

19th March 2015

Martyn Grant
Environmental Manager
The Royal Mint
Llantrisant
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Our Ref: AG/LC/RH/LUK17-20212_1 February Monitoring Report 2015

Dear Martyn,

Re: Factual Report on Groundwater and Surface Water Sampling in February 2015 and Summary of 2014/15 Monitoring Period

ENVIRON UK Limited ("ENVIRON") was instructed by The Royal Mint to carry out surface water sampling from selected locations in the Nant Mychydd River and groundwater sampling from selected boreholes in the area of Building 9A and the Coin Press Room ("CPR"). This letter presents a factual report on the third of three scheduled rounds of monitoring undertaken between June 2014 and February 2015.

Background

Surface water monitoring during 2013/14 identified elevated concentrations of copper and zinc in the culverted stream that enters the Nant Mychydd (sampling points R7 and R7A). While the source of contamination is being investigated by The Royal Mint, ENVIRON recommended that the surface water monitoring programme should be continued from selected sampling points at a reduced frequency of once every four months, or until the contamination reduces to below the respective environmental quality standards (EQS).

ENVIRON also carried out groundwater sampling at the site which has previously identified elevated concentrations of metals in some areas of the site. With the exception of boreholes BH11 and BH12, elevated concentrations of nickel, copper and zinc were identified in all boreholes monitored throughout 2013. The pH was also below [more acidic than] the acceptable EQS range in several locations across the site. It was recommended that monitoring should continue from selected boreholes at a reduced frequency of once every four months, or until the contamination reduces to below the respective EQS.

Surface Water

Surface water samples were collected on the 10th February 2015 from five sampling locations on the Nant Mychydd River and the culverted watercourse that passes through the site (sampling points R1, R6, R7, R7A and C1), as shown on Figure 2. Samples were analysed for a range of metals, pH, cyanide, total petroleum hydrocarbons (TPH) and alkalinity at a UKAS accredited laboratory. The laboratory certificates of analysis are attached which provide the method of analysis for each determinand. The surface water analysis results from April 2011 to February 2015 are summarised in the attached table and are presented graphically on Figures 6, 7 and 8.

During the February 2015 monitoring, the concentration of copper exceeded the EQS of 0.001mg/l (for hardness between 0mg/l and 50mg/l CaCO₃) at sampling points R7 (0.004mg/l) and R7A (0.013mg/l) where the culverted stream emerges from site prior to entering the Nant Mychydd. The concentration of copper was equal to the EQS at sampling point C1 (0.001mg/l).

where the watercourse to the north of the site is culverted under the site. It should be noted that sampling location C1 is upstream of the site.

The concentration of zinc exceeded the EQS value of 0.008mg/l (for hardness between 0mg/l and 50mg/l CaCO₃) R7A (0.013mg/l) during the most recent round of monitoring.

Concentrations of nickel were below the EQS value of 0.02mg/l (for hardness between 0mg/l and 50mg/l CaCO₃) at all surface water sampling locations.

The TPH concentrations in this monitoring round ranged from below the laboratory reporting limit (<0.01mg/l) at sample points R1, R6 and C1 to 0.02mg/l in R7A (in exceedance of the UK DWS of 0.01mg/l). TPH concentrations have decreased at all five sampling locations when compared to the previous round of monitoring in October 2014. Concentrations have returned to historically typical levels since maximum concentrations were recorded at C1, R7 and R7A during the previous, October 2014, monitoring round.

Statistical Analysis of Surface Water Monitoring Results

The latest three rounds of monitoring data have been further assessed using the Mann-Kendall Test, a non-parametric statistical test to detect trends in data. Statistical analysis was recommended by Natural Resources Wales (NRW) in their Compliance Assessment Report (CAR) dated August 2013 (Ref: KP3135KV/0187931).

The Mann Kendal test has been used on data from monitoring rounds undertaken from 2010 to 2015. Determinands that have exceeded the EQS on one or more occasions during the 2012 to 2015 monitoring period have been assessed using this approach. The results of the statistical analysis are shown in Table 1 below and are also presented for each sampling location on Figure 10. The data are presented graphically on Figures 6, 7 and 8.

Table 1: Results of Trend Analysis for Surface Water Results (2010 to 2015)				
	Trend			
	TPH	Copper	Nickel	Zinc
R1 (Upstream Nant Mychydd)	No Trend	No Trend	No Exceedances	Probably Increasing
R6 (Downstream Nant Mychydd)	No Trend	Probably Increasing	No Exceedances	No Trend
R7A (Tributary of Nant Mychydd)	Probably Increasing	Stable	Stable	No Trend
R7 (Downstream of confluence)	Increasing	Decreasing	No Exceedances	Decreasing
C1 (Northern (Upstream) Boundary)	No Trend	No Trend	No Exceedances	No Trend

In general, concentrations of determinands which exceeded EQS were either decreasing, stable or there was no trend. The concentration of zinc at sampling point R1 (upstream of the site) was identified as 'probably increasing'. However, this is likely to be influenced by increasing results obtained over the last two years that were above the laboratory detection limit, but remained below the EQS.

The concentration of copper at R6 was identified as 'probably increasing'. The concentration reached a maximum of 0.04mg/l in October 2014, which marginally exceeded the EQS for the first time at this location.

Concentrations of TPH at sampling points R7 and R7A, at the confluence between the Nant Mychydd and the culverted stream beneath the site were identified as 'increasing' and 'probably increasing'. This is a likely consequence of an increase in TPH concentrations recorded at all sampling points (both up and down-stream) in October 2014 and is therefore unlikely to indicate of contamination generated at the site.

Samples taken at locations C1 and R6 which are upstream of the site contained elevated copper and zinc concentrations in excess of the EQS which indicate an elevated baseline in the wider environment.

Concentrations of copper and zinc at R7A, downstream of the site are shown to be either 'decreasing', 'stable' or have 'no trend'. It should be noted that the concentrations of copper and zinc regularly exceed the EQS, so the stable trend suggests that the concentrations of these metals are not decreasing.

Rainfall Data

NRW has requested that rainfall data is collected at the time of sampling since this may influence the levels of contaminants in the receiving watercourse. In order to provide data for the February 2015 round of monitoring, weather station information for a location approximately 13km east of the site (weather station reference IMIDGLAM3) has been obtained (www.wunderground.com).

The data are presented in Table 2 below. Rainfall data has been provided for the five days preceding the monitoring visit and compared with the daily average rainfall for 11th January to 10th February 2015 and the daily average based on data from 2006 to 2014 for January and February.

Table 2: Rainfall Data			
Date	Rainfall data (mm)*	Jan/Feb 2015 daily average (mm)*	2006 – 2014 Jan/Feb daily average (mm)*
05/02/15	0.0	2.7	3.7
06/02/15	0.0		
07/02/15	0.0		
08/02/15	0.0		
09/02/15	0.0		
10/02/15	0.0		
* Data gathered from 'IMIDGLAM3' weather station in Caerphilly located 13km East of site (www.wunderground.com) (accessed 02/03/15)			

The rainfall data indicate that rainfall in the month preceding sampling was below the average; additionally, the river level was noted as being slightly lower than is normally observed.

Groundwater Sampling

Groundwater samples were collected from the following boreholes: BH8, BH9, BH901, BH10, BH11, BH12, BH13 and BH32, (shown on Figure 1). Samples were analysed for a range of metals, pH and alkalinity at a UKAS accredited laboratory. The laboratory certificates of analysis

are attached which provide the method of analysis for each determinand. The analysis results are summarised in the attached table and are represented graphically on Figures 3, 4 and 5.

The results have been benchmarked against previous analytical results from these monitoring wells and screened against EQS for freshwater. The results are summarised as follows:

- The following determinands did not exceed the screening criteria in any of the boreholes: lead, arsenic, boron, mercury, selenium and vanadium.
- Borehole BH8 was not accessible between 2011 and 2012; however, since January 2013 BH8 has become accessible and is now included in the monitoring rounds. During the most recent round of monitoring, the concentrations of nickel (0.104mg/l), copper (0.112mg/l) and zinc (0.210mg/l) all exceeded their respective EQS values of 0.02mg/l for nickel, 0.001mg/l for copper and 0.008mg/l for zinc. Concentrations of these determinands have all decreased since the previous round of monitoring in October 2014.
- Concentrations of nickel, copper and zinc in boreholes BH9 and BH901 remain above their respective EQS values. The concentration of copper has increased in BH9 (from 0.048mg/l to 0.115mg/l) and in BH901 (from 0.772mg/l to 1.219mg/l) since the previous round in October 2014. The concentration of nickel increased in borehole BH9 (from 0.107mg/l to 0.160mg/l) and the concentration of zinc increased (from 0.264mg/l to 0.315mg/l). The concentration of nickel decreased in BH901 (from, a maximum observed at this location, 1.048mg/l to 0.386mg/l) and the concentration of zinc also decreased in BH901 (from 2.042mg/l to 1.098mg/l).
- Concentrations of nickel, copper and zinc remain stable and below their respective EQS values in boreholes BH11 and BH12 for the latest monitoring round.
- Concentrations of nickel, copper and zinc in borehole BH10 have remained at the significantly reduced concentrations first recorded in October 2014. Concentrations of nickel (0.002mg/l) and zinc (0.011mg/l) are below respective EQS values during the most recent round of monitoring.
- In BH32, a significant decrease was recorded in concentrations of nickel (from 1.349mg/l to 0.085mg/l), copper (from 0.119mg/l to 0.037mg/l) and zinc (from 2.669mg/l to 0.248mg/l) since the previous round of monitoring in October 2014. However, concentrations remain above the relevant EQS.
- There has been a decrease in the concentration of nickel (from 0.644mg/l to 0.075mg/l), copper (from 0.115mg/l to 0.041mg/l) and zinc (from 0.594mg/l to 0.140mg/l) in BH13 since the previous round of monitoring in October 2014. However, concentrations remain above the relevant EQS for these determinands.
- Total chromium was not detected above the EQS value of 0.0047mg/l within any of the monitoring wells in the most recent monitoring round.
- The concentration of cadmium was recorded above the laboratory LOD (0.0001mg/l) in all boreholes except BH10 and BH11, with a maximum of 0.0009mg/l in BH901. All reported values are above the EQS value of 0.00008mg/l.
- pH values outside of the EQS range (pH 6 to pH 9) were detected in BH8 (pH 5.3) and BH13 (pH 5.4) during the most recent round of monitoring.

Statistical Analysis of Groundwater Monitoring Results

The Mann Kendal test has been performed using data from monitoring rounds undertaken from 2010 (where applicable) to 2015. Determinands that have exceeded the EQS on one or more occasion during the overall monitoring period have been assessed using this approach. The results of the statistical analysis are shown in Table 3 below and are also presented for each sampling location on Figure 9. The data are also presented graphically on Figures 3, 4 and 5.

Table 3: Results of Trend Analysis for Groundwater Results (2010 to 2015)					
	Trend				
	Cadmium	Total Chromium	Copper	Nickel	Zinc
BH901	Increasing	No Exceedance	No Trend	No Trend	Increasing
BH8	Decreasing	No Exceedance	Stable	Decreasing	Decreasing
BH9	Decreasing	Decreasing	Decreasing	Decreasing	Decreasing
BH32	No Trend	No Exceedance	Increasing	No Trend	No Trend
BH10	No Trend	No Exceedance	Stable	Probably Decreasing	Probably Decreasing
BH11	No Exceedance	No Exceedance	No Exceedance	No Exceedance	No Exceedance
BH12	Decreasing	No Exceedance	No Trend	Decreasing	Decreasing
BH13	Stable	Decreasing	Decreasing	No Trend	No Trend

The Mann Kendal statistical analysis showed that BH9, which has previously contained the most elevated metal concentrations is showing a 'decreasing' trend for all metals which exceeded the EQS values. This reflects a continued gradual reduction in concentrations shown on Figures 3, 4 and 5.

For the remainder of the monitoring wells the statistical analysis generally showed 'no trend', 'stable' or 'probably decreasing/decreasing' trends, indicating that contaminants of concern are not increasing in the groundwater. Exceptions to this are cadmium and zinc in BH901 ('increasing') and copper in BH32 ('increasing').

Whilst the overall trend for copper is increasing for BH32, this is reflective of an elevated concentration of 0.119mg/l observed in October 2014 that reduced to 0.037mg/l in February 2015.

The 'probably increasing' trend for zinc identified in BH901 reflects a general increase at this location throughout 2014/2015 monitoring, shown on Figure 5. Concentrations have been recorded between 1.098mg/l and 2.457mg/l throughout the 2014/15 monitoring. Overall the most recent concentrations represent a slight increase from 2013 concentrations; however, recent monitoring has shown that concentrations have remained below the May 2012 maximum of 17.55mg/l.

Conclusions and Recommendations

Surface Water

Over the monitoring period of 2014/15, concentrations of copper and zinc have consistently exceeded the respective EQS for surface water (hardness adjusted) in the tributary of the Nant Mychydd, downstream from the site (Sampling Point R7A). Concentrations of copper and zinc recorded during the October 2014 monitoring round represented the maximum concentrations recorded to date at the majority of sampling locations. Whilst EQS were exceeded for copper and

zinc in the upstream locations (C1, R1 and R6) on at least one sampling occasion; concentrations were generally detected at R7A up to an order of magnitude higher than upstream samples.

The statistical analysis has indicated that in general, concentrations of determinands which exceeded EQS were either decreasing, stable or there was no trend. However, at sample location R7A, concentrations of copper and zinc regularly exceed the EQS, so the stable trend suggests that these concentrations are not decreasing overall.

TPH concentrations continued to be slightly elevated during 2014/15 at similar concentrations detected during 2013; however, the values do not vary significantly from samples taken upstream to samples taken downstream of the site. Therefore it is unlikely that the TPH concentrations detected in the surface water environment are attributable to the Royal Mint site.

The CAR issued by NRW in August 2013 recommended that the results of statistical analysis are used to determine the frequency and scope of future monitoring. The CAR also stipulated that trend analysis should be carried out annually.

We recommend that the surface water sampling scheme continues on a four month frequency (i.e. three rounds per year) until the elevated concentrations decrease.

Groundwater

In groundwater, concentrations of nickel, cadmium, copper and zinc have continued to exceed EQS values in each monitoring well with the exception of BH11 (BH12 only exceeded EQS for cadmium). Low pH values have been recorded in BH8, BH10, BH13, BH32 and BH901 on at least one occasion throughout the monitoring programme of 2014/2015.

Statistical analysis has generally shown that trends in groundwater concentrations of the contaminants of concern are 'decreasing', 'stable' or have 'no trend' indicating that concentrations have not been significantly increasing. Exceptions to this are cadmium and zinc in BH901 ('increasing') and copper in BH32 ('increasing').

The Mann Kendal statistical analysis showed that BH9, which has previously contained the most elevated metal concentrations is showing a 'decreasing' trend for all metals which exceeded the EQS values. A decreasing trend in metal concentrations has also been indicated for BH10.

Given the locations of consistent elevated concentrations (BH32 and BH901), the results indicate a potential source of groundwater impact may be associated with Building 9A (pickling, plating, annealing, burnishing).

A continuation of groundwater monitoring is recommended for a further year on a four monthly basis from selected boreholes or until metal concentrations have reduced below the respective EQS. We recommend that the monitoring results from the annual SPMP are also taken into consideration when selecting boreholes for the forthcoming year's monitoring; e.g. up-gradient borehole BH001 also has an increasing trend in metal concentrations.

Please do not hesitate to contact me if there is anything you wish to discuss.

