



St Francis Group

Former BA Tubes, Redditch

Remediation Verification Report

March 2017

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| Report Title | Former BA Tubes, Redditch Remediation Verification Report | Site Address | Former British Aluminium Tubes Site, Studley Rd, Redditch, B98 7HN |
| Author | G&J Geoenvironmental Consultants Ltd | Contamination / Geotechnical | Contamination |
| Work Stage | Verification | Report Date | March 2017 |
| Brief Description of the Report Contents | <p>The site was remediated in accordance with the remediation strategy agreed with the Environment Agency. This report presents the data collected to validate the remediation of the site and reviews this data to verify that this part of the site has been remediated in accordance with the agreed specification.</p> <p>This work is to enable the removal of the Part IIA determination for the site and also establish the site's suitability for the proposed commercial end use.</p> | | |



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Contents Page

| | | |
|------------|---|-----------|
| 1.0 | Introduction | 1 |
| 1.1 | Report Format | 2 |
| 1.2 | Terms and Conditions | 3 |
| 2.0 | Site Information | 4 |
| 2.1 | Site Location | 4 |
| 2.2 | Brief Site History | 4 |
| 2.3 | Geology and Hydrogeology | 5 |
| 2.4 | Development Proposals..... | 5 |
| 3.0 | Background to the Remedial Works | 6 |
| 3.1 | Changes at the site following agreement to URS Remediation Strategy | 6 |
| 3.2 | Remediation Action to Date..... | 6 |
| 3.3 | Hotspot Areas to be remediated by current scheme..... | 7 |
| 3.4 | Pre-Remediation Conceptual Site Model (CSM)..... | 8 |
| 3.5 | Summary of Remediation Objectives | 9 |
| 4.0 | Summary of Remedial Measures | 10 |
| 4.1 | Remedial Strategy | 10 |
| 4.2 | Remedial Targets | 10 |
| 4.3 | Pre-Remediation Delineation | 12 |
| 4.4 | Verification Sampling | 12 |
| 5.0 | Remediation Works | 14 |
| 5.1 | Placement of a clay cut-off wall to control groundwater | 14 |
| 5.2 | Identification of Contaminated Soils | 15 |
| 5.3 | Volumes Excavated | 16 |
| 6.0 | Validation Sampling and Analysis | 22 |
| 6.1 | General | 22 |
| 6.2 | Hotspot Validation | 22 |
| 6.3 | Validation of Treated Soils..... | 22 |
| 6.4 | Validation of Site Won Soils (Materials Management)..... | 23 |
| 7.0 | Summary & Conclusions | 24 |
| 7.1 | Remediation Validation | 24 |
| 7.2 | Post Remediation Conceptual Model..... | 24 |
| 7.3 | Further Works..... | 24 |

APPENDIX CONTENTS

Appendix A – Soil Volumes Removed for Treatment

Appendix B – Soil Volumes Stockpiled for Re-Use

Appendix C – Volumes of Groundwater Removed for Treatment

Appendix D – River Arrow Chemical Results

Appendix E – Validation Samples

Appendix F – Laboratory certificates



1.0 Introduction

G&J Geoenvironmental Consultants Ltd (G&J) has been commissioned by St Francis Group (SFG) to carry out the verification of remediation works at the former British Aluminium Tubes Site, Studley Rd, Redditch, B98 7HN.

The site has been designated by the local authority (Redditch Borough Council) as Contaminated Land under Part IIA of the Environmental Protection Act 1990, given the presence of TCE and its degradation products and petroleum hydrocarbons in the subsurface at the site. It is proposed to redevelop the site for a mixed commercial / industrial use and this report has been prepared primarily to remove the Part IIA determination of the site but also to support the discharge of any contamination linked planning conditions imposed on the planning consent.

Previous investigations, risk assessments and proposed remediation schemes (undertaken by Fairhurst, RPS, URS, KDC, and Ramboll) identified ground contamination which represented potentially significant risks to controlled waters and therefore required remediation. The findings of these investigations and risk assessments, and recommendations of the remediation schemes are detailed in the following reports:

- FAIRHURST, REMEDIATION OF A SITE AT OLD FORGE DRIVE, REDDITCH, REF: R/I/D/40689/05, NOVEMBER 1998;
- RPS CONSULTANTS, SITE INVESTIGATION: BRITISH ALUMINIUM TUBES, REDDITCH, REF: CD3059, MAY 2000;
- URS CORPORATION LTD., LAND AT STUDLEY ROAD, REDDITCH: CONCEPTUAL SITE MODEL, 8 JULY 2004;
- URS CORPORATION LTD., LAND AT STUDLEY ROAD, REDDITCH: REVISED CONCEPTUAL SITE MODEL AND RISK ASSESSMENT, REF: R890/44358949-1942, 20 DECEMBER 2006;
- URS CORPORATION LTD., LAND AT STUDLEY ROAD, REDDITCH: STAGE 2 REMEDIATION OPTIONS APPRAISAL, R998/44358990-3040, 14 JULY 2008;
- URS CORPORATION LTD., LAND AT STUDLEY ROAD, REDDITCH: SITE CONDITION REPORT , REF: R1136/49327994-3040, 16 DECEMBER 2009;
- URS CORPORATION LTD., LAND AT STUDLEY ROAD, REDDITCH: OUTLINE REMEDIATION STRATEGY TO FACILITATE A POTENTIAL DEVELOPMENT, REF: R1142/49327994-3040, 27 JANUARY 2010;
- URS CORPORATION LTD., LAND AT STUDLEY ROAD, REDDITCH: SUMMARY OF PROPOSED REMEDIATION SCHEME, REF: R1178/49327994-3039, 4 AUGUST 2010;



- URS CORPORATION LTD., LAND AT STUDLEY ROAD, REDDITCH: SURFACE WATER & GROUNDWATER MONITORING PROGRAMME, R1253/46399389-3053, 23 JULY 2012;
- KDC CONTRACTORS LTD, DUE DILIGENCE TRIAL PIT SITE INVESTIGATION, FORMER BA TUBES SITE, REDDITCH, REF:1181/MM/SI, JULY 2015;
- RAMBOLL ENVIRON, LAND AT STUDLEY ROAD, REDDITCH: COST-BENEFIT ANALYSIS OF PROPOSED REMEDIATION OPTIONS, REF: UK15-22659-1, JANUARY 2016;
- RAMBOLL ENVIRON, LAND AT STUDLEY ROAD, REDDITCH: CONTROLLED WATERS RISK ASSESSMENT, REF: UK15-22659-2, FEBRUARY 2016.

In order to mitigate the risks identified by the site investigations and assessments, an updated remedial strategy was developed by G&J and agreed with the Environment Agency in April 2016. The remedial strategy was developed after consideration of all the previous information held for the site and represented the most reasonable, practicable and sustainable approach to the clean-up of the site. The strategy is described in detail in the following report;

- G&J GEOENVIRONMENTAL CONSULTANTS LTD, REMEDIATION STATEMENT FOR LAND AT STUDLEY ROAD, REDDITCH, REPORT REFERENCE GJ079-GT-L01-RS, 8 APRIL 2016.

This report describes validation works undertaken to demonstrate the successful remediation of the agreed hotspot areas in accordance with the agreed remediation strategy above.

All works have been undertaken in general accordance with industry guidance and best practice including Environment Agency reports *CLR11: Model Procedures for the Management of Land Contamination* and *SC030114-R1 - Verification of Remediation of Land Contamination*

1.1 Report Format

This report is presented as follows:

Section 2 presents a summary of the site setting and proposed development;

Section 3 presents a summary of the areas of the site requiring remediation, background to the remedial works and the pre-remediation Conceptual Site Model;

Section 4 of the report presents a summary of the remedial strategy, the remedial targets and their derivation, and the proposed verification sampling regime;



Section 5 of the report presents a summary of the works undertaken during the remediation programme and the volumes excavated, treated and reused;

Section 6 of the report summarises the results of the validation works and presents an assessment of the remediation validation data with reference to the agreed remedial targets and the risks to human health and controlled waters;

Section 7 summarises the outcome of the remedial works, the post remediation Conceptual Site Model and any further works required to meet the final remedial objectives.

1.2 Terms and Conditions

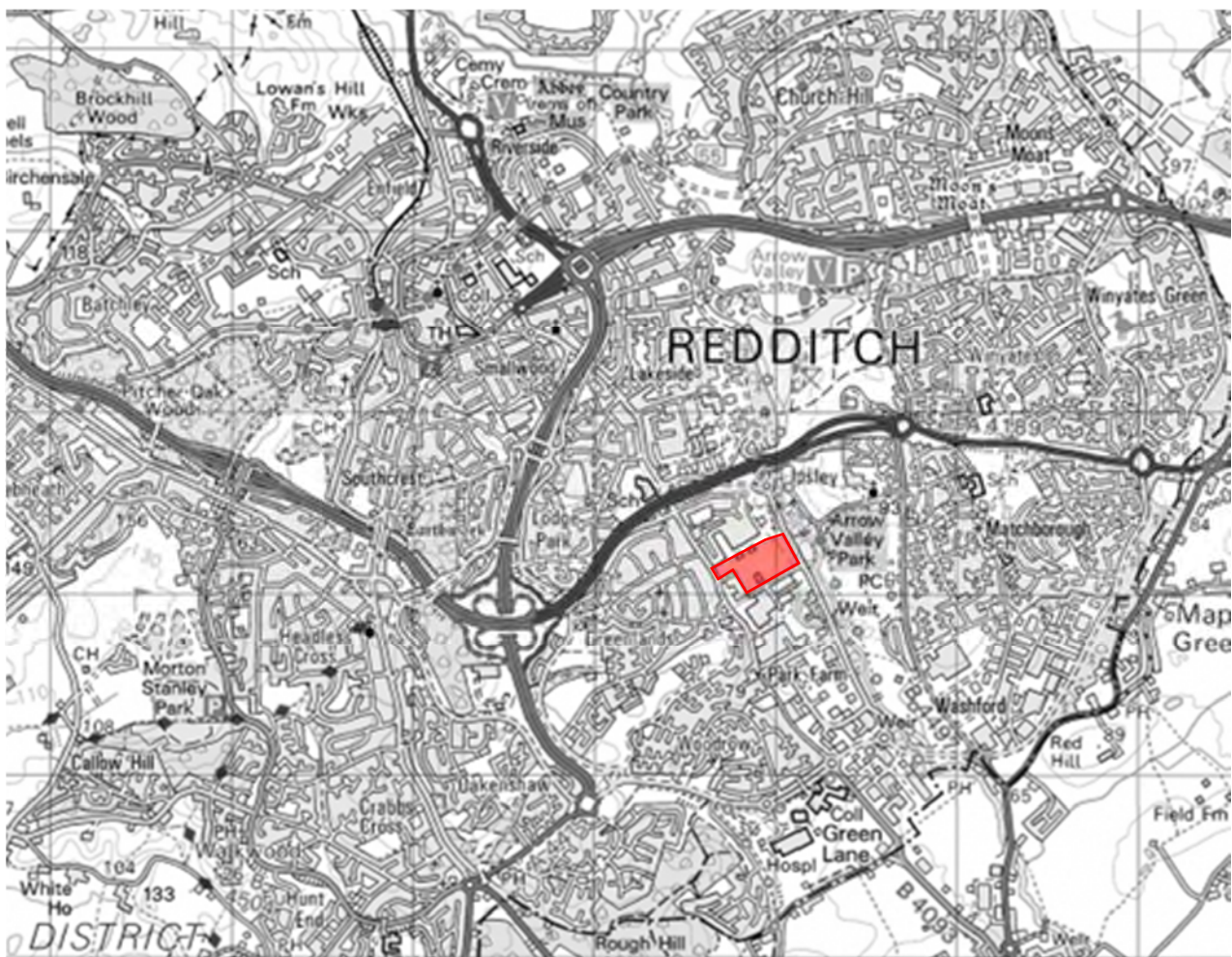
This report has been prepared for St Francis Group in consideration of the proposed commercial end use of the site. Much of the environmental information relates to the site in its present state and should not be used in a different context without reference to G&J.

2.0 Site Information

2.1 Site Location

The former BA Tubes site is located approximately 2km to the south-east of Redditch town centre and covers an area of approximately 6.5 hectares. The general topography slopes gently from approximately 79.8m Above Ordnance Datum (mAOD) in the western part of the site to 73.3mAOD in eastern part, towards the River Arrow, which is located approximately 100m to the east of the site at its nearest point. The site location is shown in Figure 2.1.

Figure 2.1 - Site Location



2.2 Brief Site History

Industrial activities at the site started during the 1940s and the site was demolished in early 2011. Historical operations involved the manufacture of aluminium tubes, which included the handling of chemicals such as



caustic soda, TCE and various hydrocarbon-based fuels and oils. In addition to the main tube production areas, other facilities at the site included materials storage, distribution and general administration areas.

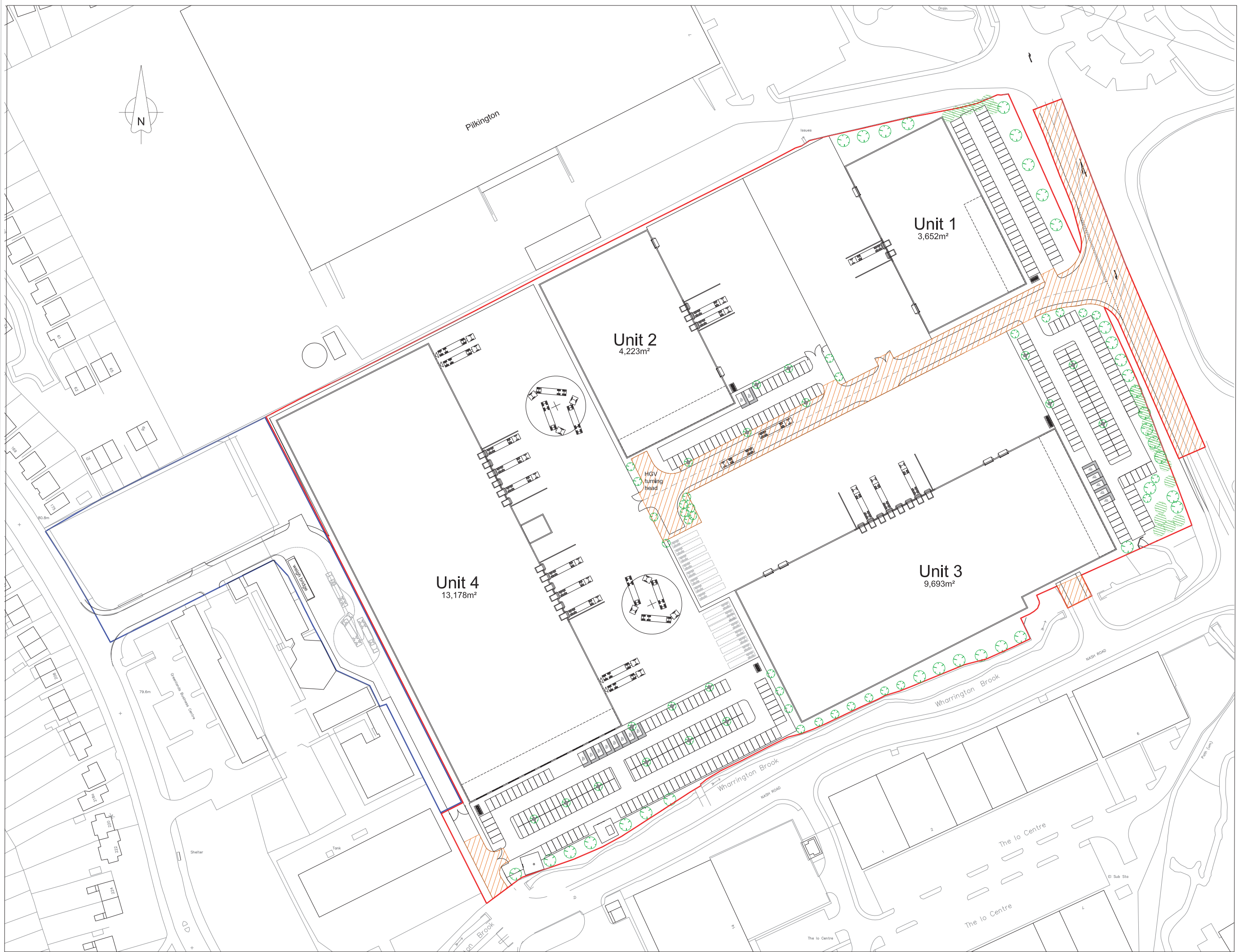
The site comprised two large manufacturing buildings (Heavy Tube Mill and the Light Tube Mill) and other ancillary buildings (small office building, a laboratory, canteen, workshop and caustic shop). The chlorinated solvent TCE was used for **degreasing**, which involved degreasing products in large liquid or vapour baths at several locations across the site, and **greasing**, which involved greasing of products in large dip tanks at several locations on the site using a mixture of 75% TCE and 25% lubricating oil.

2.3 Geology and Hydrogeology

Available previous site investigation reports indicate that the subject site is underlain by Made Ground to depths of up to 2.9mbgl, which mainly comprises a mixture of brick/concrete fragments in a clay matrix. The Made Ground overlies unconsolidated superficial alluvial and periglacial flood gravel deposits (up to 4.2m thick), which in turn overlie bedrock of the Mercia Mudstone Group. Groundwater was typically encountered during previous investigations in sand and gravel deposits, sometimes confined beneath an overlying shallow clay layer. Discontinuous perched shallow groundwater was identified in made ground on top of the superficial clay. Groundwater flow is towards the east / southeast, in the direction of the River Arrow. The saturated thickness of the aquifer in the superficial deposits and, to a degree, in the weathered mudstone, is relatively thin. It was observed in previous investigations to vary between approximately 1m and 4m thick, although was generally in the order of 2m thick. Both the Mercia Mudstone bedrock and overlying superficial deposits are classified by the Environment Agency as a Secondary B Aquifers. The aquifers are unlikely to represent a significant groundwater resource and there are no known groundwater abstractions within 1km of the site.

2.4 Development Proposals

The proposals are for redevelopment of the site with the construction of up to 30,745m² of B1, B2 and B8 end use with ancillary offices, parking and servicing areas (Planning application reference: **2016/350/HYB**). The proposed development masterplan is presented overleaf.



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NOTES:
 Metres 0 5m 10m 15m 20m 25m
 1:500
 Centimetres 0 1cm 2cm 3cm 4cm 5cm

— Planning Application boundary
 7.44 hectares (18.4 acres).

— Area of adjoining land in the ownership of applicant

Red line plan for purpose of planning application only (Not for section 106 purposes).

Area of detailed application (site access and estate roads) all other matters reserved with exception of drainage infrastructure.

Area Summary
 30,745 m² of B1 / B2 / B8 use with ancillary offices.

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| G | 27-10-2016 | Redline amended |
| F | 26-10-2016 | trees updated |
| E | 25-10-2016 | Redline amended |
| D | 24-10-2016 | Redline amended to include Nash Road access |
| C | 16-09-2016 | notes amended |
| B | 15-09-2016 | residential site limited, planning boundary added |
| A | 14-09-2016 | residential site indicated |

Client: ST FRANCIS GROUP

Project: OLD FORGE DRIVE, REDDITCH

Drawing Title: ILLUSTRATIVE MASTERPLAN

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| Project No. | Drawing No. | Revision No. | Revision | |
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3.0 Background to the Remedial Works

The previous investigations identified contamination at the site, most notably from chlorinated solvents. Visual and olfactory evidence of gross organic contamination was noted at several locations, while laboratory analysis found some contaminants at concentrations in excess of generic and detailed risk criteria.

The site was observed to be affecting Controlled Waters (primarily the River Arrow) and was therefore designated as a Special Site, with regulatory responsibility being passed to the Environment Agency. Historical discussions between the previous owner (Luxfer) and the Environment Agency identified that the main risk driver at key controlled waters receptors was TCE (and its daughter products), rather than petroleum hydrocarbons.

Following the investigations and subsequent risk assessments, an original remediation strategy was developed by URS in the context of the operational use of the site as an active aluminium tube manufacturing plant with restricted access for source zone remediation. It therefore focussed primarily on pathway management for chlorinated hydrocarbons. Once the site was demolished, a number of 'hotspot' areas would require remedial measures to treat impacted soils and groundwater.

3.1 Changes at the site following agreement to URS Remediation Strategy

A number of events have occurred since the strategy was developed:

- Site Closure and Demolition – Manufacturing operations at the site ceased some years ago and the buildings and structures were subsequently demolished to ground level. The previous presence of operational structures had prevented the suitable access for source remediation; and
- Acquisition of Adjacent Land by St Francis Group – This land was previously owned by Rio Tinto and its acquisition will form part of the redevelopment scheme of the main site.

3.2 Remediation Action to Date

Prior to the current remediation works, a series of remediation actions were implemented by the previous owners. Further information on the overall remediation strategy can be found in URS Stage 2 Remediation Options Appraisal referenced in Section 1.0. The following actions have been undertaken:

- **Decommissioning of Site Drains** – Storm-water drainage formerly discharged contaminated groundwater into Broadground Ditch. These were decommissioned in 2011 and contaminant concentrations subsequently reduced in the ditch and the River Arrow;



- **Infilling of Broadground Ditch** – Broadground Ditch, the stream immediately to the east of the site, was infilled in 2014 to remove a key preferential pathway from the Site to the River Arrow;
- **Phytoremediation Planting in Riparian Buffer Zone** – More than 800 willow trees were planted in the riparian buffer between Old Forge Drive and the River Arrow, to reduce the contaminant mass flux from shallow groundwater baseflow into the River Arrow.
- **Hyporheic Zone Attenuation** – Attenuation processes in the stream bed of the River Arrow (the “hyporheic zone”) were demonstrably reducing chlorinated hydrocarbon concentrations by up to 2 to 3 orders of magnitude in groundwater between the river bank and before it discharged into some parts of the river;
- **General downward trend in Contaminant Concentrations** – Since 2000, groundwater and surface water sampling has been undertaken by RPS, URS, the Environment Agency and other parties. The results demonstrate that concentrations of TCE and its degradation products have declined significantly over time. This reduction is attributed to the various remediation measures that have been undertaken and the likely general natural attenuation of mass in source areas. More recently, TCE concentrations had also reduced in the River Arrow to around the EQS of 10µg/l.

3.3 Hotspot Areas to be remediated by current scheme

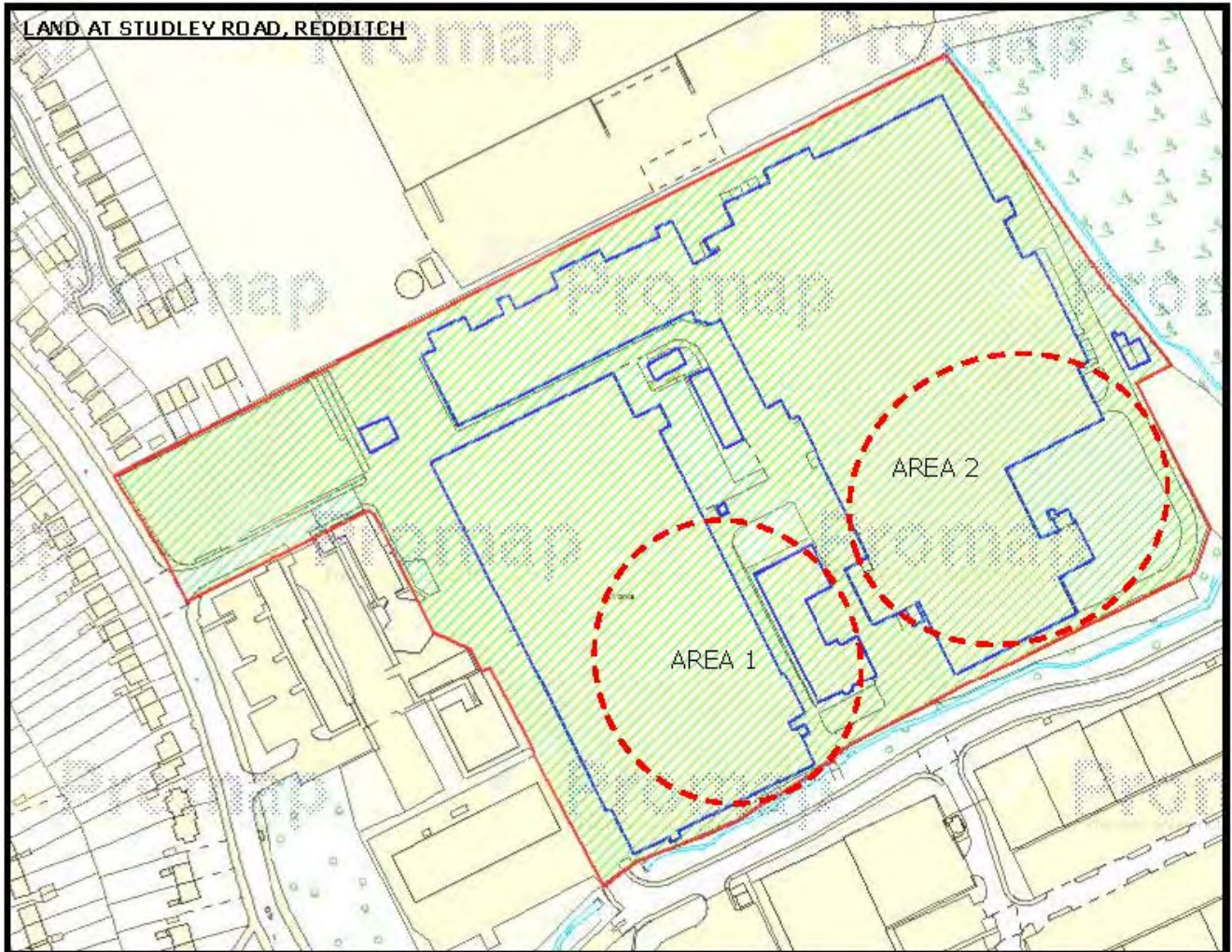
Several areas of impacted soils, groundwater and potential DNAPL have been found on site during previous investigations. It was agreed that the main ‘spill zone’ and downgradient plume zone at the site were the primary risks to controlled waters and human health. These have been identified as Area 1 (Impacted made ground throughout profile) and Area 2 (Impacted made ground at groundwater interface) in Figure 3.1 and Drawing C10726-005.

Prior to the remediation commencing, approximate soil volumes designated as ‘clean’ and ‘requiring remediation’ were calculated based on trial pit records and these are reproduced below in Table 3.1.

Table 3.1 – Hotspot volumes

| Area 1 – Main spill zone | Estimated area (m ²) | Estimated depth (m) | Estimated volume (m ³) |
|----------------------------------|----------------------------------|---------------------|------------------------------------|
| Estimated ‘Clean’ Soils | 5000 | 3 | 15,000 |
| Estimated ‘Contaminated’ Soils | 5000 | 1 | 5,000 |
| Area 2 – Downgradient plume zone | Estimated area (m ²) | Estimated depth (m) | Estimated volume (m ³) |
| Estimated ‘Clean’ Soils | 6500 | 3.5 | 22,750 |
| Estimated ‘Contaminated’ Soils | 6500 | 0.5 | 3,250 |

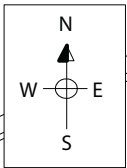
Figure 3.1 – Nominal Hotspot areas



3.4 Pre-Remediation Conceptual Site Model (CSM)

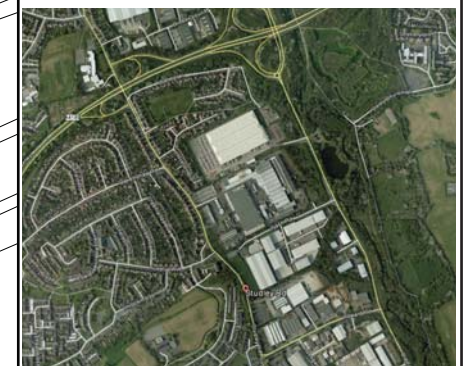
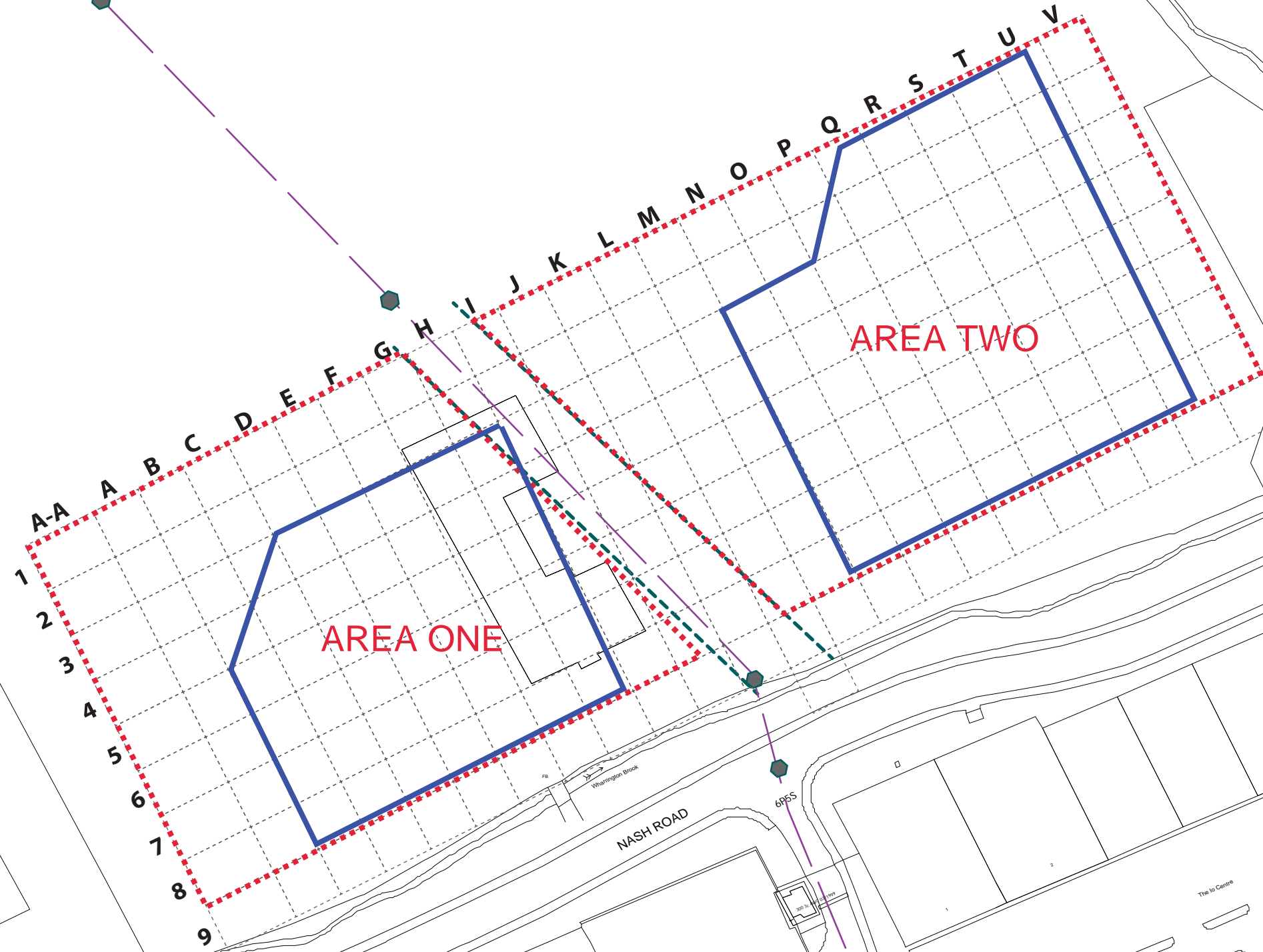
The outcome of the investigations and the subsequent risk assessments was that the following pollution linkages were identified as being potentially significant and would therefore require mitigation.

