

**FORMER TETROSYL WORKS, BEVIS
GREEN, BURY**

**PHASE 2: SUPPLEMENTARY
GROUNDWATER INVESTIGATION No.1**

**For: Urban Regen Ltd & Barratt Homes
Manchester**

December 2020

R2174c-R05-V1

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1. Introduction

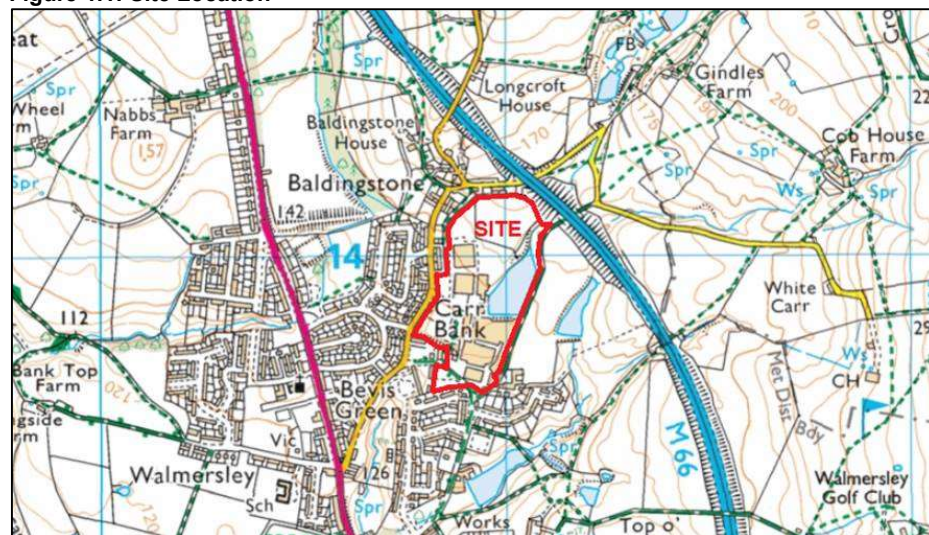
1.1 Remediation works to prepare the former Tetrosyl Bevis Green works off Mill Road, Bury for the Barratt Homes residential housing development are to be undertaken by Urban Regen Ltd. (URL) on behalf of Barratt Homes Manchester (BM). Smith Grant LLP (SGP) has been appointed by URL on behalf of BM carry out supplementary site investigations and risk assessments at the site to confirm the appropriateness of the existing Outline Remediation Strategy and inform working methods, health and safety control measures, soils and groundwater treatment requirements and additional mitigation measures to manage residual risks.

1.2 Site details are:

Table 1.1: Site Details

Address	Bevis Green Works, Mill Road, Bury BL9 6RE
National Grid Reference	380950, 413950
Local Authority	Bury Metropolitan Council (BMC)
Site Area	10.4 ha total - development area 7.2 ha, Phase 2 Area~4.6 ha
Current Use	Derelict, office, warehouse and packaging facility, car parking, access roads and landscaped / open ground undergoing demolition and preparatory earthworks
Site Access	entrances off Walmersley Old Road and Mill Road
Planning Reference	63533
Proposed Use	residential and open space

Figure 1.1: Site Location



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1.1. Planning Consent 63533 includes Condition No. 4 which relates to the requirement for site investigation, risk assessment and remediation proposals to be submitted to and approved by BMC. Condition 4 is worded as follows:

4 No development, other than site clearance, demolition, or works relating to site investigation remediation or ground works, shall commence unless and until: -

- A contaminated land Preliminary Risk Assessment report to assess the actual/potential contamination and/or ground gas/landfill gas risks at the site shall be submitted to, and approved in writing by, the Local Planning Authority.*
- Where actual/potential contamination and/or ground gas/landfill gas risks have been identified, detailed site investigation and suitable risk assessment shall be submitted to and approved in writing by the Local Planning Authority.*
- Where remediation/protection measures is/are required, a detailed Remediation Strategy shall be submitted to, and approved in writing by, the Local Planning Authority.*

- 1.2. SGP had previously undertaken a review of pre-existing site investigation information and produced an updated Preliminary Risk Assessment and Outline Remediation Strategy (Ref: R2174-R01-v2, Date 02.05.2019). This document was submitted, together with proposals for additional site investigation works, to BMC and their consultee, the Environment Agency (EA) for comment. BMC's response (Ref: CL584.240719.1 Date 24.07.19) and the EA's (07.02.2020) acknowledged the general approach of enabling / demolition works, and the proposals for further investigation and development of supplementary measures to the outline Remediation Strategy as required.
- 1.3. Both regulators reiterated the requirement for further investigations and better characterisation of the risks associated with the site before the Outline Remediation Strategy could be approved, or Detailed Remediation Strategies for issues relating to the management of risks to human health from ground gas and VOC vapours & protection of Controlled Waters could be finalised.
- 1.4. The phasing of the demolition, preparatory and remediation works, and the planned development phasing required that the northwest portion of the site be released for development first; this is referred to as Phase 1 and has undergone supplementary gas and vapour investigations, groundwater assessment and preparatory / enabling earthworks to allow development to commence.
- 1.5. The rest of the site is cumulatively referred to as Phase 2 and contains the main contamination and pollution sources associated with the historical use of the site, the extents of which are indicated on Drawing 001. This report describes the investigations and assessments undertaken to allow the assessment of risks to Controlled Waters within the southernmost part of the Phase 2 area only.
- 1.6. Further groundwater monitoring, analysis and risk assessment will be required in the rest of Phase 2. The findings of this assessment will also be used as lines of evidence in support of a separate assessment of risks to Human Health from sources within the Phase 2 area and in development of the wider site conceptual model, Risk Assessment, Options Appraisal and Detailed Remediation Strategy in respect of such risks.

2.

Investigation Methodology

2.1. Objectives and Rationale

2.1.1. It was part of the Outline Remediation Strategy that groundwater monitoring and sampling should be undertaken to better characterise the groundwater and surface water regime in all parts of the site.

2.1.1 In addition to the planned ground gas and vapour assessment programme being implemented, and the measures set out in the Outline Remediation Strategy for investigations and inspections of potential source areas as the demolition and enabling earthworks progress, this information will provide valuable lines of evidence in the developing characterisation of the site. Refined conceptual models are needed to confirm the adequacy of the Outline Remediation Strategy and requirements to amend or supplement the proposed measures to manage risks from land contamination.

2.1.2 It was decided to undertake the groundwater investigation in the southernmost part of Phase 2 in advance of the rest of Phase2 for four reasons:

- This southern part of the site was determined as the downgradient end of the site in respect of groundwater gradients;
- The southern part of the site is also the location at which the surface water receptor, the culverted tributary of Pig Lee Brook leaves the site;
- A large number of Underground Storage Tanks, as well as other potential sources in above ground fuel storage tanks and the former drum store are present in the south of the site, and;
- The area did not contain significant constraints to investigation and could be accessed in advance of the main programme of demolition works in the rest of Phase 2 which are currently ongoing.

2.1.2. The most significant potential contamination hotspots within the Phase 2 area are the bulk storage Above Ground Tanks (ASTs) and solvent processing areas located in the north (HS9, 10, 11, 13 & 14) and central areas (HS5, 6, 7 & 8) and the USTs in the south as indicated in Drawing 001. Although many of these are a considerable distance from the site's southern boundary, depending on the proven groundwater gradients it seemed most likely that any large plumes of groundwater pollution from these areas would extend to the southern boundary, and in any case the ASTs, USTs, and drum store in the south of the site (HS1, 2, 3 & 4) represent very close potential sources to the boundary.

2.1.3. Selection of the response zones was targeted to the underlying sandstone aquifer, the Rough Rock where present, which underlies much of the site either at formation (over the central and

northern parts of Phase 2, at relatively shallow depth below a veneer of Glacial Till in the east or below more substantial thicknesses of made ground in the south of Phase 2. Previous investigations in relation to Coal Mining suggest that the Rough Rock may thin to the south, so determination that the aquifer extends to the site boundary was also an objective of the exercise as well as determining if pollution plumes associated with any of the possible upgradient sources had reached or crossed the site boundary.

2.1.4. Locations were also informed by hydrological gradients established during previous phases of groundwater investigations, although a secondary objective of the investigation was to establish contemporary gradients/flow directions specific to the southern Phase 2 area; this has necessarily utilised groundwater monitoring wells outside Phase 2 which are being constructed as part of the wider site hydrogeological appraisal, although sampling results from these locations will be reported elsewhere.

2.1.5. As the main contaminants of concern (aliphatic and aromatic hydrocarbons) comprise light non-aqueous phase liquids (LNAPL), targeting of the upper part of the aquifer was considered the most appropriate means of identifying any significant plume of LNAPL or dissolved phase pollution emanating from the areas of concern. Sampling depths were also informed by the aquifer rock condition, with sampling depths of groundwater targeted to zones of weak, fractured or heavily weathered rock, as these were considered likely to constitute the more active migration pathways from any upgradient sources.

2.1.6. Surface water samples have also been collected from the Tributary of Pig Lee Brook which leaves the site in a deep culvert at the southern boundary. Although it has not been possible to sample the culvert at the site boundary to date, the outfall around 200m from the site boundary is accessible with care.

2.1.7. All fieldwork was carried out by appropriately qualified and experienced SGP staff, B J Thomas, Partner and C Salwa, Consultant.

2.2. Source Characterisation

2.2.1. As summarised in the Outline Remediation Strategy, previous investigations and assessments carried out on the site have identified four key confirmed / potential sources of pollution within the south of Phase 2:

- 'HS 1': former reservoir, underground storage tanks (USTs – white spirit, antifreeze, and methanol), above ground storage tanks (ASTs – heating oil) and antifreeze mixing area;
- 'HS 2': drum compound;
- 'HS 3': fuel oil AST, and;
- 'HS 4': diesel AST.

2.2.2. Several boreholes were drilled in or within the vicinity of these source areas during the previous site investigation works and a limited number of these were installed with groundwater monitoring standpipes. The observations made during the drilling works and the results of the soil and groundwater testing carried out indicated varying types and levels of pollutants which can be summarised as follows:

- 'HS 1': significantly elevated petroleum hydrocarbons / BTEX in soil and groundwater;
- 'HS 2': moderately elevated lead in soil and trace aromatic hydrocarbons in groundwater;
- 'HS 3': elevated sulphate in soil;
- 'HS 4': slightly elevated arsenic and potential petroleum hydrocarbon contamination in soils (hydrocarbon odours noted from borehole arisings and volatile organic compounds (VOCs) were detected with photoionization detector (PID) at 41ppm, however this was not confirmed via testing).

2.2.3. The most significant potential sources of groundwater contamination in Phase 2 are contained within 'Hotspot 1' due to the presence of numerous USTs and ASTs as well as its former use as an antifreeze mixing area. As the contents of all of the USTs were not established during the previous site works, a sampling programme to confirm this was deemed necessary to fully characterise the potential contamination sources within Phase 2. This exercise was carried out by SGP over two separate dates (18th June 2020 and 1st July 2020) and will be reported separately with the remaining Phase 2 source investigation works report.

2.2.4. SGP has also been advised (by former workers at the site) that the historical aerosol filling plant which operated on the site during the 1980's, and which was assumed to be associated with the dissolved and vapour Phase CFCs encountered in other parts of the site, was located adjacent to the USTs on the eastern part of the southern boundary.

2.2 Groundwater Monitoring Wells

2.2.1 Between 09.07.2020 and 13.07.2020, dedicated groundwater monitoring installations were drilled in positions downgradient to the nearby identified potential contamination sources (RBH301-RBH305), these were also spread out across the southern parts of Phase 2 to pick up any other plumes emanating from the land to the north. Three rotary boreholes were drilled down to 15m (RB301, RBH302 and RBH304), and 2 deeper rotary boreholes (RBH303 and RBH305) were drilled down to 30m depth.

2.2.2 On completion of the rotary boring, all entries were utilized for the installation of 50mm diameter slotted standpipe from depths indicated in Table 2.1 below existing ground level. From depths of between 1m and 13m a plain pipe up to the ground level were installed. The slotted section of the standpipe was surrounded with pea gravel, while expansive bentonite clay was added around the annulus plain pipe and below the slotted section, from depths of 10m and 15m, down to the base

of boreholes at 15m and 30m, to seal the response zones from made ground and superficial deposits (where present), or the influence of surface water runoff.