Yours sincerely,



Lucy Cleverley
Senior Consultant



Andy Goddard
Principal

Enc. Laboratory Testing Certificates (February 2015)
Summary of Surface Water Monitoring Results
Summary of Groundwater Monitoring Results
Figure 1: Groundwater Sampling Borehole Location Plan
Figure 2: River Sampling Locations
Figure 3: Copper Graphical Representations – Groundwater
Figure 4: Nickel Graphical Representations – Groundwater
Figure 5: Zinc Graphical Representations – Groundwater
Figure 6: Copper Graphical Representations – Surface Water
Figure 7: Nickel Graphical Representations – Surface Water
Figure 8: Zinc Graphical Representations – Surface Water
Figure 9: Groundwater Statistical Results
Figure 10: Surface Water Statistical Results

Table 2: Surface Water Monitoring 2014-2015 (UK17-20212) - Summary of Results

Analysis																	
Sample Point	Date	pH	CaCO3 mg/l	Sulphate (dissolved) mg/l	Nickel (dissolved) mg/l	Chromium (dissolved) mg/l	Cadmium (dissolved) mg/l	Copper (dissolved) mg/l	Lead (dissolved) mg/l	Zinc (dissolved) mg/l	Arsenic (dissolved) mg/l	Boron (dissolved) mg/l	Mercury (dissolved) mg/l	Selenium (dissolved) mg/l	Vanadium (dissolved) mg/l	Cyanide (total) (mg/l)	TPH (mg/l)
R1	Jan-10	7.5	NT	9	<0.001	0.001	<0.0001	<0.001	<0.001	0.005	<0.001	<0.01	<0.0001	<0.001	<0.002	<0.02	0.06
	May-10	7.9	NT	9	0.001	<0.001	<0.0001	<0.001	<0.001	<0.002	<0.001	0.02	<0.0001	<0.001	<0.002	0.03	<0.01
	Jun-10	7.5	NT	13	0.001	0.002	<0.0001	<0.001	<0.001	<0.002	<0.001	0.01	<0.0001	<0.001	<0.002	<0.02	<0.01
	Aug-10	7.5	NT	21	0.001	0.002	<0.0001	<0.001	<0.001	<0.002	<0.001	0.02	<0.0001	<0.001	0.001	<0.02	0.01
	Oct-10	7.7	NT	10	<0.001	0.001	<0.0001	0.001	<0.001	<0.002	<0.001	0.02	<0.0001	0.002	<0.001	<0.02	0.01
	Dec-10	7.6	NT	12	<0.001	0.001	<0.0001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
	Apr-11	7.4	56	NT	0.001	0.001	<0.0001	0.002	<0.001	0.004	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.03
	May-11	7.6	21	NT	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.002	<0.001	0.41	<0.0001	<0.001	<0.001	<0.02	0.02
	Jul-11	8	61	NT	<0.001	0.001	<0.0001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.0001	<0.001	0.0001	<0.02	0.02
	Sep-11	7.5	64	NT	0.001	0.003	<0.0001	<0.001	<0.001	0.009	<0.001	0.06	<0.0001	0.001	<0.001	<0.02	0.02
	Nov-11	8.6	61	NT	0.001	0.002	<0.0001	0.001	<0.001	0.003	<0.001	0.03	<0.0001	<0.001	0.001	<0.02	0.01
	Jan-12	8.1	52	NT	0.001	0.005	<0.0001	0.001	<0.001	0.005	<0.001	0.02	<0.0001	<0.001	0.002	<0.02	0.01
	Mar-12	8.2	51	NT	0.001	0.002	<0.0001	0.002	<0.001	0.006	<0.001	<0.01	<0.0001	<0.001	0.001	<0.02	<0.01
	May-12	8	39	NT	0.001	0.001	<0.0001	0.002	<0.001	0.009	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.016
	Jul-12	7.7	45	NT	0.002	<0.001	<0.0001	0.002	<0.001	0.009	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.01
	Sep-12	7.8	47	NT	0.001	0.001	<0.0001	0.002	<0.001	0.006	<0.001	0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
	Nov-12	7.8	53	NT	0.001	<0.001	<0.0001	<0.001	<0.001	0.006	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.02
	Jan-13	7.5	58	NT	<0.001	<0.001	<0.0001	<0.001	<0.001	0.005	<0.001	0.03	<0.0001	<0.001	0.001	<0.02	0.02
	Apr-13	7.7	46	NT	<0.001	0.001	<0.0001	<0.001	<0.001	0.003	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.02
	May-13	8	62	NT	<0.001	0.001	<0.0001	<0.001	<0.001	0.003	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
	Jul-13	7.6	68	NT	0.001	0.001	<0.0001	0.003	<0.001	0.005	<0.001	<0.01	<0.0001	<0.001	0.001	<0.02	0.105
	Oct-13	7.2	55	NT	0.001	0.001	<0.0001	0.001	<0.001	0.006	<0.001	<0.01	<0.0001	<0.001	0.001	<0.02	<0.01
	Nov-13	7.7	62	NT	<0.001	<0.001	<0.0001	<0.001	<0.001	0.004	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
	Jan-14	7.2	36	NT	<0.001	<0.001	<0.0001	<0.001	<0.001	0.002	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.01
	Jun-14	6.9	60	NT	0.001	<0.001	<0.0001	0.001	<0.001	0.002	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.03
	Oct-14	8.1	50	NT	0.001	<0.001	<0.0001	0.002	<0.001	0.008	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.02
	Feb-15	7.4	53	NT	<0.001	<0.001	<0.0001	<0.001	<0.001	0.003	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
R6	Jan-10	7.5	NT	9	0.001	0.001	<0.0001	<0.001	<0.001	0.002	<0.001	<0.01	0.0001	<0.001	<0.002	<0.02	0.64
	May-10	7.6	NT	10	0.002	<0.001	<0.0001	<0.001	<0.001	0.003	<0.001	0.02	<0.0001	<0.001	<0.002	0.24	<0.01
	Jun-10	7.5	NT	14	0.002	0.002	<0.0001	<0.001	<0.001	0.002	<0.001	0.01	<0.0001	<0.001	<0.002	<0.02	<0.01
	Aug-10	7.7	NT	22	0.001	0.001	<0.0001	<0.001	<0.001	<0.002	<0.001	0.02	<0.0001	<0.001	<0.001	<0.02	0.01
	Oct-10	7.7	NT	11	0.001	0.001	<0.0001	<0.001	<0.001	<0.002	<0.001	0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
	Dec-10	7.4	NT	11	0.001	0.001	<0.0001	<0.001	<0.001	0.002	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
	Apr-11	7.4	52	NT	0.002	0.001	<0.0001	0.002	<0.001	0.004	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.04
	May-11	7.4	23	NT	0.001	<0.001	<0.0001	<0.001	<0.001	<0.002	<0.001	0.39	<0.0001	<0.001	<0.001	<0.02	0.04
	Jul-11	7.2	71	NT	<0.001	0.001	<0.0001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.0001	<0.001	0.001	<0.02	0.02
	Sep-11	7.7	64	NT	0.001	0.001	<0.0001	<0.001	<0.001	0.003	<0.001	0.04	<0.0001	<0.001	<0.001	<0.02	0.01
	Nov-11	7.7	61	NT	0.002	0.002	<0.0001	0.002	<0.001	0.003	<0.001	0.03	<0.0001	<0.001	0.002	<0.02	0.02
	Jan-12	8	57	NT	0.002	0.003	<0.0001	0.002	<0.001	0.008	<0.001	0.02	<0.0001	<0.001	0.002	<0.02	0.02
	Mar-12	8.2	57	NT	0.001	0.002	<0.0001	<0.001	<0.001	0.004	<0.001	<0.01	<0.0001	<0.001	0.001	<0.02	0.02
	May-12	7.9	50	NT	0.001	0.002	<0.0001	0.002	<0.001	0.014	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.016
	Jul-12	7.7	56	NT	0.002	<0.001	<0.0001	0.001	<0.001	0.005	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
	Sep-12	7.9	53	NT	0.001	0.001	<0.0001	0.001	<0.001	<0.002	<0.001	0.01	<0.0001	<0.001	<0.001	<0.02	0.01
	Nov-12	7.9	64	NT	0.001	<0.001	<0.0001	<0.001	<0.001	0.003	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.02
	Jan-13	7.6	65	NT	0.001	<0.001	<0.0001	0.001	<0.001	0.025	<0.001	0.03	<0.0001	<0.001	0.001	<0.02	0.02
	Apr-13	7.8	51	NT	<0.001	0.007	<0.0001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.01
	May-13	8	74	NT	<0.001	0.001	<0.0001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
	Jul-13	7.6	74	NT	0.002	0.001	<0.0001	0.001	<0.001	0.004	<0.001	<0.01	<0.0001	<0.001	0.001	<0.02	0.019
	Oct-13	7.3	52	NT	0.001	<0.001	<0.0001	0.001	<0.001	0.008	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
	Nov-13	7.7	77	NT	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
	Jan-14	7.5	42	NT	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.01
	Jun-14	6.9	50	NT	0.002	<0.001	0.0001	0.003	<0.001	0.018	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.04
	Oct-14	8.1	34	NT	0.001	<0.001	<0.0001	0.004	<0.001	0.087	<0.001	0.01	<0.0001	<0.001	0.001	<0.02	0.15
	Feb-15	7.3	53	NT	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.01

Analysis																	
Sample Point	Date	pH	CaCO3 mg/l	Sulphate (dissolved) mg/l	Nickel (dissolved) mg/l	Chromium (dissolved) mg/l	Cadmium (dissolved) mg/l	Copper (dissolved) mg/l	Lead (dissolved) mg/l	Zinc (dissolved) mg/l	Arsenic (dissolved) mg/l	Boron (dissolved) mg/l	Mercury (dissolved) mg/l	Selenium (dissolved) mg/l	Vanadium (dissolved) mg/l	Cyanide (total) (mg/l)	TPH (mg/l)
R7	Jan-10	7.7	NT	7	0.005	0.003	<0.0001	0.01	<0.001	0.009	<0.001	0.01	0.0001	<0.001	<0.002	<0.02	<0.01
	May-10	8	NT	14	0.019	<0.001	<0.0001	0.039	<0.001	0.097	<0.001	0.01	<0.0001	<0.001	<0.002	0.05	<0.01
	Jun-10	7.5	NT	18	0.013	0.002	<0.0001	0.028	<0.001	0.071	<0.001	0.01	<0.0001	<0.001	<0.002	<0.02	<0.01
	Aug-10	7.8	NT	29	0.008	0.001	<0.0001	0.011	<0.001	0.017	<0.001	0.03	<0.0001	<0.001	0.001	<0.02	<0.01
	Oct-10	7.7	NT	20	0.004	0.001	<0.0001	0.007	<0.001	0.009	<0.001	0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
	Dec-10	7.4	NT	12	0.004	0.001	<0.0001	0.008	<0.001	0.012	<0.001	0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
	Apr-11	7.5	47	NT	0.017	0.001	<0.0001	0.039	<0.001	0.037	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.03
	May-11	7.7	29	NT	0.011	<0.001	<0.0001	0.023	<0.001	0.038	<0.001	0.39	<0.0001	<0.001	<0.001	<0.02	0.03
	Jul-11	7.4	61	NT	0.003	0.001	<0.0001	0.007	<0.001	0.004	<0.001	<0.01	<0.0001	<0.001	0.001	<0.02	0.02
	Sep-11	7.7	50	NT	0.019	0.001	<0.0001	0.017	<0.001	0.012	<0.001	0.03	<0.0001	<0.001	<0.001	<0.02	<0.01
	Nov-11	7.7	59	NT	0.009	0.002	<0.0001	0.009	<0.001	0.008	<0.001	0.03	<0.0001	<0.001	0.001	<0.02	0.02
	Jan-12	8	52	NT	0.001	0.003	<0.0001	<0.001	<0.001	0.005	<0.001	0.01	<0.0001	<0.001	0.002	<0.02	0.01
	Mar-12	8.1	37	NT	0.006	0.001	<0.0001	0.009	<0.001	0.009	<0.001	<0.01	<0.0001	<0.001	0.001	<0.02	<0.01
	May-12	7.9	46	NT	0.002	0.001	<0.0001	0.003	<0.001	0.006	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.022
	Jul-12	7.7	38	NT	0.008	<0.001	<0.0001	0.013	<0.001	0.016	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.02
	Sep-12	7.9	54	NT	0.002	0.001	<0.0001	0.001	<0.001	0.002	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
	Nov-12	7.8	51	NT	0.002	<0.001	<0.0001	0.003	<0.001	0.004	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.02
	Jan-13	7.6	49	NT	0.005	<0.001	<0.0001	0.01	<0.001	0.023	<0.001	0.03	<0.0001	<0.001	0.001	<0.02	0.02
	Apr-13	7.8	48	NT	0.002	0.001	<0.0001	0.004	<0.001	0.002	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.02
	May-13	8.1	54	NT	0.003	<0.001	<0.0001	0.007	<0.001	0.007	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.01
	Jul-13	7.6	72	NT	0.002	0.002	<0.0001	0.003	<0.001	0.005	<0.001	<0.01	<0.0001	<0.001	0.001	<0.02	0.031
	Oct-13	7.3	57	NT	0.001	<0.001	<0.0001	0.002	<0.001	0.005	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
	Nov-13	7.7	69	NT	0.002	<0.001	<0.0001	0.004	<0.001	0.004	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.01
	Jan-14	7.4	36	NT	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.01
	Jun-14	7	55	NT	0.002	<0.001	<0.0001	0.003	<0.001	0.004	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.03
	Oct-14	8.1	33	NT	0.012	0.001	<0.0001	0.043	0.002	0.093	<0.001	0.01	<0.0001	<0.001	0.001	<0.02	1.04
	Feb-15	7.3	49	NT	0.002	<0.001	<0.0001	0.004	<0.001	0.004	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.01
R7A	Jan-10	7.8	NT	7	0.004	0.001	<0.0001	0.009	<0.001	0.009	<0.001	<0.01	0.0001	<0.001	<0.002	<0.02	0.25
	May-10	8.1	NT	14	0.021	<0.001	<0.0001	0.041	<0.001	0.113	<0.001	<0.01	<0.0001	<0.001	<0.002	0.03	0.02
	Jun-10	7.5	NT	16	0.013	0.002	<0.0001	0.027	<0.001	0.085	<0.001	0.01	<0.0001	<0.001	<0.002	<0.02	<0.01
	Aug-10	7.8	NT	32	0.013	0.001	<0.0001	0.017	<0.001	0.04	<0.001	0.03	<0.0001	<0.001	<0.001	<0.02	<0.01
	Oct-10	7.7	NT	19	0.004	0.001	<0.0001	0.007	<0.001	0.009	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
	Dec-10	7.5	NT	15	0.008	0.001	<0.0001	0.015	<0.001	0.033	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
	Apr-11	7.5	47	NT	0.017	0.001	<0.0001	0.038	<0.001	0.037	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.03
	May-11	7.7	29	NT	0.011	<0.001	<0.0001	0.022	<0.001	0.036	<0.001	0.38	<0.0001	<0.001	<0.001	<0.02	0.02
	Jul-11	7.5	56	NT	0.008	0.001	<0.0001	0.018	<0.001	0.014	<0.001	<0.01	<0.0001	<0.001	0.001	<0.02	0.01
	Sep-11	7.4	50	NT	0.021	0.001	<0.0001	0.018	<0.001	0.012	<0.001	0.02	<0.0001	<0.001	<0.001	<0.02	<0.01
	Nov-11	7.7	47	NT	0.041	0.002	<0.0001	0.029	<0.001	0.03	<0.001	0.02	<0.0001	<0.001	0.001	<0.02	0.01
	Jan-12	7.9	45	NT	0.011	0.002	<0.0001	0.011	<0.001	0.016	<0.001	0.01	<0.0001	<0.001	0.002	<0.02	<0.01
	Mar-12	8.1	38	NT	0.006	0.001	<0.0001	0.009	<0.001	0.008	<0.001	<0.01	<0.0001	<0.001	0.001	<0.02	<0.01
	May-12	7.9	20	NT	0.017	0.001	<0.0001	0.052	0.001	0.07	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.057
	Jul-12	7.8	41	NT	0.008	<0.001	<0.0001	0.013	<0.001	0.016	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
	Sep-12	7.9	44	NT	0.017	0.001	<0.0001	0.031	<0.001	0.042	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.01
	Nov-12	7.8	47	NT	0.004	<0.001	<0.0001	0.007	<0.001	0.008	<0.001	0.02	<0.0001	<0.001	<0.001	<0.02	0.02
	Jan-13	7.6	32	NT	0.02	<0.001	0.0002	0.044	0.002	0.089	<0.001	0.03	<0.0001	<0.001	0.001	<0.02	0.04
	Apr-13	7.8	37	NT	0.003	0.001	<0.0001	0.008	<0.001	0.004	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.02
	May-13	8.3	53	NT	0.006	<0.001	<0.0001	0.017	<0.001	0.018	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.01
	Jul-13	7.5	53	NT	0.018	0.001	<0.0001	0.026	<0.001	0.064	<0.001	<0.01	<0.0001	<0.001	0.001	<0.02	0.012
	Oct-13	7.3	62	NT	0.005	<0.001	<0.0001	0.010	<0.001	0.011	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
	Nov-13	7.8	61	NT	0.005	<0.001	<0.0001	0.009	<0.001	0.014	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.01
	Jan-14	7.4	26	NT	0.004	<0.001	<0.0001	0.005	<0.001	0.062	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
	Jun-14	7.1	44	NT	0.013	<0.001	0.0001	0.039	0.001	0.067	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.06
	Oct-14	8.2	20	NT	0.015	0.001	<0.0001	0.057	0.003	0.141	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.6
	Feb-15	7.2	38	NT	0.005	<0.001	<0.0001	0.013	<0.001	0.013	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.02