- PL1 Exposure of future site users to contamination in soil via dermal contact, soil and dust ingestion, and inhalation of dusts and vapours;
- PL2 Leaching of contamination in soil through the unsaturated zone to the shallow groundwater and migration via the saturated zone to the River Arrow;
- PL3 Migration of already contaminated shallow groundwater to the River Arrow.



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- New areas to be validated
- Original areas to be validated



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| | tender <input type="checkbox"/> | H&S file <input type="checkbox"/> |

Client

Project Demolitions Works BA Tubes

Address BA Tubes, Studley Road, Redditch

Drawing Site 10m Grid Layout



decommission / demolish / decontaminate
 Arden House, Arden Road, Heartlands, Birmingham, B8 1DE
 Tel: +44 (0)121 322 2225, Fax: +44 (0)121 322 2227

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3.5 Summary of Remediation Objectives

In order to address the identified pollution linkages a remedial scheme was required to meet the following objectives;

- remediation of contaminants within soil to address potential unacceptable risks to controlled waters (and human health);
- remediation of organic contaminants within shallow perched groundwater to address potential unacceptable risks to controlled waters; and
- to meet specific requirements of removing the Part IIA determination for the site whilst also ensuring suitability for the proposed redevelopment.



4.0 Summary of Remedial Measures

4.1 Remedial Strategy

The remediation strategy involved the selective excavation, segregation and treatment of two major source areas of solvent contamination. It was agreed that the potential impacts on controlled waters would be substantially mitigated and overall site betterment achieved through treatment of the on-site soils and removal / treatment of perched water from the excavations. It was further agreed, that based on the above, no post-remediation groundwater monitoring was deemed necessary.

The following strategy was considered the most appropriate in terms of effectiveness and sustainability:

- Selective excavation and segregation of overburden materials followed by direct reuse or treatment (see below) depending on chemical results;
- Bioremediation treatment followed by direct re-use of material, to address potential vapour inhalation by site users and reduce the risk of organic pollution of controlled waters to acceptable levels;
- Pumping out of any free product / contaminated groundwater encountered in excavations and treatment on site through oil separators, and sand / carbon filters, prior to discharge under a discharge consent.

The remediation strategy is described in detail in the G&J Remediation statement document referenced in Section 1.0.

Where contamination 'hotspots' were identified, soils were excavated and those showing obvious visual or olfactory evidence of contamination separated for treatment via bioremediation. Those not showing evidence of contamination were separated and samples taken to validate the material, which determined whether it could be re-used or whether treatment was required.

In addition, the remainder of the site (northern half) will be the subject of a 'surge' to 2mbgl, whereby all slabs, foundations and other below ground structures will be broken out and removed. Any soils showing evidence of gross contamination that have not been previously identified will also be excavated and any treatment or disposal reported separately.

4.2 Remedial Targets

Elevated TCE concentrations on the site were historically relatively widespread. Therefore, given the distribution of the source areas on the site along the groundwater flowpath, risk assessment calculations were undertaken by Ramboll Environ (the previous site owner's consultant) using the Environment Agency

Remedial Targets Worksheet v3.1 to assess the potential influence of distance from receptors on target concentrations. They proposed that the remedial target concentrations varying between 2.9mg/kg to 3471 mg/kg of TCE should be applied across the site based on distance from source areas (backfill location) to the nearest controlled waters receptor.

Following a meeting between G&J, St Francis Group and the Environment Agency on 5th April 2016, a single site wide remedial target based on the EA's own P20 modelling work was agreed for TCE. The remedial target (Table 4.1) was only to be used to validate excavations.

Table 4.1 – Remedial Target for Part IIA remediation

| Contaminant of Concern | Remedial Target (mg/kg) |
|------------------------|-------------------------|
| TCE | 35 |

The soil remedial target was determined such that no risk to the River Arrow will exist once soils are excavated and remediated. The derived soil remedial target is not considered protective of human health. As such, the commercial end use DEFRA C4SL and LQM S4UL criteria (Land Quality Press, 2015, Unique publication number **S4UL3312**) for TCE and other contaminants of concern were used to be protective of human health. These criteria (Table 4.2) were used to determine the suitability of both untreated site won and bioremediated soils for re-use under a commercial end use.

Table 4.2 – LQM S4UL Commercial End Use

| Determinand | Chemical acceptance criteria – GAC (mg/kg) | Source |
|--------------------|--|-----------------|
| Arsenic | 640 | DEFRA C4SL |
| Cadmium | 410 | DEFRA C4SL |
| Chromium | 8,600 | LQM / CIEH S4UL |
| Copper | 68,000 | LQM / CIEH S4UL |
| Lead | 2,300 | DEFRA C4SL |
| Mercury | 1,100 | LQM / CIEH S4UL |
| Nickel | 980 | LQM / CIEH S4UL |
| Selenium | 12,000 | LQM / CIEH S4UL |
| Zinc | 730,000 | LQM / CIEH S4UL |
| Naphthalene | 190 | LQM / CIEH S4UL |
| Acenaphthylene | 83,000 | LQM / CIEH S4UL |
| Acenaphthene | 84,000 | LQM / CIEH S4UL |
| Fluorene | 63,000 | LQM / CIEH S4UL |
| Phenanthrene | 22,000 | LQM / CIEH S4UL |
| Anthracene | 520,000 | LQM / CIEH S4UL |
| Fluoranthene | 23,000 | LQM / CIEH S4UL |
| Pyrene | 54,000 | LQM / CIEH S4UL |
| Benzo(a)anthracene | 170 | LQM / CIEH S4UL |

| Determinand | Chemical acceptance criteria – GAC (mg/kg) | Source |
|-----------------------|--|-----------------|
| Chrysene | 350 | LQM / CIEH S4UL |
| Benzo(b)fluoranthene | 44 | LQM / CIEH S4UL |
| Benzo(k)fluoranthene | 1,200 | LQM / CIEH S4UL |
| Benzo(a)pyrene | 35 | DEFRA C4SL |
| Indeno(123-cd)pyrene | 500 | LQM / CIEH S4UL |
| Dibenzo(ah)anthracene | 3.5 | LQM / CIEH S4UL |
| Benzo(ghi)perylene | 3,900 | LQM / CIEH S4UL |
| Aliphatics >C5-C6 | 3,200 | LQM / CIEH S4UL |
| Aliphatics >C6-C8 | 7,800 | LQM / CIEH S4UL |
| Aliphatics >C8-C10 | 2,000 | LQM / CIEH S4UL |
| Aliphatics >C10-C12 | 9,700 | LQM / CIEH S4UL |
| Aliphatics >C12-C16 | 59,000 | LQM / CIEH S4UL |
| Aliphatics >C16-C35 | 1,600,000 | LQM / CIEH S4UL |
| Aromatics >EC5-EC7 | 26,000 | LQM / CIEH S4UL |
| Aromatics >EC7-EC8 | 56000 | LQM / CIEH S4UL |
| Aromatics >EC8-EC10 | 3500 | LQM / CIEH S4UL |
| Aromatics >EC10-EC12 | 16,000 | LQM / CIEH S4UL |
| Aromatics >EC12-EC16 | 36,000 | LQM / CIEH S4UL |
| Aromatics >EC16-EC21 | 28,000 | LQM / CIEH S4UL |
| Aromatics >EC21-EC35 | 28,000 | LQM / CIEH S4UL |
| Benzene | 27 | DEFRA C4SL |
| Toluene | 56,000 | LQM / CIEH S4UL |
| Ethylbenzene | 5,700 | LQM / CIEH S4UL |
| Xylene | 5,900 | LQM / CIEH S4UL |
| TCE | 1.2 | LQM / CIEH S4UL |

4.3 Pre-Remediation Delineation

As part of the remedial strategy, an initial trial trenching exercise was undertaken within the perimeter of the proposed contamination hotspot areas to assess level of contamination and potential for water ingress. The findings of the delineation exercise confirmed the areas of worst contamination were in line with previous investigations but volumes of contamination appeared higher than those made in the initial assessment (Table 3.1). Following this work, each of the hotspot areas was set out using a 10m x 10m grid to aid in the management of the zone.

4.4 Verification Sampling

As part of the works to verify the remediation has been completed successfully, the remedial strategy details a programme of verification sampling and analysis which comprises the following:

- verification samples taken from the remediation excavations at a frequency of 1 sample from the base per 10m by 10m grid square and every 10m along the sides of excavations;



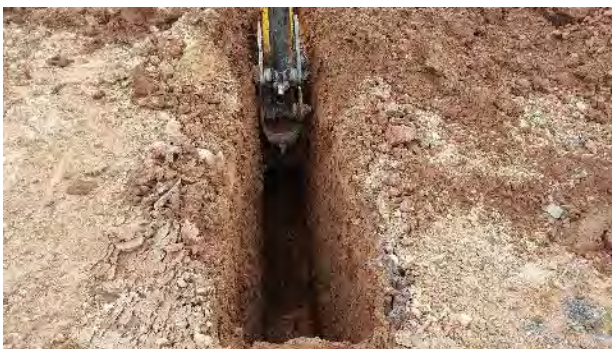
- as per agreement with EA, the samples retrieved for validation of the sides and base of the excavation was only analysed for the contaminant with a remedial target (TCE);
- clean site won soil was tested for Speciated TPH (including BTEX), Metals, USEPA PAH and TCE at a rate of one sample per 500m³ for the first 5000m³ reducing to 1 sample per 1000m³ thereafter;
- remediated material was tested for Speciated TPH (including BTEX), Metals, USEPA PAH and TCE at a rate of one sample per 250m³ for the first 1500m³ reducing to 1 sample per 500m³ thereafter;
- Excavation sample data was screened against the relevant remedial target for the site for TCE (detailed in Table 4.1) and site reuse and treated material samples for the other parameters against suitability for use criteria (LOM S4UL Commercial) detailed in Table 4.2.

In addition, material movements were tracked via a Material Management Plan and excavations recorded through a photographic record and the logging of locations and depths. The works were undertaken under the CL:AIRE Definition of Waste Industry Code of Practice.

5.0 Remediation Works

5.1 Placement of a clay cut-off wall to control groundwater

The trial pits carried out as part of the pre-remediation delineation works identified there was a high potential for water ingress into the remediation excavations. Therefore a puddle clay “cut off wall” was installed in an “inverted horseshoe” up-gradient of Area 1 to impede groundwater into the remedial excavations. A reduced level dig was carried out to 2mbgl which facilitated the excavation of a slip trench for the installation of the clay barrier to a depth of 4.5-5mbgl. The trench was extended 0.5m past the standing water level with the clay being keyed into the mudstone. The clay barrier was 0.5m wide and extended to 100m in length with two 90 degree returns which were 20m at the eastern end and 10m at the western end (see photos below).



5.2 Identification of Contaminated Soils

Remediation works were based on olfactory and visual evidence and set out on a 10m by 10m grid to ensure that material movements could be tracked easily. The hotspot labelled Area 1 essentially lies within columns A to I and between rows 1 to 9. The hotspot labelled Area 2 essentially lies within columns K to V and between rows 1 to 9. A minimum 5m 'stand-off zone' was marked out along the route of the live sewer and was maintained throughout bulk excavation works. The stand-off zone lies within columns I, J and K.

The entirety of Areas 1 and 2 were subjected to a 'surge' (minimum 2m deep turn over), where slabs, foundations and other large below ground obstructions were broken out and removed to be crushed and re-used on site (see photo below). Contaminated soils identified during the 'surge' exercise were excavated and treated as appropriate.



Where evidence of contamination had been previously noted, the soils across the square were excavated and separated based on whether they displayed evidence of contamination or not. Soils exhibiting obvious evidence of contamination were sent to the treatment area to undergo bioremediation. The remainder were stockpiled and samples taken for analysis to determine whether they could be re-used or whether they would require treatment. The photographs below show remediation excavations being undertaken in both the main hotspot areas.



5.3 Volumes Excavated

Material volumes were recorded on a grid square by grid square basis. Appendix A is an extract of the Materials Management Plan (MMP) which details the volumes of soil removed from each grid square for treatment. Appendix B is a further extract of the MMP which details the volumes of soil which demonstrated no evidence of significant contamination and were stockpiled for re-use pending validation sampling.



5.2.1 Material sent for Treatment

The treatment area was constructed on concrete slabs with lined and banded edges. A sump was created to collect any contaminated water run-off from the windrows (see photos below).



Appendix A details the volumes from each grid square that was sent to the treatment area to undergo bioremediation, together with the date it was sent. A total of approximately 9770m³ of contaminated soil from Area 1 was sent for treatment. A total of approximately 8055m³ of contaminated soil from Area 2 was sent for treatment.

Shallow groundwater filled the base of remedial excavations, and whilst no appreciable DNAPL was encountered on the surface of the mudstone, groundwater often showed evidence of a hydrocarbon sheen.

Where this was the case the groundwater was pumped to the water treatment plant for remediation prior to discharge to sewer. A total of approximately 767m³ of groundwater originating from Area 1 and 4088m³ of groundwater from Area 2 passed through the treatment plant. Appendix C details the volumes of groundwater removed from each area.

Excavations began in the west of Area 1 in August and gradually proceeded eastwards. Contamination was found to be more widely distributed than anticipated, predominantly occurring in large hotspots (which extended to the full depth in several adjacent grid squares) rather than a continuous 1m thick band of contamination on the surface of the mudstone. A total of 2350m³ of soil was sent for treatment in August.

During September, the excavation moved into the main area where contamination had been previously identified. More significant volumes of soil exhibiting evidence of contamination were removed to the treatment area during this period. During September a total of 4790m³ of soil was sent to the treatment area.

There was further eastward progression during October and Area 1 was terminated at the western edge of the stand-off zone for the existing sewer. A total of 2630m³ of material was removed for treatment in October. The total volume of treatment of soils from Area 1 was 9770m³.



As there was a significant drop in site level in the Area 2 part of site, groundwater in trial trenches was encountered much shallower than in Area 1 (at approx. 2mbgl). G&J felt that it would be unreasonable to dig out saturated soils up to 2 metres below static water level due to a) the practicalities of dewatering a larger



volume and b) the issues associated with backfilling a larger volume beneath the water table than originally envisaged. The main driver for remediation at this site was to remove or treat the source of contamination on site, such that the remediation is compliant with the Part 2A legislation. Therefore, it was agreed with the EA that excavations would proceed to 2.5mbgl where no contamination was encountered and a trial pit would be excavated to the surface of the bedrock (circa 3.5-4mbgl) for validation purposes. Where gross contamination was encountered in the top 2.5m of a grid square, the excavations would proceed to the surface of the bedrock (as per Area 1 works).

Excavations began in the west of Area 2 (at the eastern edge of the stand-off zone for the existing sewer) at the end of October and gradually proceeded eastwards. Contamination was found to be more patchily distributed than Area 1 with two main chlorinated hydrocarbon hotspots which extended to the full depth between cells N4-N8 and O7-O8, and between cells P1-P4 and Q1 to Q5. A total of 400m³ of soil was sent for treatment in October, 1050m³ in November and 1725m³ in December.

The site was made safe over the Christmas and New Year shutdown. On return to site in January the excavation moved eastwards, in January a total of 3050m³ of soil was sent to the treatment area, with a further 830m³ in February. The remediation excavation was terminated at the eastern edge of Column T. The total volume of treatment of soils from Area 2 was 7055m³.

During the surge to the eastern site boundary, approximately a further 1000m³ of material was sent for treatment. A hotspot (found adjacent to the 3 stage interceptor in Cells U4 to U10) was impacted with petroleum hydrocarbons rather than chlorinated hydrocarbons. Whilst petroleum hydrocarbons were not considered a primary risk driver for controlled waters at the site, the hotspot was removed for treatment as part of the overall site betterment and to ensure suitability for use as a commercial development in terms of human health / perceived risk. Therefore, the total volume of treatment of soils from the area to the east of the sewer stand-off zone was 8055m³.

5.2.2 Tanks

During the surging and remediation excavation, a number of below ground structures (i.e. redundant tanks) were encountered, which in some cases may have represented the primary sources of contamination. Where encountered, the tanks were pumped to remove any remaining oily waters and residues and removed from the ground. Photographs of a deep tank in situ is shown below.



5.2.3 Material not requiring treatment

Appendix B details the volumes of soil removed from each grid square that did not show evidence of contamination and was stockpiled for re-use pending results of verification testing (Individual laboratory certificates are presented in Appendix F). A total of approximately 18,230m³ is recorded in Appendix B as being stockpiled for re-use for Area 1, and a total of approximately 15,745m³ from Area 2. The photos below show the excavation of clean material and also the backfilling of suitable for re-use materials.



5.2.3 River Arrow monitoring

As part of the Environmental Permit, the EA requested that surface water monitoring of the River Arrow was undertaken at two locations on a weekly basis to demonstrate that the remediation works were not causing the TCE contamination to mobilise and affect the controlled waters receptor. The photos below show the sampling of the River and the results of the chemical analysis are included in Appendix D. All results demonstrate that concentrations of TCE in the River Arrow are less than the EQS of 10µg/l.





6.0 Validation Sampling and Analysis

6.1 General

Validation sampling was undertaken for three reasons:

- To demonstrate the suitability of 'clean' soils for direct re-use;
- To demonstrate that contaminated soils had been removed from the main hotspot areas identified prior to, and during, the remediation works;
- To demonstrate the suitability of soils for re-use after treatment.

A master sheet containing all validation sample analysis screened against remedial targets is presented in Appendix E. In addition, the individual laboratory certificates are presented in Appendix F.

6.2 Hotspot Validation

The removal of contaminated soils from hotspot areas was confirmed by taking validation samples from the sides of the excavation at a frequency of 1 every 10m, and from the base of the excavation at a frequency of 1 every 10m grid square. In Area 1, the samples were taken between 2 September and 25 October 2016. In Area 2, the samples were taken between 27 October 2016 and 8 February 2017. The location of the grid squares system used for validation samples is shown overleaf.

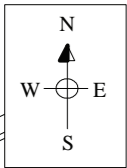
The results of the validation sampling showed that all samples returned concentrations below the remedial targets for the contaminants of concern.

6.3 Validation of Treated Soils

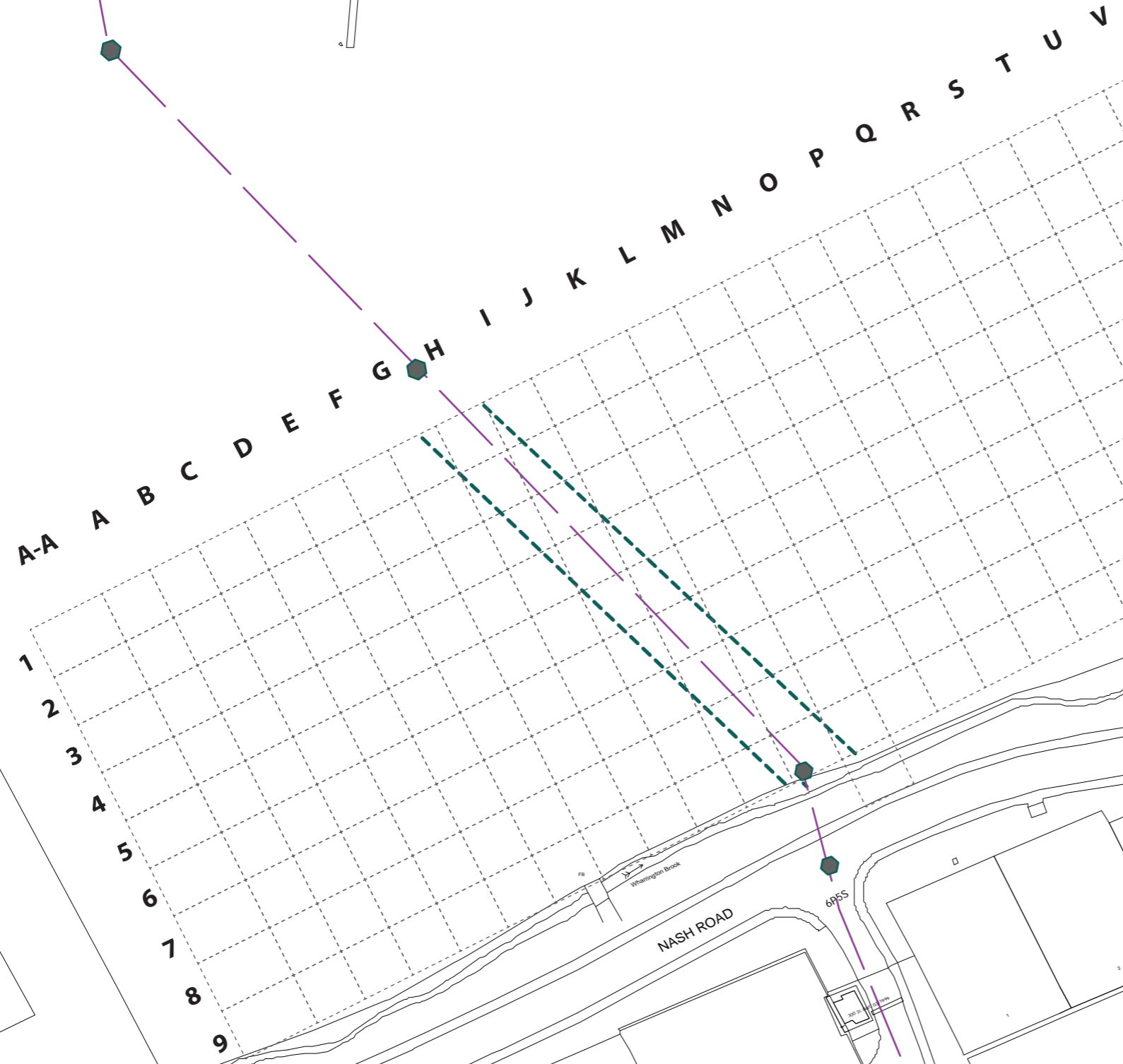
Approximately 17,825m³ of soil was removed to the treatment area during the course of the remediation between August 2016 and February 2017.

Thirty-eight samples of the treated material, designated T1.1 to T38.1 (and prefixed by the windrow number) were taken at regular intervals from the windrows, with the final validation sample being collected in March 2017. These were sampled at a frequency of 1 for every 250m³ for the first 1500m³, and 1 per 500m³ thereafter as agreed in the remedial strategy.

The results of chemical analysis on these samples showed no exceedances of the remedial targets. In addition, all samples returned concentrations below the C4SL and LQM S4UL criteria for a commercial development with the exception of 9 samples for TCE.



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|-------|--------------------------------------|---|
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| | tender <input type="checkbox"/> | H&S file <input type="checkbox"/> |

Client

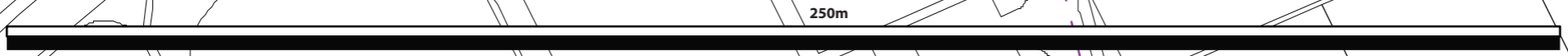
Project **Remediation Works BA Tubes**

Address **BA Tubes, Studley Road, Redditch**

Drawing **Site 10m Grid Layout - Validation**

35-37 High Street
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| | | |
|----------|------------|---------|
| Scale | Sheet Size | Signed |
| 1: 100 | A3 | |
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| Job No | Drawing No | Rev |
| GJ079 | DR02 | A |



Samples T2.1 (Windrow 1), T7.1-T11.1 (Windrow 3), T15.1 (Windrow 4), T18.1 and T20.1 (Windrow 5) recorded TCE concentrations in excess of the LQM S4UL value of 1.2mg/kg. This criteria is set for human health risk so usually applies to materials contained in the top 0.5m of the development. With this in mind, materials were backfilled at 1.3mbgl in Column A to E (W1/T2.1), between 2.5-1.9mbgl in Columns K to O (W3/T7.1 to W3/T11.1 and W4/T15.1), and 1.2-0.7mbgl in Columns P, Q, R and S (W5/T18.1 and W5/T20.1).

6.4 Validation of Site Won Soils (Materials Management)

Appendix B details the volumes of soil removed from each grid square that did not show evidence of contamination and was stockpiled for re-use pending results of verification testing. A total of approximately 18,230m³ from Area 1 and approximately 15,745m³ from Area 2.

Forty five samples of this 'suitable for use' material, designated SFU1 to SFU45 (1 for every 500m³ for the first 5000m³, and 1 per 1000m³ thereafter, as agreed in the remedial strategy), were taken at regular intervals from the stockpiles.

The results of chemical analysis on these samples showed no exceedances of the remedial targets (Individual laboratory certificates are presented in Appendix F). In addition, all samples returned concentrations below the C4SL and LQM S4UL criteria for a commercial development with the exception of 4 samples for TCE.

Samples SFU15, SFU16, SFU23 and SFU33 recorded TCE concentrations in excess of the LQM S4UL value of 1.2mg/kg. As described above, this usually only applies to materials contained in the top 0.5m of the development. With this in mind, materials were backfilled between 3.7-1.3mbgl in Column F (SFU15 and SFU16), 3.8-2.5mbgl in Columns G, H and I (SFU23), and 2.1-1.5mbgl in Columns G, H and I (SFU33).





7.0 Summary & Conclusions

7.1 Remediation Validation

Remediation works have resulted in approximately 17,825m³ of soil being removed to the treatment area, and approximately 4855m³ of groundwater removed for treatment and disposal. There were no exceedances of the remedial targets but there were a number of exceedances of the human health generic assessment criteria for TCE by suitable for use and treated materials. However, the validation sampling and analysis and the backfill locations of the exceeding materials is considered to demonstrate that the remedial works have been successful and that no significant risks remain to human health or controlled waters. Therefore no further action is considered necessary.

7.2 Post Remediation Conceptual Model

Prior to the remediation of the organic contamination within soil and groundwater, the following pollutant linkages were considered to be potentially significant;

- PL1 Exposure of future site users to contamination in soil via dermal contact, soil and dust ingestion, and inhalation of dusts and vapours;
- PL2 Leaching of contamination in soil through the unsaturated zone to the shallow groundwater and migration via the saturated zone to River Arrow;
- PL3 Migration of already contaminated shallow groundwater to River Arrow.

The removal of primary sources such as tanks, the successful remediation of the organic contamination in soil and the removal of contaminated groundwater from the remedial excavations is considered to have addressed PL2 and PL3, and the vapour inhalation element of PL1 for the most contaminated part of the site. Therefore the remediation of the site is considered complete and it's designation as 'Contaminated Land' under Part IIA of the Environmental Protection Act 1990 can be removed.

7.3 Further Works

Although it is considered that significant risks are no longer present as a result of TCE contamination within the southern half of the site, a watching brief should be undertaken during the 'surge' and removal of slabs, foundations and other below ground structures on the remainder of the site (northern half). Any soils showing evidence of contamination that had not been previously identified will need to be excavated and any treatment or disposal reported separately. Depending on the chemical test results from this area, a clean cover may also need to be placed in landscaped areas in order to address PL1.