- 2.2.3 The standpipes were finished with a gas bung and a raised cover, which was then concreted at the ground level.
- 2.2.4 Groundwater monitoring locations are indicated on Drawing 001, relative to the nearby hotspot areas to be targeted by supplementary investigations.
- 2.2.5 Sampling depths were targeted to the upper parts of the bedrock including the Rough Rock aquifer wherever this was encountered. Samples were only collected from the shales of the underlying Rossendale formation where the Rough Rock was absent, and also to horizons where the drilling records noted heavily weathered or fractured strata as evidence by loss of returns or friable samples, as these would be expected to transmit groundwater and pollutants from upstream source zones. For ease of reference in interpreting the results, the strata intercepted by the various response zones of each borehole and the target depth for sampling are provided below

Table 2.1 Groundwater Monitoring Response Zones

Monitoring Installation	Response Zone Depth Range (m bgl)	Groundwater Sample Depth (m bgl)	Response Zone Strata Type(s)
RBH301	6.00-15.00	8.00	Rossendale Formation (Mudstone)
RBH302	13.00-15.00	14.00	Rough Rock (Sandstone)
			Rossendale Formation (Mudstone)
RBH303	10.00-15.00	12.00	Glacial Till
			No recovery
RBH304	1.00-10.00	8.00	Glacial Till
			Rough Rock (Sandstone)
RBH305	5.00-15.00	9.00	Rough Rock (Sandstone)
			Rossendale Formation (Mudstone)

2.3. Groundwater Monitoring

- 2.3.1. Following initial development of the wells through high volume purging on completion of drilling, groundwater samples were initially collected from the 5 boreholes on three site visits: 04 September 2020 (boreholes RBH301, RBH304 & RBH305), on 10 September 2020 (RBH302) and on 16 September 2020 (boreholes RBH303). A repeat round of sampling from all monitoring wells was carried out on 14 October 2020 to improve confidence in the representativeness of the results.

- 2.3.2. Most boreholes were purged and sampled from the target depths using a peristaltic pump with dedicated plastic tubing for each borehole to remove the risk of cross contamination. Water pumped from the wells was passed through an in-line trap allowing monitoring by YSI Pro Series multi-parameter. Following purging of the borehole until a steady state was reached for most parameters (See Appendix C for results and instrument calibration), with steady oxygen and very slow drift on ORP defining constant conditions and triggering sampling.
- 2.3.3. Groundwater in boreholes RBH302 & RBH303 was too deep to employ the peristaltic pump, these were bailed using a dedicated plastic disposable bailer removing an estimated 2 x well volumes and allowed to recharge before sampling from the nominated depth using dedicated tubing fitted with a non-return valve (inertial pump).
- 2.3.4. Surface water samples from the outfall of the Culverted tributary to Pig Lee Brook were collected during the groundwater monitoring on 16 September 2020 and on 14 October 2020.
- 2.3.5. Samples were placed in appropriate containers comprising VOC zero headspace glass vials and glass bottles supplied by Element Materials Technology, Deeside.
- 2.3.6. Samples were delivered to Element Materials Technology, Deeside for analysis within 6 hours of sample collection within a sealed cool box kept at a temperature below 9°C. Chain of Custody documentation is retained by SGP. The investigation was undertaken in accordance with appropriate guidance.
- 2.3.7. Samples were submitted for chemical analysis for TPHCWG banded hydrocarbons. These are anticipated to include the majority of the pollutants stored and used at the site, however a comprehensive suite of other Volatile Organic Compounds (VOCs) and SVOCs and glycols were also tested for, as well as an assessment to estimate concentrations of any Tentatively Identified Compounds (TICs) that are not in the VOC or SVOC target list.
- 2.3.8. On the 13 August 2020, the monitoring wells were surveyed in and leveled by a URL engineer, and dip readings taken to allow correction of groundwater levels relative to Ordnance Datum; these are also provided in Appendix C.

2.4. Constraints

- 2.4.1. The locations of the boreholes were not unduly constrained by stockpiled materials, vehicles, demolition activities, etc. And all could be drilled at the intended locations. The depths to which the rotary drilling equipment could achieve was not limited by the ground conditions and sufficient depth was achieved to allow installation of a sealed response zone within the Rough Rock aquifer (where present) as planned.

3. Investigation Observations & Results

3.1. Physical Conditions

3.1.1. Borehole logs are provided in Appendix A, with borehole locations provided in Drawing 001. The site investigation work revealed that the general succession of strata can be represented by made ground, overlying Glacial Till, underlain by bedrock comprising the Rough Rock sandstone and the upper Rossendale Formation (mudstone) which extend to the base of the boreholes in all locations.

- Made ground is typically represented by dark grey to black clay gravelly sand with a high proportion of ash and clinker. This material was deepest in the central part of the southern boundary either side of the culverted watercourse where the original valley profile has been backfilled to depths of 8m (RBH302 & RBH303). Either side of this, made ground was significantly thinner with more cohesive fill encountered in RBH301 to 3.6m and only a veneer of made ground encountered on the other side of the former valley profile in RBH304 & RBH305;
- Suspected Alluvium was restricted to RBH302 whereas Glacial Till was observed in RBH301 (but only formed a thin veneer) and 2.5m to RBH303, 4.5m in RBH304 and 3.0m RBH305 as stiff to very stiff slightly gravelly clay;
- The Rough Rock is represented by weathered sandstone observed typically as sandy gravel of sandstone followed by medium strong to strong coarse pale (discoloured yellowish) sandstone. In the eastern part of the site a substantial thickness of 6-8m of sandstone was recorded, however the Rough Rock was very thin <0.5m or absent in the central and western boreholes, and;
- The Rossendale Formation is represented by weathered mudstone observed as gravelly clay, gravel is mudstone, followed by dark grey extremely weak laminated mudstone in all locations beneath the superficial deposits and Rough Rock (where present).

3.1.2. Interpolation between the borehole positions has allowed representative cross sections of the site geology to be produced (see Appendix B). The sections extend to the broadly east-west across the profile of the valley, and also consider the estimated invert level of the culvert proving a local deepening of the made ground. The most notable feature is that the Rough Rock thins to the west, being absent in the western parts of the site.

3.2. Groundwater Conditions

3.2.1. Groundwater monitoring and testing undertaken during a site visit on 13 August 2020, revealed standing groundwater levels in boreholes of between 5.19mbgl and 9.69mbgl, mainly within

sandstone (the Rough Rock), and due to the pressure from groundwater levels to the northern part of the site within the Rough Rock, groundwater was observed within overlying layers of Glacial Till and made ground to the south-western portion of the site.

3.2.2. Typically, groundwater levels were encountered at greater depths to the western portion of the site (RBH302 and RBH303), and at shallower depth in the north-eastern portion of the site (RB202). These depths and levels of groundwater relative to Ordnance Datum, as surveyed on 13 August 2020 are provided in Appendix C.

3.2.3. The recorded depths to groundwater relative to the top of the standpipe at each of the monitoring wells which penetrate the underlying aquifer in the bedrock strata have been used to plot groundwater contours within the site, these are indicated on Drawing 003.

3.2.4. The hydraulic head levels in the wells consistently indicate a flow direction from the north-northeast towards the south-southwest as indicated on the interpolated groundwater contour plan in Drawing 003 and the cross sections provide in Appendix B.

3.2.5. The monitoring wells would therefore be expected to pick up any contaminant plumes emanating from all the potential sources within the southern part of Phase 2 and from more distant sources to the north in the central and northern parts of Phase 2 if these were generating large plumes of pollutants migrating within the Rough Rock Aquifer or Rossendale formation to the site boundary.

3.3. Contamination Indicators

3.3.1. No sheen, free product or hydrocarbon odour was observed during the groundwater water monitoring.

3.4. Results of Groundwater Analysis

3.4.1. The full laboratory analysis certificate (Refs:20/11920, 20/12217, 20/12540 & 20/14115) are included within Appendix D. A summary of the results for contaminants that were detected from the groundwater surface water samples are provided in table 3.1 below:

Table 3.1 Groundwater and surface water monitoring results summary

Contaminant	Number of Sampling locations	Range of Concentrations (µg/l)
Aliphatic C5-C6	5	<10
Aliphatic C6-C8	5	<10-129
Aliphatic C8-C10	5	<10-848
Aliphatic C10-C12	5	<5-199
Aliphatic C12-C16	5	<10-20
Aliphatic C16-C21	5	<10
Aliphatic C21-C35	5	<10
Aromatic EC8-EC10	5	<10-2428
Aromatic EC10-EC12	5	<5-547
Aromatic EC12-EC16	5	<10-80
Aromatic EC16-EC21	5	<10
Aromatic EC21-EC35	5	<10
Benzene	5	<0.5-2
Ethylbenzene	5	<1-426
m/p-Xylene	5	<2-1733
o-Xylene	5	<1-100
Isopropyl benzene	5	<3-32
Propyl benzene	5	<3-42
1,3,5-Trimethylbenzene	5	<3-78
1,2,4-Trimethylbenzene	5	<3-349
sec-Butylbenzene	5	<3-13
4-Isopropyltoluene	5	<3
n-Butylbenzene	5	<3-7
2-Methylnaphthalene	5	<1-3
Naphthalene	5	<1-12
Acenaphthene	5	<1-2
Fluorene	5	<0.5-1.8
Phenanthrene	5	<0.5-1.1
Dibenzofuran	5	<0.5-1.4
Monoethylene Glycol	5	<10-27,388
Propylene Glycol	5	<10-72
Diethylene glycol	5	<10-2,552
Triethylene glycol	5	<10-47
2-Methylphenol	5	<0.5-0.6
2,4-Dimethylphenol	5	<1-19
Nitrobenzene	5	<1-7

3.4.2. All of the highest concentrations were from RBH305, the borehole directly downgradient of the USTs at HS1, although high concentrations of Glycols were reported both at this location and nearby RBH304 during the initial monitoring round. The remaining samples contained substantially lower concentrations, for the most part below limits of detection.

3.4.3. The repeat sampling round indicated slightly higher concentrations of hydrocarbons at RBH305 but substantially lower concentrations of Glycols in both RBH304 & RBH305. Traces of Glycols were also reported in RBH3020, RBH303 & the surface water sampling point at the downstream culvert outfall but not consistently.

3.4.4. With a limited number of exceptions, (which are discussed below) all of the substances detected are unsubstituted aliphatic and aromatic hydrocarbons. This confirms the existing site conceptual model, that within Phase 1, the main contaminants of concern are mixtures of light aliphatic and aromatic hydrocarbons, which do not contain appreciable amounts of benzene. Nearly all of the

contaminants are represented by the various total hydrocarbon fractions within the TPHCWG bands given as totals for the various molecular weight fractions selected.

- 3.4.5. Glycols were present in multiple locations including the surface water sample at low concentrations but at much higher concentrations in the monitoring wells near the USTs. Other substances were confirmed were restricted to low concentrations of phenols and nitrobenzene, and TICs were also screened, however these all belonged to the TPHCWG fractions considered elsewhere with the single exception of a low concentration of possible acetaldehyde (187µg/l in RBH305) and dodecanoic acid (410 µg/l in RBH302). Drawing 002 indicates the range of concentrations of total hydrocarbons at each of the sampling locations.
- 3.4.6. There are no existing water quality standards for groundwater. Groundwater results can be compared against Environmental Quality Standards (EQSs) provided for surface waters¹. Where an EQS has not been published under the WFD, reference has been made to the EQSs referred to under the EC Dangerous Substances Directive 76/464/EEC. Maximum allowable concentrations are used for “priority substances” and long-term mean standards for “Specific Pollutants”
- 3.4.7. In the absence of an EQS and based on the assumption that the Rough Rock constitutes a possible future groundwater resource and provides base flow to Pig Lee Brook, reference has been made to the standards provided for groundwater drinking water protected areas or in the Water Supply (Water Quality) Regulations 2000 (typically referred to as the UK Drinking Water Standards or UK DWS). It should be noted that these are particularly stringent as they are used to protect drinking water consumers and hence, although they provide an indication of the presence of any contamination, they are not necessarily directly applicable to risks posed to receptors associated with the site itself.
- 3.4.8. Environmental Quality Standards are available for some of the indicator compounds detected. In the absence of current UK standards for certain potential contaminants, World Health Organisation (WHO) guidance has been considered²³ or, for Glycols, the United States Environmental Protection Agency (USEPA)⁴. The generic criteria for all hydrocarbons are usually 10 µg/l, however this is for the known carcinogen benzene, which forms a very minor constituent of the hydrocarbon mixes present. The most common fractions were aromatic and aliphatic hydrocarbons in the EC6-EC12 range. Therefore, the following standards have been adopted for a Tier -1 assessment of the significance of the concentrations recorded.

