 | 3.46 | 57.18 |
| | Mar-12 | 0.01 | ND | ND | 0.3 | 2 | ND | 2 | 0.1 | 1 | 1 | 9 | ND | ND | 6.8 | 60 | 3.50 | 57.14 |
| | Sep-12 | 0.06 | ND | 20 | 0.1 | ND | ND | 2 | ND | 1 | 2 | 12 | ND | ND | 7 | 51 | 3.24 | 57.40 |
| | Apr-13 | 0.03 | ND | NA | 0.2 | 2 | ND | ND | ND | 1 | 1 | 29 | ND | ND | 7.1 | 49 | 3.36 | 57.28 |
| | Oct-13 | 0.06 | ND | 20 | 0.1 | 2 | ND | ND | ND | ND | 1 | 13 | ND | ND | 6.8 | 32 | 3.56 | 57.08 |
| | Jul-14 | 0.01 | ND | 20 | ND | 1 | ND | ND | ND | ND | 1 | 3 | ND | ND | 6.8 | 35 | 3.60 | 57.04 |
| | Jan-15 | 0.08 | ND | ND | ND | ND | 2 | ND | ND | 4 | ND | 4 | 10 | ND | 6.9 | 37 | 2.95 | 57.69 |
| | Jul-15 | 0.03 | ND | 20 | ND | ND | ND | ND | ND | 1 | 1 | ND | 20 | ND | 7.3 | 29 | 3.45 | 57.19 |
| | Feb-16 | 0.15 | 1 | 80 | 0.2 | ND | 7 | 1 | ND | 8 | 1 | 64 | 20 | ND | 6.5 | 43 | 2.51 | 58.13 |
| | Aug-16 | 0.02 | ND | 70 | 0.1 | ND | 3 | ND | ND | 6 | ND | 98 | ND | ND | 6.7 | 32.6 | 3.43 | 57.21 |
| | Jan-17 | 0.05 | 1 | ND | 0.2 | ND | 5 | ND | ND | 7 | ND | 4 | 10 | ND | 7.3 | 36.2 | 3.43 | 57.21 |
| | Aug-17 | 0.02 | 1 | ND | 0.1 | ND | 4 | ND | ND | 5 | 1 | ND | ND | ND | 6.8 | 38 | 3.37 | 57.27 |
| | Feb-18 | 0.29 | 4 | 190 | 0.6 | ND | 19 | 4 | ND | 19 | 5 | 248 | 20 | ND | 7 | 44 | 3.07 | 57.57 |
| | Aug-18 | 0.011 | ND | ND | ND | ND | 52 | ND | ND | 14 | ND | 173 | 110 | ND | 7 | 39 | 3.58 | 57.06 |
| | Jul-19 | 0.037 | ND | 20 | ND | ND | ND | ND | ND | 2 | ND | 4 | 120 | ND | 6.9 | 35 | 3.66 | 56.98 |
| | Feb-20 | ND | 5.47 | 40 | 0.36 | 1 | 26 | 9.8 | 0.06 | 23 | 3.2 | 19 | < 15 | < 10 | 7.6 | 31.9 | 2.55 | 58.09 |
| BH11 | Aug-05 | 0.06 | 11 | NA | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | 7.4 | 190 | 3.62 | 57.02 |
| | Nov-05 | 0.05 | 6 | ND | ND | ND | ND | ND | ND | ND | ND | 7 | ND | ND | 6.8 | 140 | 2.79 | 57.85 |
| | Feb-06 | 0.03 | ND | 34 | ND | 10 | ND | ND | ND | ND | ND | 6 | 50 | ND | 7.6 | 560 | 3.00 | 57.64 |
| | May-06 | 0.03 | ND | 31 | ND | ND | ND | ND | ND | ND | ND | ND | 400 | 30 | 7.1 | 180 | 3.27 | 57.37 |
| | Oct-06 | 0.09 | ND | 12 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 6.9 | 13 | 3.33 | 57.31 |
| | Feb-07 | ND | ND | 34 | ND | ND | ND | ND | ND | ND | ND | ND | 70 | 50 | 6.8 | 31 | 2.77 | 57.87 |
| | Jun-07 | 0.04 | ND | 32 | ND | ND | ND | ND | ND | ND | ND | ND | 220 | ND | 6.8 | 44 | 3.21 | 57.43 |
| | Dec-07 | ND | ND | 31 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 20 | 6.5 | 49 | 3.08 | 57.56 |
| | Apr-08 | 0.17 | ND | 21 | ND | ND | ND | ND | ND | ND | ND | 47 | ND | ND | 7.0 | 30 | 3.00 | 57.64 |
| | Aug-08 | 0.04 | ND | 25 | ND | 6 | 5 | ND | ND | 25 | ND | 94 | 60 | ND | 6.8 | 200 | 3.10 | 57.54 |
| | Jun-09 | ND | ND | ND | ND | ND | 1.9 | 1.8 | ND | 2.5 | ND | 24 | 230 | ND | 6.7 | 23 | 3.50 | 57.14 |
| | Apr-10 | ND | 1.7 | NA | 0.04 | 10 | ND | ND | 0.05 | 4 | 1.8 | 7 | NA | NA | 6.5 | 49 | 3.05 | 57.59 |
| | Sep-10 | 0.04 | ND | 40 | ND | 3 | ND | ND | ND | 2 | ND | 12 | 80 | 190 | 7.0 | 53 | 3.36 | 57.28 |
| | Apr-11 | 0.24 | ND | 30 | ND | 2 | 3 | ND | ND | 1 | ND | 5 | 10 | 260 | 7.3 | 28 | 3.56 | 57.08 |
| | Sep-11 | 0.04 | ND | 20 | ND | 5 | 1 | ND | ND | 1 | 1 | 18 | 10 | 60 | 6.5 | 41 | 3.48 | 57.16 |
| | Mar-12 | 0.01 | ND | ND | ND | 3 | ND | ND | ND | ND | 2 | 16 | ND | 40 | 7.3 | 28 | 3.51 | 57.13 |
| | Sep-12 | 0.47 | ND | 20 | ND | 1 | 1 | 2 | ND | 6 | ND | 15 | 800 | ND | 7.1 | 18 | 3.11 | 57.53 |
| | Apr-13 | 0.04 | ND | NA | 0.1 | 2 | ND | ND | ND | 3 | 1 | 10 | 900 | 40 | 7.1 | 31 | 3.26 | 57.38 |
| | Oct-13 | 0.07 | ND | 30 | ND | 2 | 3 | ND | ND | 2 | 1 | 10 | 70 | 560 | 7.5 | 40 | 3.60 | 57.04 |
| | Jul-14 | 0.19 | ND | 50 | ND | 1 | 1 | ND | ND | 1 | ND | 7 | ND | 50 | 6.8 | 23 | 3.64 | 57.00 |
| | Jan-15 | 0.01 | ND | ND | ND | ND | ND | ND | 0.3 | 1 | ND | 18 | 30 | ND | 7.7 | 26 | 2.71 | 57.93 |
| | Jul-15 | 0.03 | ND | ND | ND | ND | ND | ND | ND | 3 | ND | 10 | 20 | ND | 7.3 | 12 | 3.45 | 57.19 |
| | Feb-16 | 0.01 | ND | ND | ND | ND | ND | ND | ND | ND | 2 | 5 | 500 | ND | 6.4 | 36 | 2.38 | 58.26 |
| | Aug-16 | 0.09 | ND | ND | ND | ND | ND | ND | ND | 3 | ND | 13 | 30 | ND | 6.8 | 27 | 3.44 | 57.20 |
| | Jan-17 | 0.09 | ND | ND | ND | 2 | 3 | 3 | ND | 8 | ND | 7 | 2100 | ND | 7.1 | 24.8 | 3.42 | 57.22 |
| | Aug-17 | 0.08 | ND | 80 | ND | ND | ND | ND | ND | 2 | ND | 11 | 200 | ND | 7 | 39 | 3.36 | 57.28 |
| | Feb-18 | ND | ND | 20 | ND | ND | ND | ND | ND | ND | 3 | 89 | 30 | 30 | 6.6 | 35 | 2.96 | 57.68 |
| | Aug-18 | 0.056 | ND | 140 | ND | ND | 2 | ND | ND | 5 | 1 | 82 | 1200 | 20 | 6.8 | 39 | 3.67 | 56.97 |
| | Jul-19 | 0.316 | ND | 60 | ND | ND | ND | ND | ND | 5 | 2 | 7 | 1600 | 50 | 7.1 | 35 | 3.77 | 56.87 |
| | Feb-20 | ND | ND | 47 | 0.03 | ND | 1.5 | ND | 0.52 | 1.5 | 3.3 | 30 | 26 | ND | 7.4 | 24.3 | 2.43 | 58.21 |