APPENDICES



Appendix A – Soil Volumes Removed for Treatment

| Date Placed (week commencing) | Source | | Approx. Amount Placed m ³ | Location | Approx. Total Amount m ³ | Treatment windrow | Testing Details | | | Comments |
|----------------------------------|--------|--------------|---|----------|--|-----------------------|-----------------|----------------|-------------------------|---------------|
| | Area | Grid Squares | | | | | Date Sampled | Sample Numbers | Test Certificate Number | |
| 22/08/2016 | 1 | A7 | 100 | T | 100 | WINDROW 1 (800m3) | 28/09/2016 | W1/T1.1 | 16-49810 | PASS |
| 22/08/2016 | 1 | A6 | 100 | T | 200 | | 28/09/2016 | W1/T2.1 | 16-49810 | PASS |
| 22/08/2016 | 1 | A5 | 200 | T | 400 | | 28/09/2016 | W1/T3.1 | 16-49810 | PASS |
| 22/08/2016 | 1 | A4 | 200 | T | 600 | | | | | REUSED AREA 1 |
| 22/08/2016 | 1 | A2 | 200 | T | 800 | | | | | |
| 22/08/2016 | 1 | A8 | 200 | T | 1000 | WINDROW 2 (800m3) | 28/09/2016 | W2/T4.1 | 16-49810 | PASS |
| 22/08/2016 | 1 | A7 | 50 | T | 1050 | | 28/09/2016 | W2/T5.1 | 16-49810 | PASS |
| 29/08/2016 | 1 | B2 | 100 | T | 1150 | | 28/09/2016 | W2/T6.1 | 16-49810 | PASS |
| 29/08/2016 | 1 | B3 | 150 | T | 1300 | | | | | REUSED AREA 1 |
| 29/08/2016 | 1 | A3 | 100 | T | 1400 | | | | | |
| 29/08/2016 | 1 | B4 | 200 | T | 1600 | | | | | |
| 29/08/2016 | 1 | B5 | 200 | T | 1800 | WINDROW 3 (2550m3) | 27/10/2016 | W3/T7.1 | 16-51122 | PASS |
| 29/08/2016 | 1 | B6 | 100 | T | 1900 | | 27/10/2016 | W3/T8.1 | 16-51122 | PASS |
| 29/08/2016 | 1 | B7 | 100 | T | 2000 | | 27/10/2016 | W3/T9.1 | 16-51122 | PASS |
| 29/08/2016 | 1 | B8 | 100 | T | 2100 | | 27/10/2016 | W3/T10.1 | 16-51122 | PASS |
| 29/08/2016 | 1 | A2 | 100 | T | 2200 | | 27/10/2016 | W3/T11.1 | 16-51122 | PASS |
| 29/08/2016 | 1 | B2 | 150 | T | 2350 | | | | | REUSED AREA 2 |
| 05/09/2016 | 1 | B3 | 150 | T | 2500 | | | | | |
| 05/09/2016 | 1 | A4 | 150 | T | 2650 | | | | | |
| 05/09/2016 | 1 | B4 | 150 | T | 2800 | | | | | |
| 05/09/2016 | 1 | A5 | 150 | T | 2950 | | | | | |
| 05/09/2016 | 1 | B5 | 150 | T | 3100 | | | | | |
| 05/09/2016 | 1 | A6 | 100 | T | 3200 | | | | | |
| 05/09/2016 | 1 | B6 | 200 | T | 3400 | | | | | |
| 05/09/2016 | 1 | A7 | 150 | T | 3550 | | | | | |
| 05/09/2016 | 1 | B7 | 100 | T | 3650 | | | | | |
| 05/09/2016 | 1 | A8 | 100 | T | 3750 | | | | | |
| 05/09/2016 | 1 | B8 | 100 | T | 3850 | | | | | |
| 12/09/2016 | 1 | C1 | 50 | T | 3900 | | | | | |
| 12/09/2016 | 1 | C2 | 100 | T | 4000 | | | | | |
| 12/09/2016 | 1 | C3 | 150 | T | 4150 | | | | | |
| 12/09/2016 | 1 | C4 | 150 | T | 4300 | WINDROW 4 (3000m3) | 27/10/2016 | W4/T12.1 | 16-51122 | PASS |
| 12/09/2016 | 1 | C5 | 150 | T | 4450 | | 27/10/2016 | W4/T13.1 | 16-51122 | PASS |
| 12/09/2016 | 1 | C6 | 150 | T | 4600 | | 27/10/2016 | W4/T14.1 | 16-51122 | PASS |
| 12/09/2016 | 1 | C7 | 150 | T | 4750 | | 27/10/2016 | W4/T15.1 | 16-51122 | PASS |
| 12/09/2016 | 1 | C8 | 50 | T | 4800 | | 27/10/2016 | W4/T16.1 | 16-51122 | PASS |
| 19/09/2016 | 1 | D3 | 50 | T | 4850 | | 27/10/2016 | W4/T17.1 | 16-51122 | PASS |
| 19/09/2016 | 1 | D4 | 150 | T | 5000 | | | | | REUSED AREA 2 |
| 19/09/2016 | 1 | D5 | 150 | T | 5150 | | | | | |
| 19/09/2016 | 1 | D6 | 150 | T | 5300 | | | | | |
| 19/09/2016 | 1 | D7 | 150 | T | 5450 | | | | | |
| 19/09/2016 | 1 | D8 | 50 | T | 5500 | | | | | |
| 26/09/2016 | 1 | E1 | 20 | T | 5520 | | | | | |
| 26/09/2016 | 1 | E2 | 160 | T | 5680 | | | | | |
| 26/09/2016 | 1 | E3 | 220 | T | 5900 | | | | | |
| 26/09/2016 | 1 | E4 | 280 | T | 6180 | | | | | |
| 26/09/2016 | 1 | E5 | 200 | T | 6380 | | | | | |
| 26/09/2016 | 1 | E6 | 200 | T | 6580 | | | | | |
| 26/09/2016 | 1 | E7 | 120 | T | 6700 | | | | | |
| 26/09/2016 | 1 | F1 | 60 | T | 6760 | | | | | |
| 26/09/2016 | 1 | F2 | 140 | T | 6900 | | | | | |
| 26/09/2016 | 1 | F3 | 180 | T | 7080 | | | | | |
| 26/09/2016 | 1 | F4 | 60 | T | 7140 | | | | | |
| 03/10/2016 | 1 | F5 | 100 | T | 7240 | WINDROW 5 (2630m3) | 13/12/2016 | W5/T18.1 | 16-52964 | PASS |
| 03/10/2016 | 1 | F6 | 100 | T | 7340 | | 13/12/2016 | W5/T19.1 | 16-52964 | PASS |
| 03/10/2016 | 1 | F7 | 50 | T | 7390 | | 13/12/2016 | W5/T20.1 | 16-52964 | PASS |
| 03/10/2016 | 1 | F8 | 100 | T | 7490 | | 13/12/2016 | W5/T21.1 | 16-52964 | PASS |
| 17/10/2016 | 1 | G7 | 20 | T | 7510 | | 13/12/2016 | W5/T22.1 | 16-52964 | PASS |
| 17/10/2016 | 1 | G8 | 350 | T | 7860 | | | | | REUSED AREA 2 |
| 17/10/2016 | 1 | H8 | 350 | T | 8210 | | | | | |
| 17/10/2016 | 1 | H7 | 350 | T | 8560 | | | | | |
| 17/10/2016 | 1 | H6 | 350 | T | 8910 | | | | | |
| 17/10/2016 | 1 | I7 | 400 | T | 9310 | | | | | |
| 17/10/2016 | 1 | I8 | 400 | T | 9710 | | | | | |
| 24/10/2016 | 1 | I6 | 60 | T | 9770 | | | | | |
| 24/10/2016 | 2 | K1 | 100 | T | 100 | WINDROW 6 (1450m3) | 08/02/2017 | W6/T23.1 | 17-54958 | PASS |
| 31/10/2016 | 2 | K2 | 100 | T | 200 | | 08/02/2017 | W6/T24.1 | 17-54958 | PASS |
| 31/10/2016 | 2 | K3 | 100 | T | 300 | | 08/02/2017 | W6/T25.1 | 17-54958 | PASS |
| 31/10/2016 | 2 | K4 | 100 | T | 400 | | | | | REUSED AREA 2 |
| 21/11/2016 | 2 | M4 | 100 | T | 500 | | | | | |
| 21/11/2016 | 2 | S8 | 100 | T | 600 | | | | | |
| 21/11/2016 | 2 | T8 | 150 | T | 750 | | | | | |
| 28/11/2016 | 2 | N7 | 300 | T | 1050 | | | | | |
| 28/11/2016 | 2 | N8 | 200 | T | 1250 | | | | | |
| 28/11/2016 | 2 | O8 | 200 | T | 1450 | | | | | |
| 05/12/2016 | 2 | N4 | 350 | T | 1800 | WINDROW 7 (1725m3) | 23/02/2017 | W7/T26.1 | 17-55729 | PASS |
| 05/12/2016 | 2 | N5 | 350 | T | 2150 | | 23/02/2017 | W7/T27.1 | 17-55729 | PASS |
| 05/12/2016 | 2 | N6 | 200 | T | 2350 | | 23/02/2017 | W7/T28.1 | 17-55729 | PASS |
| 05/12/2016 | 2 | N7 | 300 | T | 2650 | | | | | REUSED AREA 2 |
| 05/12/2016 | 2 | O1 | 50 | T | 2700 | | | | | |
| 05/12/2016 | 2 | O7 | 200 | T | 2900 | | | | | |
| 05/12/2016 | 2 | O8 | 200 | T | 3100 | | | | | |
| 05/12/2016 | 2 | O4 | 25 | T | 3125 | | | | | |
| 05/12/2016 | 2 | O5 | 25 | T | 3150 | | | | | |
| 05/12/2016 | 2 | O6 | 25 | T | 3175 | | | | | |
| 02/01/2017 | 2 | P1 | 250 | T | 3425 | | | | | |
| 02/01/2017 | 2 | P2 | 250 | T | 3675 | | | | | |
| | | | | | | | 08/03/2017 | W8/T29.1 | 17-56163 | PASS |

| | | | | | | | | | | | |
|------------|---|-----|-----|---|------|--------------------------------------|------------|------------|-----------|-------------------|---------------|
| 02/01/2017 | 2 | P3 | 125 | T | 3800 | | 08/03/2017 | W8/T30.1 | 17-56163 | PASS | |
| 02/01/2017 | 2 | P4 | 125 | T | 3925 | | 08/03/2017 | W8/T31.1 | 17-56163 | PASS | |
| 09/01/2017 | 2 | Q1 | 200 | T | 4125 | | 08/03/2017 | W8/T32.1 | 17-56163 | PASS | |
| 09/01/2017 | 2 | Q2 | 200 | T | 4325 | | 08/03/2017 | W8/T33.1 | 17-56163 | PASS | |
| 09/01/2017 | 2 | Q3 | 200 | T | 4525 | | 08/03/2017 | W8/T34.1 | 17-56163 | PASS | |
| 09/01/2017 | 2 | Q4 | 200 | T | 4725 | | | | | REUSED AREA 1 & 2 | |
| 09/01/2017 | 2 | Q5 | 200 | T | 4925 | | | | | | |
| 16/01/2017 | 2 | R3 | 100 | T | 5025 | WINDROW 8 (2850m3) | | | | | |
| 16/01/2017 | 2 | R4 | 100 | T | 5125 | | | | | | |
| 16/01/2017 | 2 | R5 | 100 | T | 5225 | | | | | | |
| 16/01/2017 | 2 | R6 | 100 | T | 5325 | | | | | | |
| 16/01/2017 | 2 | R7 | 100 | T | 5425 | | | | | | |
| 16/01/2017 | 2 | R8 | 100 | T | 5525 | | | | | | |
| 23/01/2017 | 2 | R1 | 50 | T | 5575 | | | | | | |
| 23/01/2017 | 2 | R2 | 50 | T | 5625 | | | | | | |
| 23/01/2017 | 2 | S8 | 100 | T | 5725 | | | | | | |
| 23/01/2017 | 2 | S7 | 100 | T | 5825 | | | | | | |
| 23/01/2017 | 2 | S6 | 100 | T | 5925 | | | | | | |
| 23/01/2017 | 2 | S5 | 100 | T | 6025 | | | | | | |
| 23/01/2017 | 2 | S4 | 100 | T | 6125 | | | | | | |
| 23/01/2017 | 2 | S3 | 100 | T | 6225 | | | 08/03/2017 | W9/T35.1 | 17-56163 | PASS |
| 06/02/2017 | 2 | S2 | 100 | T | 6325 | | | 08/03/2017 | W9/T36.1 | 17-56163 | PASS |
| 06/02/2017 | 2 | S1 | 80 | T | 6405 | | | | | | REUSED AREA 1 |
| 06/02/2017 | 2 | T8 | 100 | T | 6505 | WINDROW 9 (1030m3) | | | | | |
| 06/02/2017 | 2 | T7 | 100 | T | 6605 | | | | | | |
| 06/02/2017 | 2 | T6 | 100 | T | 6705 | | | | | | |
| 06/02/2017 | 2 | T5 | 100 | T | 6805 | | | | | | |
| 06/02/2017 | 2 | T4 | 80 | T | 6885 | | | | | | |
| 06/02/2017 | 2 | T3 | 70 | T | 6955 | | | | | | |
| 06/02/2017 | 2 | T2 | 50 | T | 7005 | | | | | | |
| 06/02/2017 | 2 | T1 | 50 | T | 7055 | | | | | | |
| 06/02/2017 | 2 | U8 | 150 | T | 7205 | | | 08/03/2017 | W10/T37.1 | 17-56163 | PASS |
| 06/02/2017 | 2 | U7 | 150 | T | 7355 | | | 08/03/2017 | W10/T38.2 | 17-56163 | PASS |
| 06/02/2017 | 2 | U6 | 150 | T | 7505 | WINDROW 10 - H/carbon (1000m3) | | | | REUSED AREA 1 | |
| 06/02/2017 | 2 | U5 | 150 | T | 7655 | | | | | | |
| 06/02/2017 | 2 | U4 | 150 | T | 7805 | | | | | | |
| 13/02/2017 | 2 | U9 | 150 | T | 7955 | | | | | | |
| 13/02/2017 | 2 | U10 | 100 | T | 8055 | | | | | | |

| Cell | Volume | Matches dirty on 'site won' sheet | Cell | Volume | Matches dirty on 'site won' sheet |
|------|--------|---|------|--------|---|
| A1 | 0 | TRUE | K1 | 100 | TRUE |
| A2 | 300 | TRUE | K2 | 100 | TRUE |
| A3 | 100 | TRUE | K3 | 100 | TRUE |
| A4 | 350 | TRUE | K4 | 100 | TRUE |
| A5 | 350 | TRUE | M4 | 100 | TRUE |
| A6 | 200 | TRUE | S8 | 100 | TRUE |
| A7 | 300 | TRUE | T8 | 150 | TRUE |
| A8 | 300 | TRUE | N7 | 300 | TRUE |
| B1 | 0 | TRUE | N8 | 200 | TRUE |
| B2 | 250 | TRUE | O8 | 200 | TRUE |
| B3 | 300 | TRUE | N4 | 350 | TRUE |
| B4 | 350 | TRUE | N5 | 350 | TRUE |
| B5 | 350 | TRUE | N6 | 200 | TRUE |
| B6 | 300 | TRUE | N7 | 300 | TRUE |
| B7 | 200 | TRUE | O1 | 50 | TRUE |
| B8 | 200 | TRUE | O7 | 200 | TRUE |
| C1 | 50 | TRUE | O8 | 200 | TRUE |
| C2 | 100 | TRUE | O4 | 25 | TRUE |
| C3 | 150 | TRUE | O5 | 25 | TRUE |
| C4 | 150 | TRUE | O6 | 25 | TRUE |
| C5 | 150 | TRUE | P1 | 250 | TRUE |
| C6 | 150 | TRUE | P2 | 250 | TRUE |
| C7 | 150 | TRUE | P3 | 125 | TRUE |
| C8 | 50 | TRUE | P4 | 125 | TRUE |
| D1 | 0 | TRUE | Q1 | 200 | TRUE |
| D2 | 0 | TRUE | Q2 | 200 | TRUE |
| D3 | 50 | TRUE | Q3 | 200 | TRUE |
| D4 | 150 | TRUE | Q4 | 200 | TRUE |
| D5 | 150 | TRUE | Q5 | 200 | TRUE |
| D6 | 150 | TRUE | R3 | 100 | TRUE |
| D7 | 150 | TRUE | R4 | 100 | TRUE |
| D8 | 50 | TRUE | R5 | 100 | TRUE |
| E1 | 20 | TRUE | R6 | 100 | TRUE |
| E2 | 160 | TRUE | R7 | 100 | TRUE |
| E3 | 220 | TRUE | R8 | 100 | TRUE |
| E4 | 280 | TRUE | R1 | 50 | TRUE |
| E5 | 200 | TRUE | R2 | 50 | TRUE |
| E6 | 200 | TRUE | S8 | 100 | TRUE |
| E7 | 120 | TRUE | S7 | 100 | TRUE |
| E8 | 0 | TRUE | S6 | 100 | TRUE |
| F1 | 60 | TRUE | S5 | 100 | TRUE |
| F2 | 140 | TRUE | S4 | 100 | TRUE |
| F3 | 180 | TRUE | S3 | 100 | TRUE |
| F4 | 60 | TRUE | S2 | 100 | TRUE |
| F5 | 100 | TRUE | S1 | 80 | TRUE |
| F6 | 100 | TRUE | T8 | 100 | TRUE |
| F7 | 50 | TRUE | T7 | 100 | TRUE |
| F8 | 100 | TRUE | T6 | 100 | TRUE |
| G1 | 0 | TRUE | T5 | 100 | TRUE |
| G2 | 0 | TRUE | T4 | 80 | TRUE |
| G3 | 0 | TRUE | T3 | 70 | TRUE |
| G4 | 0 | TRUE | T2 | 50 | TRUE |
| G5 | 0 | TRUE | T1 | 50 | TRUE |
| G6 | 0 | TRUE | U8 | 150 | TRUE |
| G7 | 20 | TRUE | U7 | 150 | TRUE |
| G8 | 350 | TRUE | U6 | 150 | TRUE |
| H6 | 350 | TRUE | U5 | 150 | TRUE |
| H7 | 350 | TRUE | U4 | 150 | TRUE |
| H8 | 350 | TRUE | U9 | 150 | TRUE |
| I6 | 60 | TRUE | U10 | 100 | TRUE |
| I7 | 400 | TRUE | | | |
| I8 | 400 | TRUE | | | |

| Date Removed | Removed From | Approx. Amount Removed m ³ | Removed To | Location | |
|--------------|-----------------------|---------------------------------------|--------------------|------------------|--------------------|
| | | | | T treatment area | Q quarantine area |
| | | | | Depth | Notes |
| Oct-16 | Windrow 1 & Windrow 2 | 1600 | Rows A, B, C, D, E | 0.9-1.3m bgl | See site won sheet |
| Nov-16 | Windrow 3 & Windrow 4 | 5550 | Rows K to O | 2.5-1.1mbgl | See site won sheet |
| Jan-17 | Windrow 5 | 2600 | Row P, Q, R, S | 1.2-0.5mbgl | See site won sheet |
| Feb-17 | Windrow 6 | 1450 | Row T & U | 1.7-0.9mbgl | See site won sheet |
| Feb-17 | Windrow 7 | 1725 | Row P to U | 0.9-0.1mbgl | See site won sheet |
| Mar-17 | Windrow 8 | 2850 | Row AA to U | ~0.5-0.0mbgl | See site won sheet |
| Mar-17 | Windrow 9 | 1030 | Row AA to I | ~0.5-0.0mbgl | See site won sheet |
| Mar-17 | Windrow 10 | 1000 | Row AA to I | ~0.5-0.0mbgl | See site won sheet |



Appendix B – Soil Volumes Stockpiled for Re-Use

GJ079 Nash Road, Redditch

Tested at 1 per 500m3 for first 5000m3, then 1 per 1000m3

Summary of Site won material validation



| Source | | Approx. Amount m ³ | Location | Approx. Total m3 | Testing Details | | | Comments |
|--------------|--------------|-------------------------------|----------|------------------|-----------------|-------------------------|----------|---|
| Grid Squares | Date Sampled | | | | Sample numbers | Test Certificate Number | | |
| Area 1 | AA1 | 300 | S | 300 | 02/08/2016 | SFU1 | 16-47533 | Passed |
| Area 1 | AA2 | 300 | S | 600 | 02/08/2016 | SFU2 | 16-47534 | Passed |
| Area 1 | AA3 | 300 | S | 900 | 02/08/2016 | SFU3 | 16-47535 | Passed |
| Area 1 | AA4 | 300 | S | 1200 | 02/08/2016 | SFU4 | 16-47536 | Passed |
| Area 1 | AA5 | 300 | S | 1500 | 02/08/2016 | SFU5 | 16-47537 | Passed |
| Area 1 | AA6 | 300 | S | 1800 | 02/08/2016 | SFU6 | 16-47538 | Passed |
| Area 1 | AA7 | 300 | S | 2100 | 24/08/2016 | SFU7 | 16-48570 | Passed |
| Area 1 | AA8 | 300 | S | 2400 | 24/08/2016 | SFU8 | 16-48571 | Passed |
| Area 1 | A1 | 400 | S | 2800 | 26/08/2016 | SFU9 | 16-48572 | Passed |
| Area 1 | A2 | 100 | S | 2900 | 26/08/2016 | SFU10 | 16-48573 | Passed |
| Area 1 | A3 | 300 | S | 3200 | 27/08/2016 | SFU11 | 16-48574 | Passed |
| Area 1 | A4 | 50 | S | 3250 | 27/08/2016 | SFU12 | 16-48575 | Passed |
| Area 1 | A5 | 50 | S | 3300 | | | | |
| Area 1 | A6 | 200 | S | 3500 | | | | |
| Area 1 | A7 | 100 | S | 3600 | | | | FIRST 5000m3 @ 1 per 500m3; then 1 per 1000m3 |
| Area 1 | A8 | 100 | S | 3700 | | | | |
| Area 1 | B1 | 400 | S | 4100 | | | | |
| Area 1 | B2 | 150 | S | 4250 | | | | |
| Area 1 | B3 | 100 | S | 4350 | | | | |
| Area 1 | B4 | 50 | S | 4400 | | | | |
| Area 1 | B5 | 50 | S | 4450 | | | | |
| Area 1 | B6 | 100 | S | 4550 | | | | |
| Area 1 | B7 | 200 | S | 4750 | | | | |
| Area 1 | B8 | 200 | S | 4950 | | | | |
| Area 1 | C1 | 350 | S | 5300 | | | | |
| Area 1 | C2 | 300 | S | 5600 | | | | |
| Area 1 | C3 | 250 | S | 5850 | | | | |
| Area 1 | C4 | 250 | S | 6100 | | | | |
| Area 1 | C5 | 250 | S | 6350 | | | | |
| Area 1 | C6 | 250 | S | 6600 | | | | |
| Area 1 | C7 | 250 | S | 6850 | | | | |
| Area 1 | C8 | 350 | S | 7200 | 14/09/2016 | SFU13 | 16-49272 | Passed |
| Area 1 | D1 | 400 | S | 7600 | 14/09/2016 | SFU14 | 16-49272 | Passed |
| Area 1 | D2 | 400 | S | 8000 | | | | |
| Area 1 | D3 | 350 | S | 8350 | | | | |
| Area 1 | D4 | 250 | S | 8600 | | | | |
| Area 1 | D5 | 250 | S | 8850 | | | | |
| Area 1 | D6 | 250 | S | 9100 | 28/09/2016 | SFU15 | 16-49810 | Passed |
| Area 1 | D7 | 250 | S | 9350 | 28/09/2016 | SFU16 | 16-49810 | Passed |
| Area 1 | D8 | 350 | S | 9700 | | | | |
| Area 1 | E1 | 380 | S | 10080 | | | | |
| Area 1 | E2 | 240 | S | 10320 | | | | |
| Area 1 | E3 | 180 | S | 10500 | | | | |
| Area 1 | E4 | 120 | S | 10620 | | | | |
| Area 1 | E5 | 200 | S | 10820 | | | | |
| Area 1 | E6 | 200 | S | 11020 | 05/10/2016 | SFU 17 | 16-50174 | Passed |
| Area 1 | E7 | 280 | S | 11300 | 05/10/2016 | SFU18 | 16-50174 | Passed |
| Area 1 | E8 | 400 | S | 11700 | 05/10/2016 | SFU19 | 16-50174 | Passed |
| Area 1 | F1 | 340 | S | 12040 | | | | |
| Area 1 | F2 | 260 | S | 12300 | | | | |
| Area 1 | F3 | 220 | S | 12520 | | | | |
| Area 1 | F4 | 340 | S | 12860 | | | | |
| Area 1 | F5 | 300 | S | 13160 | | | | |
| Area 1 | F6 | 300 | S | 13460 | | | | |
| Area 1 | F7 | 350 | S | 13810 | | | | |
| Area 1 | F8 | 300 | S | 14110 | | | | |
| Area 1 | G1 | 400 | S | 14510 | 20/10/2016 | SFU20 | 16-50793 | Passed |
| Area 1 | G2 | 400 | S | 14910 | 20/10/2016 | SFU21 | 16-50793 | Passed |
| Area 1 | G3 | 400 | S | 15310 | 20/10/2016 | SFU22 | 16-50793 | Passed |
| Area 1 | G4 | 400 | S | 15710 | 26/10/2016 | SFU23 | 16-51122 | Passed |
| Area 1 | G5 | 400 | S | 16110 | | | | |
| Area 1 | G6 | 400 | S | 16510 | | | | |
| Area 1 | G7 | 380 | S | 16890 | | | | |
| Area 1 | G8 | 50 | S | 16940 | | | | |
| Area 1 | H3 | 100 | S | 17040 | | | | |
| Area 1 | H4 | 200 | S | 17240 | | | | |
| Area 1 | H5 | 400 | S | 17640 | | | | |
| Area 1 | H6 | 50 | S | 17690 | | | | |
| Area 1 | H7 | 50 | S | 17740 | | | | |
| Area 1 | H8 | 50 | S | 17790 | | | | |
| Area 1 | I5 | 200 | S | 17990 | | | | |
| Area 1 | I6 | 240 | S | 18230 | | | | |