¹ [Surface water pollution risk assessment for your environmental permit - GOV.UK \(www.gov.uk\)](http://www.gov.uk)

² https://www.who.int/water_sanitation_health/dwq/chemicals/petroleumproducts_2add_june2008.pdf

³ [Microsoft Word - Fourth edition nitrobenzene final 12 Jan 2010.doc \(who.int\)](#)

⁴ [ATSDR - Public Health Statement: Ethylene Glycol \(cdc.gov\)](#)

Table 3.2 Groundwater and surface water monitoring results summary

Pollutant	Source	Tier – 1 Standard (µg/l)	Exceedances (µg/l)	Location of Exceedance
Benzene	EQS	10	None	None
Toluene	EQS	74	None	None
Ethylbenzene	EQS	30	426	RBH305
Xylenes	EQS	30	1,833	RBH305
EC5-EC8 Aliphatic	WHO DWS	1500	None	None
EC9-EC16 Aliphatic	WHO DWS	300	1,067	RBH305
EC8-EC16 Aromatic	WHO DWS	90	3,114	RBH305
EC16-EC35 Aromatic	WHO DWS	90	None	None
Phenols	EQS	7.7	19	RBH305
Glycols	USEPA DWS	14,000	30,059	RBH304
Nitrobenzene	WHO DWS	8	None	None

3.4.9. Elevated concentrations in excess of Tier 1 standards are present within the 2 monitoring wells closest to and immediately downgradient to the USTs and Drum Store. Xylenes and other light aromatic fractions are present in the highest concentrations, although with total hydrocarbons only present at a few thousand µg/l, they are not excessively high or of the order where free product would be anticipated in the groundwater column.

3.4.10. The other downgradient monitoring wells within Phase 2 did not indicate detectable concentrations of hydrocarbons and only traces of glycols, which were also detectable at trace concentrations in the surface water outfall on the initial monitoring round but well above the adopted Tier -1 criteria.

3.4.11. Other substances detected included very low concentrations of phenols, nitrobenzene, aldehyde, and a fatty acid..

3.4.12. CFCs were absent which suggests impacts from these appears to be restricted to the northern part of the site and are not associated with the aerosol filling plant in the south.

4. Conclusions

- 4.1. Previous investigations into the historical use of the site and data from soil analysis, indicated potential pollution sources from aliphatic and aromatic hydrocarbons, and potentially, other chemicals in 5 locations in the far south of Phase 2 and this area is also downgradient of more distant sources in the north and central parts of Phase 2.
- 4.2. The groundwater monitoring has confirmed local impacts to the groundwater in wells situated at the site boundary immediately downgradient of a number of USTs and a former drum store in the eastern end of the southern boundary. Groundwater samples were collected from the Rough Rock Aquifer which extends over most of the site but thins towards the southern boundary and was recorded as being completely absent in the central and western areas. Where the Rough Rock is absent groundwater from the underlying Rossendale formation was sampled.
- 4.3. Overall, the combined results indicate that localised pollution of the aquifer underlying the site has occurred and that this is probably resulting in migration of hydrocarbons and glycols beyond the site boundary at this specific location; i.e., the eastern end of the southern boundary at RBH304 & RBH305, next to HS1 & HS2.
- 4.4. Elsewhere at the downgradient end of the site there is no evidence of contaminant plumes originating from the southern areas or elsewhere within Phase 2. This does not exclude the possibility that groundwater pollution further north within Phase 2 associated with other process or storage areas has occurred, but if large-scale pollution with the potential to impact off-site receptors had occurred then the hydrocarbon impacts from diffuse plumes might have been expected in the other downgradient monitoring wells (RBH301, RBH302 & RBH303) or the surface watercourse.
- 4.5. The area of the USTs at the eastern end of the Phase 2 southern boundary will require remediation to remove the source of the groundwater pollution and risk-based Remediation Criteria must be determined for this purpose.
- 4.6. There remains the possibility that additional contamination sources remain in the unremediated parts of the site within Phase 2, and these are to be addressed in the remaining preparatory remediation earthworks, to be undertaken under the provisions of the existing Outline Remediation Strategy, alongside individual phase-specific strategies to be developed where appropriate.

5. Recommendations

- 5.1. Further investigation and assessment are required to confirm risks to controlled waters for the other central and northern parts of Phase 2, however sufficient information exists to determine that remediation measure to protect groundwater are required at Hotspots HS1, HS2 within the southern part of Phase 2.
- 5.2. This will involve source characterisation of the remaining primary (USTs) and secondary soil sources throughout the Southern parts of Phase 2 (HS1 & HS2), followed by their selective removal to achieve site -specific, risk-based Remediation Criteria. It is intended that criteria be developed that are protective of off-site receptors but also prevent excessive mobilisation and migration of contaminants within the site following completion of remediation earthworks. Further Detailed Quantitative Risk Assessment will be required to fully determine these risks, and the potential for groundwater treatment as well as removal of primary and secondary sources within Phase 2 cannot be ruled out at this stage.
- 5.3. The observations and testing results from these exercises and the general inspections of the preparatory earthworks within Phase 2 will be compiled into an enabling earthworks remediation verification report for issue to the regulators for approval. This will confirm the construction-stage mitigation measures required to manage residual risks to human health.
- 5.4. Given the southern Phase 2 monitoring wells represent the downgradient compliance points to the site boundary, it would be prudent to maintain the positions and continue to sample them, and the surface water monitoring point at the culvert outfall as the Phase 2 works progress. This should continue on a bi-monthly basis while the wells remain intact, with surface water monitoring continuing until all remediation works are completed.

5.5. Limitations

Stratigraphy and Contamination Distribution

5.5.1. The evidence of stratigraphy is taken from discrete borehole locations, and partly informed by factual information provided by other parties. Whilst it is usually reasonable to infer that similar conditions may extend between these locations; caution should be exercised.

5.5.2. The site investigations involved sampling at discrete locations, and it should be recognised that further areas or types of contamination may exist between investigation positions. The analyses performed are drawn from a suite of tests specific to the confirmed and potential pollution sources within the site.

Gas and Groundwater

5.5.3. Any comments made on gas and/or groundwater conditions are based on observations or tests made at the time that the work was carried out. It should be noted that gas concentrations and pressures and groundwater levels and concentrations of substances may vary according to seasonal or weather related effects, sometimes in an unpredictable fashion.

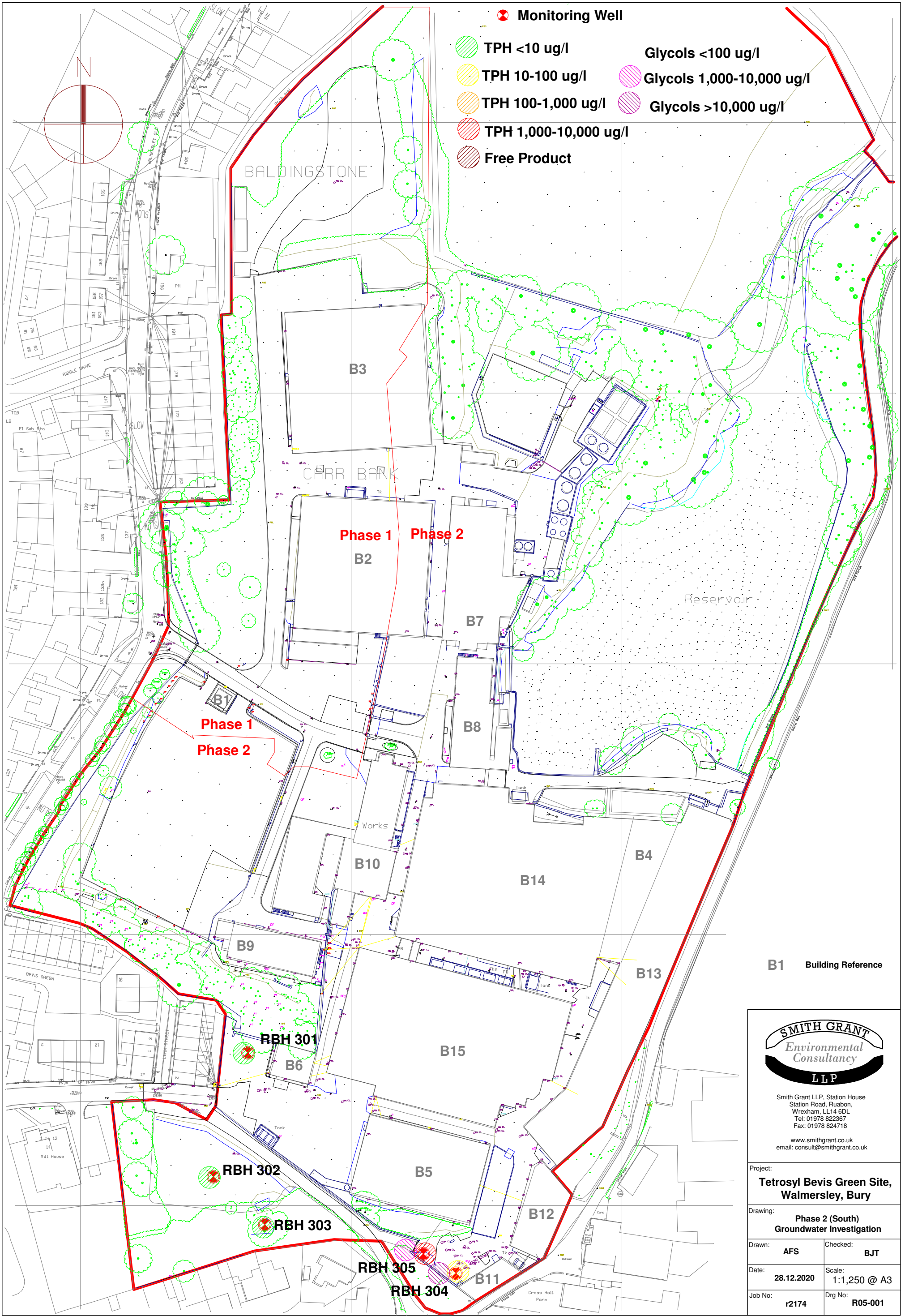
General

5.5.4. This report partially reviews and relies upon information provided by others. Smith Grant LLP accepts no responsibility for advice given on the basis of incorrect factual information provided to it.

5.5.5. This report has been prepared by SGP for the sole and exclusive use of Urban Regen Ltd, and Barratt Homes Manchester. Reasonable skill, care and diligence has been exercised within the budget available, and in accordance with the technical requirements of the brief. Notwithstanding the efforts made by the professional team in undertaking the assessment and preparing this report, it is possible that other ground conditions and contamination as yet undetected may exist. Reliance on the findings of this report must therefore be limited accordingly. Such reliance must be based on the whole report and not on extracts which may lead to incomplete or incorrect conclusions when taken out of context.

5.5.6. SGP reserves the right to alter any of the foregoing information in the event of new information being disclosed or provided and in the light of changes to legislation, guidelines, and responses by the statutory and regulatory authorities.

DRAWINGS



APPENDIX A

Borehole Logs

SHEET:	LOCATION:	PROJECT:	ENGINEER:	JOB NO.	HOLE ID
	Bury	Tetrosyl	BJT	R2174C	
	DRILL TYPE:	Rotary	CLIENT:	Urban Regen	DATE: 09/07/2020

Core Run	TCR (%)	SCR (%)	RQD (%)	Installation	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND
	0 25 50 75 100	0 20 40 60 80 100	0 20 40 60 80 100				
0.7				plain	0	MADE GROUND: Concrete.	
					0.2	MADE GROUND: Soft to firm clay fill with occasional brick and clinker gravel	
					0.7	No recovery.	
3.3				plain	3.3	MADE GROUND: Very soft sandy clay fill with occasional brick and clinker gravel	
3.6					Firm brown very sandy CLAY (GLACIAL TILL).		
3.8					Stiff gray dark grey CLAY weathered MUDSTONE (ROSSENDALE FORMATION).		
4.0							
5				plain	5.0	Extremely weak dark grey laminated MUDSTONE (ROSSENDALE FORMATION).	
5							
8				plain			

 Smith Grant LLP Station House, Station Road, Ruabon, Wrexham LL146DL Tel: 01978822367 Fax: 019788247182 www.smithgrant.co.uk email: consult@smithgrant.co.uk	GROUND WATER: BJT	
	REMARKS: Groundwater: 6.2m bgl	
	Operator: Borehole Solutions	
	SCALE: 1:500	LOGGED BY: BJT

TCR: total core recovery (%)
 SCR: solid core recovery (%)
 RQD: rock quality designation (%)

SHEET:	LOCATION:	PROJECT:	ENGINEER:	JOB NO.	HOLE ID
	Bury	Tetrosyl	BJT	R2174C	
	DRILL TYPE:	Rotary	CLIENT:	Urban Regen	DATE: 09/07/2020

Core Run	TCR (%)	SCR (%)	RQD (%)	Installation	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND
	0 25 50 75 100	0 20 40 60 80 100	0 20 40 60 80 100				
12				Installation slotted	5		
15							
						Borehole terminated at 15m.	