| Borehole Location | Date | 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) | Water Level (m bgl) | Water Level (m AOD) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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* | | |
| BH12 | Aug-05 | 7.8 | 7 | NA | ND | ND | ND | ND | ND | ND | ND | ND | 1400 | ND | 6.6 | 5 | 4.00 | 56.77 |
| | Nov-05 | 34 | ND | ND | ND | 20 | ND | ND | ND | 7 | ND | 9 | ND | ND | 6.4 | 22 | 3.02 | 57.75 |
| | Feb-06 | 13 | ND | 16 | ND | ND | ND | ND | ND | 10 | ND | ND | 70 | ND | 6.3 | ND | 3.64 | 57.13 |
| | May-06 | 71 | ND | 15 | ND | 10 | ND | ND | ND | 5 | ND | ND | ND | ND | 6.5 | ND | 3.51 | 57.26 |
| | Oct-06 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | Feb-07 | 21 | ND | 23 | ND | ND | ND | ND | ND | ND | ND | ND | 120 | ND | 6.5 | ND | 3.01 | 57.76 |
| | Jun-07 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | Dec-07 | 1000 | ND | 26 | ND | ND | ND | ND | ND | 7 | ND | 30 | 79 | ND | 6.3 | ND | 3.23 | 57.54 |
| | Apr-08 | 34 | ND | 19 | ND | ND | ND | ND | ND | 5 | ND | ND | ND | ND | 6.6 | ND | 3.33 | 57.44 |
| | Aug-08 | 260 | ND | 23 | ND | ND | ND | ND | ND | ND | ND | 8 | ND | ND | 6.5 | ND | 3.28 | 57.49 |
| | Feb-09 | 48 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 3.11 | 57.66 |
| | Jun-09 | 240 | ND | ND | ND | ND | 2 | 1.5 | ND | 3.7 | ND | 15 | 190 | ND | 6.4 | 4.8 | 3.68 | 57.09 |
| | Oct-09 | 380 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | | NA | 3.85 | 56.92 |
| | Apr-10 | 72 | 1.7 | NA | 0.04 | 15 | 0.9 | ND | ND | 6 | 0.9 | 7 | NA | NA | 6.5 | ND | 3.45 | 57.32 |
| | Sep-10 | 160.7 | ND | 20 | ND | 5 | ND | ND | ND | 2 | ND | 6 | 40 | ND | 6.4 | ND | 3.71 | 57.06 |
| | Apr-13 | 45.98 | 1 | NA | ND | 2 | ND | ND | ND | 12 | ND | 10 | 10 | ND | 7.2 | 8 | 3.51 | 57.26 |
| | Oct-13 | 128 | ND | 10 | ND | 3 | ND | ND | ND | 2 | ND | 8 | 80 | ND | 6.9 | ND | 3.80 | 56.97 |
| | Jul-14 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | 3.88 | 56.89 |
| | Jan-15 | 34.2 | ND | ND | ND | ND | ND | ND | ND | 1 | ND | 67 | 60 | ND | 6.8 | ND | 2.92 | 57.85 |
| | Jul-15 | 49 | ND | ND | ND | ND | ND | ND | ND | 4 | ND | ND | 80 | ND | 6.9 | ND | 3.68 | 57.09 |
| | Feb-16 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | 2.55 | 58.22 |
| | Aug-16 | 90.2 | ND | 10 | ND | ND | ND | ND | ND | 2 | ND | 7 | 40 | ND | 6.5 | ND | 3.69 | 57.08 |
| | Jan-17 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | 3.70 | 57.07 |
| | Aug-17 | 121 | ND | ND | ND | ND | ND | ND | ND | 2 | ND | ND | 50 | ND | 6.5 | ND | 3.63 | 57.14 |
| | Feb-18 | 34.3 | ND | ND | ND | ND | ND | ND | ND | 1 | ND | 11 | 200 | ND | 6.7 | 4 | 3.18 | 57.59 |
| | Aug-18 | 42.7 | ND | 20 | ND | ND | ND | ND | ND | 5 | ND | 20 | ND | ND | 6.5 | 5 | 3.92 | 56.85 |
| | Jul-19 | 95.8 | ND | 20 | ND | ND | ND | ND | ND | 3 | ND | 5 | 100 | ND | 6.7 | ND | 3.98 | 56.79 |
| | Feb-20 | 2.3 | ND | 56 | 0.03 | ND | 2.4 | 0.6 | 0.35 | 1.9 | 0.7 | 29 | 97 | ND | 7 | 3.85 | 2.59 | 58.18 |
| MW1 | Aug-05 | 0.17 | 11 | NA | ND | ND | ND | ND | ND | ND | ND | 32 | 160 | ND | 6.6 | 24 | 4.01 | 56.66 |
| | Nov-05 | 0.13 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 43 | ND | ND | 6.8 | 33 | 3.11 | 57.56 |
| | Feb-06 | 0.16 | ND | 22 | ND | ND | ND | ND | ND | ND | ND | 80 | 50 | ND | 6.6 | 25 | 3.73 | 56.94 |
| | May-06 | 0.14 | ND | 20 | ND | 8 | ND | ND | ND | ND | ND | 32 | ND | ND | 6.8 | 23 | 3.58 | 57.09 |
| | Oct-06 | 0.08 | 12 | 20 | ND | 10 | 5 | ND | ND | ND | ND | 24 | ND | ND | 7.2 | 22 | 3.87 | 56.80 |
| | Feb-07 | 0.58 | ND | 27 | ND | ND | ND | ND | ND | ND | ND | 51 | 230 | ND | 7 | 22 | 3.18 | 57.49 |
| | Jun-07 | 0.35 | ND | 27 | ND | ND | ND | ND | ND | ND | ND | 40 | 80 | ND | 6.7 | 21 | 3.61 | 57.06 |
| | Dec-07 | 0.31 | ND | 29 | ND | ND | ND | ND | ND | ND | ND | 40 | ND | ND | 6.5 | 22 | 3.29 | 57.38 |
| | Apr-08 | 2.1 | ND | 26 | ND | ND | ND | ND | ND | ND | ND | 37 | 50 | ND | 6.8 | 20 | 3.41 | 57.26 |
| | Aug-08 | 0.06 | ND | 26 | ND | ND | ND | ND | ND | ND | ND | 56 | ND | ND | 6.7 | 18 | 3.29 | 57.38 |
| | Feb-09 | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 3.44 | 57.23 |
| | Jun-09 | ND | ND | ND | ND | ND | 10 | 14 | ND | 3.4 | ND | 120 | 210 | ND | 7 | 2.6 | 3.15 | 57.52 |
| | Oct-09 | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 3.87 | 56.80 |
| | Apr-10 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 3.41 | 57.26 |
| | Sep-10 | 0.03 | ND | 20 | 0.1 | 4 | 1 | ND | ND | 1 | ND | 86 | 20 | ND | 6.6 | 24 | 3.64 | 57.03 |
| | Apr-11 | 0.55 | ND | 30 | 0.1 | 1 | 5 | ND | ND | 2 | ND | 126 | ND | ND | 6.8 | 22 | 3.86 | 56.81 |
| | Sep-11 | 0.12 | ND | 50 | ND | 4 | 1 | ND | ND | 1 | ND | 49 | 20 | ND | 6.7 | 26 | 3.64 | 57.03 |
| | Mar-12 | 0.12 | ND | ND | 0.2 | 5 | 3 | 3 | ND | 2 | 1 | 126 | ND | ND | 7.1 | 22 | 3.75 | 56.92 |
| | Sep-12 | 0.31 | ND | 20 | ND | 2 | 2 | 2 | ND | 1 | 1 | 46 | ND | ND | 7.3 | 19 | 3.41 | 57.26 |
| | Apr-13 | 0.08 | ND | NA | 0.1 | 2 | ND | ND | ND | 2 | ND | 84 | 30 | ND | 7.3 | 17 | 3.56 | 57.11 |
| | Oct-13 | 2.32 | ND | 20 | ND | 2 | ND | ND | ND | 2 | 1 | 73 | ND | ND | 7 | 22 | 3.80 | 56.87 |
| | Jul-14 | 2.42 | ND | 20 | ND | 1 | 1 | ND | ND | 2 | ND | 40 | ND | ND | 6.9 | 15 | 3.86 | 56.81 |
| | Jan-15 | 0.31 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 36 | 10 | ND | 7.2 | 14 | 2.95 | 57.72 |
| | Jul-15 | 0.08 | ND | 20 | ND | ND | ND | ND | ND | 1 | ND | 26 | 60 | ND | 7.4 | 20 | 3.65 | 57.02 |
| | Feb-16 | 0.3 | ND | ND | ND | ND | 1 | ND | ND | ND | ND | 26 | 10 | ND | 6.8 | 26 | 2.47 | 58.20 |
| | Aug-16 | 0.15 | ND | 10 | ND | ND | 1 | ND | ND | ND | 1 | 14 | ND | ND | 6.6 | 19.8 | 3.67 | 57.00 |
| | Jan-17 | 0.15 | ND | ND | ND | 2 | 1 | ND | ND | ND | ND | 38 | ND | ND | 7.2 | 20.7 | 3.70 | 56.97 |