From cut off wall excavation

CROSS CHECK

| CELL | DIRTY | CLEAN | Depth to Base | Cross check | |
|------|-----------------------------|--------------------------------------|---------------|-------------|--|
| | Number from treatment sheet | Area of cell (100m2) * depth - dirty | | | |
| AA1 | 0 | 300 | 2 | TRUE | |
| AA2 | 0 | 300 | 2 | TRUE | |
| AA3 | 0 | 300 | 2 | TRUE | |
| AA4 | 0 | 300 | 2 | TRUE | |
| AA5 | 0 | 300 | 2 | TRUE | |
| AA6 | 0 | 300 | 2 | TRUE | |
| AA7 | 0 | 300 | 2 | TRUE | |
| AA8 | 0 | 300 | 2 | TRUE | |
| A1 | 0 | 400 | 4 | TRUE | |
| A2 | 300 | 100 | 4 | TRUE | |
| A3 | 100 | 300 | 4 | TRUE | |
| A4 | 350 | 50 | 4 | TRUE | |
| A5 | 350 | 50 | 4 | TRUE | |
| A6 | 200 | 200 | 4 | TRUE | |
| A7 | 300 | 100 | 4 | TRUE | |
| A8 | 300 | 100 | 4 | TRUE | |
| B1 | 0 | 400 | 4 | TRUE | |
| B2 | 250 | 150 | 4 | TRUE | |
| B3 | 300 | 100 | 4 | TRUE | |
| B4 | 350 | 50 | 4 | TRUE | |
| B5 | 350 | 50 | 4 | TRUE | |
| B6 | 300 | 100 | 4 | TRUE | |
| B7 | 200 | 200 | 4 | TRUE | |
| B8 | 200 | 200 | 4 | TRUE | |
| C1 | 50 | 350 | 4 | TRUE | |
| C2 | 100 | 300 | 4 | TRUE | |
| C3 | 150 | 250 | 4 | TRUE | |
| C4 | 150 | 250 | 4 | TRUE | |
| C5 | 150 | 250 | 4 | TRUE | |
| C6 | 150 | 250 | 4 | TRUE | |
| C7 | 150 | 250 | 4 | TRUE | |
| C8 | 50 | 350 | 4 | TRUE | |
| D1 | 0 | 400 | 4 | TRUE | |
| D2 | 0 | 400 | 4 | TRUE | |
| D3 | 50 | 350 | 4 | TRUE | |
| D4 | 150 | 250 | 4 | TRUE | |
| D5 | 150 | 250 | 4 | TRUE | |
| D6 | 150 | 250 | 4 | TRUE | |
| D7 | 150 | 250 | 4 | TRUE | |
| D8 | 50 | 350 | 4 | TRUE | |
| E1 | 20 | 380 | 4 | TRUE | |
| E2 | 160 | 240 | 4 | TRUE | |
| E3 | 220 | 180 | 4 | TRUE | |
| E4 | 280 | 120 | 4 | TRUE | |
| E5 | 200 | 200 | 4 | TRUE | |
| E6 | 200 | 200 | 4 | TRUE | |
| E7 | 120 | 280 | 4 | TRUE | |
| E8 | 0 | 400 | 4 | TRUE | |
| F1 | 60 | 340 | 4 | TRUE | |
| F2 | 140 | 260 | 4 | TRUE | |
| F3 | 180 | 220 | 4 | TRUE | |
| F4 | 60 | 340 | 4 | TRUE | |
| F5 | 100 | 300 | 4 | TRUE | |
| F6 | 100 | 300 | 4 | TRUE | |
| F7 | 50 | 350 | 4 | TRUE | |
| F8 | 100 | 300 | 4 | TRUE | |
| G1 | 0 | 400 | 4 | TRUE | |
| G2 | 0 | 400 | 4 | TRUE | |
| G3 | 0 | 400 | 4 | TRUE | |
| G4 | 0 | 400 | 4 | TRUE | |
| G5 | 0 | 400 | 4 | TRUE | |
| G6 | 0 | 400 | 4 | TRUE | |
| G7 | 20 | 380 | 4 | TRUE | |
| G8 | 350 | 50 | 4 | TRUE | |
| H3 | 0 | 100 | 4 | TRUE | Cell incomplete due to shape of Area 1 |
| H4 | 0 | 200 | 4 | TRUE | Cell incomplete due to shape of Area 1 |
| H5 | 0 | 400 | 4 | TRUE | |
| H6 | 350 | 50 | 4 | TRUE | |
| H7 | 350 | 50 | 4 | TRUE | |
| H8 | 350 | 50 | 4 | TRUE | |
| I5 | 0 | 200 | 4 | TRUE | Cell incomplete due to shape of Area 1 |
| I6 | 60 | 240 | 4 | TRUE | Cell incomplete due to shape of Area 1 |
| I7 | 400 | 0 | 4 | TRUE | |
| I8 | 400 | 0 | 4 | TRUE | |

| Date Removed | Removed From | Approx. Amount Removed m ³ | Removed To | Depth | Notes | Calcs |
|--------------|-----------------------------|---------------------------------------|--|--------------|--|------------------------------|
| Aug-16 | Site won stockpile | 1200 | ROW AA | 2.0-1.0mbgl | | 1200m ² by 1m |
| Aug-16 | Gypsy bund | 720 | ROWS A, B, C | 4m-3.7mbgl | Not included in site won figures | 2400m ² by 300mm |
| Aug-16 | Site won stockpile | 5800 | ROWS A, B, C | 3.7-1.3mbgl | | 2400m ² by ~2.4m |
| Sep-16 | Gypsy bund | 480 | Row D & E | 4m-3.7mbgl | Not included in site won figures | 1600m ² by 300mm |
| Sep-16 | Site won stockpile | 2400 | Row D & E | 3.7-2.2mbgl | | 1600m ² by ~1.5m |
| Oct-16 | Site won stockpile | 1400 | Row D & E | 2.2-1.3mbgl | | 1600m ² by ~0.9m |
| Oct-16 | Windrow 1 & Windrow 2 | 1600 | ROWS A, B, C, D, E | 1.3-0.9mbgl | | 4000m ² by 400mm |
| Oct-16 | Gypsy bund | 500 | Row F (and deep tank) | 4m-3.7mbgl | Not included in site won figures | 800m ² by 400mm |
| Oct-16 | Site won stockpile | 2000 | Row F | 3.7-1.3mbgl | | 800m ² by ~2.4m |
| Oct-16 | Site won stockpile | 1200 | Rows AA to F | 0.9-0.7mbgl | | 6000m ² by ~200mm |
| Oct-16 | Gypsy bund / Brick piles | 480 | Rows G,H & I | 4m-3.8mbgl | Not included in site won figures | 2400m ² by 200mm |
| Oct-16 | Site won stockpile | 3200 | Rows G,H & I | 3.8m-2.5mbgl | | 2400m ² by ~1.3m |
| Nov-16 | Site won stockpile | 1030 | Rows G,H & I | 2.5-2.1mbgl | | 2400m ² by ~0.4m |
| Dec-16 | Site won stockpile (Area 2) | 1440 | Rows G,H & I | 2.1-1.5mbgl | | 2400m ² by ~0.6m |
| Jan-17 | Site won stockpile (Area 2) | 1900 | Rows G,H & I | 1.5-0.7mbgl | | 2400m ² by ~0.8m |
| Jan-17 | Site won stockpile (Area 2) | 1600 | Rows AA to I | 0.7-0.5mbgl | | 8400m ² by ~0.2m |
| Mar-17 | Windrow 8 | 2000 | Proposed to be used as part of end development | | Currently stockpiled ready for reuse - All meets HH and CW risk values so can be used anywhere on site | |
| Mar-17 | Windrow 9 | 1030 | | | | |
| Mar-17 | Windrow 10 | 1000 | | | | |

| | |
|-----------------------------|--------------|
| Gypsy bund | 2180 |
| Site won stockpile (Area 1) | 18230 |
| Site won stockpile (Area 2) | 4940 |
| Treatment stockpile | 5630 |
| | 30980 |

Check validated site won / treatment volume

OK

18,230m³ Site won (Area 1); 4,940m³ Site won (Area 2); 5,630m³ Treated

Summary of Site won material validation



| Source | Grid Squares | Approx. Amount m ³ | Location | Approx. Total m3 | Testing Details | | | Comments |
|--------|--------------|-------------------------------|----------|------------------|-----------------|----------------|-------------------------|---|
| | | | | | Date Sampled | Sample numbers | Test Certificate Number | |
| Area 2 | K1 | 150 | S | 150 | 16/11/2016 | SFU24 | 16-51959 | Passed |
| Area 2 | K2 | 150 | S | 300 | 16/11/2016 | SFU25 | 16-51959 | Passed |
| Area 2 | K3 | 150 | S | 450 | 23/11/2016 | SFU26 | 16-52472 | Passed |
| Area 2 | K4 | 150 | S | 600 | 23/11/2016 | SFU27 | 16-52472 | Passed |
| Area 2 | K5 | 250 | S | 850 | 23/11/2016 | SFU28 | 16-52472 | Passed |
| Area 2 | L1 | 250 | S | 1100 | 23/11/2016 | SFU29 | 16-52472 | Passed |
| Area 2 | L2 | 250 | S | 1350 | 29/11/2016 | SFU30 | 16-52472 | Passed |
| Area 2 | L3 | 250 | S | 1600 | 29/11/2016 | SFU31 | 16-52472 | Passed |
| Area 2 | L4 | 250 | S | 1850 | 29/11/2016 | SFU32 | 16-52472 | Passed |
| Area 2 | L5 | 250 | S | 2100 | 08/12/2016 | SFU33 | 16-52716 | Passed |
| Area 2 | L6 | 250 | S | 2350 | | | | FIRST 5000m3 @ 1 per 500m3; then 1 per 1000m3 |
| Area 2 | L7 | 250 | S | 2600 | | | | |
| Area 2 | L8 | 250 | S | 2850 | | | | |
| Area 2 | M1 | 250 | S | 3100 | | | | |
| Area 2 | M2 | 250 | S | 3350 | | | | |
| Area 2 | M3 | 250 | S | 3600 | | | | |
| Area 2 | M4 | 300 | S | 3900 | | | | |
| Area 2 | M5 | 250 | S | 4150 | | | | |
| Area 2 | M6 | 250 | S | 4400 | | | | |
| Area 2 | M7 | 250 | S | 4650 | | | | |
| Area 2 | M8 | 250 | S | 4900 | | | | |
| Area 2 | S8 | 100 | S | 5000 | | | | |
| Area 2 | T8 | 50 | S | 5050 | 08/12/2016 | SFU34 | 16-52716 | Passed |
| Area 2 | N1 | 250 | S | 5300 | 13/12/2016 | SFU35 | 16-52964 | Passed |
| Area 2 | N2 | 250 | S | 5550 | 13/12/2016 | SFU36 | 16-52964 | Passed |
| Area 2 | N3 | 250 | S | 5800 | 13/12/2016 | SFU37 | 16-52964 | Passed |
| Area 2 | N4 | 50 | S | 5850 | 17/01/2017 | SFU38 | 17-53778 | Passed |
| Area 2 | N5 | 50 | S | 5900 | 17/01/2017 | SFU39 | 17-53778 | Passed |
| Area 2 | N6 | 200 | S | 6100 | 17/01/2017 | SFU40 | 17-53778 | Passed |
| Area 2 | N7 | 100 | S | 6200 | 17/01/2017 | SFU41 | 17-54167 | Passed |
| Area 2 | N8 | 200 | S | 6400 | 17/01/2017 | SFU42 | 17-54167 | Passed |
| Area 2 | O1 | 200 | S | 6600 | | | | 1 per 1000m3 |
| Area 2 | O2 | 250 | S | 6850 | | | | |
| Area 2 | O3 | 250 | S | 7100 | | | | |
| Area 2 | O4 | 225 | S | 7325 | | | | |
| Area 2 | O5 | 225 | S | 7550 | | | | |
| Area 2 | O6 | 225 | S | 7775 | | | | |
| Area 2 | O7 | 200 | S | 7975 | | | | |
| Area 2 | O8 | 200 | S | 8175 | | | | |
| Area 2 | P1 | 150 | S | 8325 | | | | |
| Area 2 | P2 | 150 | S | 8475 | | | | |
| Area 2 | P3 | 125 | S | 8600 | | | | |
| Area 2 | P4 | 125 | S | 8725 | | | | |
| Area 2 | P5 | 250 | S | 8975 | | | | |
| Area 2 | P6 | 250 | S | 9225 | | | | |
| Area 2 | P7 | 250 | S | 9475 | | | | |
| Area 2 | P8 | 250 | S | 9725 | | | | |
| Area 2 | Q1 | 200 | S | 9925 | | | | |
| Area 2 | Q2 | 200 | S | 10125 | | | | |
| Area 2 | Q3 | 200 | S | 10325 | | | | |
| Area 2 | Q4 | 200 | S | 10525 | | | | |
| Area 2 | Q5 | 200 | S | 10725 | | | | |
| Area 2 | Q6 | 250 | S | 10975 | | | | |
| Area 2 | Q7 | 250 | S | 11225 | | | | |
| Area 2 | Q8 | 250 | S | 11475 | | | | |
| Area 2 | R3 | 150 | S | 11625 | | | | |
| Area 2 | R4 | 150 | S | 11775 | | | | |
| Area 2 | R5 | 150 | S | 11925 | | | | |
| Area 2 | R6 | 150 | S | 12075 | | | | |
| Area 2 | R7 | 150 | S | 12225 | | | | |
| Area 2 | R8 | 150 | S | 12375 | | | | |
| Area 2 | R1 | 200 | S | 12575 | | | | |
| Area 2 | R2 | 200 | S | 12775 | | | | |
| Area 2 | S8 | 150 | S | 12925 | | | | |
| Area 2 | S7 | 150 | S | 13075 | | | | |
| Area 2 | S6 | 150 | S | 13225 | | | | |
| Area 2 | S5 | 150 | S | 13375 | | | | |
| Area 2 | S4 | 150 | S | 13525 | | | | |
| Area 2 | S3 | 150 | S | 13675 | | | | |
| Area 2 | S2 | 150 | S | 13825 | 17/01/2017 | SFU43 | 17-54167 | Passed |
| Area 2 | S1 | 170 | S | 13995 | 08/02/2017 | SFU44 | 17-54958 | Passed |
| Area 2 | T8 | 150 | S | 14145 | 08/02/2017 | SFU45 | 17-54958 | Passed |
| Area 2 | T7 | 150 | S | 14295 | | | | 1 per 1000m3 |
| Area 2 | T6 | 150 | S | 14445 | | | | |
| Area 2 | T5 | 150 | S | 14595 | | | | |
| Area 2 | T4 | 170 | S | 14765 | | | | |
| Area 2 | T3 | 180 | S | 14945 | | | | |
| Area 2 | T2 | 200 | S | 15145 | | | | |
| Area 2 | T1 | 200 | S | 15345 | | | | |
| Area 2 | U8 | 50 | S | 15395 | | | | |
| Area 2 | U7 | 50 | S | 15445 | | | | |
| Area 2 | U6 | 50 | S | 15495 | | | | |
| Area 2 | U5 | 50 | S | 15545 | | | | |
| Area 2 | U4 | 50 | S | 15595 | | | | |
| Area 2 | U9 | 50 | S | 15645 | | | | |
| Area 2 | U10 | 100 | S | 15745 | | | | |

CROSS CHECK

| CELL | DIRTY | CLEAN | Depth to Base | Cross check |
|------|-----------------------------|--------------------------------------|---------------|-------------|
| | Number from treatment sheet | Area of cell (100m2) * depth - dirty | | |

Due to water issues, Area 2 excavation to 2.5m then trial pit to validate bases.
Materials movement based on depth to 2.5mbgl

| | | | | | |
|-----|-----|-----|-----|------|---|
| K1 | 100 | 150 | 2.5 | TRUE | |
| K2 | 100 | 150 | 2.5 | TRUE | |
| K3 | 100 | 150 | 2.5 | TRUE | |
| K4 | 100 | 150 | 2.5 | TRUE | |
| K5 | 0 | 250 | 2.5 | TRUE | |
| L1 | 0 | 250 | 2.5 | TRUE | |
| L2 | 0 | 250 | 2.5 | TRUE | |
| L3 | 0 | 250 | 2.5 | TRUE | |
| L4 | 0 | 250 | 2.5 | TRUE | |
| L5 | 0 | 250 | 2.5 | TRUE | |
| L6 | 0 | 250 | 2.5 | TRUE | |
| L7 | 0 | 250 | 2.5 | TRUE | |
| L8 | 0 | 250 | 2.5 | TRUE | |
| M1 | 0 | 250 | 2.5 | TRUE | |
| M2 | 0 | 250 | 2.5 | TRUE | |
| M3 | 0 | 250 | 2.5 | TRUE | |
| M4 | 100 | 300 | 4 | TRUE | Dug to full depth due to area of contam |
| M5 | 0 | 250 | 2.5 | TRUE | |
| M6 | 0 | 250 | 2.5 | TRUE | |
| M7 | 0 | 250 | 2.5 | TRUE | |
| M8 | 0 | 250 | 2.5 | TRUE | |
| S8 | 100 | 100 | 2 | TRUE | |
| T8 | 150 | 50 | 2 | TRUE | |
| N1 | 0 | 250 | 2.5 | TRUE | |
| N2 | 0 | 250 | 2.5 | TRUE | |
| N3 | 0 | 250 | 2.5 | TRUE | |
| N4 | 350 | 50 | 4 | TRUE | Dug to full depth due to area of contam |
| N5 | 350 | 50 | 4 | TRUE | Dug to full depth due to area of contam |
| N6 | 200 | 200 | 4 | TRUE | Dug to full depth due to area of contam |
| N7 | 300 | 100 | 4 | TRUE | Dug to full depth due to area of contam |
| N8 | 200 | 200 | 4 | TRUE | Dug to full depth due to area of contam |
| O1 | 50 | 200 | 2.5 | TRUE | |
| O2 | 0 | 250 | 2.5 | TRUE | |
| O3 | 0 | 250 | 2.5 | TRUE | |
| O4 | 25 | 225 | 2.5 | TRUE | |
| O5 | 25 | 225 | 2.5 | TRUE | |
| O6 | 25 | 225 | 2.5 | TRUE | |
| O7 | 200 | 200 | 4 | TRUE | Dug to full depth due to area of contam |
| O8 | 200 | 200 | 4 | TRUE | Dug to full depth due to area of contam |
| P1 | 250 | 150 | 4 | TRUE | Dug to full depth due to area of contam |
| P2 | 250 | 150 | 4 | TRUE | Dug to full depth due to area of contam |
| P3 | 125 | 125 | 2.5 | TRUE | |
| P4 | 125 | 125 | 2.5 | TRUE | |
| P5 | 0 | 250 | 2.5 | TRUE | |
| P6 | 0 | 250 | 2.5 | TRUE | |
| P7 | 0 | 250 | 2.5 | TRUE | |
| P8 | 0 | 250 | 2.5 | TRUE | |
| Q1 | 200 | 200 | 4 | TRUE | Dug to full depth due to area of contam |
| Q2 | 200 | 200 | 4 | TRUE | Dug to full depth due to area of contam |
| Q3 | 200 | 200 | 4 | TRUE | Dug to full depth due to area of contam |
| Q4 | 200 | 200 | 4 | TRUE | Dug to full depth due to area of contam |
| Q5 | 200 | 200 | 4 | TRUE | Dug to full depth due to area of contam |
| Q6 | 0 | 250 | 2.5 | TRUE | |
| Q7 | 0 | 250 | 2.5 | TRUE | |
| Q8 | 0 | 250 | 2.5 | TRUE | |
| R3 | 100 | 150 | 2.5 | TRUE | |
| R4 | 100 | 150 | 2.5 | TRUE | |
| R5 | 100 | 150 | 2.5 | TRUE | |
| R6 | 100 | 150 | 2.5 | TRUE | |
| R7 | 100 | 150 | 2.5 | TRUE | |
| R8 | 100 | 150 | 2.5 | TRUE | |
| R1 | 50 | 200 | 4 | TRUE | |
| R2 | 50 | 200 | 4 | TRUE | |
| S8 | 100 | 150 | 2.5 | TRUE | |
| S7 | 100 | 150 | 2.5 | TRUE | |
| S6 | 100 | 150 | 2.5 | TRUE | |
| S5 | 100 | 150 | 2.5 | TRUE | |
| S4 | 100 | 150 | 2.5 | TRUE | |
| S3 | 100 | 150 | 2.5 | TRUE | |
| S2 | 100 | 150 | 2.5 | TRUE | |
| S1 | 80 | 170 | 2.5 | TRUE | |
| T8 | 100 | 150 | 2.5 | TRUE | |
| T7 | 100 | 150 | 2.5 | TRUE | |
| T6 | 100 | 150 | 2.5 | TRUE | |
| T5 | 100 | 150 | 2.5 | TRUE | |
| T4 | 80 | 170 | 2.5 | TRUE | |
| T3 | 70 | 180 | 2.5 | TRUE | |
| T2 | 50 | 200 | 2.5 | TRUE | |
| T1 | 50 | 200 | 2.5 | TRUE | |
| U8 | 150 | 50 | 2 | TRUE | |
| U7 | 150 | 50 | 2 | TRUE | |
| U6 | 150 | 50 | 2 | TRUE | |
| U5 | 150 | 50 | 2 | TRUE | |
| U4 | 150 | 50 | 2 | TRUE | |
| U9 | 150 | 50 | 2 | TRUE | |
| U10 | 100 | 100 | 2 | TRUE | |

Shallow hotspots of fuel hydrocarbons- Removed for HH risk, not CW driver or Part 2A determination

| Date Removed | Removed From | Approx. Amount Removed m ³ | Removed To | Depth | Notes | Calcs |
|--------------|-----------------------|---------------------------------------|--|----------------------------------|-----------------------------|---------------------------------|
| Nov-16 | Windrow 3 & Windrow 4 | 5550 | Rows K to O | 2.5-1.1mbgl | | 4000m ² by ~1.4m |
| Dec-16 | Site won stockpile | 1440 | Rows G,H & I | | See Site won (Area 1) sheet | |
| Dec-16 | Site won stockpile | 3500 | Rows AA to I | | See Site won (Area 1) sheet | |
| Jan-17 | Site won stockpile | 4000 | Rows K to O | 1.1-0.1mbgl | | 4000m ² by ~1m |
| Feb-17 | Site won stockpile | 5000 | Row P, Q, R, S | Base (between 2.5-4m) to 1.2mbgl | | 3200m ² by ~1.3-2.8m |
| Feb-17 | Windrow 5 | 2600 | Row P, Q, R, S | 1.2-0.5mbgl | | 3200m ² by ~0.7m |
| Feb-17 | Site won stockpile | 600 | Row P, Q, R, S | 0.5-0.3mbgl | | 3200m ² by ~0.2m |
| Feb-17 | Site won stockpile | 1300 | Row T & U | Base (2.6m) to 1.7mbgl | | 1400m ² by ~0.9m |
| Feb-17 | Windrow 6 | 1450 | Row T & U | 1.7-0.9mbgl | | 1400m ² by ~0.8m |
| Feb-17 | Windrow 7 | 840 | Row T & U | 0.9-0.3mbgl | | 1400m ² by ~0.6m |
| Feb-17 | Windrow 7 | 920 | Row P to U | 0.3-0.1mbgl | | 4600m ² by ~0.2m |
| Feb-17 | Windrow 8 | 860 | Rows K to U | 0.1-0.0mbgl | | 8600m ² by ~0.1m |
| Mar-17 | Windrow 8 | 2000 | Proposed to be used as part of end development | | See Site won (Area 1) sheet | |
| Mar-17 | Windrow 9 | 1030 | | See Site won (Area 1) sheet | | |
| Mar-17 | Windrow 10 | 1000 | | See Site won (Area 1) sheet | | |

| | |
|---------------------|--------------|
| Site won stockpile | 10900 |
| Treatment stockpile | 12220 |
| | 23120 |

Check validated site won / treatment volume

OK

10,900m³ Site won (Area 2); 12,220m³ Treated



Appendix C – Volumes of Groundwater Removed for Treatment

GJ079 Nash Road, Redditch

Water Treatment

Location
W water plant



Max discharge rate approx - 6l/s

| Date Removed | Removed From | Approx. Amount Removed (L) | | Removed To | Meter Reading Start m ³ | Meter Reading End m ³ | Total Amount Discharged m ³ |
|--------------|--------------|----------------------------|----------------|------------|------------------------------------|----------------------------------|--|
| | | Litres | m ³ | | | | |
| 05/09/2016 | Area 1 | 30000 | 30 | W | 385620 | 385650 | 30 |
| 06/09/2016 | Area 1 | 25000 | 25 | W | 385650 | 385675 | 55 |
| 07/09/2016 | Area 1 | 53000 | 53 | W | 385675 | 385728 | 108 |
| 12/09/2016 | Area 1 | 58000 | 58 | W | 385728 | 385786 | 166 |
| 13/09/2016 | Area 1 | 19000 | 19 | W | 385786 | 385805 | 185 |
| 14/09/2016 | Area 1 | 60000 | 60 | W | 385805 | 385865 | 245 |
| 26/09/2016 | Area 1 | 27000 | 27 | W | 385865 | 385892 | 272 |
| 27/09/2016 | Area 1 | 9000 | 9 | W | 385892 | 385901 | 281 |
| 28/09/2016 | Area 1 | 65000 | 65 | W | 385901 | 385966 | 346 |
| 30/09/2016 | Area 1 | 60000 | 60 | W | 385966 | 386026 | 406 |
| 11/10/2016 | Area 1 | 120000 | 120 | W | 386026 | 386146 | 526 |
| 12/10/2016 | Area 1 | 40000 | 40 | W | 386146 | 386186 | 566 |
| 17/10/2016 | Area 1 | 15000 | 15 | W | 386186 | 386201 | 581 |
| 19/10/2016 | Area 1 | 54000 | 54 | W | 386201 | 386255 | 635 |
| 20/10/2016 | Area 1 | 50000 | 50 | W | 386255 | 386305 | 685 |
| 21/10/2016 | Area 1 | 82000 | 82 | W | 386305 | 386387 | 767 |
| 28/10/2016 | Area 2 | 61000 | 61 | W | 386387 | 386448 | 828 |
| 31/10/2016 | Area 2 | 13000 | 13 | W | 386448 | 386461 | 841 |
| 04/11/2016 | Area 2 | 365000 | 365 | W | 386461 | 386826 | 1206 |
| 07/11/2016 | Area 2 | 164000 | 164 | W | 386826 | 386990 | 1370 |
| 08/11/2016 | Area 2 | 5000 | 5 | W | 386990 | 386995 | 1375 |
| 15/11/2016 | Area 2 | 49000 | 49 | W | 386995 | 387044 | 1424 |
| 16/11/2016 | Area 2 | 124000 | 124 | W | 387044 | 387168 | 1548 |
| 17/11/2016 | Area 2 | 49000 | 49 | W | 387168 | 387217 | 1597 |
| 18/11/2016 | Area 2 | 70000 | 70 | W | 387217 | 387287 | 1667 |
| 23/11/2016 | Area 2 | 147000 | 147 | W | 387287 | 387434 | 1814 |
| 24/11/2016 | Area 2 | 23000 | 23 | W | 387434 | 387457 | 1837 |
| 29/11/2016 | Area 2 | 148000 | 148 | W | 387457 | 387605 | 1985 |
| 06/12/2016 | Area 2 | 73000 | 73 | W | 387605 | 387678 | 2058 |
| 07/12/2016 | Area 2 | 156000 | 156 | W | 387678 | 387834 | 2214 |
| 08/12/2016 | Area 2 | 108000 | 108 | W | 387834 | 387942 | 2322 |
| 15/12/2016 | Area 2 | 123000 | 123 | W | 387942 | 388065 | 2445 |
| 04/01/2017 | Area 2 | 84000 | 84 | W | 388065 | 388149 | 2529 |
| 05/01/2017 | Area 2 | 88000 | 88 | W | 388149 | 388237 | 2617 |
| 09/01/2017 | Area 2 | 149000 | 149 | W | 388237 | 388386 | 2766 |
| 10/01/2017 | Area 2 | 136000 | 136 | W | 388386 | 388522 | 2902 |
| 11/01/2017 | Area 2 | 155000 | 155 | W | 388522 | 388677 | 3057 |
| 12/01/2017 | Area 2 | 101000 | 101 | W | 388677 | 388778 | 3158 |
| 13/01/2017 | Area 2 | 119000 | 119 | W | 388778 | 388897 | 3277 |
| 16/01/2017 | Area 2 | 168000 | 168 | W | 388897 | 389065 | 3445 |
| 17/01/2017 | Area 2 | 137000 | 137 | W | 389065 | 389202 | 3582 |
| 18/01/2017 | Area 2 | 35000 | 35 | W | 389202 | 389237 | 3617 |
| 19/01/2017 | Area 2 | 179000 | 179 | W | 389237 | 389416 | 3796 |
| 23/01/2017 | Area 2 | 118000 | 118 | W | 389416 | 389534 | 3914 |
| 25/01/2017 | Area 2 | 357000 | 357 | W | 389534 | 389891 | 4271 |
| 26/01/2017 | Area 2 | 103000 | 103 | W | 389891 | 389994 | 4374 |
| 30/01/2017 | Area 2 | 136000 | 136 | W | 389994 | 390130 | 4510 |
| 31/01/2017 | Area 2 | 24000 | 24 | W | 390130 | 390154 | 4534 |
| 02/02/2017 | Area 2 | 17000 | 17 | W | 390154 | 390171 | 4551 |
| 03/02/2017 | Area 2 | 151000 | 151 | W | 390171 | 390322 | 4702 |
| 06/02/2017 | Area 2 | 153000 | 153 | W | 390322 | 390475 | 4855 |



Appendix D – River Arrow Chemical Analytical Results

Note: Also includes laboratory data from the discharge point into the remediation water treatment plant (Those samples prefixed by "DIS")



Up Stream Point

Down Stream Point



Ian Chambers
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QTS Environmental Ltd
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Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 16-48941

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C17026

Order No: 78347

Sample Receipt Date: 07/09/2016

Sample Scheduled Date: 08/09/2016

Report Issue Number: 1

Reporting Date: 14/09/2016

Authorised by:

A handwritten signature in black ink, appearing to read 'Kevin Old'.

Kevin Old
Associate Director of Laboratory

Authorised by:

A handwritten signature in black ink, appearing to read 'Russell Jarvis'.

Russell Jarvis
Associate Director of Client Services



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



| Water Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | |
|--|------------------------|-----------------|-----------------|--|--|
| QTS Environmental Report No: 16-48941 | Date Sampled | 16/08/16 | 16/08/16 | | |
| DSM Demolition Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: ex BA Tubes Redditch | TP / BH No | DSM17026/RA/7/1 | DSM17026/RA/8/1 | | |
| Project / Job Ref: C17026 | Additional Refs | None Supplied | None Supplied | | |
| Order No: 78347 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 14/09/2016 | QTSE Sample No | 226568 | 226569 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|-----------------------------|-------------|-----------|----------------------|------|------|--|--|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | < 1 | | |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Trichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| TAME | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 16-48941 |
| DSM Demolition Ltd |
| Site Reference: ex BA Tubes Redditch |
| Project / Job Ref: C17026 |
| Order No: 78347 |
| Reporting Date: 14/09/2016 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|----------|-------------|---|---|-----------|
| Water | UF | Alkalinity | Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point | E103 |
| Water | UF | BTEX | Determination of BTEX by headspace GC-MS | E101 |
| Water | F | Cations | Determination of cations by filtration followed by ICP-MS | E102 |
| Water | UF | Chemical Oxygen Demand (COD) | Determination using a COD reactor followed by colorimetry | E112 |
| Water | F | Chloride | Determination of chloride by filtration & analysed by ion chromatography | E109 |
| Water | F | Chromium - Hexavalent | Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by | E116 |
| Water | UF | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through liquid:liquid extraction with cyclohexane | E111 |
| Water | F | Diesel Range Organics (C10 - C24) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | Dissolved Organic Content (DOC) | Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection | E110 |
| Water | UF | Electrical Conductivity | Determination of electrical conductivity by electrometric measurement | E123 |
| Water | F | EPH (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E104 |
| Water | F | Fluoride | Determination of Fluoride by filtration & analysed by ion chromatography | E109 |
| Water | F | Hardness | Determination of Ca and Mg by ICP-MS followed by calculation | E102 |
| Leachate | F | Leachate Preparation - NRA | Based on National Rivers Authority leaching test 1994 | E301 |
| Leachate | F | Leachate Preparation - WAC | Based on BS EN 12457 Pt1, 2, 3 | E302 |
| Water | F | Metals | Determination of metals by filtration followed by ICP-MS | E102 |
| Water | F | Mineral Oil (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GI-FID | E104 |
| Water | F | Nitrate | Determination of nitrate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Monohydric Phenol | Determination of phenols by distillation followed by colorimetry | E121 |
| Water | F | PAH - Speciated (EPA 16) | Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E105 |
| Water | F | PCB - 7 Congeners | Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane | E108 |
| Water | UF | Petroleum Ether Extract (PEE) | Gravimetrically determined through liquid:liquid extraction with petroleum ether | E111 |
| Water | UF | pH | Determination of pH by electrometric measurement | E107 |
| Water | F | Phosphate | Determination of phosphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Redox Potential | Determination of redox potential by electrometric measurement | E113 |
| Water | F | Sulphate (as SO4) | Determination of sulphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Sulphide | Determination of sulphide by distillation followed by colorimetry | E118 |
| Water | F | SVOC | Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E106 |
| Water | UF | Toluene Extractable Matter (TEM) | Gravimetrically determined through liquid:liquid extraction with toluene | E111 |
| Water | UF | Total Organic Carbon (TOC) | Low heat with persulphate addition followed by IR detection | E110 |
| Water | F | TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS | E104 |
| Water | F | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS | E104 |
| Water | UF | VOCs | Determination of volatile organic compounds by headspace GC-MS | E101 |
| Water | UF | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E101 |

Key

F Filtered
UF Unfiltered



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russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 16-48943

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Sample Receipt Date: 07/09/2016

Sample Scheduled Date: 08/09/2016

Report Issue Number: 1

Reporting Date: 14/09/2016

Authorised by:

A handwritten signature in black ink, appearing to read 'Kevin Old'.