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	BJT	
	REMARKS:	
	Groundwater: 6.2m bgl	
Operator: Borehole Solutions		TCR: total core recovery (%) SCR: solid core recovery (%) RQD: rock quality designation (%)
SCALE:	1:500	LOGGED BY: BJT Rig: Eijkelpamp SonicSampDrill

SHEET:	LOCATION:	PROJECT:	ENGINEER:	JOB NO.	HOLE ID
	Bury	Tetrosyl	CS	R2174C	
	DRILL TYPE:	Rotary	CLIENT:	Urban Regen	DATE: 20/03/2020

Core Run	TCR (%)	SCR (%)	RQD (%)	Installation	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND
	0 25 50 75 100	0 20 40 60 80 100	0 20 40 60 80 100				
2				plain	0	MADE GROUND: blackish dark grey slightly clayey gravelly sand, gravel is of various lithologies including slag, clinker and coal.	
					4.0	MADE GROUND: Soft, sandy clay with occasional gravel and brick inclusions	
5					5.0		
					6	MADE GROUND: Firm becoming stiff, sandy clay with occasional gravel and brick inclusions	
8					8	Stiff silty clay with very frequent gravel of coal and occasional medium coarse sand and gravel (ALLUVIUM)	
9					10		

 Smith Grant LLP Station House, Station Road, Ruabon, Wrexham LL146DL Tel: 01978822367 Fax: 019788247182 www.smithgrant.co.uk email: consult@smithgrant.co.uk	GROUND WATER:	
	BJT	
	REMARKS:	
	Groundwater: 8.0m bgl	
	Operator: Borehole Solutions	
SCALE:	LOGGED BY:	Rig: Eijkelpamp SonicSampDrill
1:500	CS	

TCR: total core recovery (%)
 SCR: solid core recovery (%)
 RQD: rock quality designation (%)

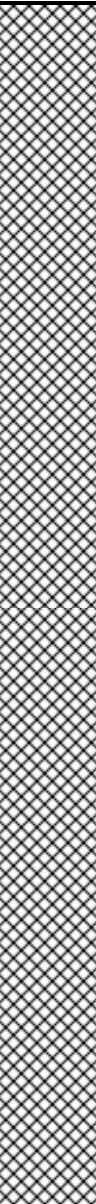
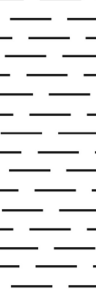
SHEET:	LOCATION:	PROJECT:	ENGINEER:	JOB NO.	HOLE ID
	Bury	Tetrosyl	CS	R2174C	
	DRILL TYPE:	Rotary	CLIENT:	Urban Regen	DATE: 20/03/2020

Core Run	TCR (%)	SCR (%)	RQD (%)	Installation	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND
	0 25 50 75 100	0 20 40 60 80 100	0 20 40 60 80 100				
10.5				Installation slotted	10	Firm brown very sandy CLAY (GLACIAL TILL).	
12					12.5	Light grey, well cemented SANDSTONE (ROUGH ROCK)	
15					13	Extremely weak dark grey laminated MUDSTONE (ROSSENDALE FORMATION).	
						Borehole terminated at 15m.	

 Smith Grant LLP Station House, Station Road, Ruabon, Wrexham LL146DL Tel: 01978822367 Fax: 019788247182 www.smithgrant.co.uk email: consult@smithgrant.co.uk	GROUND WATER:	
	BJT	
	REMARKS:	
	Groundwater: 8.0m bgl	
	Operator: Borehole Solutions	
	SCALE:	LOGGED BY:
	1:500	CS
	Rig: Eijkelkamp SonicSampDrill	

TCR: total core recovery (%)
 SCR: solid core recovery (%)
 RQD: rock quality designation (%)

SHEET:	LOCATION:	PROJECT:	ENGINEER:	JOB NO.	HOLE ID
	Bury	Tetrosyl	CS	R2174C	
	DRILL TYPE:	Rotary	CLIENT:	Urban Regen	DATE: 09/07/2020

Core Run	TCR (%)	SCR (%)	RQD (%)	Installation	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND
	0 25 50 75 100	0 20 40 60 80 100	0 20 40 60 80 100				
2				plain	0	MADE GROUND: blackish dark grey slightly clayey gravelly sand, gravel is of various lithologies including slag. Occasional plastic.	
5					4.0	Firm to stiff grey locally brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subrounded limestone, gravel of mudstone from from 9m (GLACIAL TILL).	
8					5.0		
9					8		
					10		

 Smith Grant LLP Station House, Station Road, Ruabon, Wrexham LL146DL Tel: 01978822367 Fax: 019788247182 www.smithgrant.co.uk email: consult@smithgrant.co.uk	GROUND WATER:	
	CS	
	REMARKS:	
	Groundwater: 9.2m bgl	
	Operator: Borehole Solutions	
SCALE:	1:500	LOGGED BY:
		CS
	Rig: Eijkelpamp SonicSampDrill	

TCR: total core recovery (%)
SCR: solid core recovery (%)
RQD: rock quality designation (%)

SHEET:	LOCATION:	PROJECT:	ENGINEER:	JOB NO.	HOLE ID
	Bury	Tetrosyl	CS	R2174C	
	DRILL TYPE:	Rotary	CLIENT:	Urban Regen	DATE: 09/07/2020

Core Run	TCR (%)	SCR (%)	RQD (%)	Installation	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND
	0 25 50 75 100	0 20 40 60 80 100	0 20 40 60 80 100				
10.5	25			silted	10	Firm brown very sandy CLAY (GLACIAL TILL).	
12					10.5	No recovery.	
15							
16	25				15	Extremely weak dark grey laminated MUDSTONE (ROSSENDALE FORMATION).	
17	50				16.5	Possibly weathered MUDSTONE: Recovered as dark grey clayey gravel of extremely weak mudstone (ROSSENDALE FORMATION).	
18.5	50			bentonite			
19.5	50						
					19.5	No recovery.	
					20		

 Smith Grant LLP Station House, Station Road, Ruabon, Wrexham LL146DL Tel: 01978822367 Fax: 019788247182 www.smithgrant.co.uk email: consult@smithgrant.co.uk	GROUND WATER:	
	CS	
	REMARKS:	
	Groundwater: 9.2m bgl	
	Operator: Borehole Solutions	
SCALE:	1:500	LOGGED BY:
		CS
	Rig: Eijkelpamp SonicSampDrill	

TCR: total core recovery (%)
 SCR: solid core recovery (%)
 RQD: rock quality designation (%)

SHEET:	LOCATION:	PROJECT:	ENGINEER:	JOB NO.	HOLE ID		
	Bury	Tetrosyl	CS	R2174C			
	DRILL TYPE:	Rotary	CLIENT:	Urban Regen	DATE: 09/07/2020		
Core Run	TCR (%)	SCR (%)	RQD (%)	Installation	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND
	0 25 50 75 100	0 20 40 60 80 100	0 20 40 60 80 100				
21.5				Bentonite	20	No recovery.	
24					21.5	Possibly weathered MUDSTONE: Recovered as dark grey clayey gravel of extremely weak mudstone (ROSSENDALE FORMATION).	
26							
28							
30						Borehole terminated at 30m.	
Smith Grant LLP Station House, Station Road, Ruabon, Wrexham LL14 6DL Tel: 01978 822367 Fax: 01978 8247182 www.smithgrant.co.uk email: consult@smithgrant.co.uk		GROUND WATER: CS REMARKS: Groundwater: 9.2m bgl Operator: Borehole Solutions TCR: total core recovery (%) SCR: solid core recovery (%) RQD: rock quality designation (%) SCALE: 1:500 LOGGED BY: CS Rig: Eijkelpamp SonicSampDrill					

SHEET:	LOCATION: Bury	PROJECT: Tetrosyl	ENGINEER: CS	JOB NO. R2174C	HOLE ID RBH304
	DRILL TYPE: Rotary		CLIENT: Urban Regen	DATE: 13/07/2020	

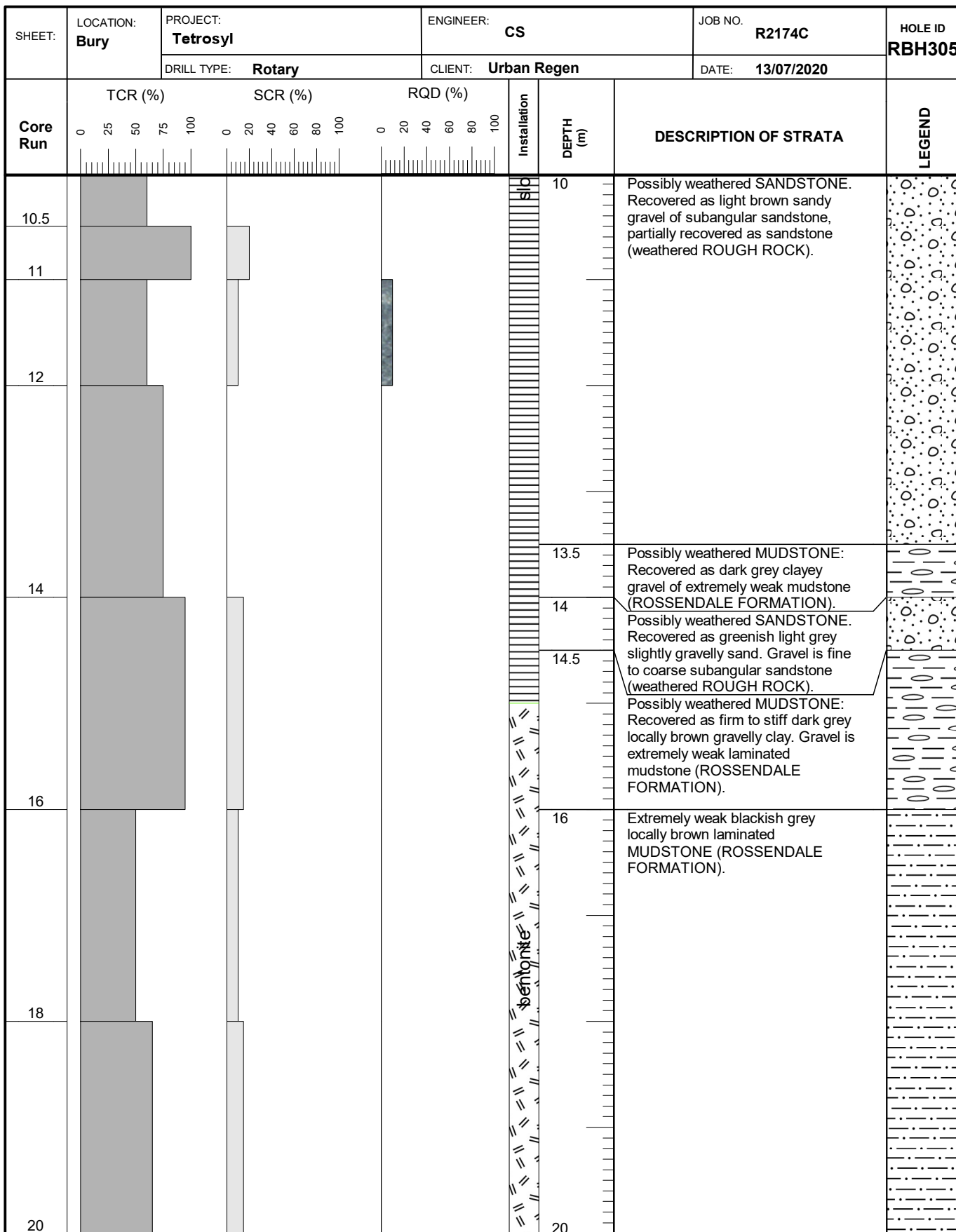
Core Run	TCR (%)	SCR (%)	RQD (%)	Installation	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND
	0 25 50 75 100	0 20 40 60 80 100	0 20 40 60 80 100				
Trial hole from GL to 0.5m				plain	0	MADE GROUND: concrete slab	
					0.3	MADE GROUND: blackish grey gravelly sand, gravel is brick and crushed stone.	
					0.5	Firm greyish brown slightly gravelly, sandy to very sandy between 1.5m and 2m, CLAY. Gravel is fine to coarse subrounded limestone and sandstone, occasional gravel of coal, from 3m gravel of sandstone (GLACIAL TILL).	
1.5				slotted			
3							
4.5							
5							
6						5.0	Possibly weathered SANDSTONE. Recovered as whitish and yellowish light brown gravelly sand and occasional cobbles of sandstone. Gravel is medium to coarse subangular sandstone (weathered ROUGH ROCK).
8					8	Medium strong to strong pale locally yellowish brown coarse grained SANDSTONE (THE ROUGH ROCK).	
10					10		

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	REMARKS:	
	Operator: Borehole Solutions	
	SCALE: 1:500	LOGGED BY: CS