| | Aug-17 | 0.06 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 46 | ND | ND | 6.8 | 24 | 3.60 | 57.07 |
| | Feb-18 | 0.03 | ND | 80 | ND | ND | ND | ND | ND | ND | ND | 168 | ND | ND | 6.9 | 22 | 3.20 | 57.47 |
| | Aug-18 | 0.339 | ND | 20 | 0.3 | ND | 2 | ND | ND | 1 | 2 | 116 | ND | ND | 6.7 | 20 | 3.88 | 56.79 |
| | Jul-19 | 0.147 | ND | 30 | ND | ND | ND | ND | ND | ND | ND | 22 | 340 | ND | 7 | 29 | 3.99 | 56.68 |
| | Feb-20 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| MW2 | Aug-05 | 0.03 | 6 | NA | ND | ND | ND | ND | ND | 140 | ND | 120 | 95 | ND | 5.5 | 370 | 3.19 | 56.06 |
| | Nov-05 | 0.1 | ND | ND | 2 | ND | ND | ND | ND | 100 | ND | 100 | ND | ND | 5.4 | 380 | 2.60 | 56.65 |
| | Feb-06 | 0.27 | ND | 24 | 4 | 6 | ND | ND | ND | 140 | ND | 110 | 70 | ND | 5.5 | 480 | 3.00 | 56.25 |
| | May-06 | ND | ND | 25 | 3 | ND | ND | ND | ND | 120 | ND | 91 | 70 | ND | 5.6 | 580 | 2.94 | 56.31 |
| | Oct-06 | 0.01 | ND | 27 | 7 | ND | ND | ND | ND | 210 | ND | 200 | 90 | ND | 5.8 | 790 | 3.04 | 56.21 |
| | Feb-07 | ND | ND | 33 | 3 | ND | ND | ND | ND | 150 | ND | 110 | 90 | ND | 5.6 | 510 | 2.69 | 56.56 |
| | Jun-07 | 0.03 | ND | 28 | 5 | ND | ND | ND | ND | 170 | ND | 170 | 240 | ND | 5.4 | 510 | 2.94 | 56.31 |
| | Dec-07 | ND | ND | 29 | 3 | ND | ND | ND | ND | 100 | ND | 120 | 88 | ND | 5.5 | 350 | 2.68 | 56.57 |
| | Apr-08 | ND | ND | 27 | 2 | ND | ND | ND | ND | 62 | ND | 72 | ND | ND | 5.5 | 210 | 2.83 | 56.42 |
| | Aug-08 | 0.09 | ND | 30 | 1 | ND | ND | ND | ND | 50 | ND | 76 | ND | ND | 5.6 | 170 | 2.70 | 56.55 |
| | Jun-09 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | Apr-10 | ND | 0.5 | NA | 0.54 | 8 | 3.6 | ND | ND | 10 | 0.6 | 170 | NA | NA | 6.3 | 100 | NA | NA |
| | Sep-10 | 0.04 | ND | 30 | 0.8 | 3 | ND | ND | ND | 19 | ND | 121 | 30 | ND | 6.1 | 82 | 2.94 | 56.31 |
| | Apr-11 | 11.97 | ND | 30 | 0.1 | 2 | 2 | ND | ND | 5 | ND | 7 | ND | ND | 7.4 | 71 | 3.14 | 56.11 |
| | Sep-11 | 0.3 | ND | 40 | 0.1 | 5 | ND | ND | ND | 10 | ND | 11 | 60 | ND | 6.4 | 71 | 3.00 | 56.25 |
| | Mar-12 | 0.2 | ND | ND | 0.5 | 2 | 1 | 6 | ND | 12 | 1 | 33 | ND | ND | 7 | 61 | 3.09 | 56.16 |
| | Sep-12 | 0.22 | ND | 20 | 0.1 | ND | 1 | 5 | ND | 8 | ND | 30 | ND | ND | 7.1 | 54 | 2.82 | 56.43 |
| | Apr-13 | 0.13 | ND | NA | 0.4 | 2 | ND | ND | ND | 5 | ND | 21 | 30 | ND | 7.7 | 55 | 2.95 | 56.30 |
| | Oct-13 | 0.38 | ND | 20 | ND | 1 | ND | ND | ND | 6 | ND | 17 | 10 | ND | 6.7 | 60 | 3.12 | 56.13 |
| | Jul-14 | 0.42 | ND | 20 | ND | ND | ND | ND | ND | 4 | ND | 16 | ND | ND | 6.6 | 45 | 3.18 | 56.07 |
| | Jan-15 | 0.11 | ND | ND | 0.1 | ND | ND | ND | ND | 4 | ND | 17 | 50 | ND | 6.8 | 44 | 2.58 | 56.67 |
| | Jul-15 | 0.18 | ND | 30 | ND | ND | ND | ND | ND | 7 | ND | 21 | 50 | ND | 7 | 43 | 3.05 | 56.20 |
| | Feb-16 | 0.06 | ND | ND | 0.1 | ND | ND | ND | ND | 2 | ND | 17 | 20 | ND | 6.3 | 36 | 2.11 | 57.14 |
| | Aug-16 | 0.71 | ND | ND | ND | ND | ND | ND | ND | 2 | ND | 9 | 30 | ND | 6.3 | 36.4 | 3.02 | 56.23 |
| | Jan-17 | 0.12 | ND | ND | 0.1 | 1 | ND | ND | ND | 3 | ND | 9 | 10 | ND | 6.9 | 39.4 | 3.04 | 56.21 |
| | Aug-17 | 0.04 | ND | 80 | ND | ND | ND | ND | ND | 2 | ND | 8 | 10 | ND | 6.2 | 41 | 2.96 | 56.29 |
| | Feb-18 | 0.03 | ND | ND | ND | ND | ND | ND | ND | 2 | ND | 80 | 10 | ND | 6.3 | 36 | 2.70 | 56.55 |
| | Aug-18 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 3.20 | 56.05 |
| | Jul-19 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 3.22 | 56.03 |
| | Feb-20 | ND | 0.37 | 40 | ND | 0.3 | 2.9 | 1.9 | ND | 3.5 | 1.1 | 40 | 330 | ND | 7.5 | 35.7 | 2.18 | 57.07 |
| BHS6 (Sentry Borehole) | Feb-09 | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 3.47 | 57.14 |
| | 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 | 56.61 |
| | Oct-09 | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 4.00 | 56.61 |
| | Apr-10 | 0.74 | 30 | NA | 1.8 | 380 | 410 | 41 | 2.5 | 51 | 21 | 71 | NA | NA | 7.5 | 81 | 3.65 | 56.96 |
| | Sep-10 | 0.01 | ND | 30 | 1 | 28 | 1723 | 11 | ND | 26 | ND | 338 | 300 | ND | 7.3 | 46 | 3.86 | 56.75 |
| | Apr-11 | 0.04 | 10 | 40 | 0.8 | 48 | 85 | 21 | 0.4 | 7 | 4 | 37 | 400 | ND | 7.8 | 55 | 4.03 | 56.57 |
| | Sep-11 | 0.07 | 9 | ND | 1.1 | 28 | 81 | 22 | 0.2 | 7 | 4 | 24 | 400 | ND | 7.5 | 61 | 3.90 | 56.71 |
| | Mar-12 | 0.04 | 8 | ND | 0.9 | 14 | 66 | 17 | ND | 5 | 3 | 22 | 330 | ND | 7.9 | 63 | 3.95 | 56.66 |
| | Sep-12 | 0.04 | 8 | ND | 0.8 | 38 | 99 | 20 | 0.3 | 7 | 3 | 15 | 160 | ND | 8.2 | 59 | 3.66 | 56.95 |
| | Apr-13 | 0.04 | ND | NA | 10.6 | ND | 189 | ND | ND | ND | ND | 515 | 60800 | ND | 8.2 | 60 | 3.81 | 56.80 |
| | Oct-13 | 0.02 | 7 | 50 | 0.5 | 24 | 62 | 14 | 0.2 | 5 | 2 | 20 | 280 | ND | 7.5 | ND | 3.97 | 56.64 |
| | Jul-14 | 0.05 | 8 | ND | 0.5 | 8 | 38 | 4 | ND | 5 | 2 | 11 | 240 | ND | 7.9 | 47 | 4.02 | 56.59 |
| | Jan-15 | 0.03 | 9 | ND | 0.4 | 33 | 119 | 12 | 0.2 | 8 | 1 | 9 | 250 | ND | 7.7 | 3 | 3.30 | 57.31 |
| | Jul-15 | 0.02 | 9 | ND | 0.3 | 10 | 66 | 7 | 0.2 | 5 | 3 | 8 | 320 | ND | 7.8 | 29 | 3.85 | 56.76 |
| | Feb-16 | 0.05 | 5 | 30 | 0.1 | 10 | 38 | 3 | 0.1 | 3 | 2 | 48 | 160 | ND | 7.4 | 56 | 2.85 | 57.76 |
| | Aug-16 | 0.04 | 8 | 60 | 0.3 | 15 | 75 | 7 | 0.2 | 5 | 1 | 58 | 180 | ND | 8.1 | 63.4 | 3.86 | 56.75 |
| | Jan-17 | 0.03 | 9 | ND | 0.3 | 15 | 81 | 7 | 0.1 | 5 | 1 | 19 | 220 | ND | 8.2 | 57.9 | 3.87 | 56.74 |
| | Sep-17 | 0.15 | 8 | ND | 0.3 | 15 | 71 | 8 | ND | 7 | 4 | 27 | 180 | ND | 7.7 | 55 | 3.78 | 56.83 |
| | Feb-18 | 0.58 | 7 | ND | 0.2 | 6 | 49 | 4 | ND | 4 | 2 | 102 | ND | ND | 7.9 | 41 | 3.48 | 57.13 |
| | Aug-18 | 0.011 | ND | ND | ND | ND | 69 | ND | ND | ND | ND | 88 | 200 | ND | 7.7 | 41 | 4.02 | 56.59 |
| | Jul-19 | 0.039 | ND | 20 | ND | 13 | 66 | ND | ND | ND | ND | ND | 470 | ND | 7.8 | 30 | 4.09 | 56.52 |
| | Feb-20 | ND | 2.96 | 39 | ND | 0.7 | 4 | 0.2 | 0.2 | 1.6 | 2.5 | 3.8 | ND | ND | 7.8 | 115 | 2.89 | 57.72 |