Analysis																	
Sample Point	Date	pH	CaCO3 mg/l	Sulphate (dissolved) mg/l	Nickel (dissolved) mg/l	Chromium (dissolved) mg/l	Cadmium (dissolved) mg/l	Copper (dissolved) mg/l	Lead (dissolved) mg/l	Zinc (dissolved) mg/l	Arsenic (dissolved) mg/l	Boron (dissolved) mg/l	Mercury (dissolved) mg/l	Selenium (dissolved) mg/l	Vanadium (dissolved) mg/l	Cyanide (total) (mg/l)	TPH (mg/l)
C1	Mar-12	8.1	40	NT	0.004	0.001	<0.0001	0.009	0.002	0.01	0.001	<0.01	<0.0001	<0.001	0.002	<0.02	<0.01
	May-12	7.9	43	NT	0.011	0.001	<0.0001	0.026	<0.001	0.01	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.014
	Jul-12	7.8	45	NT	0.002	<0.001	<0.0001	0.004	<0.001	0.007	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
	Sep-12	7.7	43	NT	0.003	0.001	<0.0001	0.004	<0.001	<0.002	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.01
	Nov-12	7.7	45	NT	0.002	<0.001	<0.0001	0.002	<0.001	0.002	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.01
	Jan-13	7.7	30	NT	0.006	<0.001	<0.0001	0.009	<0.001	0.016	<0.001	0.03	<0.0001	<0.001	0.001	<0.02	<0.01
	Apr-13	7.8	41	NT	0.001	0.002	<0.0001	0.001	<0.001	<0.002	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.04
	May-13	7.9	69	NT	0.002	<0.001	<0.0001	0.002	<0.001	<0.002	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
	Jul-13	7.4	50	NT	0.002	<0.001	<0.0001	0.003	<0.001	0.004	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.058
	Oct-13	7.7	88	NT	0.002	<0.001	<0.0001	0.004	<0.001	0.002	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
	Nov-13	7.6	37	NT	0.002	<0.001	<0.0001	0.002	<0.001	<0.002	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.01
	Jan-14	7.6	39	NT	0.002	<0.001	<0.0001	0.002	<0.001	<0.002	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
	Jun-14	7	34	NT	0.005	<0.001	<0.0001	0.01	<0.001	0.003	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.01
	Oct-14	8.1	14	NT	0.008	<0.001	<0.0001	0.014	<0.001	0.012	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	0.3
	Feb-15	7	38	NT	<0.001	<0.001	<0.0001	0.001	<0.001	0.002	<0.001	<0.01	<0.0001	<0.001	<0.001	<0.02	<0.01
EQS (mg/l)		6 to 9 (2)		400	0.02 (1)	0.0047 (3)	0.00009 (1)	0 - 50 = 0.001 (3) 50-100 = 0.006	0.0072 (1)	0-50 = 0.008 (3) 50-100 = 0.05	0.05 (2)	2 (2)	0.001 (1)	0.01 (4)	0.02 (3)	0.001 (1)	0.01(4)

Notes:

2014-2015 Sampling Points
EQS Adjusted for Harndess

The yellow cells indicate elevated concentrations compared with Environmental Quality Standards (EQS).

NG = No Guideline

NT = Not Tested

1 = Annex I of Directive 2008/105/EC of the European Parliament & of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC

2 = Table 2a: Environmental Quality Standards for List 2 dangerous substances, EC Dangerous Substances Directive (76/464/EEC)

3 = Table 2b: Environmental Quality Standards for hardness related List 2 dangerous substances, EC dangerous substances Directive (76/464/EEC)

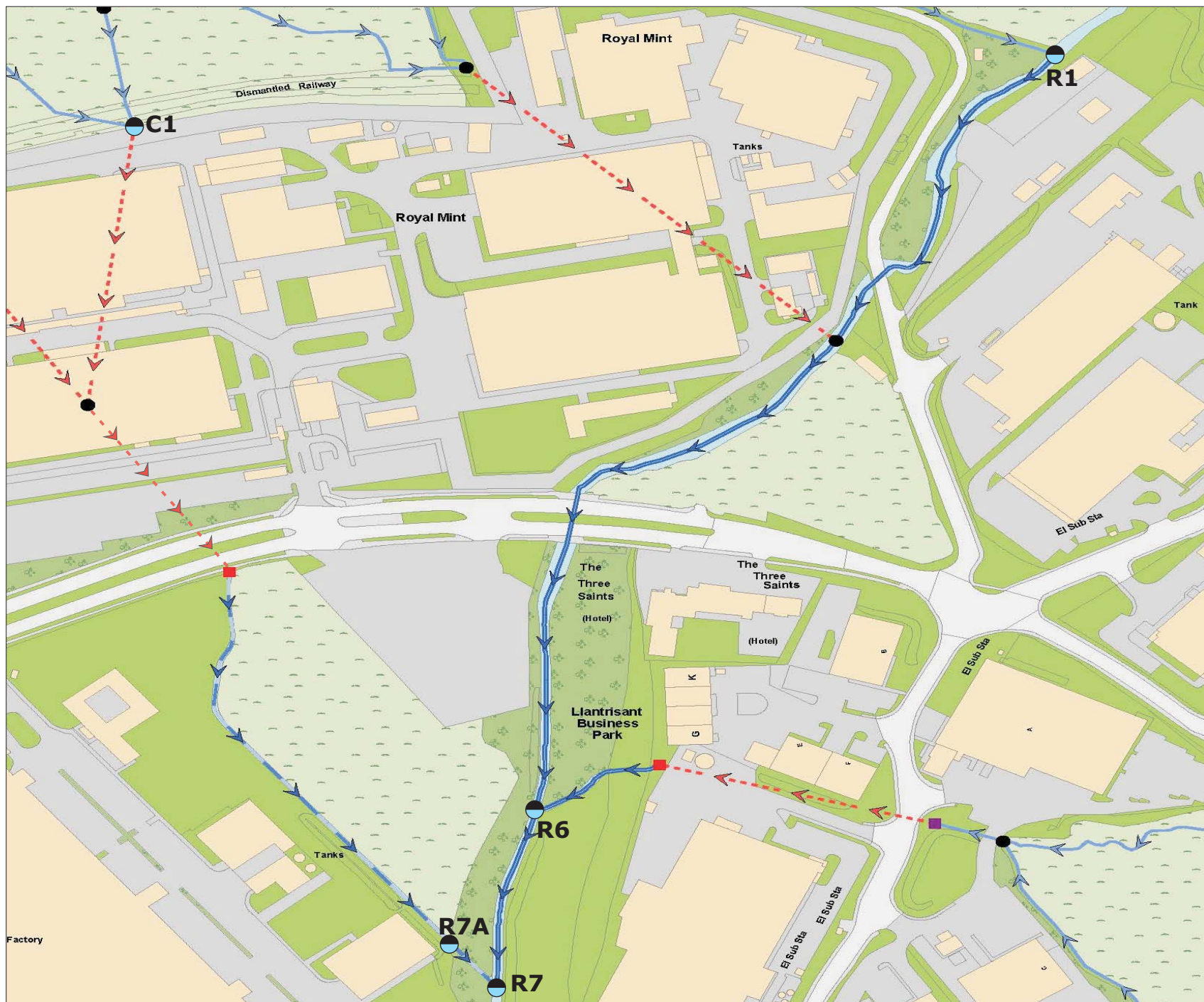
NB - in the absence of hardness data, a conservative approach has been adopted and the lowest EQS values used

4 = Water Supply (Water Quality) (England and Wales) Regulations 2000 (SI 2000/3184) (as amended); Water Supply (Water Quality) (Wales) Regulations 2001 (SI 3911 W.323) (as amended)

Table 1: Groundwater Monitoring 2014 -2015 (UK17-20212) - Summary of Results

		Analysis												
Borehole	Date	pH	CaCO3 (mg/l)	Nickel (dissolved) mg/l	Chromium (dissolved) mg/l	Cadmium (dissolved) mg/l	Copper (dissolved) mg/l	Lead (dissolved) mg/l	Zinc (dissolved) mg/l	Arsenic (dissolved) mg/l	Boron (dissolved) mg/l	Mercury (dissolved) mg/l	Selenium (dissolved) mg/l	Vanadium (dissolved) mg/l
Guideline Value		6-9 (1)	NG	0.02 (1)	0.0047(1)	0.00008(1)	0.001-0.028* (1)	0.0072 (1)	0.008 - 0.125* (1)	0.05(1)	2 (1)	0.00005(1)	0.01(2)	0.02 - 0.06* (1)
BH8	01-Oct-09	4.5	NT	0.571	0.001	0.0021	0.22	0.002	0.45	<0.001	0.05	<0.0001	0.002	<0.002
	01-Feb-10	4.3	NT	0.315	0.002	0.0027	0.239	0.002	0.68	<0.001	0.06	<0.0001	0.003	<0.002
	01-Apr-10	4.4	NT	0.141	<0.001	<0.0001	0.17	<0.001	0.952	<0.001	0.03	<0.0001	0.001	<0.002
	01-Jun-10	4.6	NT	0.57	0.001	0.0019	0.195	0.002	1.368	<0.001	0.04	<0.0001	0.001	<0.002
	25-Jan-13	5.2	14	0.162	<0.001	0.0013	0.283	0.002	0.379	<0.001	0.05	<0.0001	<0.001	0.001
	03-Apr-13	5.4	5	0.19	<0.001	0.0014	0.293	0.002	0.482	<0.001	<0.01	<0.0001	0.001	<0.001
	31-May-13	5.9	<30	0.307	0.001	0.0009	0.452	<0.001	1.325	<0.001	<0.01	<0.0001	<0.001	<0.001
	26-Jul-13	4.9	<2	0.176	<0.001	0.0017	0.262	0.004	0.703	<0.001	0.02	<0.0001	<0.001	<0.001
	07-Oct-13	5.4	0	0.111	<0.001	0.001	0.225	0.003	0.323	<0.001	0.02	<0.0001	<0.001	<0.001
	25-Nov-13	6.6	7	0.103	0.001	0.0007	0.152	<0.001	0.232	<0.001	0.03	<0.0001	<0.001	<0.001
	30-Jan-14	5.9	8	0.08	<0.001	0.0007	0.099	<0.001	0.205	<0.001	0.03	<0.0001	<0.001	<0.001
	04-Jun-14	4.8	6	0.085	<0.001	0.0007	0.132	0.001	0.23	<0.001	<0.01	<0.0001	<0.001	<0.001
	08-Oct-14	6.5	<2	0.235	<0.001	0.0014	0.285	0.003	0.564	<0.001	0.03	<0.0001	<0.001	<0.001
	10-Feb-15	5.3	5	0.104	<0.001	0.0006	0.112	<0.001	0.21	<0.001	0.03	<0.0001	0.001	<0.001
	BH9	15-Oct-09	7.5	NA	0.002	0.001	<0.0001	0.001	<0.001	0.005	<0.001	0.05	<0.0001	<0.001
06-Sep-11		4.5	NA	1.011	0.006	0.0012	1.11	<0.001	5.872	0.001	0.07	<0.0001	<0.001	<0.001
27-Sep-11		4.5	NA	3.96	0.004	0.0049	2.081	<0.001	19.61	<0.001	0.07	<0.0001	0.002	0.001
31-Oct-11		4.4	0	7.402	0.02	0.0022	9.91	0.002	31.02	0.001	NA	<0.0001	<0.001	NA
14-Dec-11		4.7	0	10.4	0.013	0.0059	9.567	<0.001	40.3	<0.001	0.3	<0.0001	0.003	<0.001
13-Mar-12		6.1	3	2.57	0.027	0.0017	3.452	0.005	22.99	0.001	<0.01	<0.0001	<0.001	0.014
14-May-12		4.7	0	2.254	0.012	0.0015	4.592	0.002	7.107	<0.001	0.08	<0.0001	<0.001	<0.001
10-Jul-12		4.5	0	1.122	0.014	0.0011	2.581	0.002	5.178	0.001	0.08	<0.0001	<0.001	0.002
18-Sep-12		6.7	0	0.458	0.003	0.0006	1.41	<0.001	1.921	<0.001	0.06	<0.0001	<0.001	<0.001
27-Nov-12		6.8	9	0.679	0.002	0.0009	1.29	<0.001	2.205	<0.001	0.09	<0.0001	<0.001	<0.001
25-Jan-13		7.5	24	0.546	<0.001	0.0008	0.771	<0.001	1.765	<0.001	0.11	<0.0001	<0.001	0.001
03-Apr-13		6.2	17	0.522	0.001	0.0008	2.185	<0.001	1.806	<0.001	0.04	<0.0001	<0.001	<0.001
31-May-13		5.1	117	0.754	0.006	0.0014	2.888	0.001	2.901	<0.001	0.08	<0.0001	<0.001	<0.001
26-Jul-13		5.4	<2	0.329	0.002	0.0009	1.397	<0.001	1.313	<0.001	0.04	<0.0001	<0.001	<0.001
07-Oct-13		5.1	10	1.176	0.005	0.0014	1.906	<0.001	2.568	<0.001	0.1	<0.0001	<0.001	<0.001
25-Nov-13		6.7	104	0.227	<0.001	0.0005	0.123	0.006	0.575	<0.001	0.07	<0.0001	<0.001	<0.001
30-Jan-14		6.7	111	0.121	<0.001	0.0002	0.051	<0.001	0.154	<0.001	0.05	<0.0001	<0.001	<0.001
04-Jun-14		6.2	115	0.066	0.001	0.0003	0.054	<0.001	0.192	<0.001	0.01	<0.0001	<0.001	<0.001
08-Oct-14		8	83	0.107	0.001	0.0004	0.048	<0.001	0.264	<0.001	0.02	<0.0001	<0.001	0.001
10-Feb-15		6.4	134	0.16	<0.001	0.0004	0.115	<0.001	0.315	<0.001	0.05	<0.0001	<0.001	<0.001
BH10	01-Jun-10	4.6	NA	0.176	<0.001	0.0003	0.184	<0.001	0.314	<0.001	0.02	<0.0001	<0.001	<0.002
	06-Sep-11	5.6	NA	0.097	<0.001	0.0001	0.044	<0.001	0.428	<0.001		<0.0001	<0.001	<0.001
	27-Sep-11	5.8	NA	0.052	<0.001	<0.0001	0.012	<0.001	0.154	<0.001	0.02	<0.0001	<0.001	<0.001
	31-Oct-11	6.8	13	0.073	0.001	<0.0001	0.032	<0.001	0.291	<0.001	NA	<0.0001	<0.001	NA
	14-Dec-11	7.2	50	0.009	0.001	<0.0001	0.009	<0.001	0.027	<0.001	0.07	<0.0001	0.001	<0.001
	13-Mar-12	5	0	4.727	0.001	0.0034	0.686	0.003	20.9	<0.001	0.01	<0.0001	0.002	0.001
	14-May-12	5.2	0	1.558	<0.001	0.0017	0.709	0.002	5.341	<0.001	0.04	<0.0001	<0.001	<0.001
	10-Jul-12	4.7	0	0.998	0.001	0.002	1.117	0.003	6.488	<0.001	0.05	<0.0001	0.001	<0.001
	18-Sep-12	5.1	0	0.755	0.001	0.0013	1.806	0.002	3.781	<0.001	0.04	<0.0001	<0.001	<0.001
	27-Nov-12	4.8	<2	0.752	<0.001	0.0013	0.728	0.002	3.319	<0.001	0.07	<0.0001	<0.001	<0.001
	25-Jan-13	5.4	16	0.617	<0.001	0.0011	0.984	0.002	2.05	<0.001	0.1	<0.0001	<0.001	<0.001
	03-Apr-13	5.6	4	0.596	<0.001	0.0011	1.537	0.002	1.898	<0.001	0.02	<0.0001	<0.001	<0.001
	31-May-13	5.7	49	0.464	<0.001	0.0009	1.244	0.002	1.704	<0.001	0.02	<0.0001	<0.001	<0.001
	26-Jul-13	5.4	<2	0.203	<0.001	0.0005	0.491	0.001	0.726	<0.001	<0.01	0.0002	<0.001	<0.001
	07-Oct-13	5.9	0	0.221	<0.001	0.0006	0.435	0.001	0.801	<0.001	0.03	<0.0001	<0.001	<0.001
	25-Nov-13	6.3	0	0.34	<0.001	0.0006	0.531	0.001	1.003	<0.001	0.05	<0.0001	<0.001	<0.001
	30-Jan-14	5.3	3	0.277	<0.001	0.0006	0.434	<0.001	0.945	<0.001	0.06	<0.0001	<0.001	<0.001
	04-Jun-14	4.8	4	0.138	<0.001	0.0004	0.352	0.001	0.38	<0.001	0.01	<0.0001	<0.001	<0.001
08-Oct-14	8.1	38	0.003	<0.001	<0.0001	0.006	<0.001	0.007	<0.001	0.01	<0.0001	<0.001	<0.001	
10-Feb-15	6.8	53	0.002	<0.001	<0.0001	0.009	<0.001	0.011	<0.001	<0.01	<0.0001	<0.001	<0.001	
BH32	01-Jun-10	6.6	NA	0.004	0.001	<0.0001	0.002	<0.001	<0.002	<0.001	0.02	<0.0001	<0.001	<0.002
	06-Sep-11	5.6	NA	2.18	0.003	0.0023	0.029	<0.001	4.856	<0.001	0.06	<0.0001	<0.001	<0.001
	27-Sep-11	6.3	NA	1.992	0.004	0.0014	0.006	<0.001	2.702	<0.001	0.06	<0.0001	0.001	0.001
	31-Oct-11	5.8	18	6.396	0.003	0.0042	0.04	<0.001	16.36	<0.001	NA	<0.0001	0.002	NA
	14-Dec-11	6.9	177	0.247	0.004	0.0002	0.003	<0.001	0.265	<0.001	0.07	<0.0001	0.002	0.002
	13-Mar-12	7.2	80	0.688	0.003	0.0006	0.003	<0.001	0.963	<0.001	<0.01	<0.0001	0.001	0.002
	14-May-12	7.2	166	0.465	0.004	0.0003	0.004	<0.001	0.871	<0.001	0.03	<0.0001	0.002	0.002
	10-Jul-12	6.8	13	1.96	0.001	0.0031	0.03	<0.001	4.906	<0.001	0.07	0.0001	<0.001	<0.001
	18-Sep-12	6.6	9	2.488	0.002	0.004	0.038	<0.001	6.379	<0.001	0.11	<0.0001	<0.001	<0.001
	27-Nov-12	7.2	67	0.834	0.001	0.001	0.009	<0.001	1.657	<0.001	0.06	<0.0001	<0.001	<0.001
	25-Jan-13	7	20	0.862	<0.001	0.0013	0.012	<0.001	1.903	<0.001	0.08	<0.0001	<0.001	0.001
	03-Apr-13	7.2	26	0.952	<0.001	0.001	0.006	<0.001	1.767	<0.001	0.04	<0.0001	<0.001	<0.001
	31-May-13	6.9	52	1.87	0.001	0.0028	0.044	<0.001	3.44	<0.001	0.06	<0.0001	<0.001	<0.001
	26-Jul-13	5.4	8	2.461	0.001	0.0043	0.069	<0.001	7.082	<0.001	0.08	<0.0001	<0.001	<0.001
	07-Oct-13	5.7	13	2.991	0.001	0.0051	0.136	<0.001	6.877	<0.001	0.1	<0.0001	<0.001	<0.001
	25-Nov-13	6.7	82	0.511	<0.001	0.0007	0.005	<0.001	1.32	<0.001	0.07	<0.0001	0.003	<0.001
	30-Jan-14	6.4	66	0.298	<0.001	0.0004	0.008	<0.001	0.785	<0.001	0.05	<0.0001	0.002	<0.001
	04-Jun-14	5.8	40	0.512	<0.001	0.0008	0.005	<0.001	1.157.					