SHEET:	LOCATION: Bury	PROJECT: Tetrosyl	ENGINEER: CS		JOB NO. R2174C	HOLE ID RBH305								
	DRILL TYPE: Rotary		CLIENT: Urban Regen		DATE: 13/07/2020									
Core Run	TCR (%)			SCR (%)			RQD (%)			Installation	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND	
	0 25 50 75 100			0 20 40 60 80 100			0 20 40 60 80 100							
Trial hole from GL to 0.5m										plain	0	MADE GROUND (reworked): Soft dark grey slightly gravelly CLAY interbedded with yellowish brown sand. Gravel is fine to coarse subangular sandstone. Possibly reworked MADE GROUND: very soft to soft greyish brown to grey slightly gravelly CLAY. Gravel is fine to coarse subangular sandstone, limestone and mudstone. Firm becoming stiff reddish brown locally greyish brown slightly gravelly CLAY. Gravel is fine to coarse subrounded limestone and occasional coal sand (GLACIAL TILL).		
1											0.5			
											1			
4											4.0	Possibly weathered SANDSTONE. Recovered as light brown clayey gravel of sandstone with carbonates, lenses of reddish brown clay, rare gravel of coal (weathered ROUGH ROCK).		
5											5.0			
6											5	Possibly weathered SANDSTONE. Recovered as light brown sandy gravel of subangular sandstone (weathered ROUGH ROCK).		
8											6	Medium strong to strong pale locally yellowish brown coarse grained SANDSTONE (THE ROUGH ROCK).		
10												10		

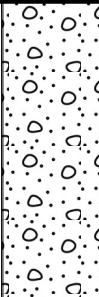
Smith Grant LLP Station House, Station Road, Ruabon, Wrexham LL146DL Tel: 01978822367 Fax: 019788247182 www.smithgrant.co.uk email: consult@smithgrant.co.uk	GROUND WATER: CS	
	REMARKS:	
	Operator: Borehole Solutions	
	SCALE: 1:500	LOGGED BY: CS
		Rig: Eijkelkamp SonicSampDrill

TCR: total core recovery (%)
SCR: solid core recovery (%)
RQD: rock quality designation (%)



Smith Grant LLP Station House, Station Road, Ruabon, Wrexham LL146DL Tel: 01978822367 Fax: 019788247182 www.smithgrant.co.uk email: consult@smithgrant.co.uk	GROUND WATER: CS		
	REMARKS:		
	Operator: Borehole Solutions		
	SCALE: 1:500	LOGGED BY: CS	Rig: Eijkelpamp SonicSampDrill

TCR: total core recovery (%)
 SCR: solid core recovery (%)
 RQD: rock quality designation (%)

SHEET:	LOCATION: Bury	PROJECT: Tetrosyl	ENGINEER: CS		JOB NO. R2174C	HOLE ID RBH305							
	DRILL TYPE: Rotary		CLIENT: Urban Regen		DATE: 13/07/2020								
Core Run	TCR (%)			SCR (%)			RQD (%)			Installation	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND
	0 25 50 75 100			0 20 40 60 80 100			0 20 40 60 80 100						
22										Bentonite	20	Possibly weathered MUDSTONE: Recovered as grey slightly gravelly coarse sand. Gravel is fine to coarse subangular sandstone and mudstone (ROSSENDALE FORMATION).	
24											22	No recovery. Possibly grey mudstone (mudstone sand material flushed out).	
26											24	Extremely weak blackish grey locally brown laminated MUDSTONE, occasional blackish grey clay between 24m and 26m, between 26m and 28m interbedded with strong grey sandstone (5cm of thickness) (ROSSENDALE FORMATION).	
28													
30												Borehole terminated at 30m.	

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	REMARKS:		
	Operator: Borehole Solutions		
	SCALE: 1:500	LOGGED BY: CS	Rig: Eijkelpamp SonicSampDrill

TCR: total core recovery (%)
SCR: solid core recovery (%)
RQD: rock quality designation (%)

SHEET:	LOCATION: Bury	PROJECT: Tetrosyl	ENGINEER: CS		JOB NO. R2174C	HOLE ID RBH304	
	DRILL TYPE: Rotary		CLIENT: Urban Regen		DATE: 13/07/2020		
Core Run	TCR (%) SCR (%) RQD (%)			Installation	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND

Smith Grant LLP Station House, Station Road, Ruabon, Wrexham LL146DL Tel: 01978822367 Fax: 019788247182 www.smithgrant.co.uk email: consult@smithgrant.co.uk	GROUND WATER: CS		
	REMARKS:		
	Operator: Borehole Solutions		
	SCALE: 1:500	LOGGED BY: CS	Rig: Eijkelkamp SonicSampDrill

TCR: total core recovery (%)
SCR: solid core recovery (%)
RQD: rock quality designation (%)

APPENDIX B

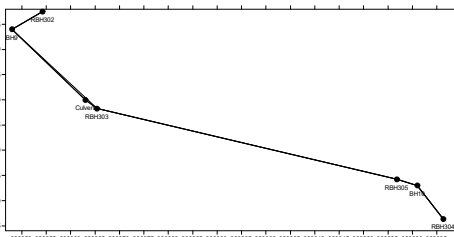
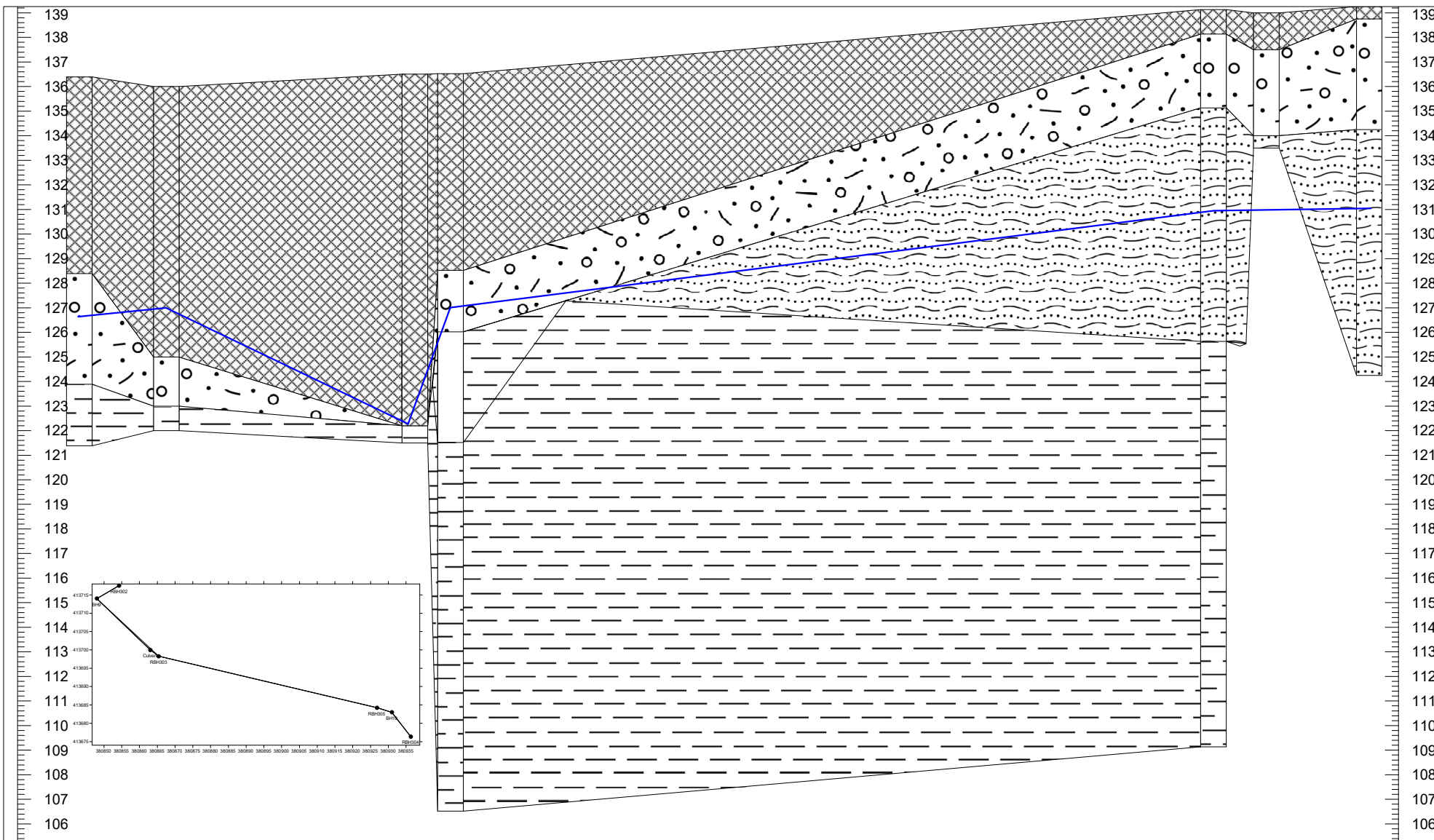
Cross-Sections

Tetrosyl, Bury.
 Cross Section:
 Boreholes: RBH302-BH9-RBH303-RBH305-BH10-RBH304

Legend Title

-  GLACIAL TILL
-  MADE GROUND
-  MUDSTONE (Rossendale Formation)
-  No recovery
-  SANDSTONE (The Rough Rock)

 Groundwater level



APPENDIX C

Groundwater Monitoring Record

Tetrosyl Bury
Groundwater levels 13/08/2020

Hole ID	Eastings	Northings	Height (mAOD)	GW Depth (m)	Total depth (m)	GW Level (mAOD)	Notes
RB202	380955.371	413709.221	139.315	5.19	11.55	134.13	
RB203	380923.565	413905.293	148.927	nr	2.45	#VALUE!	obstructed at 2.45m
RBH301	380857.639	413756.452	136.42	7.72	13.35	128.70	
RBH302	380854.269	413717.519	136.386	9.69	14.21	126.70	
RBH303	380865.4	413698.283	136.52	9.48	14.94	127.04	
RBH304	380936.311	413676.367	139.249	8.13	13.10	131.12	
RBH305	380926.802	413684.221	139.133	8.12	15.90	131.01	
RBH306	380902.115	413882.902	147.227	2.00	9.93	145.23	
RBH307	nr	nr	nr	2.14	10.00	#VALUE!	not found
RBH308	380846.926	413890.742	145.219	0.05	9.75	145.17	
RBH309	380900.565	413941.286	149.034	2.69	3.20	146.34	
RBH310	380887.039	413946.803	149.277	3.21	5.85	146.07	
RBH311	380887.845	414007.057	151.079	3.24	6.83	147.84	
RBH312	380896.803	414008.71	150.509	2.51	5.80	148.00	
RBH313	380906.455	414008.518	150.755	2.72	6.70	148.04	
WS309	nr	nr	nr	nr	nr	#VALUE!	not found
WS310	380927.261	413962.193	149.923	2.26	4.90	147.66	
WS311	nr	nr	nr	2.67	4.78	#VALUE!	not found
WS312	380931.837	413998.395	150.565	2.47	4.90	148.10	
WS317	380912.846	414034.51	153.535	2.26	4.90	151.28	
WS318	380930.343	414027.389	150.46	nr	nr	#VALUE!	pipe bent, dipmeter couldn't go through

GROUNDWATER MONITORING LOG

Site name:	Tetrosyl		Job number:	R2174C	Weather Conditions:	cloudy/dry/ occasional shower	Ground Conditions:	wet
Time at:	start	09:00:00	Date:	03/09/2020	Sampling Method:	bailer / watterra tubing	Purge Method:	X3 well volume / Steady state
	finish	16:00:00	Staff:	CS	Pump (if used):	Submersible / Peristatic	Date of Equipment Last Calibration:	
Record code:	GW03							

Well No.	Time	GW depth (before purge)	GW depth (after purge)	Depth to base	Volume purged ¹	Floating Product	Sampled	Temp	DO	DO	SPC	C	pH	ORP(eH)	Description / Observations
		m bgl ^{2,3}	m bgl ²	m bgl ²	l	mm	(✓ / x)	°C	%	mg l ⁻¹	µs cm ⁻¹	µS cm ⁻¹	units	mV	
RBH304	09:30	7.69	7.72	13.10	2		✓	19.8	8.71	96.50	5.6		6.87	-11.5	cover 35cm
RBH305	11:00	7.70	7.71	16.05	2		✓	19.1	9.35	101.20	6.0		6.83	-25.4	cover 30cm
RBH301	12:00	7.39	7.46	13.45	3		✓	17.6	9.36	98.20	6.5		6.80	-42.2	top of the pipe at GL.
RBH302	14:30	9.44		14.23											could not be purged
RBH303	15:30	9.36		14.75											could not be purged

Notes:

- 1 Where well volume (l) = $1000 \times 3.142 \times (\text{well diameter in mm} / 2000)^2 \times \text{saturated depth}$
- 2 Amend to m toc (m below top of casing) as necessary
- 3 Record as 'dry' if no water present
- 4 Record sample description (odour / colouration of sample)
- 5 Note any other comments - state of casing, ground conditions, if different sampling method used etc

GROUNDWATER MONITORING LOG

Site name:	Tetrosyl		Job number:	R2174C	Weather Conditions:	dry/overcast	Ground Conditions:	wet
Time at:	start	11:00:00	Date:	10/09/2020	Sampling Method:	bailer / water tubing	Purge Method:	X3 well volume / Steady state
	finish	15:00:00	Staff:	CS	Pump (if used):	Submersible / Peristaltic	Date of Equipment Last Calibration:	
Record code:	GW04							