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

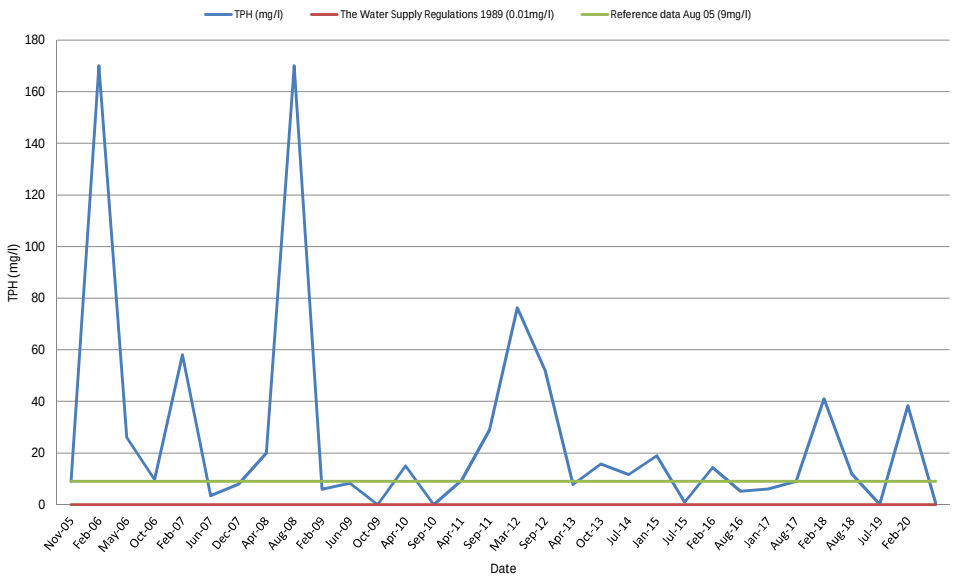
NS = No sample taken - free product present
ND = Not detected above laboratory detection limits
NA = Not analysed