Kevin Old
Associate Director of Laboratory

Authorised by:

A handwritten signature in black ink, appearing to read 'Russell Jarvis'.

Russell Jarvis
Associate Director of Client Services



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



| Water Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | |
|--|------------------------|-----------------|-----------------|--|--|
| QTS Environmental Report No: 16-48943 | Date Sampled | 29/08/16 | 29/08/16 | | |
| DSM Demolition Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: ex BA Tubes Redditch | TP / BH No | DSM10726/RA/7/1 | DSM10726/RA/8/1 | | |
| Project / Job Ref: C10726 | Additional Refs | None Supplied | None Supplied | | |
| Order No: 78347 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 14/09/2016 | QTSE Sample No | 226572 | 226573 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|-----------------------------|-------------|-----------|----------------------|------|------|--|--|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | < 1 | | |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Trichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| TAME | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 16-48943 |
| DSM Demolition Ltd |
| Site Reference: ex BA Tubes Redditch |
| Project / Job Ref: C10726 |
| Order No: 78347 |
| Reporting Date: 14/09/2016 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|----------|-------------|---|---|-----------|
| Water | UF | Alkalinity | Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point | E103 |
| Water | UF | BTEX | Determination of BTEX by headspace GC-MS | E101 |
| Water | F | Cations | Determination of cations by filtration followed by ICP-MS | E102 |
| Water | UF | Chemical Oxygen Demand (COD) | Determination using a COD reactor followed by colorimetry | E112 |
| Water | F | Chloride | Determination of chloride by filtration & analysed by ion chromatography | E109 |
| Water | F | Chromium - Hexavalent | Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by | E116 |
| Water | UF | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through liquid:liquid extraction with cyclohexane | E111 |
| Water | F | Diesel Range Organics (C10 - C24) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | Dissolved Organic Content (DOC) | Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection | E110 |
| Water | UF | Electrical Conductivity | Determination of electrical conductivity by electrometric measurement | E123 |
| Water | F | EPH (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E104 |
| Water | F | Fluoride | Determination of Fluoride by filtration & analysed by ion chromatography | E109 |
| Water | F | Hardness | Determination of Ca and Mg by ICP-MS followed by calculation | E102 |
| Leachate | F | Leachate Preparation - NRA | Based on National Rivers Authority leaching test 1994 | E301 |
| Leachate | F | Leachate Preparation - WAC | Based on BS EN 12457 Pt1, 2, 3 | E302 |
| Water | F | Metals | Determination of metals by filtration followed by ICP-MS | E102 |
| Water | F | Mineral Oil (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GI-FID | E104 |
| Water | F | Nitrate | Determination of nitrate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Monohydric Phenol | Determination of phenols by distillation followed by colorimetry | E121 |
| Water | F | PAH - Speciated (EPA 16) | Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E105 |
| Water | F | PCB - 7 Congeners | Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane | E108 |
| Water | UF | Petroleum Ether Extract (PEE) | Gravimetrically determined through liquid:liquid extraction with petroleum ether | E111 |
| Water | UF | pH | Determination of pH by electrometric measurement | E107 |
| Water | F | Phosphate | Determination of phosphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Redox Potential | Determination of redox potential by electrometric measurement | E113 |
| Water | F | Sulphate (as SO4) | Determination of sulphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Sulphide | Determination of sulphide by distillation followed by colorimetry | E118 |
| Water | F | SVOC | Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E106 |
| Water | UF | Toluene Extractable Matter (TEM) | Gravimetrically determined through liquid:liquid extraction with toluene | E111 |
| Water | UF | Total Organic Carbon (TOC) | Low heat with persulphate addition followed by IR detection | E110 |
| Water | F | TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS | E104 |
| Water | F | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS | E104 |
| Water | UF | VOCs | Determination of volatile organic compounds by headspace GC-MS | E101 |
| Water | UF | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E101 |

Key

F Filtered
UF Unfiltered



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t: 01622 850410
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 16-48942

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Sample Receipt Date: 07/09/2016

Sample Scheduled Date: 08/09/2016

Report Issue Number: 1

Reporting Date: 14/09/2016

Authorised by:

A handwritten signature in black ink, appearing to read 'Kevin Old'.

Kevin Old
Associate Director of Laboratory

Authorised by:

A handwritten signature in black ink, appearing to read 'Russell Jarvis'.

Russell Jarvis
Associate Director of Client Services



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



| Water Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | |
|--|------------------------|-----------------|-----------------|--|--|
| QTS Environmental Report No: 16-48942 | Date Sampled | 05/09/16 | 05/09/16 | | |
| DSM Demolition Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: ex BA Tubes Redditch | TP / BH No | DSM10726/RA/7/3 | DSM10726/RA/8/3 | | |
| Project / Job Ref: C10726 | Additional Refs | None Supplied | None Supplied | | |
| Order No: 78347 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 14/09/2016 | QTSE Sample No | 226570 | 226571 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|-----------------------------|-------------|-----------|----------------------|------|------|--|--|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | < 1 | | |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Trichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| TAME | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 16-48942 |
| DSM Demolition Ltd |
| Site Reference: ex BA Tubes Redditch |
| Project / Job Ref: C10726 |
| Order No: 78347 |
| Reporting Date: 14/09/2016 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|----------|-------------|---|---|-----------|
| Water | UF | Alkalinity | Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point | E103 |
| Water | UF | BTEX | Determination of BTEX by headspace GC-MS | E101 |
| Water | F | Cations | Determination of cations by filtration followed by ICP-MS | E102 |
| Water | UF | Chemical Oxygen Demand (COD) | Determination using a COD reactor followed by colorimetry | E112 |
| Water | F | Chloride | Determination of chloride by filtration & analysed by ion chromatography | E109 |
| Water | F | Chromium - Hexavalent | Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by | E116 |
| Water | UF | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through liquid:liquid extraction with cyclohexane | E111 |
| Water | F | Diesel Range Organics (C10 - C24) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | Dissolved Organic Content (DOC) | Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection | E110 |
| Water | UF | Electrical Conductivity | Determination of electrical conductivity by electrometric measurement | E123 |
| Water | F | EPH (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E104 |
| Water | F | Fluoride | Determination of Fluoride by filtration & analysed by ion chromatography | E109 |
| Water | F | Hardness | Determination of Ca and Mg by ICP-MS followed by calculation | E102 |
| Leachate | F | Leachate Preparation - NRA | Based on National Rivers Authority leaching test 1994 | E301 |
| Leachate | F | Leachate Preparation - WAC | Based on BS EN 12457 Pt1, 2, 3 | E302 |
| Water | F | Metals | Determination of metals by filtration followed by ICP-MS | E102 |
| Water | F | Mineral Oil (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GI-FID | E104 |
| Water | F | Nitrate | Determination of nitrate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Monohydric Phenol | Determination of phenols by distillation followed by colorimetry | E121 |
| Water | F | PAH - Speciated (EPA 16) | Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E105 |
| Water | F | PCB - 7 Congeners | Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane | E108 |
| Water | UF | Petroleum Ether Extract (PEE) | Gravimetrically determined through liquid:liquid extraction with petroleum ether | E111 |
| Water | UF | pH | Determination of pH by electrometric measurement | E107 |
| Water | F | Phosphate | Determination of phosphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Redox Potential | Determination of redox potential by electrometric measurement | E113 |
| Water | F | Sulphate (as SO4) | Determination of sulphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Sulphide | Determination of sulphide by distillation followed by colorimetry | E118 |
| Water | F | SVOC | Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E106 |
| Water | UF | Toluene Extractable Matter (TEM) | Gravimetrically determined through liquid:liquid extraction with toluene | E111 |
| Water | UF | Total Organic Carbon (TOC) | Low heat with persulphate addition followed by IR detection | E110 |
| Water | F | TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS | E104 |
| Water | F | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS | E104 |
| Water | UF | VOCs | Determination of volatile organic compounds by headspace GC-MS | E101 |
| Water | UF | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E101 |

Key

F Filtered
UF Unfiltered



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QTS Environmental Report No: 16-49468

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Sample Receipt Date: 19/09/2016

Sample Scheduled Date: 22/09/2016

Report Issue Number: 1

Reporting Date: 29/09/2016

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Russell Jarvis
Associate Director of Client Services



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



| Water Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | |
|--|------------------------|-----------------|-----------------|--|--|
| QTS Environmental Report No: 16-49468 | Date Sampled | 12/09/16 | 12/09/16 | | |
| DSM Demolition Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: ex BA Tubes Redditch | TP / BH No | DSM10726/RA/7/4 | DSM10726/RA/8/4 | | |
| Project / Job Ref: C10726 | Additional Refs | None Supplied | None Supplied | | |
| Order No: 78347 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 29/09/2016 | QTSE Sample No | 228828 | 228829 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|-----------------------------|-------------|-----------|----------------------|------|------|--|--|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | < 1 | | |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Trichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| TAME | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 16-49468 |
| DSM Demolition Ltd |
| Site Reference: ex BA Tubes Redditch |
| Project / Job Ref: C10726 |
| Order No: 78347 |
| Reporting Date: 29/09/2016 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|----------|-------------|---|---|-----------|
| Water | UF | Alkalinity | Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point | E103 |
| Water | UF | BTEX | Determination of BTEX by headspace GC-MS | E101 |
| Water | F | Cations | Determination of cations by filtration followed by ICP-MS | E102 |
| Water | UF | Chemical Oxygen Demand (COD) | Determination using a COD reactor followed by colorimetry | E112 |
| Water | F | Chloride | Determination of chloride by filtration & analysed by ion chromatography | E109 |
| Water | F | Chromium - Hexavalent | Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by | E116 |
| Water | UF | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through liquid:liquid extraction with cyclohexane | E111 |
| Water | F | Diesel Range Organics (C10 - C24) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | Dissolved Organic Content (DOC) | Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection | E110 |
| Water | UF | Electrical Conductivity | Determination of electrical conductivity by electrometric measurement | E123 |
| Water | F | EPH (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E104 |
| Water | F | Fluoride | Determination of Fluoride by filtration & analysed by ion chromatography | E109 |
| Water | F | Hardness | Determination of Ca and Mg by ICP-MS followed by calculation | E102 |
| Leachate | F | Leachate Preparation - NRA | Based on National Rivers Authority leaching test 1994 | E301 |
| Leachate | F | Leachate Preparation - WAC | Based on BS EN 12457 Pt1, 2, 3 | E302 |
| Water | F | Metals | Determination of metals by filtration followed by ICP-MS | E102 |
| Water | F | Mineral Oil (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GI-FID | E104 |
| Water | F | Nitrate | Determination of nitrate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Monohydric Phenol | Determination of phenols by distillation followed by colorimetry | E121 |
| Water | F | PAH - Speciated (EPA 16) | Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E105 |
| Water | F | PCB - 7 Congeners | Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane | E108 |
| Water | UF | Petroleum Ether Extract (PEE) | Gravimetrically determined through liquid:liquid extraction with petroleum ether | E111 |
| Water | UF | pH | Determination of pH by electrometric measurement | E107 |
| Water | F | Phosphate | Determination of phosphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Redox Potential | Determination of redox potential by electrometric measurement | E113 |
| Water | F | Sulphate (as SO4) | Determination of sulphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Sulphide | Determination of sulphide by distillation followed by colorimetry | E118 |
| Water | F | SVOC | Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E106 |
| Water | UF | Toluene Extractable Matter (TEM) | Gravimetrically determined through liquid:liquid extraction with toluene | E111 |
| Water | UF | Total Organic Carbon (TOC) | Low heat with persulphate addition followed by IR detection | E110 |
| Water | F | TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS | E104 |
| Water | F | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS | E104 |
| Water | UF | VOCs | Determination of volatile organic compounds by headspace GC-MS | E101 |
| Water | UF | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E101 |

Key

F Filtered
UF Unfiltered



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QTS Environmental Report No: 16-49610

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Sample Receipt Date: 26/09/2016

Sample Scheduled Date: 26/09/2016

Report Issue Number: 1

Reporting Date: 30/09/2016

Authorised by:

A handwritten signature in black ink, appearing to read 'Kevin Old'.

Kevin Old
Associate Director of Laboratory

Authorised by:

A handwritten signature in black ink, appearing to read 'Russell Jarvis'.

Russell Jarvis
Associate Director of Client Services



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



| Water Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | |
|--|------------------------|-----------------|-----------------|--|--|
| QTS Environmental Report No: 16-49610 | Date Sampled | 19/09/16 | 19/09/16 | | |
| DSM Demolition Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: ex BA Tubes Redditch | TP / BH No | DSM10726/RA/7/5 | DSM10726/RA/8/5 | | |
| Project / Job Ref: C10726 | Additional Refs | None Supplied | None Supplied | | |
| Order No: 78347 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 30/09/2016 | QTSE Sample No | 229391 | 229392 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|-----------------------------|-------------|-----------|----------------------|------|------|--|--|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | < 1 | | |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Trichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| TAME | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |

Soil Analysis Certificate - Methodology & Miscellaneous Information

QTS Environmental Report No: 16-49610

DSM Demolition Ltd

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Reporting Date: 30/09/2016

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|----------|-------------|---|---|-----------|
| Water | UF | Alkalinity | Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point | E103 |
| Water | UF | BTEX | Determination of BTEX by headspace GC-MS | E101 |
| Water | F | Cations | Determination of cations by filtration followed by ICP-MS | E102 |
| Water | UF | Chemical Oxygen Demand (COD) | Determination using a COD reactor followed by colorimetry | E112 |
| Water | F | Chloride | Determination of chloride by filtration & analysed by ion chromatography | E109 |
| Water | F | Chromium - Hexavalent | Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by | E116 |
| Water | UF | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through liquid:liquid extraction with cyclohexane | E111 |
| Water | F | Diesel Range Organics (C10 - C24) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | Dissolved Organic Content (DOC) | Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection | E110 |
| Water | UF | Electrical Conductivity | Determination of electrical conductivity by electrometric measurement | E123 |
| Water | F | EPH (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E104 |
| Water | F | Fluoride | Determination of Fluoride by filtration & analysed by ion chromatography | E109 |
| Water | F | Hardness | Determination of Ca and Mg by ICP-MS followed by calculation | E102 |
| Leachate | F | Leachate Preparation - NRA | Based on National Rivers Authority leaching test 1994 | E301 |
| Leachate | F | Leachate Preparation - WAC | Based on BS EN 12457 Pt1, 2, 3 | E302 |
| Water | F | Metals | Determination of metals by filtration followed by ICP-MS | E102 |
| Water | F | Mineral Oil (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GI-FID | E104 |
| Water | F | Nitrate | Determination of nitrate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Monohydric Phenol | Determination of phenols by distillation followed by colorimetry | E121 |
| Water | F | PAH - Speciated (EPA 16) | Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E105 |
| Water | F | PCB - 7 Congeners | Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E108 |
| Water | UF | Petroleum Ether Extract (PEE) | Gravimetrically determined through liquid:liquid extraction with petroleum ether | E111 |
| Water | UF | pH | Determination of pH by electrometric measurement | E107 |
| Water | F | Phosphate | Determination of phosphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Redox Potential | Determination of redox potential by electrometric measurement | E113 |
| Water | F | Sulphate (as SO4) | Determination of sulphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Sulphide | Determination of sulphide by distillation followed by colorimetry | E118 |
| Water | F | SVOC | Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E106 |
| Water | UF | Toluene Extractable Matter (TEM) | Gravimetrically determined through liquid:liquid extraction with toluene | E111 |
| Water | UF | Total Organic Carbon (TOC) | Low heat with persulphate addition followed by IR detection | E110 |
| Water | F | TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS | E104 |
| Water | F | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS | E104 |
| Water | UF | VOCs | Determination of volatile organic compounds by headspace GC-MS | E101 |
| Water | UF | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E101 |

Key

F Filtered
UF Unfiltered



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QTS Environmental Report No: 16-50177

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Sample Receipt Date: 10/10/2016

Sample Scheduled Date: 10/10/2016

Report Issue Number: 1

Reporting Date: 14/10/2016

Authorised by:

A handwritten signature in black ink, appearing to read 'Kevin Old'.

Kevin Old
Associate Director of Laboratory

Authorised by:

A handwritten signature in black ink, appearing to read 'Russell Jarvis'.

Russell Jarvis
Associate Director of Client Services



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Water Analysis Certificate - Volatile Organic Compounds (VOC)

| | | | | | |
|--|------------------------|-----------------|-----------------|-----------------|-----------------|
| QTS Environmental Report No: 16-50177 | Date Sampled | 26/09/16 | 26/09/16 | 03/10/16 | 03/10/16 |
| DSM Demolition Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: ex BA Tubes Redditch | TP / BH No | DSM10726/RA/7/6 | DSM10726/RA/8/6 | DSM10726/RA/7/7 | DSM10726/RA/8/7 |
| Project / Job Ref: C10726 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 78347 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 14/10/2016 | QTSE Sample No | 231654 | 231655 | 231656 | 231657 |

| Determinand | Unit | RL | Accreditation | | | | |
|-----------------------------|------|------|---------------|------|------|------|------|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | < 1 | < 1 | < 1 |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Trichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| TAME | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 16-50177 |
| DSM Demolition Ltd |
| Site Reference: ex BA Tubes Redditch |
| Project / Job Ref: C10726 |
| Order No: 78347 |
| Reporting Date: 14/10/2016 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|----------|-------------|---|---|-----------|
| Water | UF | Alkalinity | Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point | E103 |
| Water | UF | BTEX | Determination of BTEX by headspace GC-MS | E101 |
| Water | F | Cations | Determination of cations by filtration followed by ICP-MS | E102 |
| Water | UF | Chemical Oxygen Demand (COD) | Determination using a COD reactor followed by colorimetry | E112 |
| Water | F | Chloride | Determination of chloride by filtration & analysed by ion chromatography | E109 |
| Water | F | Chromium - Hexavalent | Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E116 |
| Water | UF | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through liquid:liquid extraction with cyclohexane | E111 |
| Water | F | Diesel Range Organics (C10 - C24) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | Dissolved Organic Content (DOC) | Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection | E110 |
| Water | UF | Electrical Conductivity | Determination of electrical conductivity by electrometric measurement | E123 |
| Water | F | EPH (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E104 |
| Water | F | Fluoride | Determination of Fluoride by filtration & analysed by ion chromatography | E109 |
| Water | F | Hardness | Determination of Ca and Mg by ICP-MS followed by calculation | E102 |
| Leachate | F | Leachate Preparation - NRA | Based on National Rivers Authority leaching test 1994 | E301 |
| Leachate | F | Leachate Preparation - WAC | Based on BS EN 12457 Pt1, 2, 3 | E302 |
| Water | F | Metals | Determination of metals by filtration followed by ICP-MS | E102 |
| Water | F | Mineral Oil (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GI-FID | E104 |
| Water | F | Nitrate | Determination of nitrate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Monohydric Phenol | Determination of phenols by distillation followed by colorimetry | E121 |
| Water | F | PAH - Speciated (EPA 16) | Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E105 |
| Water | F | PCB - 7 Congeners | Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E108 |
| Water | UF | Petroleum Ether Extract (PEE) | Gravimetrically determined through liquid:liquid extraction with petroleum ether | E111 |
| Water | UF | pH | Determination of pH by electrometric measurement | E107 |
| Water | F | Phosphate | Determination of phosphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Redox Potential | Determination of redox potential by electrometric measurement | E113 |
| Water | F | Sulphate (as SO4) | Determination of sulphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Sulphide | Determination of sulphide by distillation followed by colorimetry | E118 |
| Water | F | SVOC | Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E106 |
| Water | UF | Toluene Extractable Matter (TEM) | Gravimetrically determined through liquid:liquid extraction with toluene | E111 |
| Water | UF | Total Organic Carbon (TOC) | Low heat with persulphate addition followed by IR detection | E110 |
| Water | F | TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS | E104 |
| Water | F | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS | E104 |
| Water | UF | VOCs | Determination of volatile organic compounds by headspace GC-MS | E101 |
| Water | UF | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E101 |

Key

F Filtered
UF Unfiltered



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t: 01622 850410
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 16-50529

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Sample Receipt Date: 17/10/2016

Sample Scheduled Date: 17/10/2016

Report Issue Number: 1

Reporting Date: 21/10/2016

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Russell Jarvis
Associate Director of Client Services



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



| Water Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | |
|--|------------------------|-----------------|-----------------|----------------|--|
| QTS Environmental Report No: 16-50529 | Date Sampled | 10/10/16 | 10/10/16 | 12/10/16 | |
| DSM Demolition Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | |
| Site Reference: ex BA Tubes Redditch | TP / BH No | DSM10726/RA/7/8 | DSM10726/RA/8/8 | DSM10726/DIS/2 | |
| Project / Job Ref: C10726 | Additional Refs | None Supplied | None Supplied | None Supplied | |
| Order No: 78347 | Depth (m) | None Supplied | None Supplied | None Supplied | |
| Reporting Date: 21/10/2016 | QTSE Sample No | 233303 | 233304 | 233305 | |

| Determinand | Unit | RL | Accreditation | | | | |
|-----------------------------|-------------|-----------|----------------------|------|------|------|--|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | 16 | |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | < 1 | < 1 | |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Trichloroethene | ug/l | < 5 | ISO17025 | 7 | 5 | 60 | |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| TAME | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |

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|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 16-50529 |
| DSM Demolition Ltd |
| Site Reference: ex BA Tubes Redditch |
| Project / Job Ref: C10726 |
| Order No: 78347 |
| Reporting Date: 21/10/2016 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|----------|-------------|---|---|-----------|
| Water | UF | Alkalinity | Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point | E103 |
| Water | UF | BTEX | Determination of BTEX by headspace GC-MS | E101 |
| Water | F | Cations | Determination of cations by filtration followed by ICP-MS | E102 |
| Water | UF | Chemical Oxygen Demand (COD) | Determination using a COD reactor followed by colorimetry | E112 |
| Water | F | Chloride | Determination of chloride by filtration & analysed by ion chromatography | E109 |
| Water | F | Chromium - Hexavalent | Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E116 |
| Water | UF | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through liquid:liquid extraction with cyclohexane | E111 |
| Water | F | Diesel Range Organics (C10 - C24) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | Dissolved Organic Content (DOC) | Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection | E110 |
| Water | UF | Electrical Conductivity | Determination of electrical conductivity by electrometric measurement | E123 |
| Water | F | EPH (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E104 |
| Water | F | Fluoride | Determination of Fluoride by filtration & analysed by ion chromatography | E109 |
| Water | F | Hardness | Determination of Ca and Mg by ICP-MS followed by calculation | E102 |
| Leachate | F | Leachate Preparation - NRA | Based on National Rivers Authority leaching test 1994 | E301 |
| Leachate | F | Leachate Preparation - WAC | Based on BS EN 12457 Pt1, 2, 3 | E302 |
| Water | F | Metals | Determination of metals by filtration followed by ICP-MS | E102 |
| Water | F | Mineral Oil (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | Nitrate | Determination of nitrate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Monohydric Phenol | Determination of phenols by distillation followed by colorimetry | E121 |
| Water | F | PAH - Speciated (EPA 16) | Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E105 |
| Water | F | PCB - 7 Congeners | Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E108 |
| Water | UF | Petroleum Ether Extract (PEE) | Gravimetrically determined through liquid:liquid extraction with petroleum ether | E111 |
| Water | UF | pH | Determination of pH by electrometric measurement | E107 |
| Water | F | Phosphate | Determination of phosphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Redox Potential | Determination of redox potential by electrometric measurement | E113 |
| Water | F | Sulphate (as SO4) | Determination of sulphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Sulphide | Determination of sulphide by distillation followed by colorimetry | E118 |
| Water | F | SVOC | Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E106 |
| Water | UF | Toluene Extractable Matter (TEM) | Gravimetrically determined through liquid:liquid extraction with toluene | E111 |
| Water | UF | Total Organic Carbon (TOC) | Low heat with persulphate addition followed by IR detection | E110 |
| Water | F | TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS | E104 |
| Water | F | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS | E104 |
| Water | UF | VOCs | Determination of volatile organic compounds by headspace GC-MS | E101 |
| Water | UF | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E101 |

Key

F Filtered
UF Unfiltered



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QTS Environmental Report No: 16-50816

Site Reference: Ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Sample Receipt Date: 24/10/2016

Sample Scheduled Date: 24/10/2016

Report Issue Number: 1

Reporting Date: 28/10/2016

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Russell Jarvis
Associate Director of Client Services



QTS Environmental Ltd
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Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



| Water Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | |
|--|------------------------|-----------------|-----------------|----------------|--|
| QTS Environmental Report No: 16-50816 | Date Sampled | 17/10/16 | 17/10/16 | 21/10/16 | |
| DSM Demolition Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | |
| Site Reference: Ex BA Tubes Redditch | TP / BH No | DSM10726/RA/7/9 | DSM10726/RA/8/9 | DSM10726/DIS/3 | |
| Project / Job Ref: C10726 | Additional Refs | None Supplied | None Supplied | None Supplied | |
| Order No: 78347 | Depth (m) | None Supplied | None Supplied | None Supplied | |
| Reporting Date: 28/10/2016 | QTSE Sample No | 234853 | 234854 | 234855 | |

| Determinand | Unit | RL | Accreditation | | | | |
|-----------------------------|-------------|-----------|----------------------|------|------|-------|--|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | 1644 | |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | < 1 | < 1 | |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Trichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | 10530 | |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| TAME | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | 23 | |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | 39 | |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 16-50816 |
| DSM Demolition Ltd |
| Site Reference: Ex BA Tubes Redditch |
| Project / Job Ref: C10726 |
| Order No: 78347 |
| Reporting Date: 28/10/2016 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|----------|-------------|---|---|-----------|
| Water | UF | Alkalinity | Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point | E103 |
| Water | UF | BTEX | Determination of BTEX by headspace GC-MS | E101 |
| Water | F | Cations | Determination of cations by filtration followed by ICP-MS | E102 |
| Water | UF | Chemical Oxygen Demand (COD) | Determination using a COD reactor followed by colorimetry | E112 |
| Water | F | Chloride | Determination of chloride by filtration & analysed by ion chromatography | E109 |
| Water | F | Chromium - Hexavalent | Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E116 |
| Water | UF | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through liquid:liquid extraction with cyclohexane | E111 |
| Water | F | Diesel Range Organics (C10 - C24) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | Dissolved Organic Content (DOC) | Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection | E110 |
| Water | UF | Electrical Conductivity | Determination of electrical conductivity by electrometric measurement | E123 |
| Water | F | EPH (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E104 |
| Water | F | Fluoride | Determination of Fluoride by filtration & analysed by ion chromatography | E109 |
| Water | F | Hardness | Determination of Ca and Mg by ICP-MS followed by calculation | E102 |
| Leachate | F | Leachate Preparation - NRA | Based on National Rivers Authority leaching test 1994 | E301 |
| Leachate | F | Leachate Preparation - WAC | Based on BS EN 12457 Pt1, 2, 3 | E302 |
| Water | F | Metals | Determination of metals by filtration followed by ICP-MS | E102 |
| Water | F | Mineral Oil (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GI-FID | E104 |
| Water | F | Nitrate | Determination of nitrate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Monohydric Phenol | Determination of phenols by distillation followed by colorimetry | E121 |
| Water | F | PAH - Speciated (EPA 16) | Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E105 |
| Water | F | PCB - 7 Congeners | Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E108 |
| Water | UF | Petroleum Ether Extract (PEE) | Gravimetrically determined through liquid:liquid extraction with petroleum ether | E111 |
| Water | UF | pH | Determination of pH by electrometric measurement | E107 |
| Water | F | Phosphate | Determination of phosphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Redox Potential | Determination of redox potential by electrometric measurement | E113 |
| Water | F | Sulphate (as SO4) | Determination of sulphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Sulphide | Determination of sulphide by distillation followed by colorimetry | E118 |
| Water | F | SVOC | Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E106 |
| Water | UF | Toluene Extractable Matter (TEM) | Gravimetrically determined through liquid:liquid extraction with toluene | E111 |
| Water | UF | Total Organic Carbon (TOC) | Low heat with persulphate addition followed by IR detection | E110 |
| Water | F | TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS | E104 |
| Water | F | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS | E104 |
| Water | UF | VOCs | Determination of volatile organic compounds by headspace GC-MS | E101 |
| Water | UF | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E101 |