Well No.	Time	GW depth (before purge)	GW depth (after purge)	Depth to base	Volume purged ¹	Floating Product	Sampled	Temp	DO	DO	SPC	C	pH	ORP(eH)	Description / Observations
		m bgl ^{2,3}	m bgl ²	m bgl ²	l	mm	(✓ / x)	°C	%	mg l ⁻¹	µs cm ⁻¹	µS cm ⁻¹	units	mV	
RBH302	11:00	9.49	10.04	14.82	48		✓	12.1	9.87	91.80	5.0		6.82	-28.6	cover 25cm
RBH303	14:00	9.68		14.50											Obstructed at 4m depth /cover 40cm

Notes:

- 1 Where well volume (l) = $1000 \times 3.142 \times (\text{well diameter in mm} / 2000)^2 \times \text{saturated depth}$
- 2 Amend to m toc (m below top of casing) as necessary
- 3 Record as 'dry' if no water present
- 4 Record sample description (odour / colouration of sample)
- 5 Note any other comments - state of casing, ground conditions, if different sampling method used etc

GROUNDWATER MONITORING LOG

Site name:	Tetrosyl		Job number:	R2174C	Weather Conditions:	dry/sunny	Ground Conditions:	dry
Time at:	start	08:30	Date:	14/10/2020	Sampling Method:	bailer / water tubing	Purge Method:	X3 well volume / Steady state
	finish	15:00	Staff:	CS	Pump (if used):	Submersible / Peristaltic	Date of Equipment Last Calibration:	
Record code:	GW06							

Well No.	Time	GW depth (before purge)	GW depth (after purge)	Depth to base	Volume purged ¹	Floating Product	Sampled	Temp	DO	DO	SPC	C	pH	ORP(eH)	Description / Observations
		m bgl ^{2,3}	m bgl ²	m bgl ²	l	mm	(✓ / x)	°C	%	mg l ⁻¹	µs cm ⁻¹	µS cm ⁻¹	units	mV	
RBH301	09:00				5		✓	12.9	102.10	10.80	4.2		6.80	229.8	peristaltic pump
RBH302	11:00				30		✓	11.7	71.30	7.74	6.6		6.79	235.1	bailer
RBH303	10:00				20		✓	12.1	102.40	10.99	5.9		6.81	260.1	tubing
RBH304	13:00				6.00		✓	11.1	74.00	8.14	4.60		6.83	272.20	peristaltic pump
RBH305	12:00				15		✓	11.0	92.9	10.22	7.0		6.82	266.1	peristaltic pump

Notes:

- 1 Where well volume (l) = 1000 x 3.142 x (well diameter in mm / 2000)² x saturated depth
- 2 Amend to m toc (m below top of casing) as necessary
- 3 Record as 'dry' if no water present
- 4 Record sample description (odour / colouration of sample)
- 5 Note any other comments - state of casing, ground conditions, if different sampling method used etc

APPENDIX D

Analytical Results

Smith Grant LLP
Station House
Station Road
Ruabon
Wrexham
LL14 6DL



Attention :	Ben Thomas
Date :	14th September, 2020
Your reference :	R2174C
Our reference :	Test Report 20/11920 Batch 1
Location :	Tetrosyl
Date samples received :	4th September, 2020
Status :	Final report
Issue :	1

Three samples were received for analysis on 4th September, 2020 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Smith Grant LLP
Reference: R2174C
Location: Tetrosyl
Contact: Ben Thomas
EMT Job No: 20/11920

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
 H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HNO₃

EMT Sample No.	1-3	4-6	7-9									
Sample ID	RBH301	RBH304	RBH305									
Depth	8.0	8.0	9.0									
COC No / misc												
Containers	V G	V G	V G									
Sample Date	03/09/2020 12:00	03/09/2020 09:30	03/09/2020 11:00									
Sample Type	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1									
Date of Receipt	04/09/2020	04/09/2020	04/09/2020									
										LOD/LOR	Units	Method No.
VOC TICs	ND	ND	See Attached								None	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1							<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	0.6							<0.5	ug/l	TM15/PM10
Toluene #	<5	<5	11							<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	5							<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	160							<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	10							<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	102	101	104							<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	99	99	97							<0	%	TM15/PM10
SVOC TICs	ND	ND	ND								None	TM16/PM30
TPH CWG												
Aliphatics												
>C5-C6 #	<10	24	21							<10	ug/l	TM36/PM12
>C6-C8 #	<10	40	38							<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10	31							<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5	<5							<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10	64	90							<10	ug/l	TM5/PM16/PM30
Aromatics												
>C5-EC7 #	<10	<10	<10							<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10	<10							<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10	140							<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5	88							<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10	<10	228							<10	ug/l	TM5/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10	64	318							<10	ug/l	TM5/PM16/PM30
Monoethylene glycol	36	2738 ^{AC}	1098 ^{AA}							<10	ug/l	TM179/PM0
Propylene glycol	37	72	<10							<10	ug/l	TM179/PM0
Diethylene glycol	15	2552 ^{AB}	1199 ^{AA}							<10	ug/l	TM179/PM0
Triethylene glycol	<10	47	20							<10	ug/l	TM179/PM0
Thiodiglycol	<10	<10	<10							<10	ug/l	TM179/PM0

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Smith Grant LLP
Reference: R2174C
Location: Tetrosyl
Contact: Ben Thomas
EMT Job No: 20/11920

SVOC Report : Liquid

EMT Sample No.	1-3	4-6	7-9									
Sample ID	RBH301	RBH304	RBH305									
Depth	8.0	8.0	9.0									
COC No / misc												
Containers	V G	V G	V G									
Sample Date	03/09/2020 12:00	03/09/2020 09:30	03/09/2020 11:00									
Sample Type	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1									
Date of Receipt	04/09/2020	04/09/2020	04/09/2020									
	LOD/LOR	Units	Method No.									
SVOC MS												
Phenols												
2-Chlorophenol #	<1	<1	<1							<1	ug/l	TM16/PM30
2-Methylphenol #	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
2-Nitrophenol	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
2,4-Dichlorophenol #	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
2,4-Dimethylphenol	<1	<1	1							<1	ug/l	TM16/PM30
2,4,5-Trichlorophenol #	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
2,4,6-Trichlorophenol	<1	<1	<1							<1	ug/l	TM16/PM30
4-Chloro-3-methylphenol #	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
4-Methylphenol	<1	<1	<1							<1	ug/l	TM16/PM30
4-Nitrophenol	<10	<10	<10							<10	ug/l	TM16/PM30
Pentachlorophenol	<1	<1	<1							<1	ug/l	TM16/PM30
Phenol	<1	<1	<1							<1	ug/l	TM16/PM30
PAHs												
2-Chloronaphthalene #	<1	<1	<1							<1	ug/l	TM16/PM30
2-Methylnaphthalene #	<1	<1	<1							<1	ug/l	TM16/PM30
Naphthalene #	<1	<1	1							<1	ug/l	TM16/PM30
Acenaphthylene #	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Acenaphthene #	<1	<1	<1							<1	ug/l	TM16/PM30
Fluorene #	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Phenanthrene #	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Anthracene #	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Fluoranthene #	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Pyrene #	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Benzo(a)anthracene #	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Chrysene #	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Benzo(bk)fluoranthene #	<1	<1	<1							<1	ug/l	TM16/PM30
Benzo(a)pyrene	<1	<1	<1							<1	ug/l	TM16/PM30
Indeno(123cd)pyrene	<1	<1	<1							<1	ug/l	TM16/PM30
Dibenzo(ah)anthracene #	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Benzo(ghi)perylene #	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Phthalates												
Bis(2-ethylhexyl) phthalate	<5	<5	<5							<5	ug/l	TM16/PM30
Butylbenzyl phthalate	<1	<1	<1							<1	ug/l	TM16/PM30
Di-n-butyl phthalate #	<1.5	<1.5	<1.5							<1.5	ug/l	TM16/PM30
Di-n-Octyl phthalate	<1	<1	<1							<1	ug/l	TM16/PM30
Diethyl phthalate #	<1	<1	<1							<1	ug/l	TM16/PM30
Dimethyl phthalate	<1	<1	<1							<1	ug/l	TM16/PM30

Please see attached notes for all abbreviations and acronyms

Client Name: Smith Grant LLP
Reference: R2174C
Location: Tetrosyl
Contact: Ben Thomas
EMT Job No: 20/11920

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced

QF-PM 3.1.3 v11 All solid results are expressed on a dry weight basis unless stated otherwise. 4 of 11

Element Materials Technology

Client Name: Smith Grant LLP
Reference: R2174C
Location: Tetrosyl
Contact: Ben Thomas
EMT Job No: 20/11920

VOC Report : Liquid

EMT Sample No.	1-3	4-6	7-9									
Sample ID	RBH301	RBH304	RBH305									
Depth	8.0	8.0	9.0									
COC No / misc												
Containers	V G	V G	V G									
Sample Date	03/09/2020 12:00	03/09/2020 09:30	03/09/2020 11:00									
Sample Type	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1									
Date of Receipt	04/09/2020	04/09/2020	04/09/2020									
	LOD/LOR	Units	Method No.									
VOC MS												
Dichlorodifluoromethane	<2	<2	<2							<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1							<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3	<3							<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1	<0.1							<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1	<1							<1	ug/l	TM15/PM10
Chloroethane #	<3	<3	<3							<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3	<3							<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3	<3							<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<5	<5	<5							<5	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3							<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3							<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3							<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1	<1							<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2	<2							<2	ug/l	TM15/PM10
Chloroform #	<2	<2	<2							<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2	<2							<2	ug/l	TM15/PM10
1,1,1-Dichloropropene #	<3	<3	<3							<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2	<2							<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2	<2							<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	0.6							<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3							<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2	<2							<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3	<3							<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2	<2							<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2	<2							<2	ug/l	TM15/PM10
Toluene #	<5	<5	11							<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2	<2							<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2	<2							<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3							<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2	<2							<2	ug/l	TM15/PM10
Dibromochloromethane #	<2	<2	<2							<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2	<2							<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2	<2							<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2	<2							<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	5							<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	160							<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	10							<1	ug/l	TM15/PM10
Styrene	<2	<2	<2							<2	ug/l	TM15/PM10
Bromoform #	<2	<2	<2							<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3	<3							<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4	<4							<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2	<2							<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3	<3							<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3	<3							<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3	<3							<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	6							<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3	<3							<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3	<3							<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3	32							<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3	<3							<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3	<3							<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3	<3							<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3	<3							<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3	<3							<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3	<3							<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2	<2							<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3	<3							<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3	<3							<3	ug/l	TM15/PM10
Naphthalene	<2	<2	<2							<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3	<3							<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	102	101	104							<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	99	99	97							<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Job number:	20/11920
Sample number:	8
Sample identity:	RBH305
Sample depth:	9.0
Sample Type:	Ground Water
Units:	ug/l

Method: VOC
Matrix: Liquid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

[illegible]

Client Name: Smith Grant LLP

Reference: R2174C

Location: Tetrosyl

Contact: Ben Thomas

[illegible]

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 20/11920

SOILS

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

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

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

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

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

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

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

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

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

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

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

AB	x10 Dilution
AC	x50 Dilution

EMT Job No: 20/11920

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GC/FID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE re	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM179	Determination of Glycols using LCMS	PM0	No preparation is required.				

Smith Grant LLP
Station House
Station Road
Ruabon
Wrexham
LL14 6DL



Attention :	Ben Thomas
Date :	18th September, 2020
Your reference :	R2174C
Our reference :	Test Report 20/12217 Batch 1
Location :	Tetrosyl
Date samples received :	10th September, 2020
Status :	Final report
Issue :	1

One sample were received for analysis on 10th September, 2020 of which one were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

A handwritten signature in black ink, appearing to read 'L Halliwell'.