Appendix 3

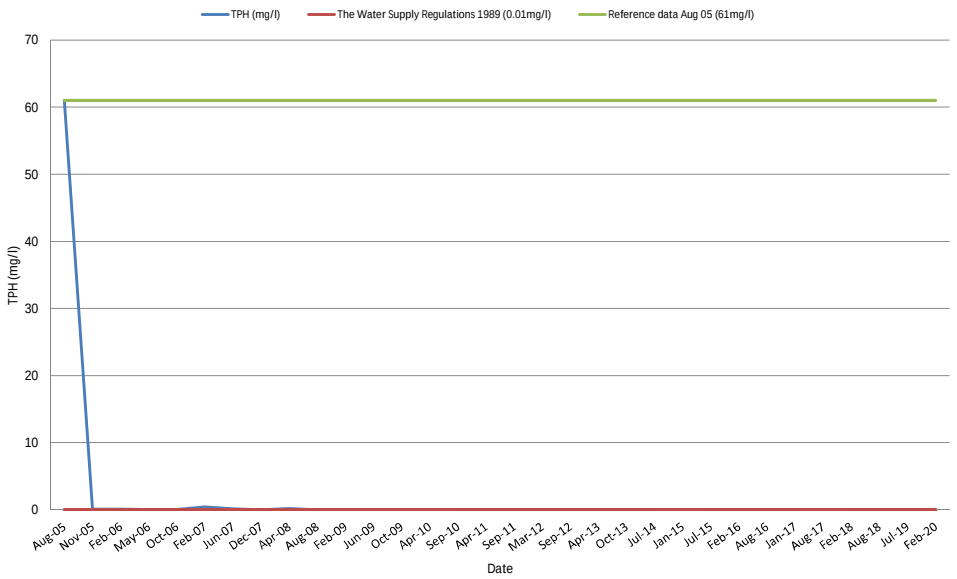
Contaminant Graphs

# TPH in Groundwater Time Series Plots

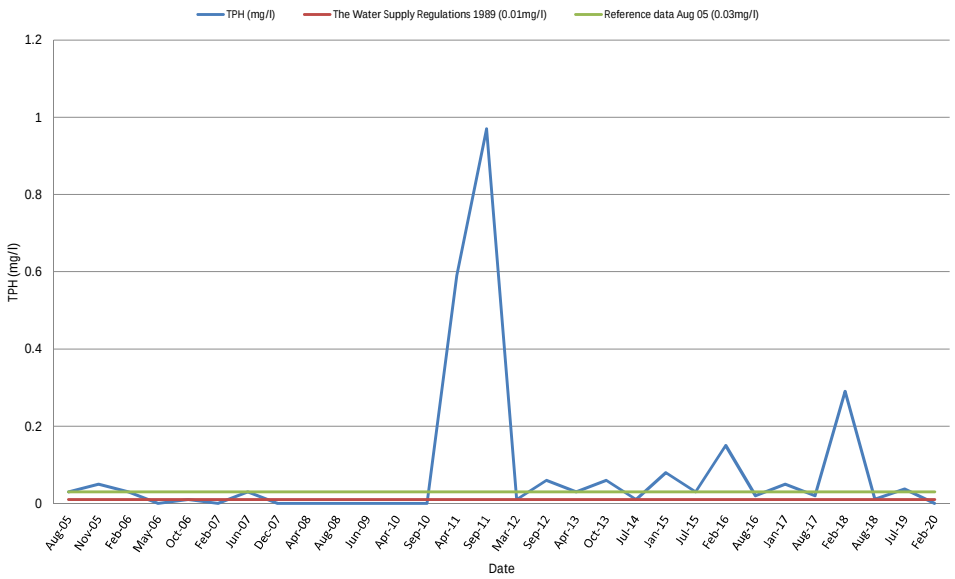
## Borehole BH1



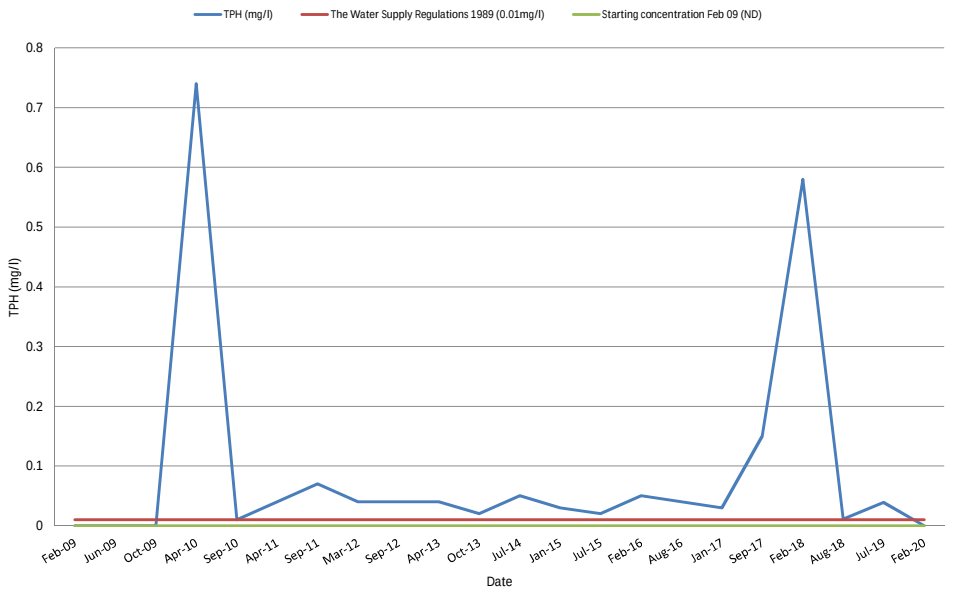

## Borehole BH4




## Borehole BH6

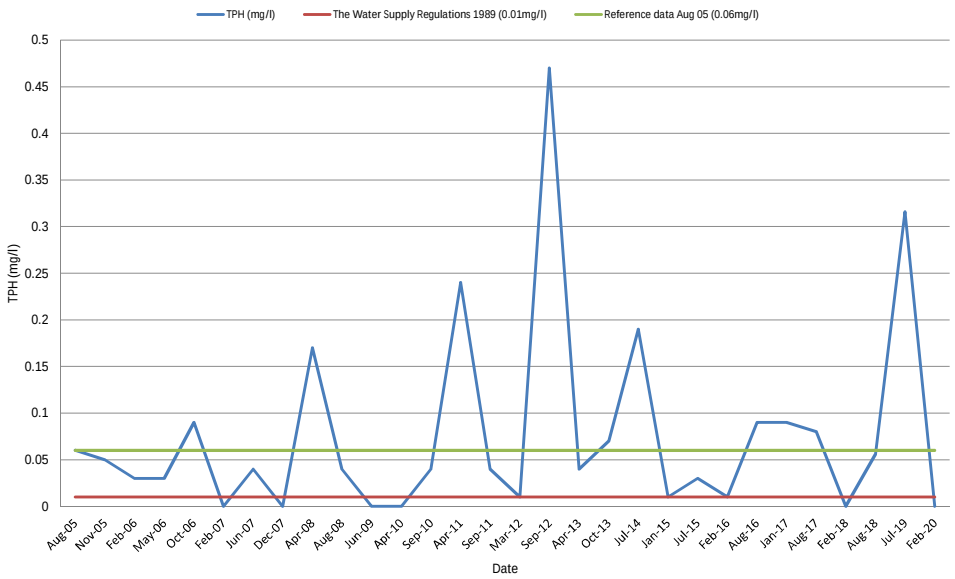



## Borehole BHS6

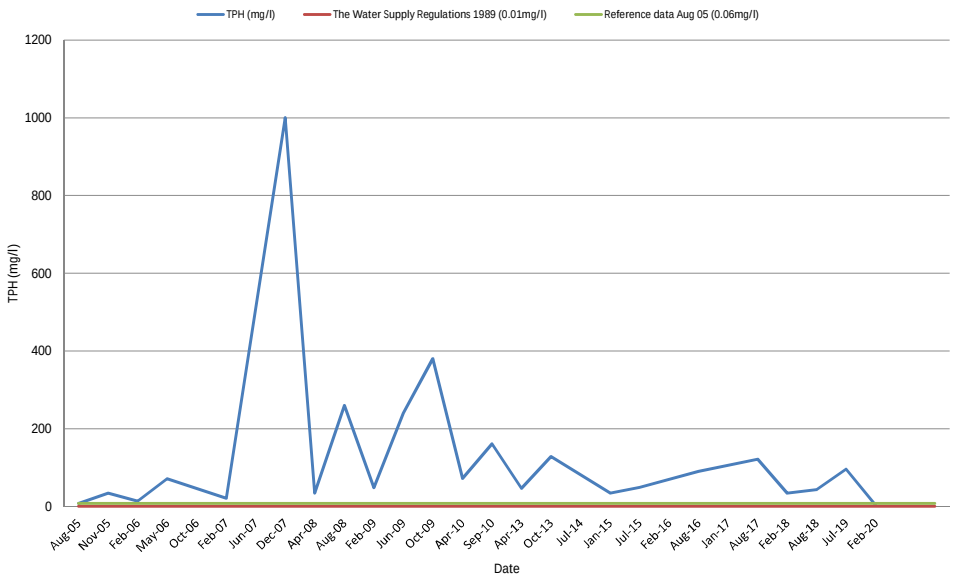


# TPH in Groundwater Time Series Plots

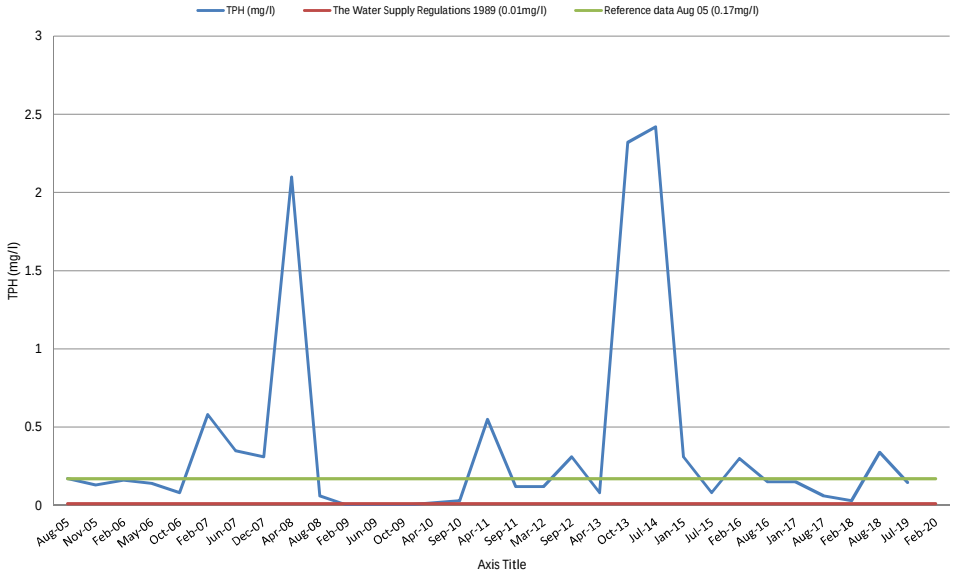
## Borehole BH11



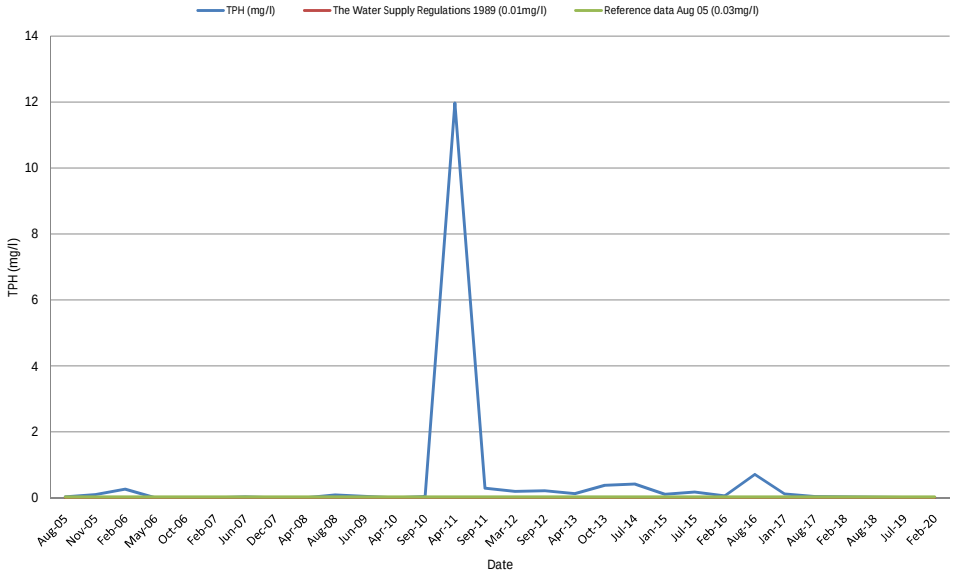

## Borehole BH12




## Borehole MW1

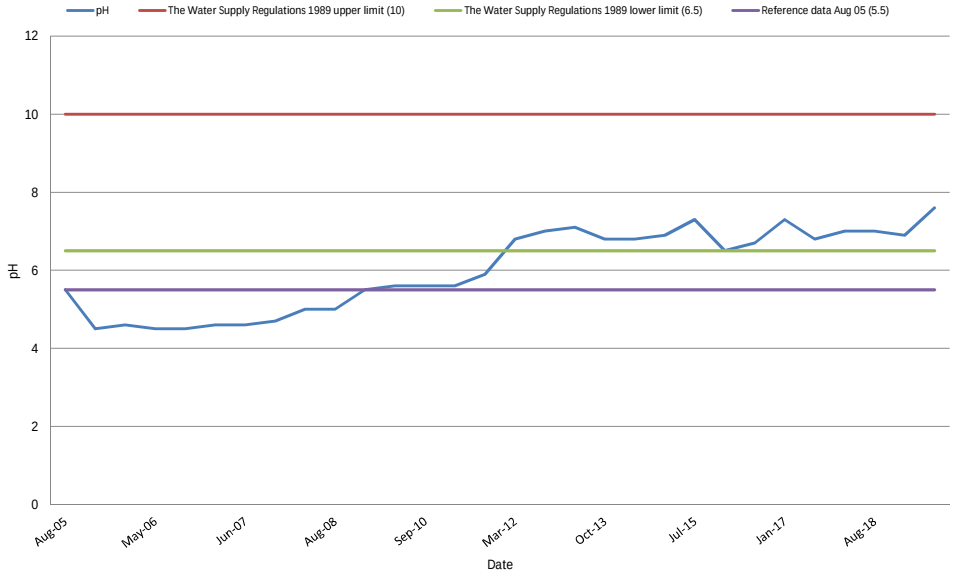



## Borehole MW2

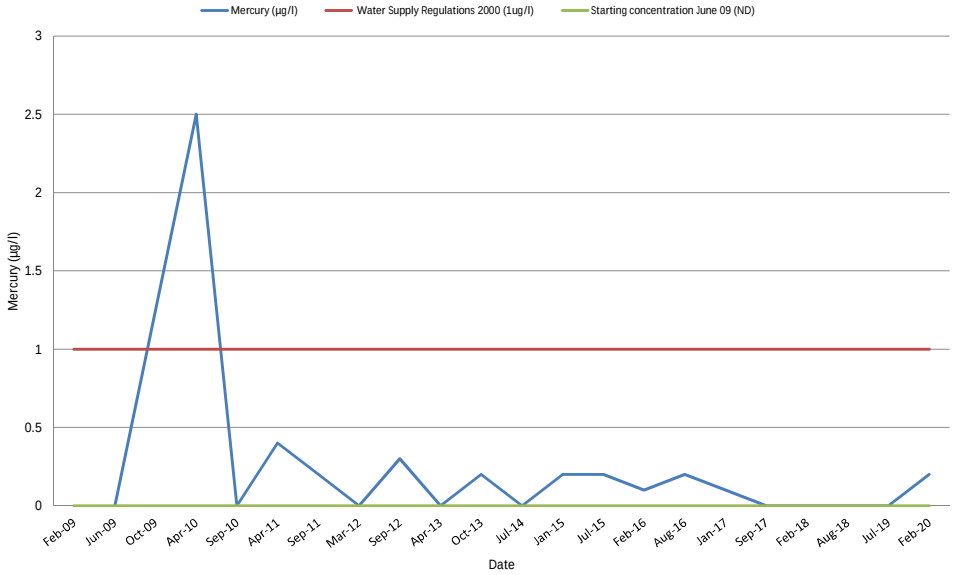


# Contaminants in Groundwater Time Series Plots

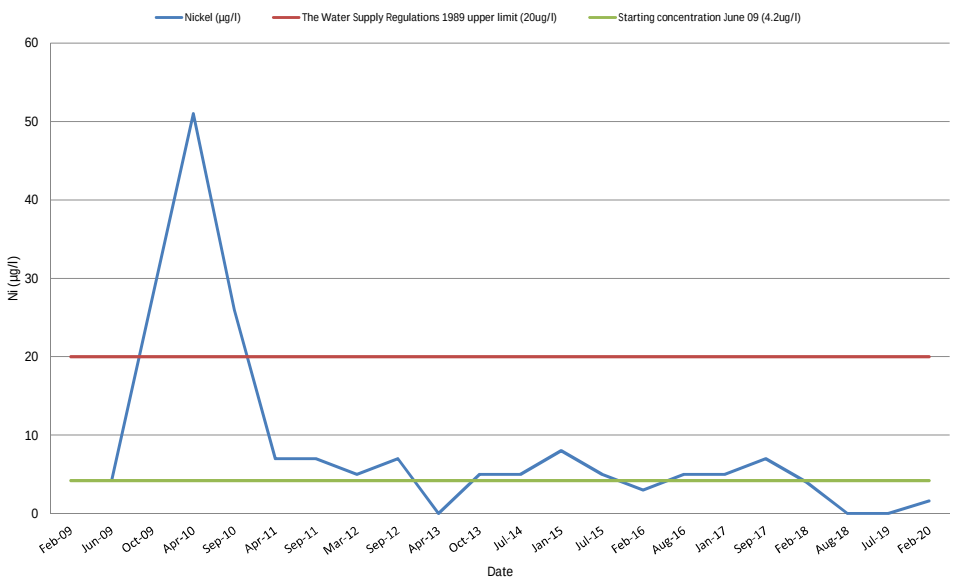
## Borehole 6 - pH



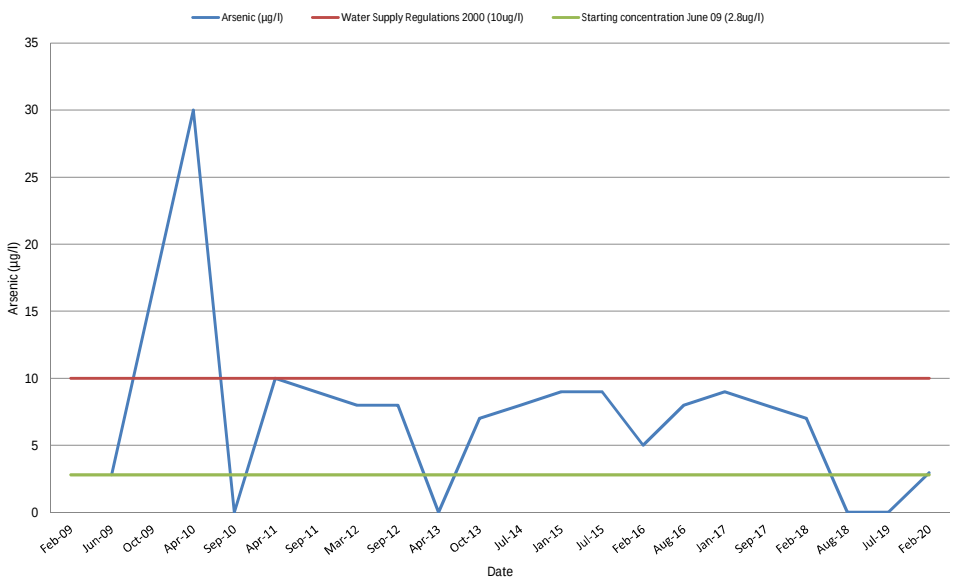