Key

F Filtered
UF Unfiltered



Ian Chambers
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t: 01622 850410
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 16-51121

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Sample Receipt Date: 31/10/2016

Sample Scheduled Date: 31/10/2016

Report Issue Number: 1

Reporting Date: 03/11/2016

Authorised by:

Russell Jarvis
Associate Director of Client Services

Authorised by:

Ela Mysiara
Inorganics & ICP Section Head



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Water Analysis Certificate - Volatile Organic Compounds (VOC)

| | | | | | |
|--|------------------------|------------------|------------------|--|--|
| QTS Environmental Report No: 16-51121 | Date Sampled | 24/10/16 | 24/10/16 | | |
| DSM Demolition Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: ex BA Tubes Redditch | TP / BH No | DSM10726/RA/7/10 | DSM10726/RA/8/10 | | |
| Project / Job Ref: C10726 | Additional Refs | None Supplied | None Supplied | | |
| Order No: 78347 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 03/11/2016 | QTSE Sample No | 235933 | 235934 | | |

| Determinand | Unit | RL | Accreditation | | | |
|-----------------------------|------|------|---------------|------|------|--|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | < 1 | |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Trichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| TAME | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 16-51121 |
| DSM Demolition Ltd |
| Site Reference: ex BA Tubes Redditch |
| Project / Job Ref: C10726 |
| Order No: 78347 |
| Reporting Date: 03/11/2016 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|----------|-------------|---|---|-----------|
| Water | UF | Alkalinity | Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point | E103 |
| Water | UF | BTEX | Determination of BTEX by headspace GC-MS | E101 |
| Water | F | Cations | Determination of cations by filtration followed by ICP-MS | E102 |
| Water | UF | Chemical Oxygen Demand (COD) | Determination using a COD reactor followed by colorimetry | E112 |
| Water | F | Chloride | Determination of chloride by filtration & analysed by ion chromatography | E109 |
| Water | F | Chromium - Hexavalent | Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E116 |
| Water | UF | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through liquid:liquid extraction with cyclohexane | E111 |
| Water | F | Diesel Range Organics (C10 - C24) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | Dissolved Organic Content (DOC) | Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection | E110 |
| Water | UF | Electrical Conductivity | Determination of electrical conductivity by electrometric measurement | E123 |
| Water | F | EPH (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E104 |
| Water | F | Fluoride | Determination of Fluoride by filtration & analysed by ion chromatography | E109 |
| Water | F | Hardness | Determination of Ca and Mg by ICP-MS followed by calculation | E102 |
| Leachate | F | Leachate Preparation - NRA | Based on National Rivers Authority leaching test 1994 | E301 |
| Leachate | F | Leachate Preparation - WAC | Based on BS EN 12457 Pt1, 2, 3 | E302 |
| Water | F | Metals | Determination of metals by filtration followed by ICP-MS | E102 |
| Water | F | Mineral Oil (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GI-FID | E104 |
| Water | F | Nitrate | Determination of nitrate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Monohydric Phenol | Determination of phenols by distillation followed by colorimetry | E121 |
| Water | F | PAH - Speciated (EPA 16) | Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E105 |
| Water | F | PCB - 7 Congeners | Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E108 |
| Water | UF | Petroleum Ether Extract (PEE) | Gravimetrically determined through liquid:liquid extraction with petroleum ether | E111 |
| Water | UF | pH | Determination of pH by electrometric measurement | E107 |
| Water | F | Phosphate | Determination of phosphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Redox Potential | Determination of redox potential by electrometric measurement | E113 |
| Water | F | Sulphate (as SO4) | Determination of sulphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Sulphide | Determination of sulphide by distillation followed by colorimetry | E118 |
| Water | F | SVOC | Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E106 |
| Water | UF | Toluene Extractable Matter (TEM) | Gravimetrically determined through liquid:liquid extraction with toluene | E111 |
| Water | UF | Total Organic Carbon (TOC) | Low heat with persulphate addition followed by IR detection | E110 |
| Water | F | TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS | E104 |
| Water | F | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS | E104 |
| Water | UF | VOCs | Determination of volatile organic compounds by headspace GC-MS | E101 |
| Water | UF | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E101 |

Key

F Filtered
UF Unfiltered



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QTS Environmental Report No: 16-51394

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Sample Receipt Date: 07/11/2016

Sample Scheduled Date: 07/11/2016

Report Issue Number: 1

Reporting Date: 11/11/2016

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Ela Mysiara
Inorganics & ICP Section Head



QTS Environmental Ltd
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Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



| Water Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | |
|--|------------------------|------------------|------------------|--|--|
| QTS Environmental Report No: 16-51394 | Date Sampled | 31/10/16 | 31/10/16 | | |
| DSM Demolition Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: ex BA Tubes Redditch | TP / BH No | DSM10726/RA/7/11 | DSM10726/RA/8/11 | | |
| Project / Job Ref: C10726 | Additional Refs | None Supplied | None Supplied | | |
| Order No: 78347 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 11/11/2016 | QTSE Sample No | 236940 | 236941 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|-----------------------------|-------------|-----------|----------------------|------|------|--|--|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | < 1 | | |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Trichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| TAME | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |

| Soil Analysis Certificate - Methodology & Miscellaneous Information | |
|---|--|
| QTS Environmental Report No: 16-51394 | |
| DSM Demolition Ltd | |
| Site Reference: ex BA Tubes Redditch | |
| Project / Job Ref: C10726 | |
| Order No: 78347 | |
| Reporting Date: 11/11/2016 | |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|----------|-------------|---|---|-----------|
| Water | UF | Alkalinity | Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point | E103 |
| Water | UF | BTEX | Determination of BTEX by headspace GC-MS | E101 |
| Water | F | Cations | Determination of cations by filtration followed by ICP-MS | E102 |
| Water | UF | Chemical Oxygen Demand (COD) | Determination using a COD reactor followed by colorimetry | E112 |
| Water | F | Chloride | Determination of chloride by filtration & analysed by ion chromatography | E109 |
| Water | F | Chromium - Hexavalent | Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazine followed by | E116 |
| Water | UF | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through liquid:liquid extraction with cyclohexane | E111 |
| Water | F | Diesel Range Organics (C10 - C24) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | Dissolved Organic Content (DOC) | Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection | E110 |
| Water | UF | Electrical Conductivity | Determination of electrical conductivity by electrometric measurement | E123 |
| Water | F | EPH (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E104 |
| Water | F | Fluoride | Determination of Fluoride by filtration & analysed by ion chromatography | E109 |
| Water | F | Hardness | Determination of Ca and Mg by ICP-MS followed by calculation | E102 |
| Leachate | F | Leachate Preparation - NRA | Based on National Rivers Authority leaching test 1994 | E301 |
| Leachate | F | Leachate Preparation - WAC | Based on BS EN 12457 Pt1, 2, 3 | E302 |
| Water | F | Metals | Determination of metals by filtration followed by ICP-MS | E102 |
| Water | F | Mineral Oil (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GI-FID | E104 |
| Water | F | Nitrate | Determination of nitrate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Monohydric Phenol | Determination of phenols by distillation followed by colorimetry | E121 |
| Water | F | PAH - Speciated (EPA 16) | Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E105 |
| Water | F | PCB - 7 Congeners | Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane | E108 |
| Water | UF | Petroleum Ether Extract (PEE) | Gravimetrically determined through liquid:liquid extraction with petroleum ether | E111 |
| Water | UF | pH | Determination of pH by electrometric measurement | E107 |
| Water | F | Phosphate | Determination of phosphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Redox Potential | Determination of redox potential by electrometric measurement | E113 |
| Water | F | Sulphate (as SO4) | Determination of sulphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Sulphide | Determination of sulphide by distillation followed by colorimetry | E118 |
| Water | F | SVOC | Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E106 |
| Water | UF | Toluene Extractable Matter (TEM) | Gravimetrically determined through liquid:liquid extraction with toluene | E111 |
| Water | UF | Total Organic Carbon (TOC) | Low heat with persulphate addition followed by IR detection | E110 |
| Water | F | TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS | E104 |
| Water | F | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS | E104 |
| Water | UF | VOCs | Determination of volatile organic compounds by headspace GC-MS | E101 |
| Water | UF | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E101 |

Key

F Filtered
UF Unfiltered



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russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 16-51731

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Sample Receipt Date: 15/11/2016

Sample Scheduled Date: 15/11/2016

Report Issue Number: 1

Reporting Date: 18/11/2016

Authorised by:

A handwritten signature in black ink, appearing to read 'Kevin Old'.

Kevin Old
Associate Director of Laboratory

Authorised by:

A handwritten signature in black ink, appearing to read 'Russell Jarvis'.

Russell Jarvis
Associate Director of Client Services



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Water Analysis Certificate - Volatile Organic Compounds (VOC)

| | | | | | | |
|--|------------------------|------------------|------------------|------------------|------------------|----------------|
| QTS Environmental Report No: 16-51731 | Date Sampled | 07/11/16 | 07/11/16 | 14/11/16 | 14/11/16 | 14/11/16 |
| DSM Demolition Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: ex BA Tubes Redditch | TP / BH No | DSM10726/RA/7/12 | DSM10726/RA/8/12 | DSM10726/RA/7/13 | DSM10726/RA/8/13 | DSM10726/DIS/4 |
| Project / Job Ref: C10726 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 78347 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 18/11/2016 | QTSE Sample No | 238229 | 238230 | 238231 | 238232 | 238233 |

| Determinand | Unit | RL | Accreditation | 07/11/16 | 07/11/16 | 14/11/16 | 14/11/16 | 14/11/16 |
|-----------------------------|------|------|---------------|----------|----------|----------|----------|----------|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | 11 |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | 4443 |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | < 1 | < 1 | < 1 | < 1 |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Trichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | 23880 |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| TAME | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | 43 |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 16-51731 |
| DSM Demolition Ltd |
| Site Reference: ex BA Tubes Redditch |
| Project / Job Ref: C10726 |
| Order No: 78347 |
| Reporting Date: 18/11/2016 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|----------|-------------|---|---|-----------|
| Water | UF | Alkalinity | Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point | E103 |
| Water | UF | BTEX | Determination of BTEX by headspace GC-MS | E101 |
| Water | F | Cations | Determination of cations by filtration followed by ICP-MS | E102 |
| Water | UF | Chemical Oxygen Demand (COD) | Determination using a COD reactor followed by colorimetry | E112 |
| Water | F | Chloride | Determination of chloride by filtration & analysed by ion chromatography | E109 |
| Water | F | Chromium - Hexavalent | Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E116 |
| Water | UF | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through liquid:liquid extraction with cyclohexane | E111 |
| Water | F | Diesel Range Organics (C10 - C24) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | Dissolved Organic Content (DOC) | Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection | E110 |
| Water | UF | Electrical Conductivity | Determination of electrical conductivity by electrometric measurement | E123 |
| Water | F | EPH (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E104 |
| Water | F | Fluoride | Determination of Fluoride by filtration & analysed by ion chromatography | E109 |
| Water | F | Hardness | Determination of Ca and Mg by ICP-MS followed by calculation | E102 |
| Leachate | F | Leachate Preparation - NRA | Based on National Rivers Authority leaching test 1994 | E301 |
| Leachate | F | Leachate Preparation - WAC | Based on BS EN 12457 Pt1, 2, 3 | E302 |
| Water | F | Metals | Determination of metals by filtration followed by ICP-MS | E102 |
| Water | F | Mineral Oil (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GI-FID | E104 |
| Water | F | Nitrate | Determination of nitrate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Monohydric Phenol | Determination of phenols by distillation followed by colorimetry | E121 |
| Water | F | PAH - Speciated (EPA 16) | Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E105 |
| Water | F | PCB - 7 Congeners | Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E108 |
| Water | UF | Petroleum Ether Extract (PEE) | Gravimetrically determined through liquid:liquid extraction with petroleum ether | E111 |
| Water | UF | pH | Determination of pH by electrometric measurement | E107 |
| Water | F | Phosphate | Determination of phosphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Redox Potential | Determination of redox potential by electrometric measurement | E113 |
| Water | F | Sulphate (as SO4) | Determination of sulphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Sulphide | Determination of sulphide by distillation followed by colorimetry | E118 |
| Water | F | SVOC | Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E106 |
| Water | UF | Toluene Extractable Matter (TEM) | Gravimetrically determined through liquid:liquid extraction with toluene | E111 |
| Water | UF | Total Organic Carbon (TOC) | Low heat with persulphate addition followed by IR detection | E110 |
| Water | F | TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS | E104 |
| Water | F | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS | E104 |
| Water | UF | VOCs | Determination of volatile organic compounds by headspace GC-MS | E101 |
| Water | UF | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E101 |

Key

F Filtered
UF Unfiltered



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russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 16-51974

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Sample Receipt Date: 21/11/2016

Sample Scheduled Date: 21/11/2016

Report Issue Number: 1

Reporting Date: 24/11/2016

Authorised by:

A handwritten signature in black ink, appearing to read 'R Jarvis'.

Russell Jarvis
Associate Director of Client Services

Authorised by:

A handwritten signature in black ink, appearing to read 'Ela Mysiara'.

Ela Mysiara
Inorganics & ICP Section Head



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



| Water Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | |
|--|------------------------|------------------|------------------|----------------|--|
| QTS Environmental Report No: 16-51974 | Date Sampled | 21/11/16 | 21/11/16 | 21/11/16 | |
| DSM Demolition Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | |
| Site Reference: ex BA Tubes Redditch | TP / BH No | DSM10726/RA/7/14 | DSM10726/RA/8/14 | DSM10726/DIS/5 | |
| Project / Job Ref: C10726 | Additional Refs | None Supplied | None Supplied | None Supplied | |
| Order No: 78347 | Depth (m) | None Supplied | None Supplied | None Supplied | |
| Reporting Date: 24/11/2016 | QTSE Sample No | 239316 | 239317 | 239318 | |

| Determinand | Unit | RL | Accreditation | | | | |
|-----------------------------|-------------|-----------|----------------------|------|------|------|--|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | < 1 | < 1 | |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Trichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| TAME | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | |

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 16-51974 |
| DSM Demolition Ltd |
| Site Reference: ex BA Tubes Redditch |
| Project / Job Ref: C10726 |
| Order No: 78347 |
| Reporting Date: 24/11/2016 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|----------|-------------|---|---|-----------|
| Water | UF | Alkalinity | Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point | E103 |
| Water | UF | BTEX | Determination of BTEX by headspace GC-MS | E101 |
| Water | F | Cations | Determination of cations by filtration followed by ICP-MS | E102 |
| Water | UF | Chemical Oxygen Demand (COD) | Determination using a COD reactor followed by colorimetry | E112 |
| Water | F | Chloride | Determination of chloride by filtration & analysed by ion chromatography | E109 |
| Water | F | Chromium - Hexavalent | Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E116 |
| Water | UF | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through liquid:liquid extraction with cyclohexane | E111 |
| Water | F | Diesel Range Organics (C10 - C24) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | Dissolved Organic Content (DOC) | Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection | E110 |
| Water | UF | Electrical Conductivity | Determination of electrical conductivity by electrometric measurement | E123 |
| Water | F | EPH (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E104 |
| Water | F | Fluoride | Determination of Fluoride by filtration & analysed by ion chromatography | E109 |
| Water | F | Hardness | Determination of Ca and Mg by ICP-MS followed by calculation | E102 |
| Leachate | F | Leachate Preparation - NRA | Based on National Rivers Authority leaching test 1994 | E301 |
| Leachate | F | Leachate Preparation - WAC | Based on BS EN 12457 Pt1, 2, 3 | E302 |
| Water | F | Metals | Determination of metals by filtration followed by ICP-MS | E102 |
| Water | F | Mineral Oil (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GI-FID | E104 |
| Water | F | Nitrate | Determination of nitrate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Monohydric Phenol | Determination of phenols by distillation followed by colorimetry | E121 |
| Water | F | PAH - Speciated (EPA 16) | Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E105 |
| Water | F | PCB - 7 Congeners | Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E108 |
| Water | UF | Petroleum Ether Extract (PEE) | Gravimetrically determined through liquid:liquid extraction with petroleum ether | E111 |
| Water | UF | pH | Determination of pH by electrometric measurement | E107 |
| Water | F | Phosphate | Determination of phosphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Redox Potential | Determination of redox potential by electrometric measurement | E113 |
| Water | F | Sulphate (as SO4) | Determination of sulphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Sulphide | Determination of sulphide by distillation followed by colorimetry | E118 |
| Water | F | SVOC | Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E106 |
| Water | UF | Toluene Extractable Matter (TEM) | Gravimetrically determined through liquid:liquid extraction with toluene | E111 |
| Water | UF | Total Organic Carbon (TOC) | Low heat with persulphate addition followed by IR detection | E110 |
| Water | F | TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS | E104 |
| Water | F | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS | E104 |
| Water | UF | VOCs | Determination of volatile organic compounds by headspace GC-MS | E101 |
| Water | UF | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E101 |

Key

F Filtered
UF Unfiltered



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Arden Road
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B8 1DE

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ME17 2JN
t: 01622 850410
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 16-52476

Site Reference: ex BA Tubes, Redditch

Project / Job Ref: C10726

Order No: 78347

Sample Receipt Date: 06/12/2016

Sample Scheduled Date: 06/12/2016

Report Issue Number: 1

Reporting Date: 09/12/2016

Authorised by:

Russell Jarvis
Associate Director of Client Services

Authorised by:

Ela Mysiara
Inorganics & ICP Section Head



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



| Water Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|------------------------|------------------|------------------|----------------|------------------|------------------|
| QTS Environmental Report No: 16-52476 | Date Sampled | 28/11/16 | 28/11/16 | 28/11/16 | 05/12/16 | 05/12/16 |
| DSM Demolition Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: ex BA Tubes, Redditch | TP / BH No | DSM10726/RA/7/15 | DSM10726/RA/8/15 | DSM10726/DIS/6 | DSM10726/RA/7/16 | DSM10726/RA/8/16 |
| Project / Job Ref: C10726 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 78347 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 09/12/2016 | QTSE Sample No | 241546 | 241547 | 241548 | 241549 | 241550 |

| Determinand | Unit | RL | Accreditation | | | | | | |
|-----------------------------|-------------|-----------|----------------------|------|------|------|------|------|------|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Trichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| TAME | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



| Water Analysis Certificate - Volatile Organic Compounds (VOC) | | | |
|--|------------------------|----------------|--|
| QTS Environmental Report No: 16-52476 | Date Sampled | 05/12/16 | |
| DSM Demolition Ltd | Time Sampled | None Supplied | |
| Site Reference: ex BA Tubes, Redditch | TP / BH No | DSM10726/DIS/7 | |
| Project / Job Ref: C10726 | Additional Refs | None Supplied | |
| Order No: 78347 | Depth (m) | None Supplied | |
| Reporting Date: 09/12/2016 | QTSE Sample No | 241551 | |

| Determinand | Unit | RL | Accreditation | | | | |
|-----------------------------|-------------|-----------|----------------------|------|--|--|--|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | | | |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | | | |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | | | |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | | | |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | | | |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | | | |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | | | |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | | | |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | | | |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | | | |
| Trichloroethene | ug/l | < 5 | ISO17025 | < 5 | | | |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| TAME | ug/l | < 5 | ISO17025 | < 5 | | | |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | | | |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | | | |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | | | |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | | | |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | | | |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | | | |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | | | |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | | | |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | | | |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | | | |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | | | |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | | | |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | | | |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | | | |

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 16-52476 |
| DSM Demolition Ltd |
| Site Reference: ex BA Tubes, Redditch |
| Project / Job Ref: C10726 |
| Order No: 78347 |
| Reporting Date: 09/12/2016 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|----------|-------------|---|---|-----------|
| Water | UF | Alkalinity | Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point | E103 |
| Water | UF | BTEX | Determination of BTEX by headspace GC-MS | E101 |
| Water | F | Cations | Determination of cations by filtration followed by ICP-MS | E102 |
| Water | UF | Chemical Oxygen Demand (COD) | Determination using a COD reactor followed by colorimetry | E112 |
| Water | F | Chloride | Determination of chloride by filtration & analysed by ion chromatography | E109 |
| Water | F | Chromium - Hexavalent | Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by | E116 |
| Water | UF | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through liquid:liquid extraction with cyclohexane | E111 |
| Water | F | Diesel Range Organics (C10 - C24) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | Dissolved Organic Content (DOC) | Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection | E110 |
| Water | UF | Electrical Conductivity | Determination of electrical conductivity by electrometric measurement | E123 |
| Water | F | EPH (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E104 |
| Water | F | Fluoride | Determination of Fluoride by filtration & analysed by ion chromatography | E109 |
| Water | F | Hardness | Determination of Ca and Mg by ICP-MS followed by calculation | E102 |
| Leachate | F | Leachate Preparation - NRA | Based on National Rivers Authority leaching test 1994 | E301 |
| Leachate | F | Leachate Preparation - WAC | Based on BS EN 12457 Pt1, 2, 3 | E302 |
| Water | F | Metals | Determination of metals by filtration followed by ICP-MS | E102 |
| Water | F | Mineral Oil (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GI-FID | E104 |
| Water | F | Nitrate | Determination of nitrate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Monohydric Phenol | Determination of phenols by distillation followed by colorimetry | E121 |
| Water | F | PAH - Speciated (EPA 16) | Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E105 |
| Water | F | PCB - 7 Congeners | Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane | E108 |
| Water | UF | Petroleum Ether Extract (PEE) | Gravimetrically determined through liquid:liquid extraction with petroleum ether | E111 |
| Water | UF | pH | Determination of pH by electrometric measurement | E107 |
| Water | F | Phosphate | Determination of phosphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Redox Potential | Determination of redox potential by electrometric measurement | E113 |
| Water | F | Sulphate (as SO4) | Determination of sulphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Sulphide | Determination of sulphide by distillation followed by colorimetry | E118 |
| Water | F | SVOC | Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E106 |
| Water | UF | Toluene Extractable Matter (TEM) | Gravimetrically determined through liquid:liquid extraction with toluene | E111 |
| Water | UF | Total Organic Carbon (TOC) | Low heat with persulphate addition followed by IR detection | E110 |
| Water | F | TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS | E104 |
| Water | F | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS | E104 |
| Water | UF | VOCs | Determination of volatile organic compounds by headspace GC-MS | E101 |
| Water | UF | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E101 |

Key

F Filtered
UF Unfiltered



Ian Chambers
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t: 01622 850410
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 16-53082

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Sample Receipt Date: 19/12/2016

Sample Scheduled Date: 19/12/2016

Report Issue Number: 1

Reporting Date: 21/12/2016

Authorised by:

A handwritten signature in black ink, appearing to read 'Kevin Old'.

Kevin Old
Associate Director of Laboratory

Authorised by:

A handwritten signature in black ink, appearing to read 'Ela Mysiara'.

Ela Mysiara
Inorganics & ICP Section Head



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



| Water Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | |
|--|------------------------|------------------|------------------|----------------|--|
| QTS Environmental Report No: 16-53082 | Date Sampled | 12/12/16 | 12/12/16 | 08/12/16 | |
| DSM Demolition Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | |
| Site Reference: ex BA Tubes Redditch | TP / BH No | DSM10726/RA/7/18 | DSM10726/RA/8/18 | DSM10726/DIS/9 | |
| Project / Job Ref: C10726 | Additional Refs | None Supplied | None Supplied | None Supplied | |
| Order No: 78347 | Depth (m) | None Supplied | None Supplied | None Supplied | |
| Reporting Date: 21/12/2016 | QTSE Sample No | 244153 | 244154 | 244155 | |

| Determinand | Unit | RL | Accreditation | | | | |
|-----------------------------|-------------|-----------|----------------------|------|------|------|------|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | < 1 | < 1 | < 1 |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Trichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| TAME | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 16-53082 |
| DSM Demolition Ltd |
| Site Reference: ex BA Tubes Redditch |
| Project / Job Ref: C10726 |
| Order No: 78347 |
| Reporting Date: 21/12/2016 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|----------|-------------|---|---|-----------|
| Water | UF | Alkalinity | Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point | E103 |
| Water | UF | BTEX | Determination of BTEX by headspace GC-MS | E101 |
| Water | F | Cations | Determination of cations by filtration followed by ICP-MS | E102 |
| Water | UF | Chemical Oxygen Demand (COD) | Determination using a COD reactor followed by colorimetry | E112 |
| Water | F | Chloride | Determination of chloride by filtration & analysed by ion chromatography | E109 |
| Water | F | Chromium - Hexavalent | Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by | E116 |
| Water | UF | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through liquid:liquid extraction with cyclohexane | E111 |
| Water | F | Diesel Range Organics (C10 - C24) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | Dissolved Organic Content (DOC) | Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection | E110 |
| Water | UF | Electrical Conductivity | Determination of electrical conductivity by electrometric measurement | E123 |
| Water | F | EPH (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E104 |
| Water | F | Fluoride | Determination of Fluoride by filtration & analysed by ion chromatography | E109 |
| Water | F | Hardness | Determination of Ca and Mg by ICP-MS followed by calculation | E102 |
| Leachate | F | Leachate Preparation - NRA | Based on National Rivers Authority leaching test 1994 | E301 |
| Leachate | F | Leachate Preparation - WAC | Based on BS EN 12457 Pt1, 2, 3 | E302 |
| Water | F | Metals | Determination of metals by filtration followed by ICP-MS | E102 |
| Water | F | Mineral Oil (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GI-FID | E104 |
| Water | F | Nitrate | Determination of nitrate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Monohydric Phenol | Determination of phenols by distillation followed by colorimetry | E121 |
| Water | F | PAH - Speciated (EPA 16) | Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E105 |
| Water | F | PCB - 7 Congeners | Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane | E108 |
| Water | UF | Petroleum Ether Extract (PEE) | Gravimetrically determined through liquid:liquid extraction with petroleum ether | E111 |
| Water | UF | pH | Determination of pH by electrometric measurement | E107 |
| Water | F | Phosphate | Determination of phosphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Redox Potential | Determination of redox potential by electrometric measurement | E113 |
| Water | F | Sulphate (as SO4) | Determination of sulphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Sulphide | Determination of sulphide by distillation followed by colorimetry | E118 |
| Water | F | SVOC | Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E106 |
| Water | UF | Toluene Extractable Matter (TEM) | Gravimetrically determined through liquid:liquid extraction with toluene | E111 |
| Water | UF | Total Organic Carbon (TOC) | Low heat with persulphate addition followed by IR detection | E110 |
| Water | F | TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS | E104 |
| Water | F | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS | E104 |
| Water | UF | VOCs | Determination of volatile organic compounds by headspace GC-MS | E101 |
| Water | UF | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E101 |

Key

F Filtered
UF Unfiltered



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russell.jarvis@qtseenvironmental.com

QTS Environmental Report No: 17-53388

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Sample Receipt Date: 09/01/2017

Sample Scheduled Date: 09/01/2017

Report Issue Number: 1

Reporting Date: 13/01/2017

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Russell Jarvis
Associate Director of Client Services

QTSE is the trading name of DETS Ltd, company registration number 03705645

| Water Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | |
|---|-----------------|------------------|------------------|--|--|
| QTS Environmental Report No: 17-53388 | Date Sampled | 03/01/17 | 03/01/17 | | |
| DSM Demolition Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: ex BA Tubes Redditch | TP / BH No | DSM10726/RA/7/19 | DSM10726/RA/8/19 | | |
| Project / Job Ref: C10726 | Additional Refs | None Supplied | None Supplied | | |
| Order No: 78347 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 13/01/2017 | QTSE Sample No | 245478 | 245479 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|-----------------------------|------|------|---------------|------|------|--|--|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | < 1 | | |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Trichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| TAME | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | |

Soil Analysis Certificate - Methodology & Miscellaneous Information

QTS Environmental Report No: 17-53388

DSM Demolition Ltd

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Reporting Date: 13/01/2017

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|----------|-------------|---|---|-----------|
| Water | UF | Alkalinity | Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point | E103 |
| Water | UF | BTEX | Determination of BTEX by headspace GC-MS | E101 |
| Water | F | Cations | Determination of cations by filtration followed by ICP-MS | E102 |
| Water | UF | Chemical Oxygen Demand (COD) | Determination using a COD reactor followed by colorimetry | E112 |
| Water | F | Chloride | Determination of chloride by filtration & analysed by ion chromatography | E109 |
| Water | F | Chromium - Hexavalent | Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by | E116 |
| Water | UF | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through liquid:liquid extraction with cyclohexane | E111 |
| Water | F | Diesel Range Organics (C10 - C24) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | Dissolved Organic Content (DOC) | Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection | E110 |
| Water | UF | Electrical Conductivity | Determination of electrical conductivity by electrometric measurement | E123 |
| Water | F | EPH (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E104 |
| Water | F | Fluoride | Determination of Fluoride by filtration & analysed by ion chromatography | E109 |
| Water | F | Hardness | Determination of Ca and Mg by ICP-MS followed by calculation | E102 |
| Leachate | F | Leachate Preparation - NRA | Based on National Rivers Authority leaching test 1994 | E301 |
| Leachate | F | Leachate Preparation - WAC | Based on BS EN 12457 Pt1, 2, 3 | E302 |
| Water | F | Metals | Determination of metals by filtration followed by ICP-MS | E102 |
| Water | F | Mineral Oil (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GI-FID | E104 |
| Water | F | Nitrate | Determination of nitrate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Monohydric Phenol | Determination of phenols by distillation followed by colorimetry | E121 |
| Water | F | PAH - Speciated (EPA 16) | Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E105 |
| Water | F | PCB - 7 Congeners | Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane | E108 |
| Water | UF | Petroleum Ether Extract (PEE) | Gravimetrically determined through liquid:liquid extraction with petroleum ether | E111 |
| Water | UF | pH | Determination of pH by electrometric measurement | E107 |
| Water | F | Phosphate | Determination of phosphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Redox Potential | Determination of redox potential by electrometric measurement | E113 |
| Water | F | Sulphate (as SO4) | Determination of sulphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Sulphide | Determination of sulphide by distillation followed by colorimetry | E118 |
| Water | F | SVOC | Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E106 |
| Water | UF | Toluene Extractable Matter (TEM) | Gravimetrically determined through liquid:liquid extraction with toluene | E111 |
| Water | UF | Total Organic Carbon (TOC) | Low heat with persulphate addition followed by IR detection | E110 |
| Water | F | TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS | E104 |
| Water | F | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS | E104 |
| Water | UF | VOCs | Determination of volatile organic compounds by headspace GC-MS | E101 |
| Water | UF | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E101 |