Borehole	Date	Analysis												
		pH	CaCO3 (mg/l)	Nickel (dissolved) mg/l	Chromium (dissolved) mg/l	Cadmium (dissolved) mg/l	Copper (dissolved) mg/l	Lead (dissolved) mg/l	Zinc (dissolved) mg/l	Arsenic (dissolved) mg/l	Boron (dissolved) mg/l	Mercury (dissolved) mg/l	Selenium (dissolved) mg/l	Vanadium (dissolved) mg/l
Guideline Value		6-9 (1)	NG	0.02 (1)	0.0047(1)	0.00008(1)	0.001-0.028* (1)	0.0072 (1)	0.008 - 0.125* (1)	0.05(1)	2 (1)	0.00005(1)	0.01(2)	0.02 - 0.06* (1)
BH11	01-Feb-10	6.6	NA	0.003	<0.001	<0.0001	<0.001	<0.001	<0.002	<0.001	0.01	<0.0001	<0.001	<0.002
	01-Apr-10	6.7	NA	0.003	<0.001	<0.0001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.0001	<0.001	<0.002
	01-Jun-10	6.4	NA	0.003	0.001	<0.0001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.0001	<0.001	<0.002
	01-Nov-11	7.2	108	0.004	0.002	<0.0001	<0.001	<0.001	<0.002	<0.001	NA	<0.0001	<0.001	NA
	14-Dec-11	7	129	0.004	0.002	<0.0001	<0.001	<0.001	0.007	<0.001	0.08	<0.0001	0.001	0.001
	13-Mar-12	7.2	89	0.003	0.003	<0.0001	0.001	<0.001	0.003	0.002	<0.01	<0.0001	<0.001	0.002
	14-May-12	7.3	111	0.006	0.003	<0.0001	0.002	<0.001	0.009	<0.001	0.01	<0.0001	<0.001	0.001
	10-Jul-12	7.4	83	0.004	0.001	<0.0001	0.001	<0.001	0.006	<0.001	<0.01	<0.0001	<0.001	<0.001
	18-Sep-12	7.4	65	0.005	0.002	<0.0001	<0.001	<0.001	0.002	<0.001	0.02	<0.0001	<0.001	<0.001
	27-Nov-12	7.6	83	0.004	0.001	<0.0001	0.004	<0.001	0.007	<0.001	0.01	<0.0001	<0.001	<0.001
	25-Jan-13	7.5	80	0.002	<0.001	<0.0001	<0.001	<0.001	<0.002	<0.001	0.04	<0.0001	<0.001	0.001
	03-Apr-13	7.6	73	0.003	0.001	<0.0001	0.002	<0.001	0.003	<0.001	<0.01	<0.0001	<0.001	<0.001
	31-May-13	7.4	78	0.003	<0.001	<0.0001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.0001	<0.001	<0.001
	26-Jul-13	6.7	93	0.002	0.002	<0.0001	0.001	<0.001	0.006	<0.001	<0.01	0.0003	<0.001	0.001
	07-Oct-13	7	146	0.004	0.001	<0.0001	0.002	<0.001	0.007	<0.001	0.03	<0.0001	<0.001	<0.001
	25-Nov-13	7.1	124	0.003	<0.001	<0.0001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.0001	<0.001	<0.001
	30-Jan-14	7	94	0.003	<0.001	<0.0001	0.001	<0.001	<0.002	<0.001	0.02	<0.0001	<0.001	<0.001
	04-Jun-14	6.4	102	0.003	<0.001	<0.0001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.0001	<0.001	<0.001
	08-Oct-14	8	85	0.003	<0.001	<0.0001	<0.001	<0.001	0.004	<0.001	0.01	<0.0001	<0.001	<0.001
	10-Feb-15	6.7	82	0.002	<0.001	<0.0001	0.002	<0.001	0.003	<0.001	<0.01	<0.0001	<0.001	<0.001
BH12	01-Oct-09	6.4	NA	0.022	0.003	0.002	0.002	<0.001	0.008	<0.001	0.04	0.0001	<0.001	<0.002
	01-Feb-10	6.2	NA	0.01	0.002	0.0006	<0.001	<0.001	0.004	<0.001	0.04	<0.0001	<0.001	<0.002
	01-Apr-10	6.2	NA	0.012	<0.001	0.0016	<0.001	<0.001	0.003	<0.001	0.03	<0.0001	<0.001	<0.002
	01-Jun-10	6.3	NA	0.012	0.002	0.0015	0.004	<0.001	0.003	<0.001	0.02	<0.0001	<0.001	<0.002
	31-Oct-11	6.5	168	0.01	0.004	0.0006	0.002	<0.001	0.005	<0.001	NA	0.0002	0.001	NA
	16-Dec-11	7.4	91	0.002	0.002	0.0005	<0.001	<0.001	<0.002	<0.001	<0.01	<0.0001	0.001	<0.001
	13-Mar-12	5.9	0	0.36	<0.001	0.0011	0.156	0.001	1.576	<0.001	<0.01	<0.0001	0.001	0.001
	14-May-12	7.1	102	0.005	0.003	0.0002	0.001	<0.001	0.005	<0.001	0.02	<0.0001	<0.001	0.001
	10-Jul-12	7.3	155	0.007	0.002	0.0002	0.002	<0.001	0.007	<0.001	0.01	<0.0001	<0.001	0.001
	18-Sep-12	7.3	171	0.008	0.004	0.0004	0.002	<0.001	0.002	<0.001	0.05	0.0002	<0.001	<0.001
	27-Nov-12	7.6	139	0.004	0.002	0.0002	<0.001	<0.001	0.003	<0.001	0.02	<0.0001	<0.001	0.001
	25-Jan-13	7.6	123	0.003	<0.001	0.0001	<0.001	<0.001	<0.002	<0.001	0.04	<0.0001	<0.001	0.001
	03-Apr-13	7.6	178	0.008	0.003	0.0004	<0.001	<0.001	<0.002	<0.001	0.01	<0.0001	<0.001	0.001
	31-May-13	7.4	201	0.007	0.004	0.0003	0.001	<0.001	<0.002	<0.001	0.01	<0.0001	<0.001	0.002
	26-Jul-13	6.6	158	0.008	0.004	0.0005	0.004	<0.001	0.004	<0.001	0.01	<0.0001	<0.001	0.002
	07-Oct-13	7.1	165	0.009	0.002	0.0008	0.005	<0.001	0.004	<0.001	0.03	<0.0001	<0.001	0.001
	25-Nov-13	6.8	162	0.004	<0.001	0.0003	0.001	<0.001	<0.002	<0.001	0.01	<0.0001	<0.001	<0.001
	30-Jan-14	6.9	127	0.002	<0.001	<0.0001	0.001	<0.001	<0.002	<0.001	0.02	<0.0001	0.002	<0.001
	04-Jun-14	6.3	242	0.008	0.004	0.0005	0.002	<0.001	<0.002	<0.001	0.01	<0.0001	<0.001	0.002
	08-Oct-14	8.2	162	0.007	0.001	0.0004	0.005	<0.001	0.003	<0.001	0.03	<0.0001	<0.001	<0.001
10-Feb-15	6.5	232	0.008	0.002	0.0004	0.002	<0.001	0.002	<0.001	0.02	0.0001	<0.001	0.001	
BH13	01-Oct-09	5.2	NA	0.721	0.001	0.002	0.243	<0.001	0.611	<0.001	0.04	0.0001	<0.001	<0.002
	01-Feb-10	5.5	NA	0.263	0.001	0.0008	0.24	<0.001	0.055	<0.001	0.03	<0.0001	<0.001	<0.002
	01-Apr-10	5.5	NA	0.214	<0.001	0.0006	0.092	<0.001	0.154	<0.001	0.01	<0.0001	<0.001	<0.002
	01-Jun-10	4.6	NA	0.244	<0.001	0.0008	0.243	0.001	0.285	<0.001	0.02	0.0001	<0.001	<0.002
	01-Nov-11	6.4	0	0.193	<0.001	0.0004	0.111	<0.001	0.528	<0.001	NA	<0.0001	<0.001	NA
	16-Dec-11	7.4	47	0.128	0.001	0.0004	0.021	<0.001	0.287	<0.001	<0.01	<0.0001	<0.001	<0.001
	13-Mar-12	6.9	198	0.009	0.006	0.0004	0.001	<0.001	0.002	<0.001	<0.01	<0.0001	0.001	0.002
	14-May-12	6.7	0	0.214	<0.001	0.0005	0.104	<0.001	0.761	<0.001	0.01	<0.0001	<0.001	<0.001
	10-Jul-12	5.9	0	0.387	<0.001	0.0008	0.14	0.001	1.228	<0.001	0.02	<0.0001	<0.001	<0.001
	18-Sep-12	5.5	0	1.907	0.001	0.0037	0.138	0.002	1.851	<0.001	0.09	<0.0001	<0.001	<0.001
	27-Nov-12	7.3	12	0.249	<0.001	0.0006	0.034	<0.001	0.615	<0.001	0.02	<0.0001	<0.001	0.001
	25-Jan-13	6.5	20	0.306	<0.001	0.0007	0.114	<0.001	0.839	<0.001	0.06	<0.0001	<0.001	0.001
	03-Apr-13	6.8	12	0.276	<0.001	0.0006	0.098	<0.001	0.774	<0.001	<0.01	<0.0001	<0.001	<0.001
	31-May-13	6.9	50	0.553	<0.001	0.0011	0.091	0.001	0.681	<0.001	0.02	<0.0001	<0.001	<0.001
	26-Jul-13	5	<2	1.746	<0.001	0.0027	0.098	0.001	0.924	<0.001	0.09	<0.0001	<0.001	<0.001
	07-Oct-13	6.1	14	0.4	<0.001	0.0009	0.109	0.001	0.625	<0.001	0.04	<0.0001	<0.001	<0.001
	25-Nov-13	6.6	8	0.169	<0.001	0.0006	0.075	<0.001	0.43	<0.001	0.03	<0.0001	<0.001	<0.001
	30-Jan-14	6.3	30	0.124	<0.001	0.0005	0.004	<0.001	0.133	<0.001	0.05	<0.0001	<0.001	<0.001
	04-Jun-14	4.8	234	0.168	<0.001	0.0005	0.054	<0.001	0.373	<0.001	<0.01	<0.0001	<0.001	<0.001
	08-Oct-14	7.4	<2	0.644	<0.001	0.0015	0.115	0.001	0.594	<0.001	0.06	<0.0001	<0.001	<0.001
10-Feb-15	5.4	4	0.075	<0.001	0.0003	0.041	<0.001	0.14	<0.001	0.02	0.0004	<0.001	<0.001	
BH901	01-Mar-06	5.8	<20	0.076	0.008	<0.001	0.074	<0.005	0.031	<0.005	<0.005	<0.00005	<0.005	NA
	01-May-06	4.3	<20	2.7	<0.005	0.002	2.2	<0.005	0.89	<0.005	0.032	<0.00005	<0.005	NA
	01-Dec-06	3.5	<20	3.8	0.006	0.005	2.3	<0.005	1.6	<0.005	0.140	<0.00005	<0.005	NA
	01-Aug-07	6.70	62	0.09	<0.005	<0.001	0.013	<0.005	0.018	<0.005	0.031	<0.00005	<0.005	NA
	01-Aug-08	3.3	<20	2.1	<0.005	0.003	0.96	<0.005	2.5	<0.005	0.060	<0.00005	<0.005	NA
	01-Sep-09	5.36	6.5	0.342	<0.005	<0.001	0.401	<0.005	0.522	<0.005	<0.018	<0.00005	<0.005	NA
	01-Aug-10	6.40	41	0.035										