## Borehole BHS6 - Mercury




## Borehole BHS6 - Nickel

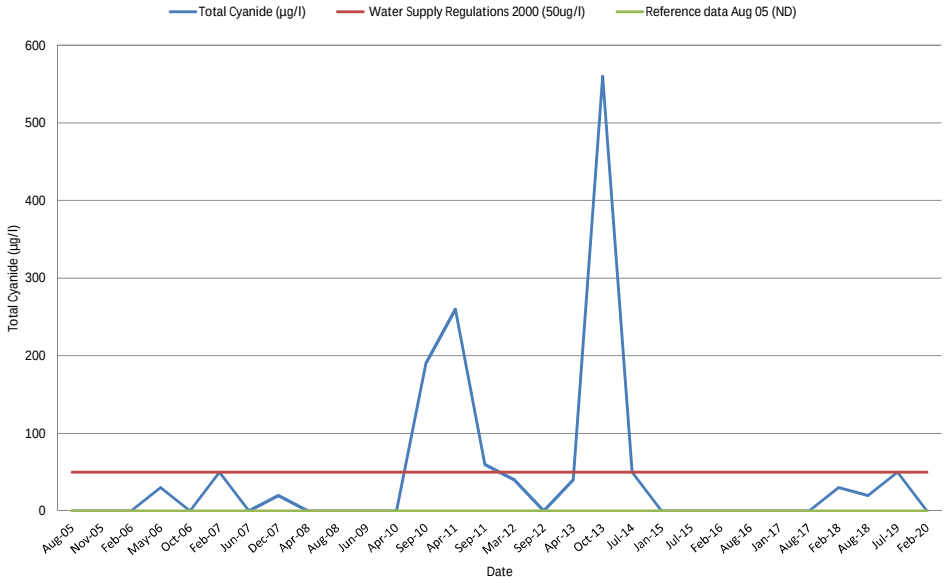



## Borehole BHS6 - Arsenic

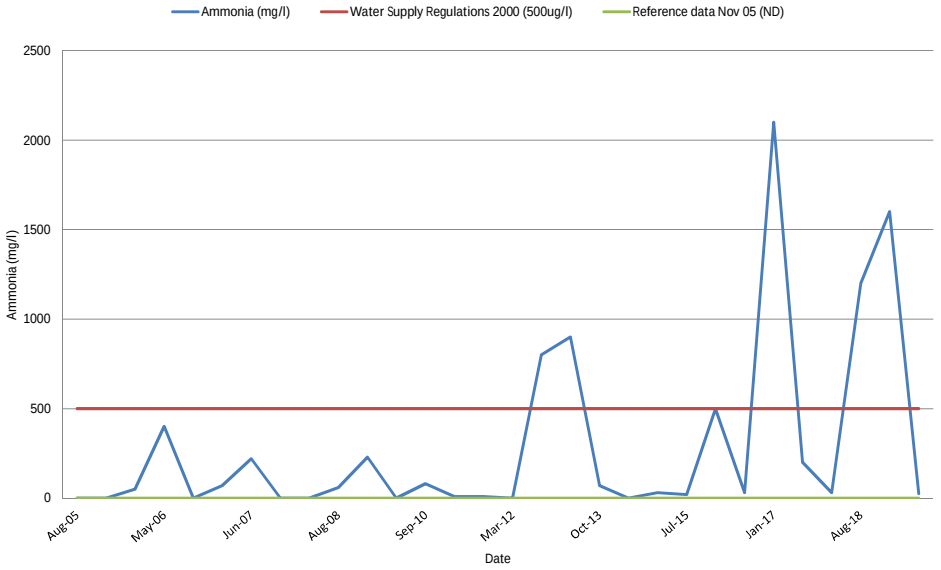


# Contaminants in Groundwater Time Series Plots

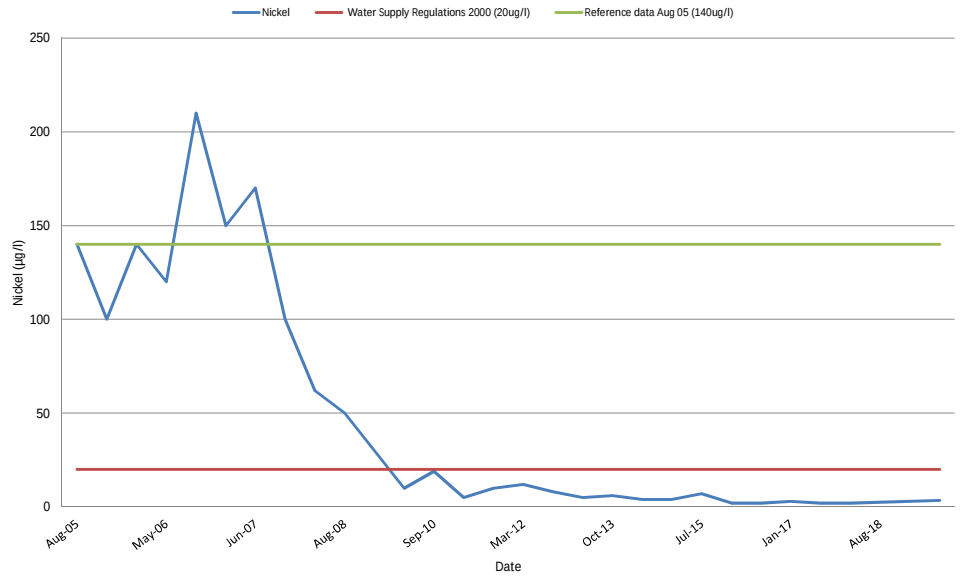
## Borehole BH11 - Total Cyanide



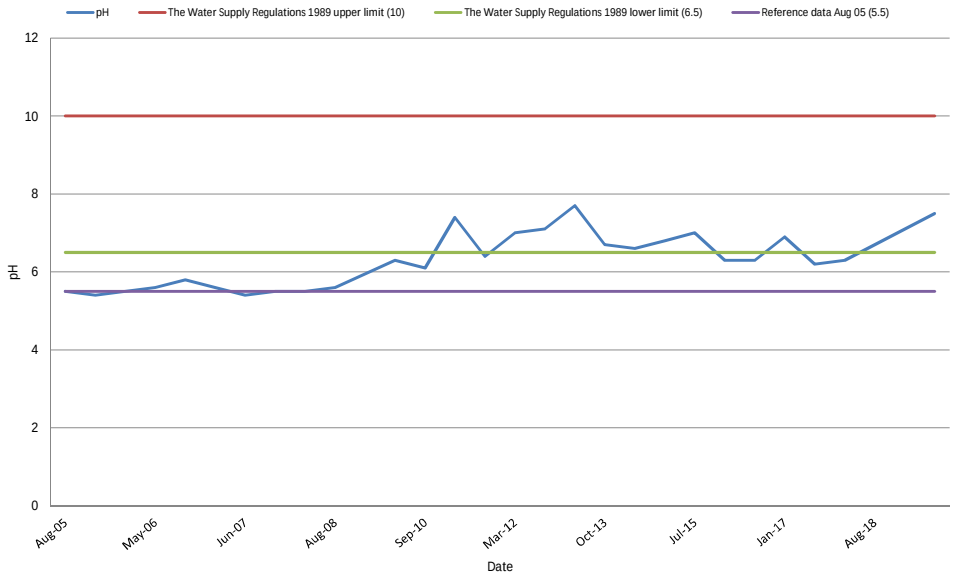

## Borehole BH11 - Ammonia




## Borehole MW2 - Nickel




## Borehole MW2 - pH



Appendix 4

Laboratory Certificate of Analysis

**Rob Hodgson**
Ramboll UK
8 Village Way
Cardiff
CF15 7NE

**e:** rhodgson@ramboll.com

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

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

# Analytical Report Number : 20-89015

Replaces Analytical Report Number : 20-89015, issue no. 1

Additional analysis undertaken.