Key

F Filtered
UF Unfiltered



Ian Chambers
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t: 01622 850410
russell.jarvis@qtsevenvironmental.com

QTS Environmental Report No: 17-53662

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Sample Receipt Date: 16/01/2017

Sample Scheduled Date: 16/01/2017

Report Issue Number: 1

Reporting Date: 20/01/2017

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Russell Jarvis
Associate Director of Client Services

QTSE is the trading name of DETS Ltd, company registration number 03705645



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



| Water Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | |
|--|------------------------|------------------|------------------|-----------------|-------------------|
| QTS Environmental Report No: 17-53662 | Date Sampled | 09/01/17 | 09/01/17 | 09/01/17 | 10/01/17 |
| DSM Demolition Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: ex BA Tubes Redditch | TP / BH No | DSM10726/RA/7/20 | DSM10726/RA/8/19 | DSM10726/DIS/10 | DSM10726/Dirty/R8 |
| Project / Job Ref: C10726 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 78347 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 20/01/2017 | QTSE Sample No | 246601 | 246602 | 246603 | 246604 |

| Determinand | Unit | RL | Accreditation | | | | |
|-----------------------------|-------------|-----------|----------------------|------|------|------|-------|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | 318 |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | 10440 |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | < 1 | < 1 | < 1 |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Trichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| TAME | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 17-53662 |
| DSM Demolition Ltd |
| Site Reference: ex BA Tubes Redditch |
| Project / Job Ref: C10726 |
| Order No: 78347 |
| Reporting Date: 20/01/2017 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|----------|-------------|---|---|-----------|
| Water | UF | Alkalinity | Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point | E103 |
| Water | UF | BTEX | Determination of BTEX by headspace GC-MS | E101 |
| Water | F | Cations | Determination of cations by filtration followed by ICP-MS | E102 |
| Water | UF | Chemical Oxygen Demand (COD) | Determination using a COD reactor followed by colorimetry | E112 |
| Water | F | Chloride | Determination of chloride by filtration & analysed by ion chromatography | E109 |
| Water | F | Chromium - Hexavalent | Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by | E116 |
| Water | UF | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through liquid:liquid extraction with cyclohexane | E111 |
| Water | F | Diesel Range Organics (C10 - C24) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | Dissolved Organic Content (DOC) | Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection | E110 |
| Water | UF | Electrical Conductivity | Determination of electrical conductivity by electrometric measurement | E123 |
| Water | F | EPH (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E104 |
| Water | F | Fluoride | Determination of Fluoride by filtration & analysed by ion chromatography | E109 |
| Water | F | Hardness | Determination of Ca and Mg by ICP-MS followed by calculation | E102 |
| Leachate | F | Leachate Preparation - NRA | Based on National Rivers Authority leaching test 1994 | E301 |
| Leachate | F | Leachate Preparation - WAC | Based on BS EN 12457 Pt1, 2, 3 | E302 |
| Water | F | Metals | Determination of metals by filtration followed by ICP-MS | E102 |
| Water | F | Mineral Oil (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GI-FID | E104 |
| Water | F | Nitrate | Determination of nitrate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Monohydric Phenol | Determination of phenols by distillation followed by colorimetry | E121 |
| Water | F | PAH - Speciated (EPA 16) | Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E105 |
| Water | F | PCB - 7 Congeners | Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane | E108 |
| Water | UF | Petroleum Ether Extract (PEE) | Gravimetrically determined through liquid:liquid extraction with petroleum ether | E111 |
| Water | UF | pH | Determination of pH by electrometric measurement | E107 |
| Water | F | Phosphate | Determination of phosphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Redox Potential | Determination of redox potential by electrometric measurement | E113 |
| Water | F | Sulphate (as SO4) | Determination of sulphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Sulphide | Determination of sulphide by distillation followed by colorimetry | E118 |
| Water | F | SVOC | Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E106 |
| Water | UF | Toluene Extractable Matter (TEM) | Gravimetrically determined through liquid:liquid extraction with toluene | E111 |
| Water | UF | Total Organic Carbon (TOC) | Low heat with persulphate addition followed by IR detection | E110 |
| Water | F | TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS | E104 |
| Water | F | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS | E104 |
| Water | UF | VOCs | Determination of volatile organic compounds by headspace GC-MS | E101 |
| Water | UF | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E101 |

Key

F Filtered
UF Unfiltered



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QTS Environmental Report No: 17-53780

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Sample Receipt Date: 18/01/2017

Sample Scheduled Date: 18/01/2017

Report Issue Number: 1

Reporting Date: 24/01/2017

Authorised by:

Russell Jarvis
Associate Director of Client Services

Authorised by:

Ela Mysiara
Inorganics & ICP Section Head

QTSE is the trading name of DETS Ltd, company registration number 03705645

Water Analysis Certificate - Volatile Organic Compounds (VOC)

| | | | | | |
|--|------------------------|------------------|------------------|----------------|-------------------|
| QTS Environmental Report No: 17-53780 | Date Sampled | 16/01/17 | 16/01/17 | 16/01/17 | 17/01/17 |
| DSM Demolition Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: ex BA Tubes Redditch | TP / BH No | DSM10726/RA/7/21 | DSM10726/RA/8/21 | DSM10726/DIS/1 | DSM10726/Dirty/R2 |
| Project / Job Ref: C10726 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 78347 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 24/01/2017 | QTSE Sample No | 247137 | 247138 | 247139 | 247140 |

| Determinand | Unit | RL | Accreditation | 16/01/17 | 16/01/17 | 16/01/17 | 17/01/17 |
|-----------------------------|------|------|---------------|----------|----------|----------|----------|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | 478 |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | < 1 | < 1 | < 1 |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Trichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | 311 |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| TAME | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 |

Soil Analysis Certificate - Methodology & Miscellaneous Information

QTS Environmental Report No: 17-53780

DSM Demolition Ltd

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Reporting Date: 24/01/2017

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|----------|-------------|---|---|-----------|
| Water | UF | Alkalinity | Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point | E103 |
| Water | UF | BTEX | Determination of BTEX by headspace GC-MS | E101 |
| Water | F | Cations | Determination of cations by filtration followed by ICP-MS | E102 |
| Water | UF | Chemical Oxygen Demand (COD) | Determination using a COD reactor followed by colorimetry | E112 |
| Water | F | Chloride | Determination of chloride by filtration & analysed by ion chromatography | E109 |
| Water | F | Chromium - Hexavalent | Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E116 |
| Water | UF | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through liquid:liquid extraction with cyclohexane | E111 |
| Water | F | Diesel Range Organics (C10 - C24) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | Dissolved Organic Content (DOC) | Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection | E110 |
| Water | UF | Electrical Conductivity | Determination of electrical conductivity by electrometric measurement | E123 |
| Water | F | EPH (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E104 |
| Water | F | Fluoride | Determination of Fluoride by filtration & analysed by ion chromatography | E109 |
| Water | F | Hardness | Determination of Ca and Mg by ICP-MS followed by calculation | E102 |
| Leachate | F | Leachate Preparation - NRA | Based on National Rivers Authority leaching test 1994 | E301 |
| Leachate | F | Leachate Preparation - WAC | Based on BS EN 12457 Pt1, 2, 3 | E302 |
| Water | F | Metals | Determination of metals by filtration followed by ICP-MS | E102 |
| Water | F | Mineral Oil (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GI-FID | E104 |
| Water | F | Nitrate | Determination of nitrate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Monohydric Phenol | Determination of phenols by distillation followed by colorimetry | E121 |
| Water | F | PAH - Speciated (EPA 16) | Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E105 |
| Water | F | PCB - 7 Congeners | Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E108 |
| Water | UF | Petroleum Ether Extract (PEE) | Gravimetrically determined through liquid:liquid extraction with petroleum ether | E111 |
| Water | UF | pH | Determination of pH by electrometric measurement | E107 |
| Water | F | Phosphate | Determination of phosphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Redox Potential | Determination of redox potential by electrometric measurement | E113 |
| Water | F | Sulphate (as SO4) | Determination of sulphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Sulphide | Determination of sulphide by distillation followed by colorimetry | E118 |
| Water | F | SVOC | Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E106 |
| Water | UF | Toluene Extractable Matter (TEM) | Gravimetrically determined through liquid:liquid extraction with toluene | E111 |
| Water | UF | Total Organic Carbon (TOC) | Low heat with persulphate addition followed by IR detection | E110 |
| Water | F | TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS | E104 |
| Water | F | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS | E104 |
| Water | UF | VOCs | Determination of volatile organic compounds by headspace GC-MS | E101 |
| Water | UF | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E101 |

Key

F Filtered
UF Unfiltered



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QTS Environmental Report No: 17-54714

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Sample Receipt Date: 07/02/2017

Sample Scheduled Date: 07/02/2017

Report Issue Number: 1

Reporting Date: 13/02/2017

Authorised by:

Russell Jarvis
Associate Director of Client Services

Authorised by:

Ela Mysiara
Inorganics & ICP Section Head

QTSE is the trading name of DETS Ltd, company registration number 03705645



QTS Environmental Ltd
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Maidstone
Kent ME17 2JN
Tel : 01622 850410



Water Analysis Certificate - Volatile Organic Compounds (VOC)

| | | | | | | |
|--|------------------------|------------------|------------------|-----------------|------------------|------------------|
| QTS Environmental Report No: 17-54714 | Date Sampled | 30/01/17 | 30/01/17 | 30/01/17 | 06/02/17 | 06/02/17 |
| DSM Demolition Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: ex BA Tubes Redditch | TP / BH No | DSM10726/RA/7/23 | DSM10726/RA/8/23 | DSM10726/DIS/13 | DSM10726/RA/7/24 | DSM10726/RA/8/24 |
| Project / Job Ref: C10726 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 78347 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 13/02/2017 | QTSE Sample No | 251298 | 251299 | 251300 | 251301 | 251302 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------------------|------|------|---------------|------|------|------|------|------|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | < 1 | < 1 | < 1 | < 1 |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Trichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| TAME | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 17-54714 |
| DSM Demolition Ltd |
| Site Reference: ex BA Tubes Redditch |
| Project / Job Ref: C10726 |
| Order No: 78347 |
| Reporting Date: 13/02/2017 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|----------|-------------|---|---|-----------|
| Water | UF | Alkalinity | Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point | E103 |
| Water | UF | BTEX | Determination of BTEX by headspace GC-MS | E101 |
| Water | F | Cations | Determination of cations by filtration followed by ICP-MS | E102 |
| Water | UF | Chemical Oxygen Demand (COD) | Determination using a COD reactor followed by colorimetry | E112 |
| Water | F | Chloride | Determination of chloride by filtration & analysed by ion chromatography | E109 |
| Water | F | Chromium - Hexavalent | Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E116 |
| Water | UF | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through liquid:liquid extraction with cyclohexane | E111 |
| Water | F | Diesel Range Organics (C10 - C24) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | Dissolved Organic Content (DOC) | Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection | E110 |
| Water | UF | Electrical Conductivity | Determination of electrical conductivity by electrometric measurement | E123 |
| Water | F | EPH (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E104 |
| Water | F | Fluoride | Determination of Fluoride by filtration & analysed by ion chromatography | E109 |
| Water | F | Hardness | Determination of Ca and Mg by ICP-MS followed by calculation | E102 |
| Leachate | F | Leachate Preparation - NRA | Based on National Rivers Authority leaching test 1994 | E301 |
| Leachate | F | Leachate Preparation - WAC | Based on BS EN 12457 Pt1, 2, 3 | E302 |
| Water | F | Metals | Determination of metals by filtration followed by ICP-MS | E102 |
| Water | F | Mineral Oil (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GI-FID | E104 |
| Water | F | Nitrate | Determination of nitrate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Monohydric Phenol | Determination of phenols by distillation followed by colorimetry | E121 |
| Water | F | PAH - Speciated (EPA 16) | Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E105 |
| Water | F | PCB - 7 Congeners | Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E108 |
| Water | UF | Petroleum Ether Extract (PEE) | Gravimetrically determined through liquid:liquid extraction with petroleum ether | E111 |
| Water | UF | pH | Determination of pH by electrometric measurement | E107 |
| Water | F | Phosphate | Determination of phosphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Redox Potential | Determination of redox potential by electrometric measurement | E113 |
| Water | F | Sulphate (as SO4) | Determination of sulphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Sulphide | Determination of sulphide by distillation followed by colorimetry | E118 |
| Water | F | SVOC | Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E106 |
| Water | UF | Toluene Extractable Matter (TEM) | Gravimetrically determined through liquid:liquid extraction with toluene | E111 |
| Water | UF | Total Organic Carbon (TOC) | Low heat with persulphate addition followed by IR detection | E110 |
| Water | F | TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS | E104 |
| Water | F | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS | E104 |
| Water | UF | VOCs | Determination of volatile organic compounds by headspace GC-MS | E101 |
| Water | UF | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E101 |

Key

F Filtered
UF Unfiltered



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QTS Environmental Report No: 17-55395

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Sample Receipt Date: 21/02/2017

Sample Scheduled Date: 21/02/2017

Report Issue Number: 1

Reporting Date: 27/02/2017

Authorised by:

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Associate Director of Client Services

Authorised by:

Ela Mysiara
Inorganics & ICP Section Head

QTSE is the trading name of DETS Ltd, company registration number 03705645



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Kent ME17 2JN
Tel : 01622 850410



Water Analysis Certificate - Volatile Organic Compounds (VOC)

| | | | | | | |
|--|------------------------|------------------|------------------|-------------------|------------------|------------------|
| QTS Environmental Report No: 17-55395 | Date Sampled | 13/02/17 | 13/02/17 | 13/02/17 | 20/02/17 | 20/02/17 |
| DSM Demolition Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: ex BA Tubes Redditch | TP / BH No | DSM10726/RA/7/25 | DSM10726/RA/8/25 | DSM10726/DIS/7/14 | DSM10726/RA/7/26 | DSM10726/RA/8/26 |
| Project / Job Ref: C10726 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 78347 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 27/02/2017 | QTSE Sample No | 254330 | 254331 | 254332 | 254333 | 254334 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------------------|------|------|---------------|------|------|------|------|------|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | < 1 | < 1 | < 1 | < 1 |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Trichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| TAME | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | < 10 | < 10 | < 10 | < 10 |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | < 5 | < 5 | < 5 | < 5 |



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Tel : 01622 850410



| Water Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | |
|--|------------------------|-----------------|--|--|--|
| QTS Environmental Report No: 17-55395 | Date Sampled | 16/02/17 | | | |
| DSM Demolition Ltd | Time Sampled | None Supplied | | | |
| Site Reference: ex BA Tubes Redditch | TP / BH No | DSM10726/DIS/15 | | | |
| Project / Job Ref: C10726 | Additional Refs | None Supplied | | | |
| Order No: 78347 | Depth (m) | None Supplied | | | |
| Reporting Date: 27/02/2017 | QTSE Sample No | 254335 | | | |

| Determinand | Unit | RL | Accreditation | | | | |
|-----------------------------|-------------|-----------|----------------------|------|--|--|--|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | | | |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | | | |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | | | |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | | | |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | | | |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | | | |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | | | |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | | | |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | | | |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | | | |
| Trichloroethene | ug/l | < 5 | ISO17025 | < 5 | | | |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| TAME | ug/l | < 5 | ISO17025 | < 5 | | | |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | | | |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | | | |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | | | |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | | | |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | | | |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | | | |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | | | |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | | | |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | | | |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | | | |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | | | |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | | | |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | | | |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | | | |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | | | |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | | | |

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 17-55395 |
| DSM Demolition Ltd |
| Site Reference: ex BA Tubes Redditch |
| Project / Job Ref: C10726 |
| Order No: 78347 |
| Reporting Date: 27/02/2017 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|----------|-------------|---|---|-----------|
| Water | UF | Alkalinity | Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point | E103 |
| Water | UF | BTEX | Determination of BTEX by headspace GC-MS | E101 |
| Water | F | Cations | Determination of cations by filtration followed by ICP-MS | E102 |
| Water | UF | Chemical Oxygen Demand (COD) | Determination using a COD reactor followed by colorimetry | E112 |
| Water | F | Chloride | Determination of chloride by filtration & analysed by ion chromatography | E109 |
| Water | F | Chromium - Hexavalent | Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E116 |
| Water | UF | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through liquid:liquid extraction with cyclohexane | E111 |
| Water | F | Diesel Range Organics (C10 - C24) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | Dissolved Organic Content (DOC) | Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection | E110 |
| Water | UF | Electrical Conductivity | Determination of electrical conductivity by electrometric measurement | E123 |
| Water | F | EPH (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E104 |
| Water | F | Fluoride | Determination of Fluoride by filtration & analysed by ion chromatography | E109 |
| Water | F | Hardness | Determination of Ca and Mg by ICP-MS followed by calculation | E102 |
| Leachate | F | Leachate Preparation - NRA | Based on National Rivers Authority leaching test 1994 | E301 |
| Leachate | F | Leachate Preparation - WAC | Based on BS EN 12457 Pt1, 2, 3 | E302 |
| Water | F | Metals | Determination of metals by filtration followed by ICP-MS | E102 |
| Water | F | Mineral Oil (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GI-FID | E104 |
| Water | F | Nitrate | Determination of nitrate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Monohydric Phenol | Determination of phenols by distillation followed by colorimetry | E121 |
| Water | F | PAH - Speciated (EPA 16) | Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E105 |
| Water | F | PCB - 7 Congeners | Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E108 |
| Water | UF | Petroleum Ether Extract (PEE) | Gravimetrically determined through liquid:liquid extraction with petroleum ether | E111 |
| Water | UF | pH | Determination of pH by electrometric measurement | E107 |
| Water | F | Phosphate | Determination of phosphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Redox Potential | Determination of redox potential by electrometric measurement | E113 |
| Water | F | Sulphate (as SO4) | Determination of sulphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Sulphide | Determination of sulphide by distillation followed by colorimetry | E118 |
| Water | F | SVOC | Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E106 |
| Water | UF | Toluene Extractable Matter (TEM) | Gravimetrically determined through liquid:liquid extraction with toluene | E111 |
| Water | UF | Total Organic Carbon (TOC) | Low heat with persulphate addition followed by IR detection | E110 |
| Water | F | TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS | E104 |
| Water | F | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS | E104 |
| Water | UF | VOCs | Determination of volatile organic compounds by headspace GC-MS | E101 |
| Water | UF | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E101 |

Key

F Filtered
UF Unfiltered



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russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 17-55728

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Sample Receipt Date: 28/02/2017

Sample Scheduled Date: 28/02/2017

Report Issue Number: 1

Reporting Date: 06/03/2017

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Russell Jarvis
Associate Director of Client Services

QTSE is the trading name of DETS Ltd, company registration number 03705645



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Water Analysis Certificate - Volatile Organic Compounds (VOC)

| | | | | | |
|--|------------------------|------------------|------------------|--|--|
| QTS Environmental Report No: 17-55728 | Date Sampled | 27/02/17 | 27/02/17 | | |
| DSM Demolition Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: ex BA Tubes Redditch | TP / BH No | DSM10726/RA/7/27 | DSM10726/RA/8/27 | | |
| Project / Job Ref: C10726 | Additional Refs | None Supplied | None Supplied | | |
| Order No: 78347 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 06/03/2017 | QTSE Sample No | 255486 | 255487 | | |

| Determinand | Unit | RL | Accreditation | | | |
|-----------------------------|------|------|---------------|------|------|--|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | < 1 | |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Trichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| TAME | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |



QTS Environmental Ltd
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Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 17-55728 |
| DSM Demolition Ltd |
| Site Reference: ex BA Tubes Redditch |
| Project / Job Ref: C10726 |
| Order No: 78347 |
| Reporting Date: 06/03/2017 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|----------|-------------|---|---|-----------|
| Water | UF | Alkalinity | Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point | E103 |
| Water | UF | BTEX | Determination of BTEX by headspace GC-MS | E101 |
| Water | F | Cations | Determination of cations by filtration followed by ICP-MS | E102 |
| Water | UF | Chemical Oxygen Demand (COD) | Determination using a COD reactor followed by colorimetry | E112 |
| Water | F | Chloride | Determination of chloride by filtration & analysed by ion chromatography | E109 |
| Water | F | Chromium - Hexavalent | Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E116 |
| Water | UF | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through liquid:liquid extraction with cyclohexane | E111 |
| Water | F | Diesel Range Organics (C10 - C24) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | Dissolved Organic Content (DOC) | Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection | E110 |
| Water | UF | Electrical Conductivity | Determination of electrical conductivity by electrometric measurement | E123 |
| Water | F | EPH (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E104 |
| Water | F | Fluoride | Determination of Fluoride by filtration & analysed by ion chromatography | E109 |
| Water | F | Hardness | Determination of Ca and Mg by ICP-MS followed by calculation | E102 |
| Leachate | F | Leachate Preparation - NRA | Based on National Rivers Authority leaching test 1994 | E301 |
| Leachate | F | Leachate Preparation - WAC | Based on BS EN 12457 Pt1, 2, 3 | E302 |
| Water | F | Metals | Determination of metals by filtration followed by ICP-MS | E102 |
| Water | F | Mineral Oil (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GI-FID | E104 |
| Water | F | Nitrate | Determination of nitrate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Monohydric Phenol | Determination of phenols by distillation followed by colorimetry | E121 |
| Water | F | PAH - Speciated (EPA 16) | Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E105 |
| Water | F | PCB - 7 Congeners | Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E108 |
| Water | UF | Petroleum Ether Extract (PEE) | Gravimetrically determined through liquid:liquid extraction with petroleum ether | E111 |
| Water | UF | pH | Determination of pH by electrometric measurement | E107 |
| Water | F | Phosphate | Determination of phosphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Redox Potential | Determination of redox potential by electrometric measurement | E113 |
| Water | F | Sulphate (as SO4) | Determination of sulphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Sulphide | Determination of sulphide by distillation followed by colorimetry | E118 |
| Water | F | SVOC | Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E106 |
| Water | UF | Toluene Extractable Matter (TEM) | Gravimetrically determined through liquid:liquid extraction with toluene | E111 |
| Water | UF | Total Organic Carbon (TOC) | Low heat with persulphate addition followed by IR detection | E110 |
| Water | F | TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS | E104 |
| Water | F | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS | E104 |
| Water | UF | VOCs | Determination of volatile organic compounds by headspace GC-MS | E101 |
| Water | UF | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E101 |

Key

F Filtered
UF Unfiltered



Ian Chambers
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t: 01622 850410
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 17-56172

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Sample Receipt Date: 09/03/2017

Sample Scheduled Date: 09/03/2017

Report Issue Number: 1

Reporting Date: 15/03/2017

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Russell Jarvis
Associate Director of Client Services

QTSE is the trading name of DETS Ltd, company registration number 03705645



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Water Analysis Certificate - Volatile Organic Compounds (VOC)

| | | | | | |
|--|------------------------|------------------------|------------------------|--|--|
| QTS Environmental Report No: 17-56172 | Date Sampled | 06/03/17 | 06/03/17 | | |
| DSM Demolition Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: ex BA Tubes Redditch | TP / BH No | DSM10726 / RA / 7 / 28 | DSM10726 / RA / 8 / 28 | | |
| Project / Job Ref: C10726 | Additional Refs | None Supplied | None Supplied | | |
| Order No: 78347 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 15/03/2017 | QTSE Sample No | 257322 | 257323 | | |

| Determinand | Unit | RL | Accreditation | | | |
|-----------------------------|------|------|---------------|------|------|--|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | < 1 | |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Trichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| TAME | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | < 10 | |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | < 5 | |

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 17-56172 |
| DSM Demolition Ltd |
| Site Reference: ex BA Tubes Redditch |
| Project / Job Ref: C10726 |
| Order No: 78347 |
| Reporting Date: 15/03/2017 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|----------|-------------|---|---|-----------|
| Water | UF | Alkalinity | Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point | E103 |
| Water | UF | BTEX | Determination of BTEX by headspace GC-MS | E101 |
| Water | F | Cations | Determination of cations by filtration followed by ICP-MS | E102 |
| Water | UF | Chemical Oxygen Demand (COD) | Determination using a COD reactor followed by colorimetry | E112 |
| Water | F | Chloride | Determination of chloride by filtration & analysed by ion chromatography | E109 |
| Water | F | Chromium - Hexavalent | Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E116 |
| Water | UF | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through liquid:liquid extraction with cyclohexane | E111 |
| Water | F | Diesel Range Organics (C10 - C24) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | Dissolved Organic Content (DOC) | Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection | E110 |
| Water | UF | Electrical Conductivity | Determination of electrical conductivity by electrometric measurement | E123 |
| Water | F | EPH (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E104 |
| Water | F | Fluoride | Determination of Fluoride by filtration & analysed by ion chromatography | E109 |
| Water | F | Hardness | Determination of Ca and Mg by ICP-MS followed by calculation | E102 |
| Leachate | F | Leachate Preparation - NRA | Based on National Rivers Authority leaching test 1994 | E301 |
| Leachate | F | Leachate Preparation - WAC | Based on BS EN 12457 Pt1, 2, 3 | E302 |
| Water | F | Metals | Determination of metals by filtration followed by ICP-MS | E102 |
| Water | F | Mineral Oil (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GI-FID | E104 |
| Water | F | Nitrate | Determination of nitrate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Monohydric Phenol | Determination of phenols by distillation followed by colorimetry | E121 |
| Water | F | PAH - Speciated (EPA 16) | Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E105 |
| Water | F | PCB - 7 Congeners | Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E108 |
| Water | UF | Petroleum Ether Extract (PEE) | Gravimetrically determined through liquid:liquid extraction with petroleum ether | E111 |
| Water | UF | pH | Determination of pH by electrometric measurement | E107 |
| Water | F | Phosphate | Determination of phosphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Redox Potential | Determination of redox potential by electrometric measurement | E113 |
| Water | F | Sulphate (as SO4) | Determination of sulphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Sulphide | Determination of sulphide by distillation followed by colorimetry | E118 |
| Water | F | SVOC | Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E106 |
| Water | UF | Toluene Extractable Matter (TEM) | Gravimetrically determined through liquid:liquid extraction with toluene | E111 |
| Water | UF | Total Organic Carbon (TOC) | Low heat with persulphate addition followed by IR detection | E110 |
| Water | F | TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS | E104 |
| Water | F | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS | E104 |
| Water | UF | VOCs | Determination of volatile organic compounds by headspace GC-MS | E101 |
| Water | UF | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E101 |

Key

F Filtered
UF Unfiltered



Ian Chambers
DSM Demolition Ltd
Arden House
Arden Road
Heartlands
Birmingham
B8 1DE

QTS Environmental Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 17-56937

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Sample Receipt Date: 27/03/2017

Sample Scheduled Date: 27/03/2017

Report Issue Number: 1

Reporting Date: 30/03/2017

Authorised by:

Kevin Old
Associate Director of Laboratory

QTSE is the trading name of DETS Ltd, company registration number 03705645

Authorised by:

Russell Jarvis
Associate Director of Client Services



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



| Water Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | |
|--|------------------------|------------------|------------------|--|--|
| QTS Environmental Report No: 17-56937 | Date Sampled | 20/03/17 | 20/03/17 | | |
| DSM Demolition Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: ex BA Tubes Redditch | TP / BH No | DSM10726/RA/7/29 | DSM10726/RA/8/29 | | |
| Project / Job Ref: C10726 | Additional Refs | None Supplied | None Supplied | | |
| Order No: 78347 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 30/03/2017 | QTSE Sample No | 260281 | 260282 | | |

| Determinand | Unit | RL | Accreditation | (hs) | (hs) | | | |
|-----------------------------|-------------|-----------|----------------------|-------------|-------------|--|--|--|
| Dichlorodifluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| Vinyl Chloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| Chloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| Chloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| Bromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| Trichlorofluoromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| 1,1-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| MTBE | ug/l | < 10 | ISO17025 | < 10 | < 10 | | | |
| trans-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| 1,1-Dichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| cis-1,2-Dichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| 2,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| Chloroform | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| Bromochloromethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | | |
| 1,1,1-Trichloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| 1,1-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| Carbon Tetrachloride | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| 1,2-Dichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | | |
| Benzene | ug/l | < 1 | ISO17025 | < 1 | < 1 | | | |
| 1,2-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| Trichloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| Bromodichloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| Dibromomethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| TAME | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| cis-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| Toluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| trans-1,3-Dichloropropene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| 1,1,2-Trichloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | | |
| 1,3-Dichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| Tetrachloroethene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| Dibromochloromethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| 1,2-Dibromoethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| Chlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| 1,1,1,2-Tetrachloroethane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| Ethyl Benzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| m,p-Xylene | ug/l | < 10 | ISO17025 | < 10 | < 10 | | | |
| o-Xylene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| Styrene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| Bromoform | ug/l | < 10 | ISO17025 | < 10 | < 10 | | | |
| Isopropylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| 1,1,2,2-Tetrachloroethane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | | |
| 1,2,3-Trichloropropane | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| n-Propylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| Bromobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| 2-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| 1,3,5-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| 4-Chlorotoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| tert-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| 1,2,4-Trimethylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| sec-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| p-Isopropyltoluene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| 1,3-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| 1,4-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| n-Butylbenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| 1,2-Dichlorobenzene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |
| 1,2-Dibromo-3-chloropropane | ug/l | < 10 | ISO17025 | < 10 | < 10 | | | |
| Hexachlorobutadiene | ug/l | < 5 | ISO17025 | < 5 | < 5 | | | |