Legend

-  River Sampling Locations

Title **Figure 2: River Sampling Locations**

Site **The Royal Mint,
Llantrisant
Pontyclun,
Mid Glamorgan,
CF72 8YT**

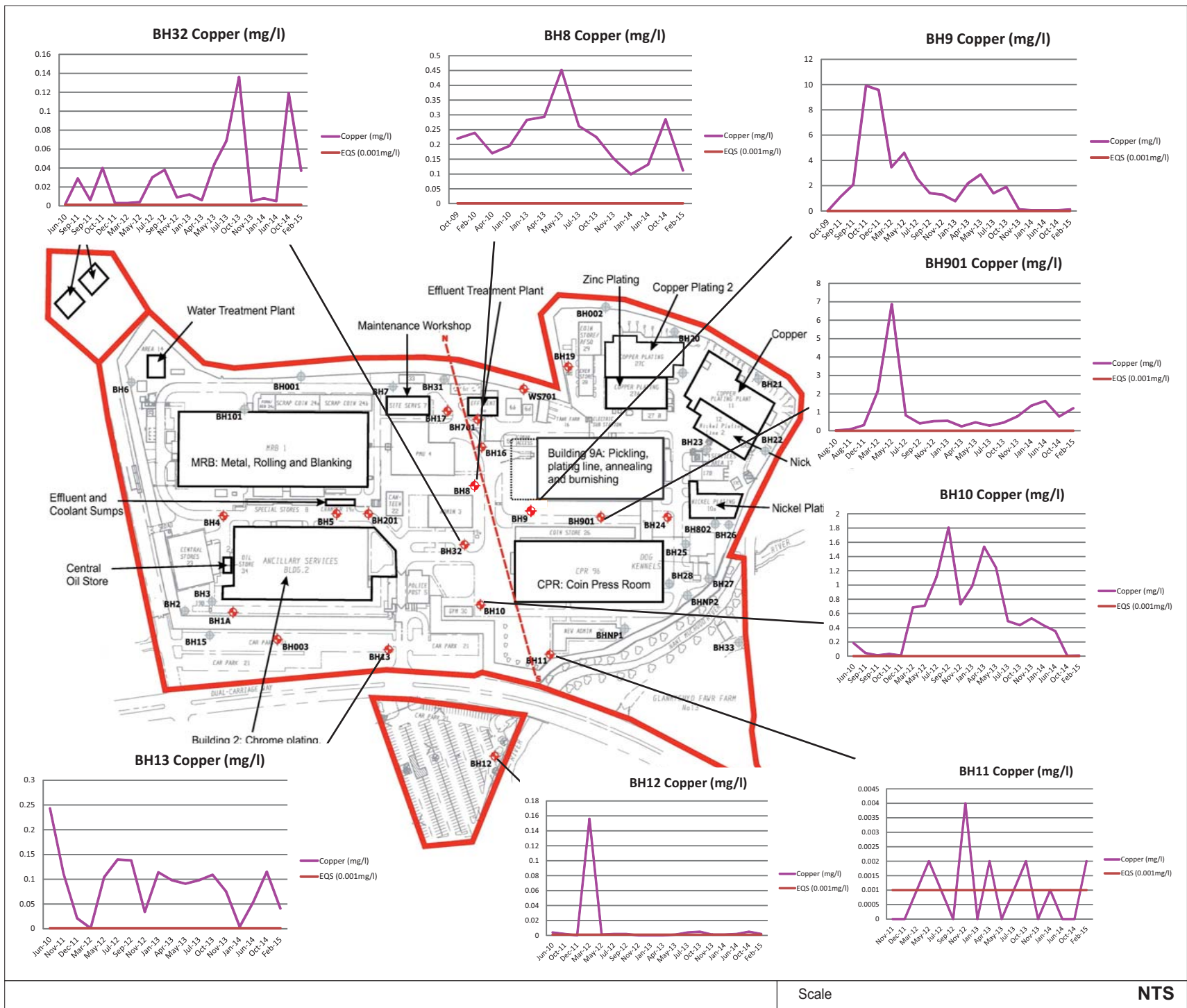
Client **The Royal Mint**

Project No. **UK17-20212**

Issue **1**

Date **June 2014**

Drawn by **RH**



Legend

Site Boundary

Sampled Boreholes

Title Figure 3: Graphical Representation of Copper Concentrations, 10/02/2015

Site The Royal Mint, Llantrisant Pontyclun, Mid Glamorgan, CF72 8YT

Client The Royal Mint

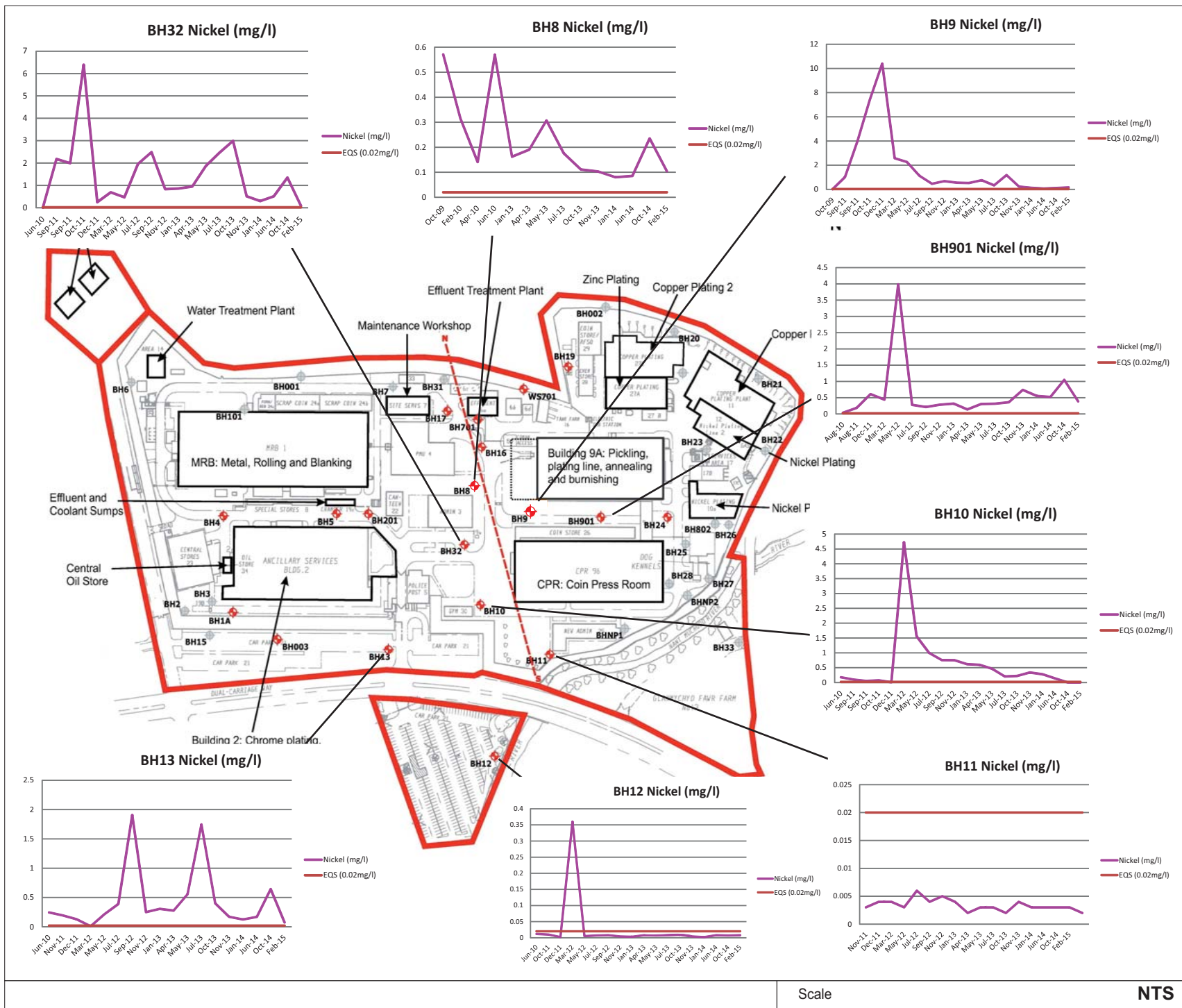
Project No. UK17-20212

Issue 1

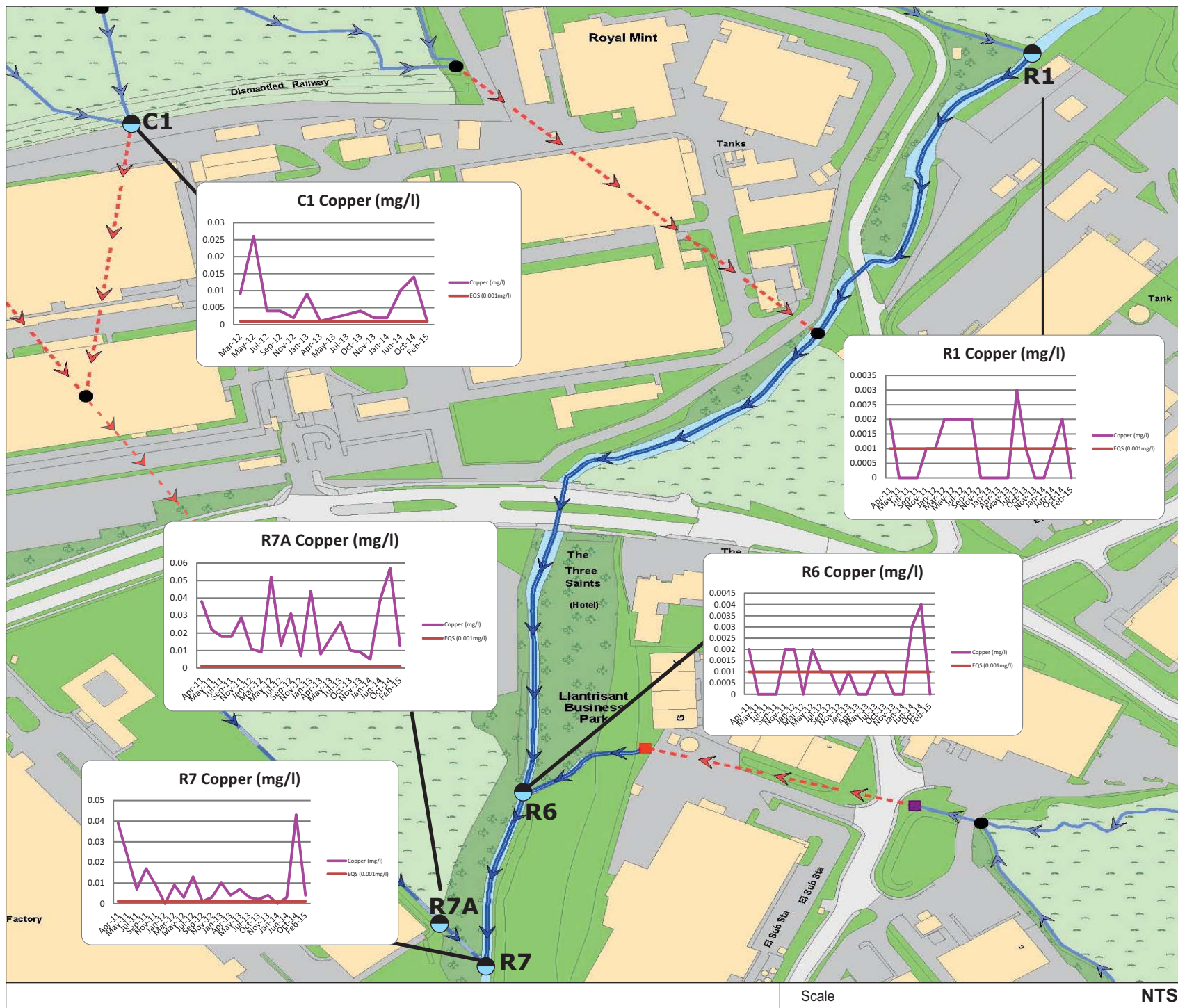
Date February 2015

Drawn by RH

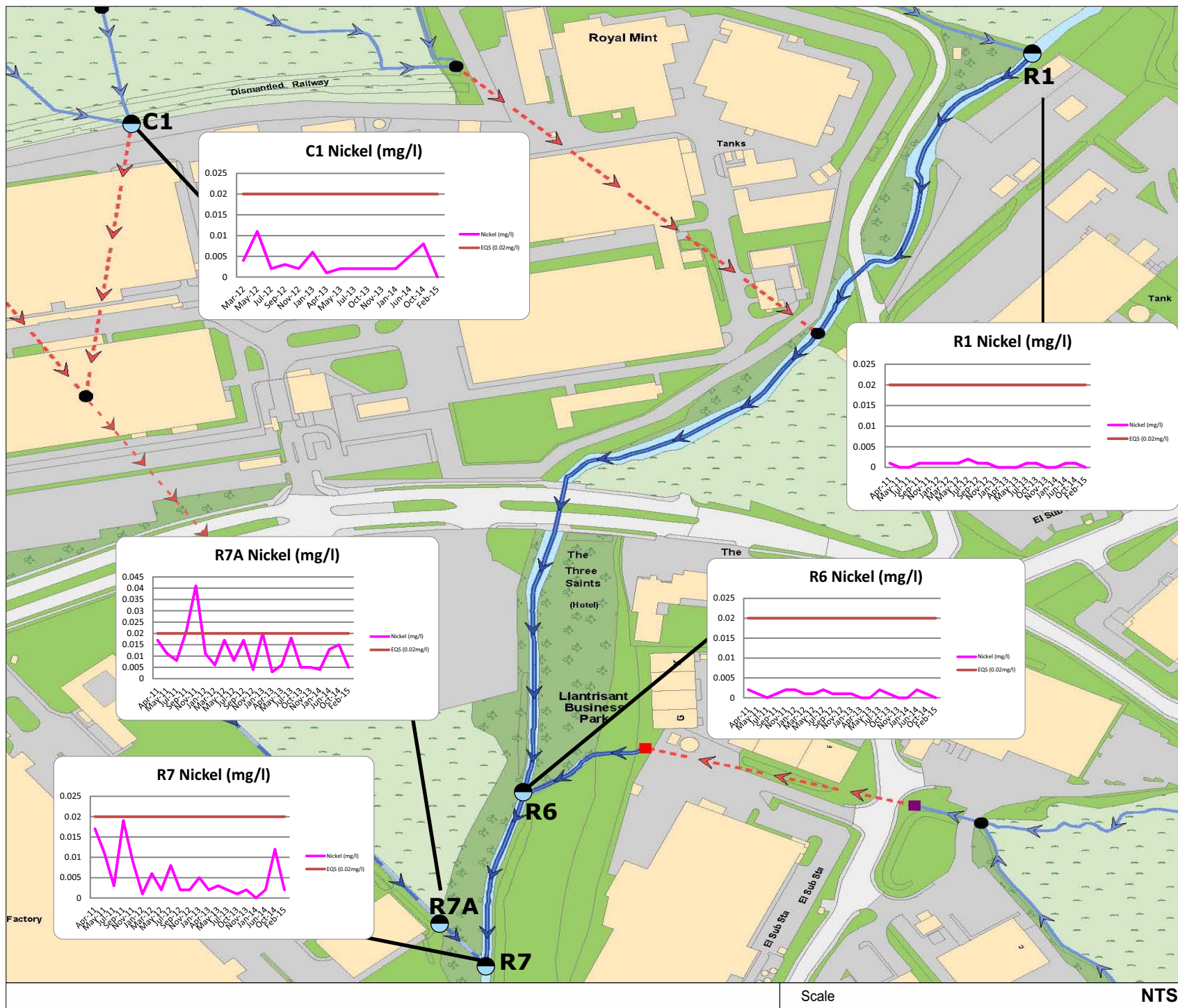




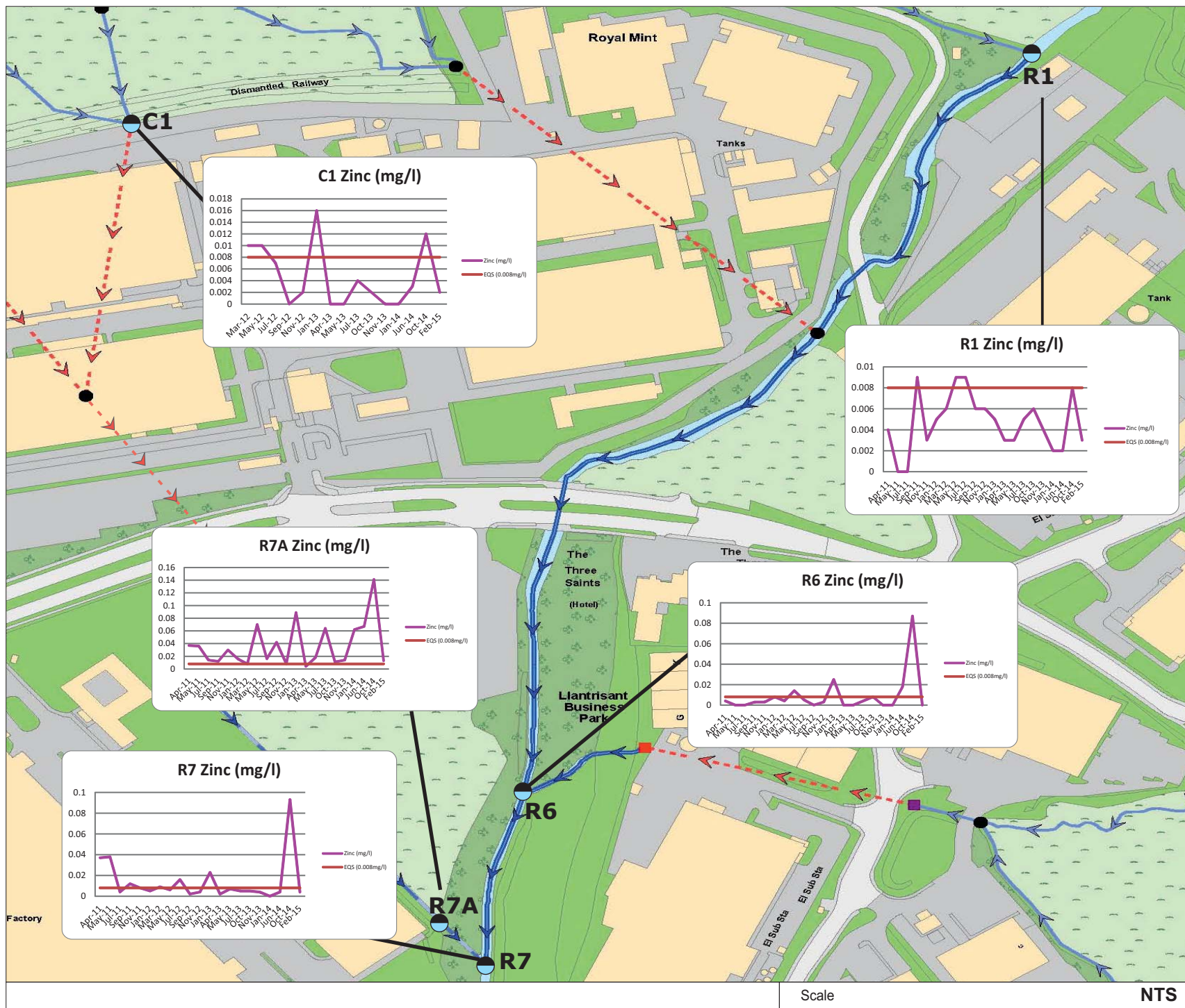




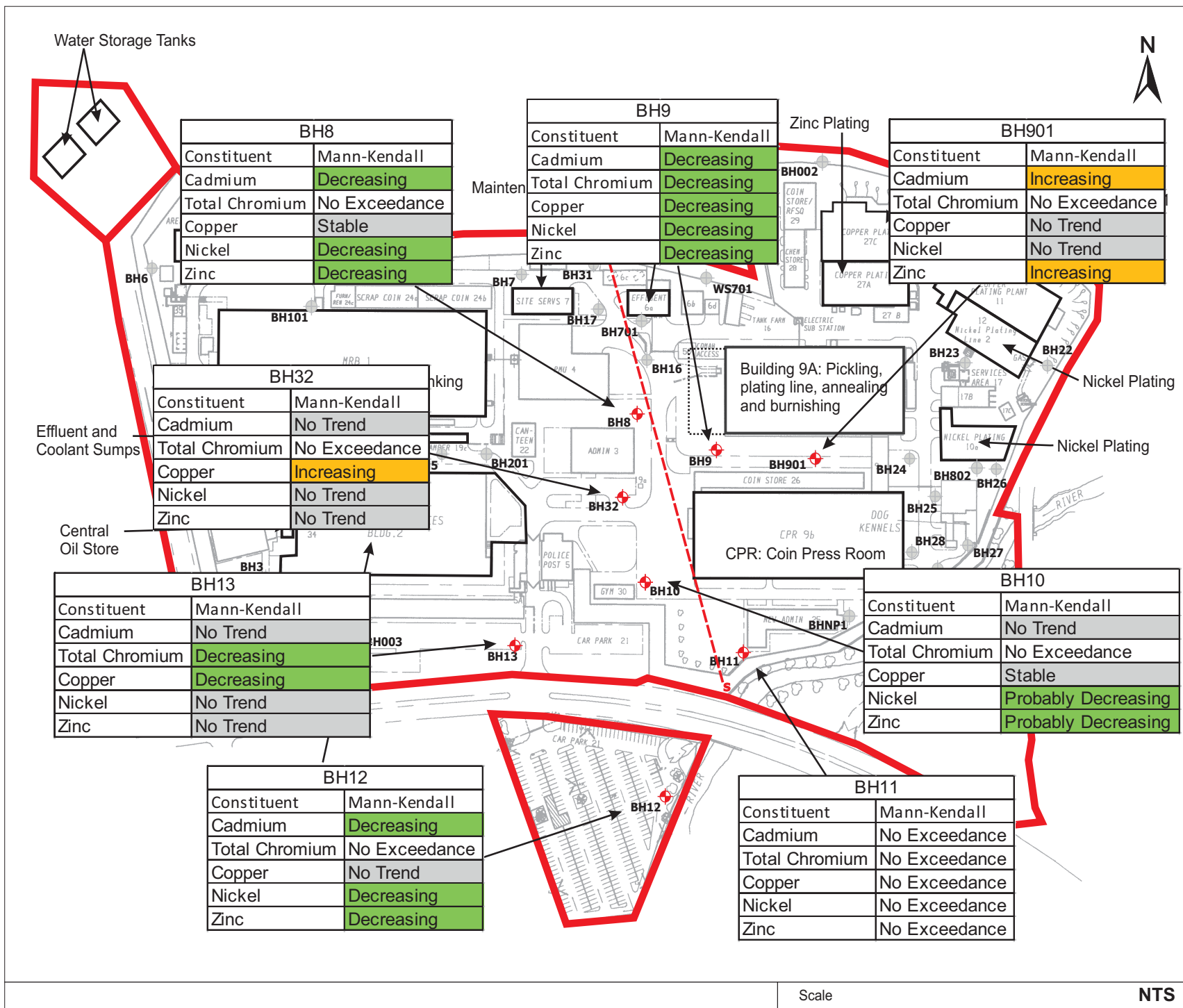
Legend River Sampling Locations	
Title Figure 6: Copper Concentration Graphs - Surface Water, 10/02/2015	
Site The Royal Mint, Llantrisant Pontyclun, Mid Glamorgan, CF22 8YT	
Client The Royal Mint	
Project No. UK17-20212	
Issue 1	
Date February 2015	
Drawn by RH	
ENVIRON	

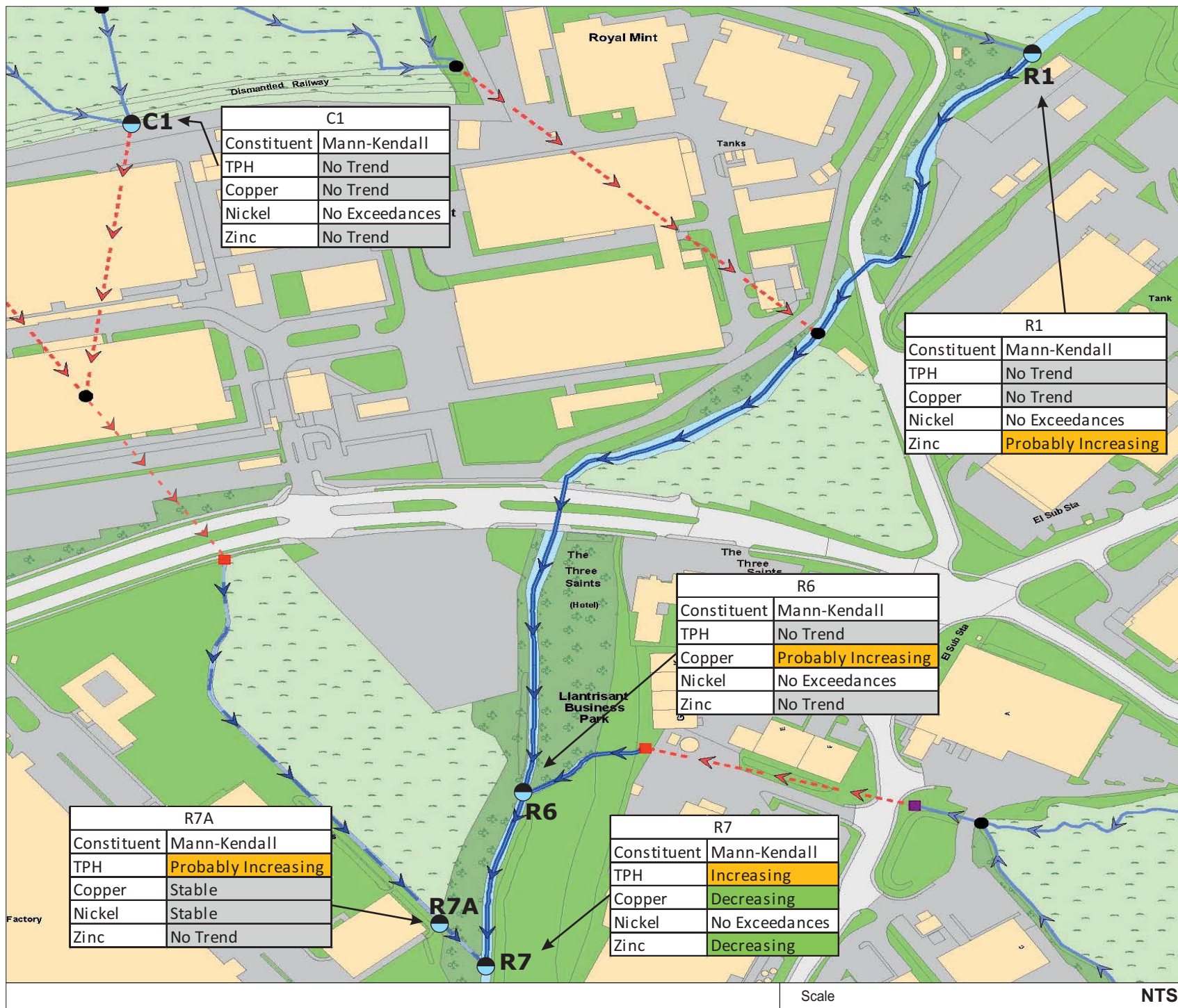


Legend River Sampling Locations	
Title	Figure 7: Nickel Concentration Graphs - Surface Water, 10/02/2015
Site	The Royal Mint, Llantrisant, Pontyclun, Mid Glamorgan, CF72 8YT
Client	The Royal Mint
Project No.	UK17-20212
Issue	1
Date	February 2015
Drawn by	RH
ENVIRON	



Legend River Sampling Locations	
Title	Figure 8: Zinc Concentration Graphs - Surface Water, 10/02/2015
Site	The Royal Mint, Llantrisant, Pontyclun, Mid Glamorgan, CF72 8YT
Client	The Royal Mint
Project No.	UK17-20212
Issue	1
Date	February 2015
Drawn by	RH
ENVIRON	





Legend