| | | | |
|---|---|---|---|
| **Project / Site name:** | Hydro SPMP GW Round 32 | **Samples received on:** | 26/02/2020 |
| **Your job number:** | 162009180 | **Samples instructed on:** | 26/02/2020 |
| **Your order number:** | 1620033426 | **Analysis completed by:** | 12/03/2020 |
| **Report Issue Number:** | 2 | **Report issued on:** | 12/03/2020 |
| **Samples Analysed:** | 9 water samples | | |

**Signed:**

Rachel Bradley

Deputy Quality Manager
**For & on behalf of i2 Analytical Ltd.**

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

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

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

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

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

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

**Analytical Report Number: 20-89015**

**Project / Site name: Hydro SPMP GW Round 32**

**Your Order No: 1620033426**

| **Lab Sample Number** | | | | 1453409 | 1453410 | 1453411 | 1453412 | 1453413 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | BH11 | BH6 | BHS6 | BH4 | MW2 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Date Sampled** | | | | 25/02/2020 | 25/02/2020 | 25/02/2020 | 25/02/2020 | 25/02/2020 |
| **Time Taken** | | | | 1000 | 1030 | 1100 | 1130 | 1230 |
| **Analytical Parameter (Water Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| **General Inorganics** | | | | | | | | |
| pH | pH Units | N/A | ISO 17025 | 7.4 | 7.6 | 7.8 | 7.3 | 7.5 |
| Total Cyanide | µg/l | 10 | ISO 17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| Sulphate as $SO_4$ | µg/l | 45 | ISO 17025 | 24300 | 31900 | 115000 | 15900 | 35700 |
| Sulphate as $SO_4$ | mg/l | 0.045 | ISO 17025 | 24.3 | 31.9 | 115 | 15.9 | 35.7 |
| Ammonia as $NH_3$ | µg/l | 15 | ISO 17025 | 26 | < 15 | < 15 | < 15 | 330 |
| Total Organic Carbon (TOC) | mg/l | 0.1 | ISO 17025 | 3.32 | 72.9 | 4.85 | 2.07 | 3.39 |
| Total Suspended Solids | mg/l | 2 | ISO 17025 | 250 | 50 | 350 | 790 | 6100 |
| Total Dissolved Solids (Gravimetric) | mg/l | 4 | ISO 17025 | 950 | 720 | 320 | 70 | 110 |
| Redox Potential | mV | -800 | NONE | 146.70 | 157.60 | 156.20 | 161.10 | 180.10 |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (dissolved) | µg/l | 0.15 | ISO 17025 | < 0.15 | 5.47 | 2.96 | 0.24 | 0.37 |
| Barium (dissolved) | µg/l | 0.06 | ISO 17025 | 55 | 140 | 23 | 16 | 430 |
| Beryllium (dissolved) | µg/l | 0.1 | ISO 17025 | < 0.1 | 0.3 | < 0.1 | < 0.1 | < 0.1 |
| Boron (dissolved) | µg/l | 10 | ISO 17025 | 47 | 40 | 39 | 27 | 40 |
| Cadmium (dissolved) | µg/l | 0.02 | ISO 17025 | 0.03 | 0.36 | < 0.02 | < 0.02 | < 0.02 |
| Chromium (hexavalent) | µg/l | 5 | ISO 17025 | < 5.0 | U/S** | < 5.0 | < 5.0 | < 5.0 |
| Chromium (III) | µg/l | 1 | NONE | < 1.0 | U/S** | < 1.0 | 1.7 | < 1.0 |
| Chromium (dissolved) | µg/l | 0.2 | ISO 17025 | < 0.2 | 1.0 | 0.7 | 1.7 | 0.3 |
| Copper (dissolved) | µg/l | 0.5 | ISO 17025 | 1.5 | 26 | 4.0 | 1.3 | 2.9 |
| Iron (dissolved) | mg/l | 0.004 | ISO 17025 | 0.025 | 0.69 | 0.37 | 0.016 | 0.076 |
| Lead (dissolved) | µg/l | 0.2 | ISO 17025 | < 0.2 | 9.8 | 0.2 | < 0.2 | 1.9 |
| Magnesium (dissolved) | mg/l | 0.005 | ISO 17025 | 7.0 | 1.4 | 3.8 | 5.1 | 6.1 |
| Manganese (dissolved) | µg/l | 0.05 | ISO 17025 | 92 | 550 | 79 | 4.3 | 1100 |
| Mercury (dissolved) | µg/l | 0.05 | ISO 17025 | 0.52 | 0.06 | 0.20 | 0.11 | < 0.05 |
| Nickel (dissolved) | µg/l | 0.5 | ISO 17025 | 1.5 | 23 | 1.6 | < 0.5 | 3.5 |
| Selenium (dissolved) | µg/l | 0.6 | ISO 17025 | 3.3 | 3.2 | 2.5 | 1.3 | 1.1 |
| Vanadium (dissolved) | µg/l | 0.2 | ISO 17025 | 0.2 | 1.0 | 0.8 | < 0.2 | 0.2 |
| Zinc (dissolved) | µg/l | 0.5 | ISO 17025 | 30 | 19 | 3.8 | 4.1 | 40 |
| **Monoaromatics & Oxygenates** | | | | | | | | |
| Benzene | µg/l | 1 | ISO 17025 | - | < 1.0 | < 1.0 | - | - |
| Toluene | µg/l | 1 | ISO 17025 | - | < 1.0 | < 1.0 | - | - |
| Ethylbenzene | µg/l | 1 | ISO 17025 | - | < 1.0 | < 1.0 | - | - |
| p & m-xylene | µg/l | 1 | ISO 17025 | - | < 1.0 | < 1.0 | - | - |
| o-xylene | µg/l | 1 | ISO 17025 | - | < 1.0 | < 1.0 | - | - |
| MTBE (Methyl Tertiary Butyl Ether) | µg/l | 1 | ISO 17025 | - | < 1.0 | < 1.0 | - | - |

**Analytical Report Number: 20-89015**

**Project / Site name: Hydro SPMP GW Round 32**

**Your Order No: 1620033426**

| **Lab Sample Number** | | | | 1453409 | 1453410 | 1453411 | 1453412 | 1453413 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | BH11 | BH6 | BHS6 | BH4 | MW2 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Date Sampled** | | | | 25/02/2020 | 25/02/2020 | 25/02/2020 | 25/02/2020 | 25/02/2020 |
| **Time Taken** | | | | 1000 | 1030 | 1100 | 1130 | 1230 |
| **Analytical Parameter (Water Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| **Petroleum Hydrocarbons** | | | | | | | | |
| TPH1 (C10 - C40) | µg/l | 10 | NONE | < 10 | - | - | < 10 | < 10 |
| TPH-CWG - Aliphatic >C5 - C6 | µg/l | 1 | ISO 17025 | - | < 1.0 | < 1.0 | - | - |
| TPH-CWG - Aliphatic >C6 - C8 | µg/l | 1 | ISO 17025 | - | < 1.0 | < 1.0 | - | - |
| TPH-CWG - Aliphatic >C8 - C10 | µg/l | 1 | ISO 17025 | - | < 1.0 | < 1.0 | - | - |
| TPH-CWG - Aliphatic >C10 - C12 | µg/l | 10 | NONE | - | < 10 | < 10 | - | - |
| TPH-CWG - Aliphatic >C12 - C16 | µg/l | 10 | NONE | - | < 10 | < 10 | - | - |
| TPH-CWG - Aliphatic >C16 - C21 | µg/l | 10 | NONE | - | < 10 | < 10 | - | - |
| TPH-CWG - Aliphatic >C21 - C35 | µg/l | 10 | NONE | - | < 10 | < 10 | - | - |
| **TPH-CWG - Aliphatic (C5 - C35)** | µg/l | 10 | NONE | - | < 10 | < 10 | - | - |
| TPH-CWG - Aromatic >C5 - C7 | µg/l | 1 | ISO 17025 | - | < 1.0 | < 1.0 | - | - |
| TPH-CWG - Aromatic >C7 - C8 | µg/l | 1 | ISO 17025 | - | < 1.0 | < 1.0 | - | - |
| TPH-CWG - Aromatic >C8 - C10 | µg/l | 1 | ISO 17025 | - | < 1.0 | < 1.0 | - | - |
| TPH-CWG - Aromatic >C10 - C12 | µg/l | 10 | NONE | - | < 10 | < 10 | - | - |
| TPH-CWG - Aromatic >C12 - C16 | µg/l | 10 | NONE | - | < 10 | < 10 | - | - |
| TPH-CWG - Aromatic >C16 - C21 | µg/l | 10 | NONE | - | < 10 | < 10 | - | - |
| TPH-CWG - Aromatic >C21 - C35 | µg/l | 10 | NONE | - | < 10 | < 10 | - | - |
| **TPH-CWG - Aromatic (C5 - C35)** | µg/l | 10 | NONE | - | < 10 | < 10 | - | - |

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

*U/S due to high result difference caused by method variation between chromium (hexavalent) and chromium (dissolved). Samples were repeated and results confirmed.
**U/S due to highly coloured sample/extract.