Lucas Halliwell
Project Co-ordinator

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Smith Grant LLP
Reference: R2174C
Location: Tetrosyl
Contact: Ben Thomas
EMT Job No: 20/12217

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
 H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HNO₃

EMT Sample No.	1-3												
Sample ID	RBH302												
Depth	11.00												
COC No / misc													
Containers	V G												
Sample Date	10/09/2020 11:00												
Sample Type	Ground Water												
Batch Number	1												
Date of Receipt	10/09/2020												
											Please see attached notes for all abbreviations and acronyms		
											LOD/LOR	Units	Method No.
VOC TICs	ND											None	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1										<0.1	ug/l	TM15/PM10
Benzene #	<0.5										<0.5	ug/l	TM15/PM10
Toluene #	<5										<5	ug/l	TM15/PM10
Ethylbenzene #	<1										<1	ug/l	TM15/PM10
m/p-Xylene #	<2										<2	ug/l	TM15/PM10
o-Xylene #	<1										<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	91										<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	93										<0	%	TM15/PM10
SVOC TICs	ND											None	TM16/PM30
TPH CWG													
Aliphatics													
>C5-C6 #	<10										<10	ug/l	TM36/PM12
>C6-C8 #	<10										<10	ug/l	TM36/PM12
>C8-C10 #	<10										<10	ug/l	TM36/PM12
>C10-C12 #	<5										<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10										<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10										<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10										<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10										<10	ug/l	TM5/PM16/PM30
Aromatics													
>C5-EC7 #	<10										<10	ug/l	TM36/PM12
>EC7-EC8 #	<10										<10	ug/l	TM36/PM12
>EC8-EC10 #	<10										<10	ug/l	TM36/PM12
>EC10-EC12 #	<5										<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10										<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10										<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10										<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10										<10	ug/l	TM5/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10										<10	ug/l	TM5/PM16/PM30
Monoethylene glycol	30										<10	ug/l	TM179/PM0
Propylene glycol	<10										<10	ug/l	TM179/PM0
Diethylene glycol	<10										<10	ug/l	TM179/PM0
Triethylene glycol	<10										<10	ug/l	TM179/PM0
Thiodiglycol	<10										<10	ug/l	TM179/PM0

Element Materials Technology

Client Name: Smith Grant LLP
Reference: R2174C
Location: Tetrosyl
Contact: Ben Thomas
EMT Job No: 20/12217

SVOC Report : Liquid

EMT Sample No.	1-3										Please see attached notes for all abbreviations and acronyms				
Sample ID	RBH302														
Depth	11.00														
COC No / misc															
Containers	V G														
Sample Date	10/09/2020 11:00														
Sample Type	Ground Water														
Batch Number	1														
Date of Receipt	10/09/2020											LOD/LOR	Units	Method No.	
SVOC MS															
Phenols															
2-Chlorophenol #	<1											<1	ug/l	TM16/PM30	
2-Methylphenol #	<0.5											<0.5	ug/l	TM16/PM30	
2-Nitrophenol	<0.5											<0.5	ug/l	TM16/PM30	
2,4-Dichlorophenol #	<0.5											<0.5	ug/l	TM16/PM30	
2,4-Dimethylphenol	<1											<1	ug/l	TM16/PM30	
2,4,5-Trichlorophenol #	<0.5											<0.5	ug/l	TM16/PM30	
2,4,6-Trichlorophenol	<1											<1	ug/l	TM16/PM30	
4-Chloro-3-methylphenol #	<0.5											<0.5	ug/l	TM16/PM30	
4-Methylphenol	<1											<1	ug/l	TM16/PM30	
4-Nitrophenol	<10											<10	ug/l	TM16/PM30	
Pentachlorophenol	<1											<1	ug/l	TM16/PM30	
Phenol	<1											<1	ug/l	TM16/PM30	
PAHs															
2-Chloronaphthalene #	<1											<1	ug/l	TM16/PM30	
2-Methylnaphthalene #	<1											<1	ug/l	TM16/PM30	
Naphthalene #	<1											<1	ug/l	TM16/PM30	
Acenaphthylene #	<0.5											<0.5	ug/l	TM16/PM30	
Acenaphthene #	<1											<1	ug/l	TM16/PM30	
Fluorene #	<0.5											<0.5	ug/l	TM16/PM30	
Phenanthrene #	<0.5											<0.5	ug/l	TM16/PM30	
Anthracene #	<0.5											<0.5	ug/l	TM16/PM30	
Fluoranthene #	<0.5											<0.5	ug/l	TM16/PM30	
Pyrene #	<0.5											<0.5	ug/l	TM16/PM30	
Benzo(a)anthracene #	<0.5											<0.5	ug/l	TM16/PM30	
Chrysene #	<0.5											<0.5	ug/l	TM16/PM30	
Benzo(bk)fluoranthene #	<1											<1	ug/l	TM16/PM30	
Benzo(a)pyrene	<1											<1	ug/l	TM16/PM30	
Indeno(123cd)pyrene	<1											<1	ug/l	TM16/PM30	
Dibenzo(ah)anthracene #	<0.5											<0.5	ug/l	TM16/PM30	
Benzo(ghi)perylene #	<0.5											<0.5	ug/l	TM16/PM30	
Phthalates															
Bis(2-ethylhexyl) phthalate	<5											<5	ug/l	TM16/PM30	
Butylbenzyl phthalate	<1											<1	ug/l	TM16/PM30	
Di-n-butyl phthalate #	<1.5											<1.5	ug/l	TM16/PM30	
Di-n-Octyl phthalate	<1											<1	ug/l	TM16/PM30	
Diethyl phthalate #	<1											<1	ug/l	TM16/PM30	
Dimethyl phthalate	<1											<1	ug/l	TM16/PM30	

Please see attached notes for all abbreviations and acronyms

[illegible]

Element Materials Technology

Client Name: Smith Grant LLP
Reference: R2174C
Location: Tetrosyl
Contact: Ben Thomas
EMT Job No: 20/12217

VOC Report : Liquid

EMT Sample No.	1-3												
Sample ID	RBH302												
Depth	11.00												
COC No / misc													
Containers	V G												
Sample Date	10/09/2020 11:00												
Sample Type	Ground Water												
Batch Number	1												
Date of Receipt	10/09/2020												
VOC MS													
Dichlorodifluoromethane	<2										<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1										<0.1	ug/l	TM15/PM10
Chloromethane #	<3										<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1										<0.1	ug/l	TM15/PM10
Bromomethane	<1										<1	ug/l	TM15/PM10
Chloroethane #	<3										<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3										<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3										<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<5										<5	ug/l	TM15/PM10
trans-1,2-Dichloroethene #	<3										<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3										<3	ug/l	TM15/PM10
cis-1,2-Dichloroethene #	<3										<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1										<1	ug/l	TM15/PM10
Bromochloromethane #	<2										<2	ug/l	TM15/PM10
Chloroform #	<2										<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2										<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3										<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2										<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2										<2	ug/l	TM15/PM10
Benzene #	<0.5										<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3										<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2										<2	ug/l	TM15/PM10
Dibromomethane #	<3										<3	ug/l	TM15/PM10
Bromodichloromethane #	<2										<2	ug/l	TM15/PM10
cis-1,3-Dichloropropene	<2										<2	ug/l	TM15/PM10
Toluene #	<5										<5	ug/l	TM15/PM10
trans-1,3-Dichloropropene	<2										<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2										<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3										<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2										<2	ug/l	TM15/PM10
Dibromochloromethane #	<2										<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2										<2	ug/l	TM15/PM10
Chlorobenzene #	<2										<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2										<2	ug/l	TM15/PM10
Ethylbenzene #	<1										<1	ug/l	TM15/PM10
m/p-Xylene #	<2										<2	ug/l	TM15/PM10
o-Xylene #	<1										<1	ug/l	TM15/PM10
Styrene	<2										<2	ug/l	TM15/PM10
Bromoform #	<2										<2	ug/l	TM15/PM10
Isopropylbenzene #	<3										<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4										<4	ug/l	TM15/PM10
Bromobenzene #	<2										<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3										<3	ug/l	TM15/PM10
Propylbenzene #	<3										<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3										<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3										<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3										<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3										<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3										<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3										<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3										<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3										<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3										<3	ug/l	TM15/PM10
n-Butylbenzene #	<3										<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3										<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2										<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3										<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3										<3	ug/l	TM15/PM10
Naphthalene	<2										<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3										<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	91										<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	93										<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Client Name: Smith Grant LLP

Reference: R2174C

Location: Tetrosyl

Contact: Ben Thomas

[illegible]

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 20/12217

SOILS

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

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

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

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

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

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

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

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

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Please include all sections of this report if it is reproduced

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

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

ABBREVIATIONS and ACRONYMS USED

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

EMT Job No: 20/12217

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GC/FID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE re	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM179	Determination of Glycols using LCMS	PM0	No preparation is required.				

Smith Grant LLP
Station House
Station Road
Ruabon
Wrexham
LL14 6DL



Attention :	Ben Thomas
Date :	25th September, 2020
Your reference :	R2174 C
Our reference :	Test Report 20/12540 Batch 1
Location :	Tetrosyl
Date samples received :	16th September, 2020
Status :	Final report
Issue :	1

Two samples were received for analysis on 16th September, 2020 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

A handwritten signature in black ink, appearing to read 'L Halliwell'.

Lucas Halliwell
Project Co-ordinator

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Smith Grant LLP
Reference: R2174 C
Location: Tetrosyl
Contact: Ben Thomas
EMT Job No: 20/12540

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
 H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HNO₃

EMT Sample No.	1-3	4-6									Please see attached notes for all abbreviations and acronyms			
Sample ID	RBH 303	SW - C/O/F												
Depth	9.00													
COC No / misc														
Containers	V G	V G												
Sample Date	16/09/2020	16/09/2020												
Sample Type	Surface Water	Surface Water												
Batch Number	1	1												
Date of Receipt	16/09/2020	16/09/2020									LOD/LOR	Units	Method No.	
VOC TICs	ND	ND										None	TM15/PM10	
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10	
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10	
Toluene #	<5	<5									<5	ug/l	TM15/PM10	
Ethylbenzene #	<1	<1									<1	ug/l	TM15/PM10	
m/p-Xylene #	<2	<2									<2	ug/l	TM15/PM10	
o-Xylene #	<1	<1									<1	ug/l	TM15/PM10	
Surrogate Recovery Toluene D8	105	105									<0	%	TM15/PM10	
Surrogate Recovery 4-Bromofluorobenzene	103	102									<0	%	TM15/PM10	
SVOC TICs	ND	ND										None	TM16/PM30	
TPH CWG														
Aliphatics														
>C5-C6 #	<10	<10									<10	ug/l	TM36/PM12	
>C6-C8 #	<10	<10									<10	ug/l	TM36/PM12	
>C8-C10 #	<10	<10									<10	ug/l	TM36/PM12	
>C10-C12 #	<5	<5									<5	ug/l	TM5/PM16/PM30	
>C12-C16 #	<10	<10									<10	ug/l	TM5/PM16/PM30	
>C16-C21 #	<10	<10									<10	ug/l	TM5/PM16/PM30	
>C21-C35 #	<10	<10									<10	ug/l	TM5/PM16/PM30	
Total aliphatics C5-35 #	<10	<10									<10	ug/l	TM5/PM16/PM30	
Aromatics														
>C5-EC7 #	<10	<10									<10	ug/l	TM36/PM12	
>EC7-EC8 #	<10	<10									<10	ug/l	TM36/PM12	
>EC8-EC10 #	<10	<10									<10	ug/l	TM36/PM12	
>EC10-EC12 #	<5	<5									<5	ug/l	TM5/PM16/PM30	
>EC12-EC16 #	<10	<10									<10	ug/l	TM5/PM16/PM30	
>EC16-EC21 #	<10	<10									<10	ug/l	TM5/PM16/PM30	
>EC21-EC35 #	<10	<10									<10	ug/l	TM5/PM16/PM30	
Total aromatics C5-35 #	<10	<10									<10	ug/l	TM5/PM16/PM30	
Total aliphatics and aromatics(C5-35) #	<10	<10									<10	ug/l	TM5/PM16/PM30	
Monoethylene glycol	15	18									<10	ug/l	TM179/PM0	
Propylene glycol	<10	<10									<10	ug/l	TM179/PM0	
Diethylene glycol	<10	<10									<10	ug/l	TM179/PM0	
Triethylene glycol	<10	<10									<10	ug/l	TM179/PM0	
Thiodiglycol	<10	<10									<10	ug/l	TM179/PM0	

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Smith Grant LLP
Reference: R2174 C
Location: Tetrosyl
Contact: Ben Thomas
EMT Job No: 20/12540