 River Sampling Locations

Title **Figure 10: Surface Water Statistical Results**

Site **The Royal Mint,
Llantrisant
Pontyclun,
Mid Glamorgan,
CF72 8YT**

Client **The Royal Mint**

Project No. **UK17-20212**

Issue **1**

Date **February 2015**

Drawn by **RH**

Our Ref: EXR/193752 (Ver. 1)

Your Ref: UK17-20212

February 19, 2015



Environmental Chemistry

ESG

Bretby Business Park

Ashby Road

Burton-on-Trent

Staffordshire

DE15 0YZ

Telephone: 01283 554400

Facsimile: 01283 554422

Ms L Cleverley
Environ UK Ltd
8 Village Way
Greenmeadow Springs
Coryton
Cardiff
CF15 7NE

For the attention of Ms L Cleverley

Dear Ms Cleverley

Sample Analysis - Royal Mint 14/15

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 Environmental Scientifics Group Ltd (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 ESG

J Colbourne
Project Co-ordinator
01283 554547

TEST REPORT



Report No. EXR/193752 (Ver. 1)

Environ UK Ltd
8 Village Way
Greenmeadow Springs
Coryton
Cardiff
CF15 7NE

Site: Royal Mint 14/15

The 13 samples described in this report were registered for analysis by ESG on 11-Feb-2015. This report supersedes any versions previously issued by the laboratory.

The analysis was completed by: 19-Feb-2015

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)
GC-FID Chromatograms (Pages 4 to 8)
Analytical and Deviating Sample Overview (Pages 9 to 10)
Table of Method Descriptions (Page 11)
Table of Report Notes (Page 12)
Table of Sample Descriptions (Appendix A Page 1 of 1)

On behalf of
ESG :
Declan Burns


Managing Director
Multi-Sector Services

Date of Issue: 19-Feb-2015

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.