**Analytical Report Number: 20-89015**

**Project / Site name: Hydro SPMP GW Round 32**

**Your Order No: 1620033426**

| **Lab Sample Number** | | | | 1453414 | 1453415 | 1453416 | 1453417 | |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | BH1 | BH12 | BHS4 | BHS1 | |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | |
| **Depth (m)** | | | | None Supplied | None Supplied | None Supplied | None Supplied | |
| **Date Sampled** | | | | 25/02/2020 | 25/02/2020 | 25/02/2020 | 25/02/2020 | |
| **Time Taken** | | | | 1330 | 1345 | 1400 | 1430 | |
| **Analytical Parameter (Water Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| **General Inorganics** | | | | | | | | |
| pH | pH Units | N/A | ISO 17025 | 7.2 | 7.0 | - | - | |
| Total Cyanide | µg/l | 10 | ISO 17025 | < 10 | < 10 | - | - | |
| Sulphate as $SO_4$ | µg/l | 45 | ISO 17025 | 17000 | 3850 | - | - | |
| Sulphate as $SO_4$ | mg/l | 0.045 | ISO 17025 | 17.0 | 3.85 | - | - | |
| Ammonia as $NH_3$ | µg/l | 15 | ISO 17025 | 150 | 97 | - | - | |
| Total Organic Carbon (TOC) | mg/l | 0.1 | ISO 17025 | - | - | - | - | |
| Total Suspended Solids | mg/l | 2 | ISO 17025 | - | - | - | - | |
| Total Dissolved Solids (Gravimetric) | mg/l | 4 | ISO 17025 | - | - | - | - | |
| Redox Potential | mV | -800 | NONE | - | - | - | - | |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (dissolved) | µg/l | 0.15 | ISO 17025 | 0.48 | < 0.15 | - | - | |
| Barium (dissolved) | µg/l | 0.06 | ISO 17025 | 110 | 84 | - | - | |
| Beryllium (dissolved) | µg/l | 0.1 | ISO 17025 | < 0.1 | < 0.1 | - | - | |
| Boron (dissolved) | µg/l | 10 | ISO 17025 | 79 | 56 | - | - | |
| Cadmium (dissolved) | µg/l | 0.02 | ISO 17025 | < 0.02 | 0.03 | - | - | |
| Chromium (hexavalent) | µg/l | 5 | ISO 17025 | U/S* | U/S* | - | - | |
| Chromium (III) | µg/l | 1 | NONE | U/S* | U/S* | - | - | |
| Chromium (dissolved) | µg/l | 0.2 | ISO 17025 | < 0.2 | < 0.2 | - | - | |
| Copper (dissolved) | µg/l | 0.5 | ISO 17025 | 4.8 | 2.4 | - | - | |
| Iron (dissolved) | mg/l | 0.004 | ISO 17025 | - | - | - | - | |
| Lead (dissolved) | µg/l | 0.2 | ISO 17025 | 0.3 | 0.6 | - | - | |
| Magnesium (dissolved) | mg/l | 0.005 | ISO 17025 | - | - | - | - | |
| Manganese (dissolved) | µg/l | 0.05 | ISO 17025 | - | - | - | - | |
| Mercury (dissolved) | µg/l | 0.05 | ISO 17025 | 0.14 | 0.35 | - | - | |
| Nickel (dissolved) | µg/l | 0.5 | ISO 17025 | 2.2 | 1.9 | - | - | |
| Selenium (dissolved) | µg/l | 0.6 | ISO 17025 | 0.7 | 0.7 | - | - | |
| Vanadium (dissolved) | µg/l | 0.2 | ISO 17025 | < 0.2 | < 0.2 | - | - | |
| Zinc (dissolved) | µg/l | 0.5 | ISO 17025 | 65 | 29 | - | - | |
| **Monoaromatics & Oxygenates** | | | | | | | | |
| Benzene | µg/l | 1 | ISO 17025 | - | - | < 1.0 | < 1.0 | |
| Toluene | µg/l | 1 | ISO 17025 | - | - | < 1.0 | < 1.0 | |
| Ethylbenzene | µg/l | 1 | ISO 17025 | - | - | < 1.0 | < 1.0 | |
| p & m-xylene | µg/l | 1 | ISO 17025 | - | - | < 1.0 | < 1.0 | |
| o-xylene | µg/l | 1 | ISO 17025 | - | - | < 1.0 | < 1.0 | |
| MTBE (Methyl Tertiary Butyl Ether) | µg/l | 1 | ISO 17025 | - | - | < 1.0 | < 1.0 | |

**Analytical Report Number: 20-89015**

**Project / Site name: Hydro SPMP GW Round 32**

**Your Order No: 1620033426**

| **Lab Sample Number** | | | | 1453414 | 1453415 | 1453416 | 1453417 | |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | BH1 | BH12 | BHS4 | BHS1 | |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | |
| **Depth (m)** | | | | None Supplied | None Supplied | None Supplied | None Supplied | |
| **Date Sampled** | | | | 25/02/2020 | 25/02/2020 | 25/02/2020 | 25/02/2020 | |
| **Time Taken** | | | | 1330 | 1345 | 1400 | 1430 | |
| **Analytical Parameter (Water Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| **Petroleum Hydrocarbons** | | | | | | | | |
| TPH1 (C10 - C40) | µg/l | 10 | NONE | 450 | 2300 | - | - | |
| TPH-CWG - Aliphatic >C5 - C6 | µg/l | 1 | ISO 17025 | - | - | < 1.0 | < 1.0 | |
| TPH-CWG - Aliphatic >C6 - C8 | µg/l | 1 | ISO 17025 | - | - | < 1.0 | < 1.0 | |
| TPH-CWG - Aliphatic >C8 - C10 | µg/l | 1 | ISO 17025 | - | - | < 1.0 | < 1.0 | |
| TPH-CWG - Aliphatic >C10 - C12 | µg/l | 10 | NONE | - | - | < 10 | < 10 | |
| TPH-CWG - Aliphatic >C12 - C16 | µg/l | 10 | NONE | - | - | < 10 | < 10 | |
| TPH-CWG - Aliphatic >C16 - C21 | µg/l | 10 | NONE | - | - | < 10 | < 10 | |
| TPH-CWG - Aliphatic >C21 - C35 | µg/l | 10 | NONE | - | - | 250 | < 10 | |
| **TPH-CWG - Aliphatic (C5 - C35)** | µg/l | 10 | NONE | - | - | 250 | < 10 | |
| TPH-CWG - Aromatic >C5 - C7 | µg/l | 1 | ISO 17025 | - | - | < 1.0 | < 1.0 | |
| TPH-CWG - Aromatic >C7 - C8 | µg/l | 1 | ISO 17025 | - | - | < 1.0 | < 1.0 | |
| TPH-CWG - Aromatic >C8 - C10 | µg/l | 1 | ISO 17025 | - | - | < 1.0 | < 1.0 | |
| TPH-CWG - Aromatic >C10 - C12 | µg/l | 10 | NONE | - | - | < 10 | < 10 | |
| TPH-CWG - Aromatic >C12 - C16 | µg/l | 10 | NONE | - | - | < 10 | < 10 | |
| TPH-CWG - Aromatic >C16 - C21 | µg/l | 10 | NONE | - | - | < 10 | < 10 | |
| TPH-CWG - Aromatic >C21 - C35 | µg/l | 10 | NONE | - | - | < 10 | < 10 | |
| **TPH-CWG - Aromatic (C5 - C35)** | µg/l | 10 | NONE | - | - | < 10 | < 10 | |

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

*U/S due to high result difference caused by method variation between chromium (hexavalent) and chromium (dissolved). Samples were repeated and results confirmed.
**U/S due to highly coloured sample/extract.

**Analytical Report Number : 20-89015**

**Project / Site name: Hydro SPMP GW Round 32**

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

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| Ammonia as NH3 in water | Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L082-PL | W | ISO 17025 |
| Boron in water | Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW | In-house method based on MEWAM | L039-PL | W | ISO 17025 |
| BTEX and MTBE in water (Monoaromatics) | Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW | In-house method based on USEPA8260 | L073B-PL | W | ISO 17025 |
| Cr (III) in water | In-house method by calculation from total Cr and Cr VI. | In-house method by calculation | L080-PL | W | NONE |
| Hexavalent chromium in water | Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry. | In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW. | L080-PL | W | ISO 17025 |
| Metals in water by ICP-MS (dissolved) | Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW. | In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS. | L012-PL | W | ISO 17025 |
| Metals in water by ICP-OES (dissolved) | Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn). | In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil. | L039-PL | W | ISO 17025 |
| pH at 20oC in water (automated) | Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW | In house method. | L099-PL | W | ISO 17025 |
| Redox Potential of waters | Determination of conductivity of water by conductivity meter | In house method. | L084-PL | W | NONE |
| Sulphate in water | Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW. | In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil. | L039-PL | W | ISO 17025 |
| Suspended solids in water | Determined gravimetrically with GFC filtration papers. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L004-PL | W | ISO 17025 |
| Total cyanide in water | Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar) | L080-PL | W | ISO 17025 |
| Total dissolved solids in water (Gravimetric) | Determination of total dissolved solids in water by gravimetry. | In house method based on BSEN 15216:2007 | L004-PL | W | ISO 17025 |
| Total organic carbon in water | Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L037-PL | W | ISO 17025 |
| TPH1 (Waters) | Determination of dichloromethane extractable hydrocarbons in water by GC-MS. | In-house method | L070-PL | W | NONE |
| TPHCWG (Waters) | Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation. | In-house method | L070-PL | W | NONE |

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