SVOC Report : Liquid

EMT Sample No.	1-3	4-6									Please see attached notes for all abbreviations and acronyms		
Sample ID	RBH 303	SW - C/OF											
Depth	9.00												
COC No / misc													
Containers	V G	V G											
Sample Date	16/09/2020	16/09/2020											
Sample Type	Surface Water	Surface Water											
Batch Number	1	1											
Date of Receipt	16/09/2020	16/09/2020									LOD/LOR	Units	Method No.
SVOC MS													
Phenols													
2-Chlorophenol #	<1	<1									<1	ug/l	TM16/PM30
2-Methylphenol #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
2-Nitrophenol	<0.5	<0.5									<0.5	ug/l	TM16/PM30
2,4-Dichlorophenol #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
2,4-Dimethylphenol	<1	<1									<1	ug/l	TM16/PM30
2,4,5-Trichlorophenol #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
2,4,6-Trichlorophenol	<1	<1									<1	ug/l	TM16/PM30
4-Chloro-3-methylphenol #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
4-Methylphenol	<1	<1									<1	ug/l	TM16/PM30
4-Nitrophenol	<10	<10									<10	ug/l	TM16/PM30
Pentachlorophenol	<1	<1									<1	ug/l	TM16/PM30
Phenol	<1	<1									<1	ug/l	TM16/PM30
PAHs													
2-Chloronaphthalene #	<1	<1									<1	ug/l	TM16/PM30
2-Methylnaphthalene #	<1	<1									<1	ug/l	TM16/PM30
Naphthalene #	<1	<1									<1	ug/l	TM16/PM30
Acenaphthylene #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Acenaphthene #	<1	<1									<1	ug/l	TM16/PM30
Fluorene #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Phenanthrene #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Anthracene #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Fluoranthene #	<0.5	0.6									<0.5	ug/l	TM16/PM30
Pyrene #	<0.5	0.5									<0.5	ug/l	TM16/PM30
Benzo(a)anthracene #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Chrysene #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Benzo(bk)fluoranthene #	<1	<1									<1	ug/l	TM16/PM30
Benzo(a)pyrene	<1	<1									<1	ug/l	TM16/PM30
Indeno(123cd)pyrene	<1	<1									<1	ug/l	TM16/PM30
Dibenzo(ah)anthracene #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Benzo(ghi)perylene #	<0.5	<0.5									<0.5	ug/l	TM16/PM30
Phthalates													
Bis(2-ethylhexyl) phthalate	<5	<5									<5	ug/l	TM16/PM30
Butylbenzyl phthalate	<1	<1									<1	ug/l	TM16/PM30
Di-n-butyl phthalate #	<1.5	<1.5									<1.5	ug/l	TM16/PM30
Di-n-Octyl phthalate	<1	<1									<1	ug/l	TM16/PM30
Diethyl phthalate #	<1	<1									<1	ug/l	TM16/PM30
Dimethyl phthalate	<1	<1									<1	ug/l	TM16/PM30

Please see attached notes for all abbreviations and acronyms

Client Name: Smith Grant LLP
Reference: R2174 C
Location: Tetrosyl
Contact: Ben Thomas
EMT Job No: 20/12540

Please see attached notes for all abbreviations and acronyms

QF-PM 3.1.3 v11

Element Materials Technology

Client Name: Smith Grant LLP
Reference: R2174 C
Location: Tetrosyl
Contact: Ben Thomas
EMT Job No: 20/12540

VOC Report : Liquid

EMT Sample No.	1-3	4-6										
Sample ID	RBH 303	SW - C/OF										
Depth	9.00											
COC No / misc												
Containers	V G	V G										
Sample Date	16/09/2020	16/09/2020										
Sample Type	Surface Water	Surface Water										
Batch Number	1	1										
Date of Receipt	16/09/2020	16/09/2020										
VOC MS												
Dichlorodifluoromethane	<2	<2								<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1								<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3								<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1								<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1								<1	ug/l	TM15/PM10
Chloroethane #	<3	<3								<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3								<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3								<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<5	<5								<5	ug/l	TM15/PM10
trans-1,2-Dichloroethene #	<3	<3								<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3								<3	ug/l	TM15/PM10
cis-1,2-Dichloroethene #	<3	<3								<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1								<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2								<2	ug/l	TM15/PM10
Chloroform #	<2	<2								<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2								<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3								<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2								<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2								<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5								<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3								<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2								<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3								<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2								<2	ug/l	TM15/PM10
cis-1,3-Dichloropropene	<2	<2								<2	ug/l	TM15/PM10
Toluene #	<5	<5								<5	ug/l	TM15/PM10
trans-1,3-Dichloropropene	<2	<2								<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2								<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3								<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2								<2	ug/l	TM15/PM10
Dibromochloromethane #	<2	<2								<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2								<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2								<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2								<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1								<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2								<2	ug/l	TM15/PM10
o-Xylene #	<1	<1								<1	ug/l	TM15/PM10
Styrene	<2	<2								<2	ug/l	TM15/PM10
Bromoform #	<2	<2								<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3								<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4								<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2								<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3								<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3								<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3								<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3								<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3								<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3								<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3								<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3								<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3								<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3								<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3								<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3								<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3								<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2								<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3								<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3								<3	ug/l	TM15/PM10
Naphthalene	<2	<2								<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3								<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	105	105								<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	103	102								<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Client Name: Smith Grant LLP

Reference: R2174 C

Location: Tetrosyl

Contact: Ben Thomas

[illegible]

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 20/12540

SOILS

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

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

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

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

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

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

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

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

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Please include all sections of this report if it is reproduced

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

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

ABBREVIATIONS and ACRONYMS USED

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

EMT Job No: 20/12540

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GC/FID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE re	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM179	Determination of Glycols using LCMS	PM0	No preparation is required.				

Smith Grant LLP
Station House
Station Road
Ruabon
Wrexham
LL14 6DL



Attention :	Ben Thomas
Date :	21st October, 2020
Your reference :	R2174C
Our reference :	Test Report 20/14115 Batch 1
Location :	Tetrosyl
Date samples received :	14th October, 2020
Status :	Final report
Issue :	1

Six samples were received for analysis on 14th October, 2020 of which six were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Phil Sommerton BSc
Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Smith Grant LLP
Reference: R2174C
Location: Tetrosyl
Contact: Ben Thomas
EMT Job No: 20/14115

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
 H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HNO₃

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18					Please see attached notes for all abbreviations and acronyms		
Sample ID	RBH301	RBH303	RBH302	RBH305	RBH304	SW/DS/OF							
Depth	8.00	12.00	14.00	11.00	8.00								
COC No / misc													
Containers	V G	V G	V G	V G	V G	V G							
Sample Date	14/10/2020	14/10/2020	14/10/2020	14/10/2020	14/10/2020	14/10/2020							
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Surface Water							
Batch Number	1	1	1	1	1	1					LOD/LOR	Units	Method No.
Date of Receipt	14/10/2020	14/10/2020	14/10/2020	14/10/2020	14/10/2020	14/10/2020							
VOC TICs	ND	ND	ND	See Attached	ND	ND						None	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5	2.0	<0.5	<0.5					<0.5	ug/l	TM15/PM10
Toluene #	<5	<5	<5	68	6	<5					<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1	426	6	<1					<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	<2	1733	<2	<2					<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1	100	<1	<1					<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	96	98	95	99	99	99					<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	103	106	101	107	107	105					<0	%	TM15/PM10
SVOC TICs	ND	ND	See Attached	See Attached	ND	ND						None	TM16/PM30
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10	<10	129	45	<10					<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10	<10	848	24	<10					<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5	<5	199	<5	<5					<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10	<10	20	<10	<10					<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10	<10	<10	1196	69	<10					<10	ug/l	TM5/PM16/PM30
Aromatics													
>C5-EC7 #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10	<10	59	<10	<10					<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10	<10	2428	<10	<10					<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5	<5	547	<5	<5					<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10	<10	80	<10	<10					<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10	<10	<10	3114	<10	<10					<10	ug/l	TM5/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10	<10	<10	4310	69	<10					<10	ug/l	TM5/PM16/PM30
Monoethylene glycol	<10	<10	<10	<10	<10	<10					<10	ug/l	TM179/PM0
Propylene glycol	<10	<10	<10	<10	<10	<10					<10	ug/l	TM179/PM0
Diethylene glycol	<10	<10	<10	<10	<10	<10					<10	ug/l	TM179/PM0
Triethylene glycol	<10	<10	24	<10	<10	<10					<10	ug/l	TM179/PM0
Thiodiglycol	<10	<10	<10	<10	<10	<10					<10	ug/l	TM179/PM0

Element Materials Technology

Client Name: Smith Grant LLP
Reference: R2174C
Location: Tetrosyl
Contact: Ben Thomas
EMT Job No: 20/14115

SVOC Report : Liquid

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18					Please see attached notes for all abbreviations and acronyms		
Sample ID	RBH301	RBH303	RBH302	RBH305	RBH304	SW/DS/OF							
Depth	8.00	12.00	14.00	11.00	8.00								
COC No / misc													
Containers	V G	V G	V G	V G	V G	V G							
Sample Date	14/10/2020	14/10/2020	14/10/2020	14/10/2020	14/10/2020	14/10/2020							
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Surface Water							
Batch Number	1	1	1	1	1	1					LOD/LOR	Units	Method No.
Date of Receipt	14/10/2020	14/10/2020	14/10/2020	14/10/2020	14/10/2020	14/10/2020							
SVOC MS													
Phenols													
2-Chlorophenol #	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
2-Methylphenol #	<0.5	<0.5	<0.5	0.6	<0.5	<0.5					<0.5	ug/l	TM16/PM30
2-Nitrophenol	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
2,4-Dichlorophenol #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
2,4-Dimethylphenol	<1	<1	<1	19	<1	<1					<1	ug/l	TM16/PM30
2,4,5-Trichlorophenol #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
2,4,6-Trichlorophenol	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
4-Chloro-3-methylphenol #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
4-Methylphenol	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
4-Nitrophenol	<10	<10	<10	<10	<10	<10					<10	ug/l	TM16/PM30
Pentachlorophenol	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
Phenol	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
PAHs													
2-Chloronaphthalene #	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
2-Methylnaphthalene #	<1	<1	<1	3	<1	<1					<1	ug/l	TM16/PM30
Naphthalene #	<1	<1	<1	12	<1	<1					<1	ug/l	TM16/PM30
Acenaphthylene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
Acenaphthene #	<1	<1	<1	2	<1	<1					<1	ug/l	TM16/PM30
Fluorene #	<0.5	<0.5	<0.5	1.8	<0.5	<0.5					<0.5	ug/l	TM16/PM30
Phenanthrene #	<0.5	<0.5	<0.5	1.1	<0.5	<0.5					<0.5	ug/l	TM16/PM30
Anthracene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
Fluoranthene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
Pyrene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
Benzo(a)anthracene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
Chrysene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
Benzo(bk)fluoranthene #	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
Benzo(a)pyrene	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
Indeno(123cd)pyrene	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
Dibenzo(ah)anthracene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
Benzo(ghi)perylene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
Phthalates													
Bis(2-ethylhexyl) phthalate	<5	<5	<5	<5	<5	<5					<5	ug/l	TM16/PM30
Butylbenzyl phthalate	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
Di-n-butyl phthalate #	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5					<1.5	ug/l	TM16/PM30
Di-n-Octyl phthalate	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
Diethyl phthalate #	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
Dimethyl phthalate	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Smith Grant LLP
Reference: R2174C
Location: Tetrosyl
Contact: Ben Thomas
EMT Job No: 20/14115

VOC Report : Liquid

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18					Please see attached notes for all abbreviations and acronyms		
Sample ID	RBH301	RBH303	RBH302	RBH305	RBH304	SW/DS/OF							
Depth	8.00	12.00	14.00	11.00	8.00								
COC No / misc													
Containers	V G	V G	V G	V G	V G	V G							
Sample Date	14/10/2020	14/10/2020	14/10/2020	14/10/2020	14/10/2020	14/10/2020							
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Surface Water							
Batch Number	1	1	1	1	1	1					LOD/LOR	Units	Method No.
Date of Receipt	14/10/2020	14/10/2020	14/10/2020	14/10/2020	14/10/2020	14/10/2020							
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1					<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1	<1	<1	<1	<1					<1	ug/l	TM15/PM10
Chloroethane #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<5	<5	<5	<5	<5	<5					<5	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1	<1	<1	<1	<1					<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
Chloroform #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5	2.0	<0.5	<0.5					<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
Toluene #	<5	<5	<5	68	6	<5					<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
Dibromochloromethane #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2	<2	4	<2	<2					<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1	426	6	<1					<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	<2	1733	<2	<2					<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1	100	<1	<1					<1	ug/l	TM15/PM10
Styrene	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
Bromoform #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3	<3	32	<3	<3					<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4	<4	<4	<4	<4					<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3	<3	42	<3	<3					<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3	78	<3	<3					<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3	<3	9	<3	<3					<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3	<3	349	<3	<3					<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3	<3	13	<3	<3					<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3	<3	7	<3	<3					<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
Naphthalene	<2	<2	<2	15	<2	<2					<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	96	98	95	99	99	99					<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	103	106	101	107	107	105					<0	%	TM15/PM10

Element Materials Technology

Method: VOC
Matrix: Liquid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

[illegible]

Element Materials Technology

Job number:	20/14115
Sample number:	9
Sample identity:	RBH302
Sample depth:	14.00
Sample Type:	Ground Water
Units:	ug/l

Method: SVOC
Matrix: Liquid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

[illegible]

Element Materials Technology

Method: SVOC
Matrix: Liquid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

[illegible]

Client Name: Smith Grant LLP

Reference: R2174C

Location: Tetrosyl

Contact: Ben Thomas

[illegible]

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 20/14115

SOILS

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

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

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

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

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

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

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

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

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Please include all sections of this report if it is reproduced

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

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

ABBREVIATIONS and ACRONYMS USED

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

EMT Job No: 20/14115

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GC/FID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE re	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM179	Determination of Glycols using LCMS	PM0	No preparation is required.				