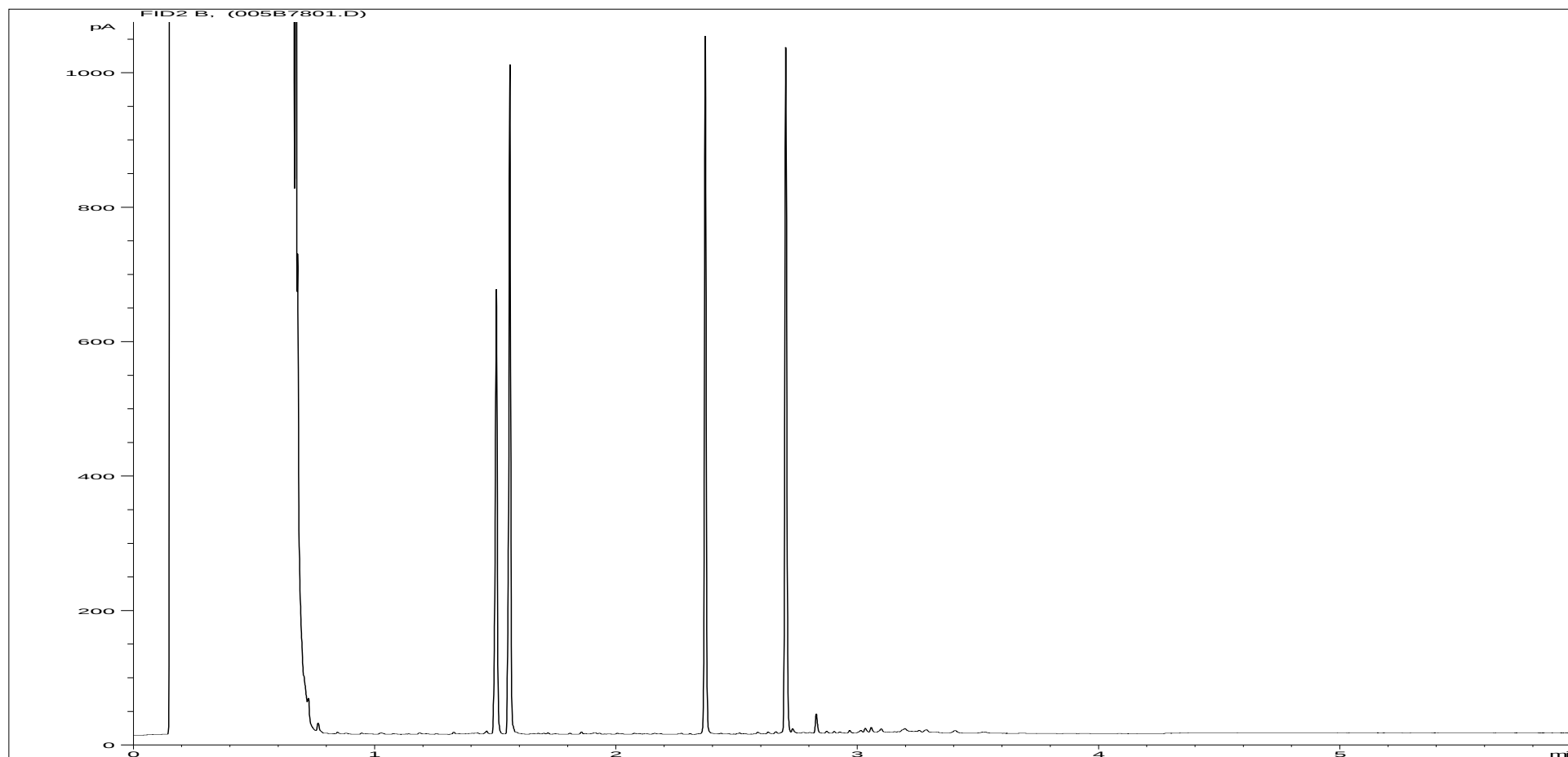
ESG accepts no responsibility for any sampling not carried out by our personnel.

Where individual results are flagged see report notes for status.

Units : Method Codes : Method Reporting Limits : UKAS Accredited :			pH 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		
			WSLM3	WSLM12	Calc. HD	ICPWATVAR	ICPWATVAR	ICPWATVAR	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPWATVAR	ICPMSW	ICPMSW	
					7	1	1	0.01	0.001	0.001	0.0001	0.001	0.001	0.002	0.001	0.01	0.0001	0.001		
			Yes	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	pH units w	Total Alkalinity as CaCO3 w	Total Hardness as CaCO3	Calcium as Ca (Dissolved) a	Magnesium as Mg (Dissolved) a	Barium as Ba (Dissolved) a	Nickel as Ni (Dissolved)	Chromium as Cr (Dissolved)	Cadmium as Cd (Dissolved)	Copper as Cu (Dissolved)	Lead as Pb (Dissolved)	Zinc as Zn (Dissolved)	Arsenic as As (Dissolved)	Boron as B (Dissolved) a	Mercury as Hg (Dissolved)	Selenium as Se (Dissolved)		
1567747	BH901	10-Feb-15 09:40	4.6	Nil	39	9	4	0.02	0.386	<0.001	0.0009	1.219	<0.001	1.098	<0.001	0.12	0.0002	<0.001		
1567748	BH9	10-Feb-15 10:15	6.4	134	215	73	8	0.04	0.16	<0.001	0.0004	0.115	<0.001	0.315	<0.001	0.05	<0.0001	<0.001		
1567749	BH801	10-Feb-15 10:45	5.3	5	78	23	5	0.02	0.104	<0.001	0.0006	0.112	<0.001	0.21	<0.001	0.03	<0.0001	0.001		
1567750	BH32	10-Feb-15 11:20	6.4	156	166	55	7	0.02	0.085	<0.001	0.0002	0.037	<0.001	0.248	<0.001	0.01	<0.0001	0.003		
1567751	BH11	10-Feb-15 12:00	6.7	82	82	23	6	0.07	0.002	<0.001	<0.0001	0.002	<0.001	0.003	<0.001	<0.01	<0.0001	<0.001		
1567752	BH10	10-Feb-15 12:30	6.8	53	83	25	5	0.03	0.002	<0.001	<0.0001	0.009	<0.001	0.011	<0.001	<0.01	<0.0001	<0.001		
1567753	BH13	10-Feb-15 13:00	5.4	4	50	15	3	0.02	0.075	<0.001	0.0003	0.041	<0.001	0.14	<0.001	0.02	0.0004	<0.001		
1567754	BH12	10-Feb-15 13:30	6.5	232	277	88	14	0.08	0.008	0.002	0.0004	0.002	<0.001	0.002	<0.001	0.02	0.0001	<0.001		
1567755	C1	10-Feb-15 14:00	7.0	38	42	12	3	<0.01	<0.001	<0.001	<0.0001	0.001	<0.001	0.002	<0.001	<0.01	<0.0001	<0.001		
1567756	R1	10-Feb-15 14:15	7.4	53	59	17	4	0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	0.003	<0.001	<0.01	<0.0001	<0.001		
1567757	R6	10-Feb-15 14:30	7.3	53	66	20	4	0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.0001	<0.001		
1567758	R7	10-Feb-15 14:45	7.3	49	61	18	4	0.01	0.002	<0.001	<0.0001	0.004	<0.001	0.004	<0.001	<0.01	<0.0001	<0.001		
1567759	R7A	10-Feb-15 15:00	7.2	38	55	17	3	<0.01	0.005	<0.001	<0.0001	0.013	<0.001	0.013	<0.001	<0.01	<0.0001	<0.001		
ESG Bretby Business Park, Ashby Road Burton-on-Trent, Staffordshire, DE15 0YZ Tel +44 (0) 1283 554400 Fax +44 (0) 1283 554422			Client Name		Environ UK Ltd							Sample Analysis								
			Contact		Ms L Cleverley															
			Royal Mint 14/15											Date Printed					19-Feb-2015	
														Report Number					EXR/193752	
														Table Number					1	

			Units :	mg/l	mg/l	mg/l	mg/l										
			Method Codes :	ICPMSW	SFAPI	TPHFID	ICPWATVAR										
			Method Reporting Limits :	0.001	0.02	0.01	0.01										
			UKAS Accredited :	Yes	Yes	Yes	No										
LAB ID Number EX/	Client Sample Description	Sample Date	Vanadium as V (Dissolved)	Cyanide (Total) as CN	TPH GC	Beryllium as Be (Dissolved) a											
1567747	BH901	10-Feb-15 09:40	<0.001			<0.01											
1567748	BH9	10-Feb-15 10:15	<0.001			<0.01											
1567749	BH801	10-Feb-15 10:45	<0.001			<0.01											
1567750	BH32	10-Feb-15 11:20	<0.001			<0.01											
1567751	BH11	10-Feb-15 12:00	<0.001			<0.01											
1567752	BH10	10-Feb-15 12:30	<0.001			<0.01											
1567753	BH13	10-Feb-15 13:00	<0.001			<0.01											
1567754	BH12	10-Feb-15 13:30	0.001			<0.01											
1567755	C1	10-Feb-15 14:00	<0.001	<0.02	<0.01	<0.01											
1567756	R1	10-Feb-15 14:15	<0.001	<0.02	<0.01	<0.01											
1567757	R6	10-Feb-15 14:30	<0.001	<0.02	<0.01	<0.01											
1567758	R7	10-Feb-15 14:45	<0.001	<0.02	0.01	<0.01											
1567759	R7A	10-Feb-15 15:00	<0.001	<0.02	0.02	<0.01											
														</			

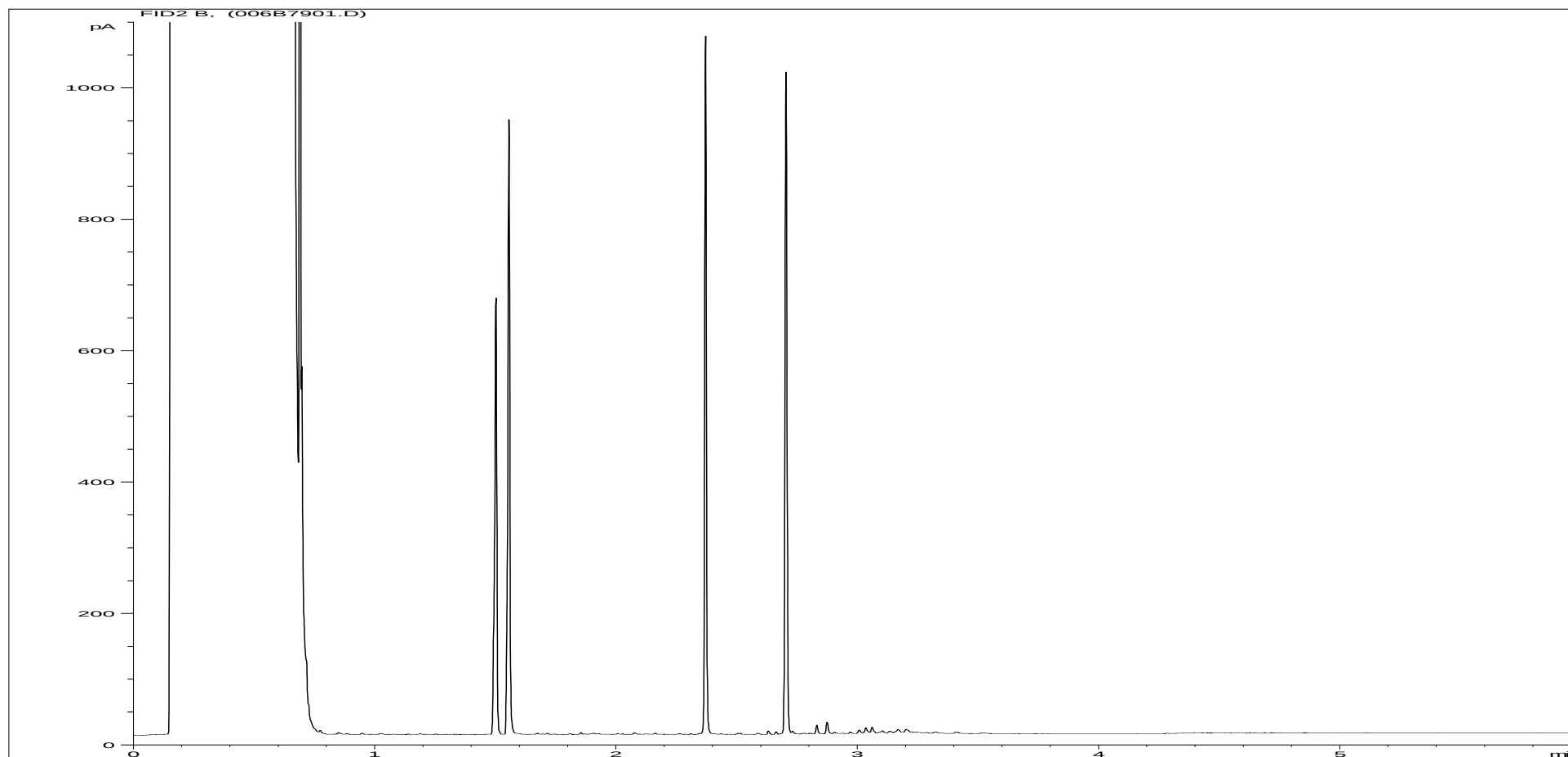
Petroleum Hydrocarbons (C8 to C40) by GC/FID



Sample ID:	EX1567755	Job Number:	W19_3752
Multiplier:	8	Client:	Environ UK Ltd
Dilution:	1	Site:	Royal Mint 14/15
Acquisition Method:	5UL_RUNF.M	Client Sample Ref:	C1
Acquisition Date/Time:	13-Feb-15, 01:57:56		
Datafile:	D:\TES\DATA\Y2015\021215TPH_GC4\021215 2015-02-12 09-03-59\005B7801.D		

Where individual results are flagged see report notes for status.

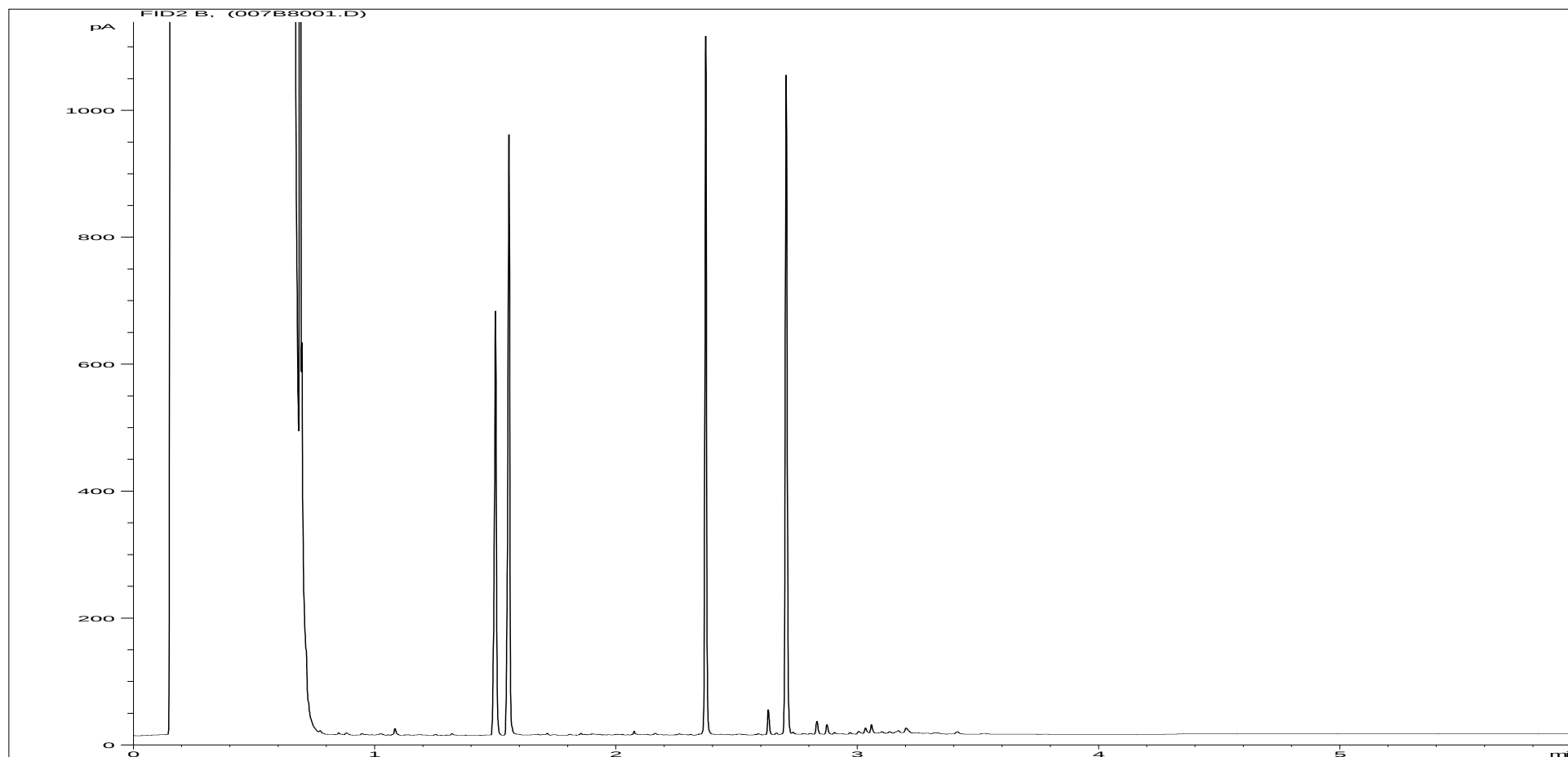
Petroleum Hydrocarbons (C8 to C40) by GC/FID



Sample ID:	EX1567756	Job Number:	W19_3752
Multiplier:	8	Client:	Environ UK Ltd
Dilution:	1	Site:	Royal Mint 14/15
Acquisition Method:	5UL_RUNF.M	Client Sample Ref:	R1
Acquisition Date/Time:	13-Feb-15, 02:11:00		
Datafile:	D:\TES\DATA\Y2015\021215TPH_GC4\021215 2015-02-12 09-03-59\006B7901.D		

Where individual results are flagged see report notes for status.

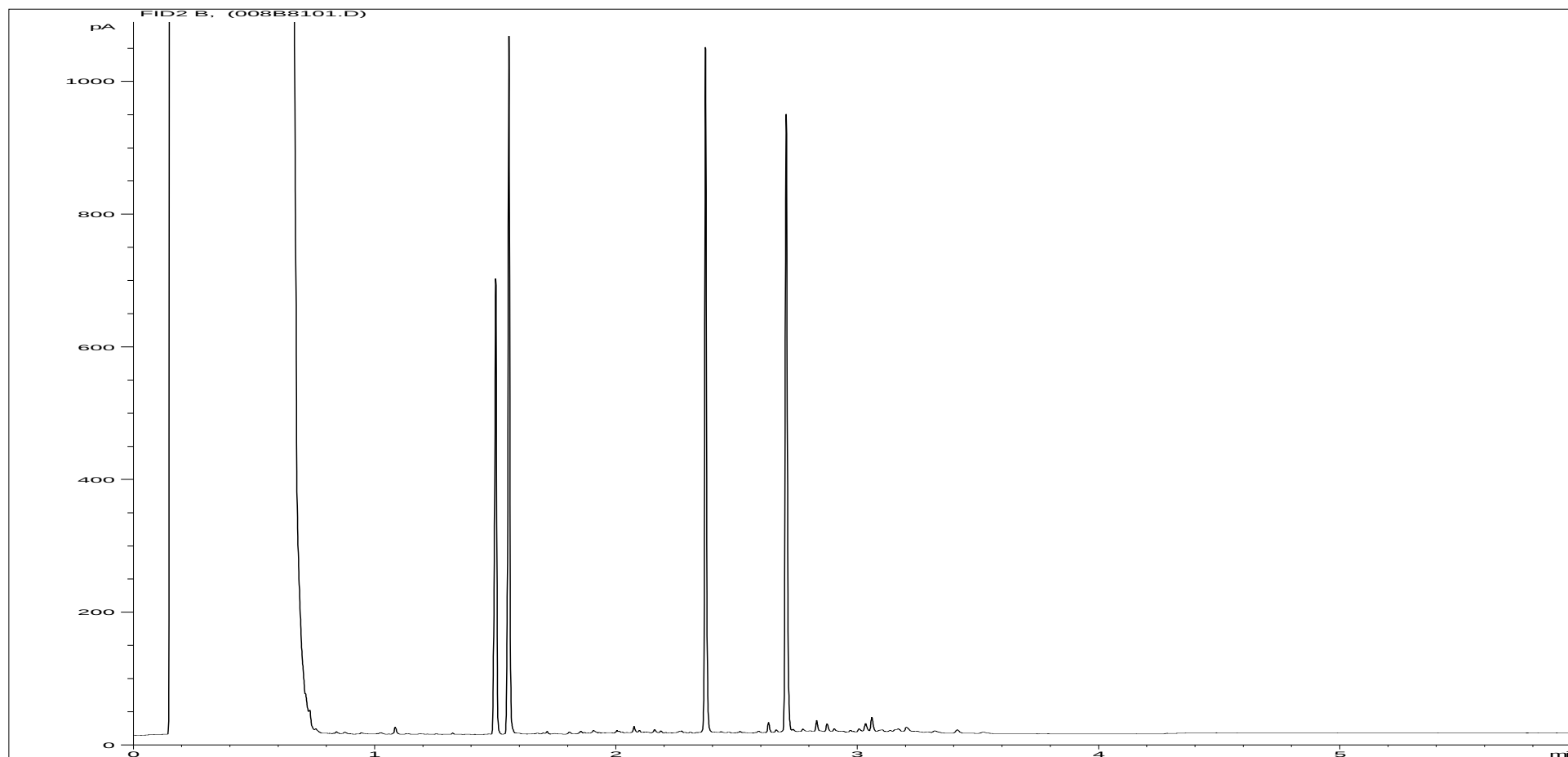
Petroleum Hydrocarbons (C8 to C40) by GC/FID



Sample ID:	EX1567757	Job Number:	W19_3752
Multiplier:	8	Client:	Environ UK Ltd
Dilution:	1	Site:	Royal Mint 14/15
Acquisition Method:	5UL_RUNF.M	Client Sample Ref:	R6
Acquisition Date/Time:	13-Feb-15, 02:24:10		
Datafile:	D:\TES\DATA\Y2015\021215TPH_GC4\021215 2015-02-12 09-03-59\007B8001.D		

Where individual results are flagged see report notes for status.

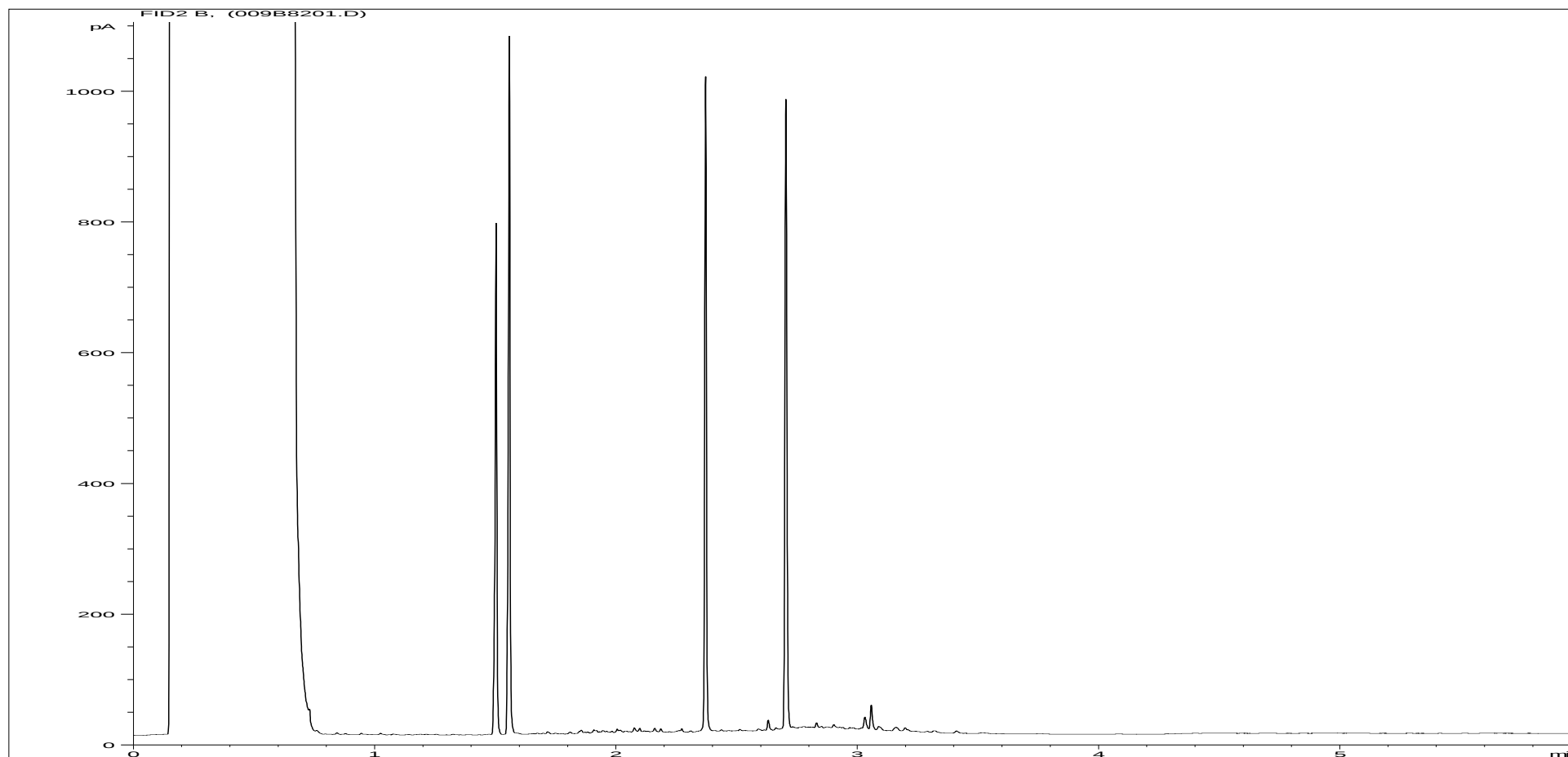
Petroleum Hydrocarbons (C8 to C40) by GC/FID



Sample ID:	EX1567758	Job Number:	W19_3752
Multiplier:	8	Client:	Environ UK Ltd
Dilution:	1	Site:	Royal Mint 14/15
Acquisition Method:	5UL_RUNF.M	Client Sample Ref:	R7
Acquisition Date/Time:	13-Feb-15, 02:37:22		
Datafile:	D:\TES\DATA\Y2015\021215TPH_GC4\021215 2015-02-12 09-03-59\008B8101.D		

Where individual results are flagged see report notes for status.

Petroleum Hydrocarbons (C8 to C40) by GC/FID



Sample ID:	EX1567759	Job Number:	W19_3752
Multiplier:	8	Client:	Environ UK Ltd
Dilution:	1	Site:	Royal Mint 14/15
Acquisition Method:	5UL_RUNF.M	Client Sample Ref:	R7A
Acquisition Date/Time:	13-Feb-15, 02:50:30		
Datafile:	D:\TES\DATA\Y2015\021215TPH_GC4\021215 2015-02-12 09-03-59\009B8201.D		

Where individual results are flagged see report notes for status.

Sample Analysis

ESG Environmental Chemistry
Analytical and Deviating Sample Overview

W193752

Customer Environ UK Ltd
Site Royal Mint 14/15
Report No W193752

Consignment No W83797
Date Logged 11-Feb-2015

Report Due 19-Feb-2015

ID Number	Description	MethodID		Calc_HD	CUST SERV	ICPMSW	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)	Arsenic as As MS (Dissolved)	Mercury as Hg MS (Dissolved)	Selenium as Se MS (Dissolved)	Vanadium as V MS (Dissolved)	Calcium as Ca (Dissolved) VAR	Magnesium as Mg (Dissolved) VAR	Barium as Ba (Dissolved) VAR	Boron as B (Dissolved) VAR	Beryllium as Be (Dissolved) VAR	Cyanide (Total) as CN SFA	SFAP1
		Matrix Type	Sampled				Report A																
EX/1567747	BH901	Groundwater	10/02/15	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
EX/1567748	BH9	Groundwater	10/02/15																				
EX/1567749	BH801	Groundwater	10/02/15																				
EX/1567750	BH32	Groundwater	10/02/15																				
EX/1567751	BH11	Groundwater	10/02/15																				
EX/1567752	BH10	Groundwater	10/02/15																				
EX/1567753	BH13	Groundwater	10/02/15																				
EX/1567754	BH12	Groundwater	10/02/15																				
EX/1567755	C1	Surface Water	10/02/15																				
EX/1567756	R1	Surface Water	10/02/15																				
EX/1567757	R6	Surface Water	10/02/15																				
EX/1567758	R7	Surface Water	10/02/15																				
EX/1567759	R7A	Surface Water	10/02/15																				

Note: For analysis where the scheduled turnaround is greater than the holding time we will do our utmost to prioritise these samples. However, it is possible that samples could become deviant whilst being processed in the laboratory.

In this instance please contact the laboratory immediately should you wish to discuss how you would like us to proceed. If you do not respond within 24 hours, we will proceed as originally requested.

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

Sample Analysis

ESG Environmental Chemistry
Analytical and Deviating Sample Overview

W193752

Customer Environ UK Ltd
Site Royal Mint 14/15
Report No W193752

Consignment No W83797
Date Logged 11-Feb-2015

Report Due 19-Feb-2015

ID Number	Description	MethodID		TPH/FID	WSL M12	WSL M13
		Matrix Type	Sampled	TPH GC	Total Alkalinity as CaCO3	pH units
				✓	✓	✓
EX/1567747	BH901	Groundwater	10/02/15			
EX/1567748	BH9	Groundwater	10/02/15			
EX/1567749	BH801	Groundwater	10/02/15			
EX/1567750	BH32	Groundwater	10/02/15			
EX/1567751	BH11	Groundwater	10/02/15			
EX/1567752	BH10	Groundwater	10/02/15			
EX/1567753	BH13	Groundwater	10/02/15			
EX/1567754	BH12	Groundwater	10/02/15			
EX/1567755	C1	Surface Water	10/02/15			
EX/1567756	R1	Surface Water	10/02/15			
EX/1567757	R6	Surface Water	10/02/15			
EX/1567758	R7	Surface Water	10/02/15			
EX/1567759	R7A	Surface Water	10/02/15			

Note: For analysis where the scheduled turnaround is greater than the holding time we will do our utmost to prioritise these samples. However, it is possible that samples could become deviant whilst being processed in the laboratory.

In this instance please contact the laboratory immediately should you wish to discuss how you would like us to proceed. If you do not respond within 24 hours, we will proceed as originally requested.

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

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Water	Calc_HD	As Received	Calculation based on Dissolved metals analysis by ICPOES
Water	ICPMSW	As Received	Direct quantitative determination of Metals in water samples using ICPMS
Water	ICPWATVAR	As Received	Direct determination of Metals and Sulphate in water samples using ICPOES
Water	SFAPI	As Received	Segmented flow analysis with colorimetric detection
Water	TPHFID	As Received	Determination of pentane extractable hydrocarbons in water by GCFID
Water	WSLM12	As Received	Titration with Sulphuric Acid to required pH
Water	WSLM3	As Received	Determination of the pH of water samples by pH probe

Where individual results are flagged see report notes for status.

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 105°C 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/cm³@ 15°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 Anthophyllite

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

▯ 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 : Environ UK Ltd
Site : Royal Mint 14/15
Report Number : W19_3752

[illegible]