(hs) Please note deviating sample due to head space in container



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate - Methodology & Miscellaneous Information

QTS Environmental Report No: 17-56937

DSM Demolition Ltd

Site Reference: ex BA Tubes Redditch

Project / Job Ref: C10726

Order No: 78347

Reporting Date: 30/03/2017

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|----------|-------------|---|---|-----------|
| Water | UF | Alkalinity | Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point | E103 |
| Water | UF | BTEX | Determination of BTEX by headspace GC-MS | E101 |
| Water | F | Cations | Determination of cations by filtration followed by ICP-MS | E102 |
| Water | UF | Chemical Oxygen Demand (COD) | Determination using a COD reactor followed by colorimetry | E112 |
| Water | F | Chloride | Determination of chloride by filtration & analysed by ion chromatography | E109 |
| Water | F | Chromium - Hexavalent | Determination of hexavalent chromium by acidification, addition of 1,5 diphénylcarbazine followed by | E116 |
| Water | UF | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E115 |
| Water | UF | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through liquid:liquid extraction with cyclohexane | E111 |
| Water | F | Diesel Range Organics (C10 - C24) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | Dissolved Organic Content (DOC) | Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection | E110 |
| Water | UF | Electrical Conductivity | Determination of electrical conductivity by electrometric measurement | E123 |
| Water | F | EPH (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID | E104 |
| Water | F | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E104 |
| Water | F | Fluoride | Determination of Fluoride by filtration & analysed by ion chromatography | E109 |
| Water | F | Hardness | Determination of Ca and Mg by ICP-MS followed by calculation | E102 |
| Leachate | F | Leachate Preparation - NRA | Based on National Rivers Authority leaching test 1994 | E301 |
| Leachate | F | Leachate Preparation - WAC | Based on BS EN 12457 Pt1, 2, 3 | E302 |
| Water | F | Metals | Determination of metals by filtration followed by ICP-MS | E102 |
| Water | F | Mineral Oil (C10 - C40) | Determination of liquid:liquid extraction with hexane followed by GI-FID | E104 |
| Water | F | Nitrate | Determination of nitrate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Monohydric Phenol | Determination of phenols by distillation followed by colorimetry | E121 |
| Water | F | PAH - Speciated (EPA 16) | Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E105 |
| Water | F | PCB - 7 Congeners | Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane | E108 |
| Water | UF | Petroleum Ether Extract (PEE) | Gravimetrically determined through liquid:liquid extraction with petroleum ether | E111 |
| Water | UF | pH | Determination of pH by electrometric measurement | E107 |
| Water | F | Phosphate | Determination of phosphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Redox Potential | Determination of redox potential by electrometric measurement | E113 |
| Water | F | Sulphate (as SO4) | Determination of sulphate by filtration & analysed by ion chromatography | E109 |
| Water | UF | Sulphide | Determination of sulphide by distillation followed by colorimetry | E118 |
| Water | F | SVOC | Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS | E106 |
| Water | UF | Toluene Extractable Matter (TEM) | Gravimetrically determined through liquid:liquid extraction with toluene | E111 |
| Water | UF | Total Organic Carbon (TOC) | Low heat with persulphate addition followed by IR detection | E110 |
| Water | F | TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS | E104 |
| Water | F | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS | E104 |
| Water | UF | VOCs | Determination of volatile organic compounds by headspace GC-MS | E101 |
| Water | UF | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E101 |

Key

F Filtered
UF Unfiltered



Appendix E – Validation Samples

GJ079 Nash Road, Redditch

Tested at 1 per 10m linear length on walls and 1 per grid square on bases

Summary of Soil Validation



| | |
|------|---|
| Area | 1 |
|------|---|

| Date | Grid Square | Sample Number | Depth (m) | Test Certificate | Test Result | Further Actions / Comments |
|------------|-------------|---------------|-----------|------------------|-------------|----------------------------|
| 02/09/2016 | A1 | AREA1/NF1 | 3.5-4 | 16-48868 | PASS | |
| 02/09/2016 | A1 | AREA1/WF1 | 3.5-4 | 16-48868 | PASS | |
| 02/09/2016 | A1 | A1 BASE | 4 | 16-48868 | PASS | |
| 02/09/2016 | A2 | AREA1/WF2 | 3.5-4 | 16-48868 | PASS | |
| 02/09/2016 | A2 | A2 BASE | 4 | 16-48868 | PASS | |
| 02/09/2016 | B1 | AREA1/NF2 | 3.5-4 | 16-48868 | PASS | |
| 02/09/2016 | B1 | B1 BASE | 4 | 16-48868 | PASS | |
| 02/09/2016 | B2 | B2 BASE | 4 | 16-48868 | PASS | |
| 05/09/2016 | A3 | AREA1/WF3 | 3.5-4 | 16-48868 | PASS | |
| 05/09/2016 | A3 | A3 BASE | 4 | 16-48868 | PASS | |
| 05/09/2016 | B3 | B3 BASE | 4 | 16-48868 | PASS | |
| 06/09/2016 | A4 | AREA1/WF4 | 3.5-4 | 16-48868 | PASS | |
| 06/09/2016 | A5 | AREA1/WF5 | 3.5-4 | 16-48868 | PASS | |
| 06/09/2016 | A4 | A4 BASE | 4 | 16-48868 | PASS | |
| 06/09/2016 | A5 | A5 BASE | 4 | 16-48868 | PASS | |
| 06/09/2016 | B4 | B4 BASE | 4 | 16-48868 | PASS | |
| 06/09/2016 | B5 | B5 BASE | 4 | 16-48868 | PASS | |
| 09/09/2016 | A6 | A6 BASE | 4 | 16-49272 | PASS | |
| 09/09/2016 | A6 | AREA 1/WF6 | 3.5-4 | 16-49272 | PASS | |
| 09/09/2016 | B6 | B6 BASE | 4 | 16-49272 | PASS | |
| 09/09/2016 | A7 | A7 BASE | 4 | 16-49272 | PASS | |
| 09/09/2016 | A7 | AREA 1/WF7 | 3.5-4 | 16-49272 | PASS | |
| 09/09/2016 | B7 | B7 BASE | 4 | 16-49272 | PASS | |
| 09/09/2016 | A8 | A8 BASE | 4 | 16-49272 | PASS | |
| 09/09/2016 | A8 | AREA 1/WF8 | 3.5-4 | 16-49272 | PASS | |
| 09/09/2016 | B8 | B8 BASE | 4 | 16-49272 | PASS | |
| 16/09/2016 | A8 | AREA 1/SF1 | 2.5-3.5 | 16-49272 | PASS | |
| 16/09/2016 | B8 | AREA 1/SF2 | 2.5-3.5 | 16-49272 | PASS | |
| 16/09/2016 | C8 | AREA 1/SF3 | 2.5-3.5 | 16-49272 | PASS | |
| 15/09/2016 | C1 | AREA 1/NF3 | 2.5-3.5 | 16-49272 | PASS | |
| 15/09/2016 | C1 | C1 BASE | 3.5-4 | 16-49272 | PASS | |
| 15/09/2016 | C2 | C2 BASE | 3.5-4 | 16-49272 | PASS | |
| 15/09/2016 | C3 | C3 BASE | 3.5-4 | 16-49272 | PASS | |
| 15/09/2016 | C4 | C4 BASE | 3.5-4 | 16-49272 | PASS | |
| 16/09/2016 | C5 | C5 BASE | 3.5-4 | 16-49272 | PASS | |
| 16/09/2016 | C6 | C6 BASE | 3.5-4 | 16-49272 | PASS | |
| 16/09/2016 | C7 | C7 BASE | 3.5-4 | 16-49272 | PASS | |
| 16/09/2016 | C8 | C8 BASE | 3.5-4 | 16-49272 | PASS | |
| 19/09/2016 | D1 | AREA 1/NF4 | 2.5-3.5 | 16-49729 | PASS | |
| 19/09/2016 | D1 | D1 BASE | 3.5-4 | 16-49729 | PASS | |
| 20/09/2016 | D2 | D2 BASE | 3.5-4 | 16-49729 | PASS | |
| 20/09/2016 | D3 | D3 BASE | 3.5-4 | 16-49729 | PASS | |
| 20/09/2016 | D4 | D4 BASE | 3.5-4 | 16-49729 | PASS | |
| 21/09/2016 | D5 | D5 BASE | 3.5-4 | 16-49729 | PASS | |
| 21/09/2016 | D6 | D6 BASE | 3.5-4 | 16-49729 | PASS | |
| 22/09/2016 | D7 | D7 BASE | 3.5-4 | 16-49729 | PASS | |
| 22/09/2016 | D8 | D8 BASE | 3.5-4 | 16-49729 | PASS | |
| 23/09/2016 | D8 | AREA 1/SF4 | 2.5-3.5 | 16-49729 | PASS | |
| 26/09/2016 | E1 | AREA 1/NF5 | 2.5m-3.5m | 16-49810 | PASS | |
| 26/09/2016 | E1 | E1 BASE | 3.5m-4m | 16-49810 | PASS | |
| 26/09/2016 | E2 | E2 BASE | 3.5m-4m | 16-49810 | PASS | |

GJ079 Nash Road, Redditch

Tested at 1 per 10m linear length on walls and 1 per grid square on bases

Summary of Soil Validation



| | |
|------|---|
| Area | 1 |
|------|---|

| Date | Grid Square | Sample Number | Depth (m) | Test Certificate | Test Result | Further Actions / Comments |
|------------|-------------|---------------|-----------|------------------|-------------|----------------------------|
| 26/09/2016 | E3 | E3 BASE | 3.5m-4m | 16-49810 | PASS | |
| 27/09/2016 | E4 | E4 BASE | 3.5m-4m | 16-49810 | PASS | |
| 27/09/2016 | E5 | E5 BASE | 3.5m-4m | 16-49810 | PASS | |
| 27/09/2016 | E6 | E6 BASE | 3.5m-4m | 16-49810 | PASS | |
| 27/09/2016 | E7 | E7 BASE | 3.5m-4m | 16-49810 | PASS | |
| 23/09/2016 | E8 | E8 BASE | 3.5m-4m | 16-49810 | PASS | |
| 23/09/2016 | E8 | AREA 1/SF5 | 2.5m-3.5m | 16-49810 | PASS | |
| 30/09/2016 | F1 | AREA 1/NF6 | 2.5m-3.5m | 16-50174 | PASS | |
| 30/09/2016 | F1 | F1 BASE | 3.5m-4m | 16-50174 | PASS | |
| 30/09/2016 | F2 | F2 BASE | 3.5m-4m | 16-50174 | PASS | |
| 30/09/2016 | F3 | F3 BASE | 3.5m-4m | 16-50174 | PASS | |
| 30/09/2016 | F4 | F4 BASE | 3.5m-4m | 16-50174 | PASS | |
| 05/10/2016 | F5 | F5 BASE | 3.5m-4m | 16-50174 | PASS | |
| 06/10/2016 | F6 | F6 BASE | 3.5m-4m | 16-50174 | PASS | |
| 06/10/2016 | F7 | F7 BASE | 3.5m-4m | 16-50174 | PASS | |
| 05/10/2016 | F8 | F8 BASE | 3.5m-4m | 16-50174 | PASS | |
| 05/10/2016 | F8 | AREA 1/SF6 | 2.5m-3.5m | 16-50174 | PASS | |
| 17/10/2016 | G1 | AREA 1/NF7 | 2.5m-3.5m | 16-50793 | PASS | |
| 17/10/2016 | G1 | G1 BASE | 3.5m-4m | 16-50793 | PASS | |
| 17/10/2016 | G2 | G2 BASE | 3.5m-4m | 16-50793 | PASS | |
| 17/10/2016 | G3 | G3 BASE | 3.5m-4m | 16-50793 | PASS | |
| 17/10/2016 | G4 | G4 BASE | 3.5m-4m | 16-50793 | PASS | |
| 18/10/2016 | G5 | G5 BASE | 3.5m-4m | 16-50793 | PASS | |
| 18/10/2016 | G6 | G6 BASE | 3.5m-4m | 16-50793 | PASS | |
| 18/10/2016 | G7 | G7 BASE | 3.5m-4m | 16-50793 | PASS | |
| 19/10/2016 | G8 | G8 BASE | 3.5m-4m | 16-50793 | PASS | |
| 19/10/2016 | G8 | AREA 1/SF7 | 2.5m-3.5m | 16-50793 | PASS | |
| 19/10/2016 | H8 | H8 BASE | 3.5m-4m | 16-50793 | PASS | |
| 19/10/2016 | H8 | AREA 1/SF8 | 2.5m-3.5m | 16-50793 | PASS | |
| 19/10/2016 | H7 | H7 BASE | 3.5m-4m | 16-50793 | PASS | |
| 19/10/2016 | H6 | H6 BASE | 3.5m-4m | 16-50793 | PASS | |
| 20/10/2016 | I8 | I8 BASE | 3.5m-4m | 16-50793 | PASS | |
| 20/10/2016 | I8 | AREA 1/SF9 | 2.5m-3.5m | 16-50793 | PASS | |
| 20/10/2016 | I8 | AREA 1/EF8 | 2.5m-3.5m | 16-50793 | PASS | |
| 20/10/2016 | I7 | I7 BASE | 3.5m-4m | 16-50793 | PASS | |
| 20/10/2016 | I7 | AREA 1/EF7 | 2.5m-3.5m | 16-50793 | PASS | |
| 24/10/2016 | H3 | H3 BASE | 3.5m-4m | 16-50916 | PASS | |
| 24/10/2016 | H4 | H4 BASE | 3.5m-4m | 16-50916 | PASS | |
| 24/10/2016 | H5 | H5 BASE | 3.5m-4m | 16-50916 | PASS | |
| 25/10/2016 | I5 | I5 BASE | 3.5m-4m | 16-50916 | PASS | |
| 25/10/2016 | I6 | I6 BASE | 3.5m-4m | 16-50916 | PASS | |
| 21/10/2016 | G1 | AREA 1/EF1 | 2.5m-3.5m | 16-50916 | PASS | |
| 21/10/2016 | G2 | AREA 1/EF2 | 2.5m-3.5m | 16-50916 | PASS | |
| 24/10/2016 | H3 | AREA 1/EF3 | 2.5m-3.5m | 16-50916 | PASS | |
| 25/10/2016 | H4 | AREA 1/EF4 | 2.5m-3.5m | 16-50916 | PASS | |
| 25/10/2016 | I5 | AREA 1/EF5 | 2.5m-3.5m | 16-50916 | PASS | |
| 25/10/2016 | I6 | AREA 1/EF6 | 2.5m-3.5m | 16-50916 | PASS | |

| | |
|------------------------|------|
| Maximum concentration: | 8.86 |
| Minimum concentration: | BLDL |
| Average concentration: | 0.4 |

AREA 1 - VALIDATION DATA

AREA 1

| | | | | | | | | | | | | | | | | | | | |
|-----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|------------|
| Date Sampled | 02/09/2016 | 02/09/2016 | 02/09/2016 | 02/09/2016 | 02/09/2016 | 02/09/2016 | 02/09/2016 | 02/09/2016 | 02/09/2016 | 02/09/2016 | 02/09/2016 | 02/09/2016 | 02/09/2016 | 02/09/2016 | 02/09/2016 | 02/09/2016 | 02/09/2016 | 02/09/2016 | 02/09/2016 |
| Sample No | Area1/NF1 | Area1/WF1 | Area1/WF2 | Area1/WF3 | Area1/WF4 | Area1/WF5 | A1 Base | A2 base | A3 Base | A4 Base | A5 Base | Area1/NF2 | B1 Base | B2 Base | B3 Base | B4 Base | B5 Base | | |
| Depth (m) | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.50 | 3.50 - 4.00 | | |
| QTSE Sample No | 226316 | 226317 | 226318 | 226319 | 226320 | 226321 | 226322 | 226323 | 226324 | 226325 | 226326 | 226327 | 226328 | 226329 | 226330 | 226331 | 226332 | | |

| | | | | | | | | | | | | | | | | | | | | |
|------------|-------|-----|--------|-----|---|-----|----|---|----|----|-----|-----|-----|-----|-----|-----|----|---|---|-----|
| VOC | | | | | | | | | | | | | | | | | | | | |
| TCE | ug/kg | < 5 | MCERTS | < 5 | 7 | < 5 | 10 | 7 | 61 | 29 | < 5 | < 5 | < 5 | 170 | < 5 | < 5 | 23 | 9 | 9 | < 5 |

| | | | | | | | | | | | | | | | | | | | |
|-----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Date Sampled | 09/09/2016 | 09/09/2016 | 09/09/2016 | 09/09/2016 | 09/09/2016 | 09/09/2016 | 09/09/2016 | 09/09/2016 | 09/09/2016 | 09/09/2016 | 09/09/2016 | 16/09/2016 | 16/09/2016 | 16/09/2016 | 15/09/2016 | 15/09/2016 | 15/09/2016 | 15/09/2016 | 15/09/2016 |
| Sample No | AREA1/WF6 | A6 BASE | B6 BASE | AREA1/WF7 | A7 BASE | B7 BASE | AREA1/WF8 | A8 BASE | B8 BASE | AREA1/SF1 | AREA1/SF2 | AREA1/SF3 | AREA1/NF3 | C1 BASE | C2 BASE | C3 BASE | C4 BASE | | |
| Depth (m) | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 |
| QTSE Sample No | 228076 | 228077 | 228078 | 228079 | 228080 | 228081 | 228082 | 228083 | 228084 | 228087 | 228088 | 228089 | 228090 | 228091 | 228092 | 228093 | 228094 | | |

| | | | | | | | | | | | | | | | | | | | |
|------------|-------|-----|--------|-----|-----|-----|-----|-----|----|---|-----|-----|---|-----|-----|-----|-----|-----|----|
| VOC | | | | | | | | | | | | | | | | | | | |
| TCE | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 | 12 | 6 | < 5 | < 5 | 7 | < 5 | < 5 | < 5 | < 5 | < 5 | 16 |

| | | | | | | | | | | | | | | | | | | | |
|-----------------------|-------------|-------------|-------------|-------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|--|
| Date Sampled | 16/09/2016 | 16/09/2016 | 16/09/2016 | 16/09/2016 | 23/09/2016 | 19/09/2016 | 19/09/2016 | 20/09/2016 | 20/09/2016 | 20/09/2016 | 20/09/2016 | 21/09/2016 | 21/09/2016 | 22/09/2016 | 22/09/2016 | 23/09/2016 | 26/09/2016 | 26/09/2016 | |
| Sample No | C5 BASE | C6 BASE | C7 BASE | C8 BASE | Area 1/SF4 | Area 1/NF4 | D1 BASE | D2 BASE | D3 BASE | D4 BASE | D5 BASE | D6 BASE | D7 BASE | D8 BASE | Area 1/SF5 | Area 1/NF5 | E1 Base | | |
| Depth (m) | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 2.50-3.50 | 2.50-3.50 | 3.50-4.00 | 3.50-4.00 | 3.50-4.00 | 3.50-4.00 | 3.50-4.00 | 3.50-4.00 | 3.50-4.00 | 3.50-4.00 | 2.50 - 3.50 | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 | |
| QTSE Sample No | 228095 | 228096 | 228097 | 228098 | 229785 | 229786 | 229787 | 229788 | 229789 | 229790 | 229791 | 229792 | 229793 | 229794 | 230185 | 230186 | 230187 | | |

| | | | | | | | | | | | | | | | | | | | |
|------------|-------|-----|--------|-----|----|-----|-----|---|----|----|-----|-----|-----|------|-----|-----|-----|----|----|
| VOC | | | | | | | | | | | | | | | | | | | |
| TCE | ug/kg | < 5 | MCERTS | < 5 | 20 | < 5 | < 5 | 8 | 14 | 30 | 622 | < 5 | < 5 | 1386 | < 5 | < 5 | < 5 | 67 | 67 |

| | | | | | | | | | | | | | | | | | | | |
|-----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|-------------|--|
| Date Sampled | 26/09/2016 | 26/09/2016 | 27/09/2016 | 27/09/2016 | 27/09/2016 | 27/09/2016 | 23/09/2016 | 30/09/2016 | 30/09/2016 | 30/09/2016 | 30/09/2016 | 30/09/2016 | 30/09/2016 | 05/10/2016 | 06/10/2016 | 06/10/2016 | 05/10/2016 | 05/10/2016 | |
| Sample No | E2 Base | E3 Base | E4 Base | E5 Base | E6 Base | E7 Base | E8 Base | Area 1 / NF6 | F1 Base | F2 Base | F3 Base | F4 Base | F5 Base | F6 Base | F7 Base | F8 Base | Area 1 / SF6 | | |
| Depth (m) | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 2.50 - 3.50 | 2.50 - 3.50 | |
| QTSE Sample No | 230188 | 230189 | 230190 | 230191 | 230192 | 230193 | 230194 | 231639 | 231640 | 231641 | 231642 | 231643 | 231644 | 231645 | 231646 | 231647 | 231648 | | |

| | | | | | | | | | | | | | | | | | | | | |
|------------|-------|-----|--------|----|----|-----|----|----|----|----|-----|-----|-----|-----|---|-----|----|-----|---|-----|
| VOC | | | | | | | | | | | | | | | | | | | | |
| TCE | ug/kg | < 5 | MCERTS | 34 | 97 | 697 | 69 | 45 | 30 | 29 | < 5 | < 5 | < 5 | < 5 | 6 | < 5 | 13 | < 5 | 7 | < 5 |

| | | | | | | | | | | | | | | | | | | | |
|-----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--|
| Date Sampled | 17/10/2016 | 17/10/2016 | 17/10/2016 | 17/10/2016 | 17/10/2016 | 18/10/2016 | 18/10/2016 | 18/10/2016 | 19/10/2016 | 19/10/2016 | 19/10/2016 | 19/10/2016 | 19/10/2016 | 19/10/2016 | 19/10/2016 | 20/10/2016 | 20/10/2016 | 20/10/2016 | |
| Sample No | AREA 1/NF7 | G1 BASE | G2 BASE | G3 BASE | G4 BASE | G5 BASE | G6 BASE | G7 BASE | G8 BASE | AREA 1/SF7 | H8 BASE | AREA 1/SF8 | H7 BASE | H6 BASE | I8 BASE | AREA 1/SF9 | AREA 1/EF8 | | |
| Depth (m) | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 2.50 - 3.00 | 3.50 - 4.00 | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 | |
| QTSE Sample No | 234716 | 234717 | 234718 | 234719 | 234720 | 234721 | 234722 | 234723 | 234724 | 234725 | 234726 | 234727 | 234728 | 234729 | 234730 | 234731 | 234732 | | |

| | | | | | | | | | | | | | | | | | | | | |
|------------|-------|-----|--------|----|---|---|----|----|----|----|-----|----|------|----|-----|----|----|------|-----|-----|
| VOC | | | | | | | | | | | | | | | | | | | | |
| TCE | ug/kg | < 5 | MCERTS | 13 | 8 | 8 | 10 | 17 | 50 | 11 | < 5 | 10 | 8859 | 23 | 122 | 10 | 10 | 2054 | 117 | 629 |

| | | | | | | | | | | | | | |
|-----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Date Sampled | 20/10/2016 | 20/10/2016 | 24/10/2016 | 24/10/2016 | 24/10/2016 | 25/10/2016 | 25/10/2016 | 21/10/2016 | 21/10/2016 | 24/10/2016 | 25/10/2016 | 25/10/2016 | 25/10/2016 |
| Sample No | I7 BASE | AREA 1/EF7 | H3 Base | H4 Base | H5 Base | I5 Base | I6 Base | Area 1 / EF1 | Area 1 / EF2 | Area 1 / EF3 | Area 1 / EF4 | Area 1 / EF5 | Area 1 / EF6 |
| Depth (m) | 3.50 - 4.00 | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 |
| QTSE Sample No | 234733 | 234734 | 235200 | 235201 | 235202 | 235203 | 235204 | 235205 | 235206 | 235207 | 235208 | 235209 | 235210 |

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|------------|-------|-----|--------|-----|-----|------|-----|-----|-----|-----|------|------|---|----|-----|----|--|--|--|
| VOC | | | | | | | | | | | | | | | | | | | |
| TCE | ug/kg | < 5 | MCERTS | 341 | 350 | 1624 | 160 | < 5 | < 5 | < 5 | 3025 | 1185 | 9 | 95 | < 5 | 81 | | | |

| | | | | | | | | | | | | | |
|------------|-------|-----|--------|---------------|------------|----------------|------------------------|---------------|-----------------|--|--|--|--|
| VOC | | | | | | | | | | | | | |
| TCE | ug/kg | < 5 | MCERTS | MAX | MIN | AVERAGE | Remedial Target | >RT | In ug/kg | | | | |
| | | | | 8859.0 | 6.0 | 400.50 | 35 | 0 | 35000 | | | | |

GJ079 Nash Road, Redditch

Tested at 1 per 10m linear length on walls and 1 per grid square on bases

Summary of Soil Validation



| | |
|------|---|
| Area | 2 |
|------|---|

| Date | Grid Square | Sample Number | Depth (m) | Test Certificate | Test Result | Further Actions / Comments |
|------------|-------------|---------------|-----------|------------------|-------------|----------------------------|
| 27/10/2016 | K1 | AREA 2/NF1 | 2.5m-3.5m | 16-51122 | PASS | |
| 27/10/2016 | K1 | AREA 2/WF1 | 2.5m-3.5m | 16-51122 | PASS | |
| 27/10/2016 | K1 | K1 BASE | 3.5m-4m | 16-51122 | PASS | |
| 01/11/2016 | K2 | AREA 2/WF2 | 2.5m-3.5m | 16-51393 | PASS | |
| 01/11/2016 | K2 | K2 BASE | 3.5m-4m | 16-51393 | PASS | |
| 01/11/2016 | K3 | AREA 2/WF3 | 2.5m-3.5m | 16-51393 | PASS | |
| 01/11/2016 | K3 | K3 BASE | 3.5m-4m | 16-51393 | PASS | |
| 01/11/2016 | K4 | AREA 2/WF4 | 2.5m-3.5m | 16-51393 | PASS | |
| 01/11/2016 | K4 | K4 BASE | 3.5m-4m | 16-51393 | PASS | |
| 08/11/2016 | K5 | AREA 2/WF5 | 2.5m-3.5m | 16-51730 | PASS | |
| 08/11/2016 | L6 | AREA 2/WF6 | 2.5m-3.5m | 16-51730 | PASS | |
| 08/11/2016 | L7 | AREA 2/WF7 | 2.5m-3.5m | 16-51730 | PASS | |
| 08/11/2016 | L8 | AREA 2/WF8 | 2.5m-3.5m | 16-51730 | PASS | |
| 08/11/2016 | L8 | AREA 2/SF1 | 2.5m-3.5m | 16-51730 | PASS | |
| 14/11/2016 | K5 | K5 BASE | 3.5m-4m | 16-51730 | PASS | |
| 14/11/2016 | L1 | AREA 2/NF2 | 2.5m-3.5m | 16-51730 | PASS | |
| 14/11/2016 | L1 | L1 BASE | 3.5m-4m | 16-51730 | PASS | |
| 14/11/2016 | L2 | L2 BASE | 3.5m-4m | 16-51730 | PASS | |
| 14/11/2016 | L3 | L3 BASE | 3.5m-4m | 16-51730 | PASS | |
| 15/11/2016 | L4 | L4 BASE | 3.5m-4m | 16-51959 | PASS | |
| 15/11/2016 | L5 | L5 BASE | 3.5m-4m | 16-51959 | PASS | |
| 15/11/2016 | L6 | L6 BASE | 3.5m-4m | 16-51959 | PASS | |
| 15/11/2016 | L7 | L7 BASE | 3.5m-4m | 16-51959 | PASS | |
| 15/11/2016 | L8 | L8 BASE | 3.5m-4m | 16-51959 | PASS | |
| 15/11/2016 | L8 | AREA 2/SF2 | 2.5m-3.5m | 16-51959 | PASS | |
| 28/11/2016 | M1 | AREA 2/NF3 | 2.5m-3.5m | 16-52472 | PASS | |
| 28/11/2016 | M1 | M1 BASE | 3.5m-4m | 16-52472 | PASS | |
| 28/11/2016 | M2 | M2 BASE | 3.5m-4m | 16-52472 | PASS | |
| 28/11/2016 | M3 | M3 BASE | 3.5m-4m | 16-52472 | PASS | |
| 06/12/2016 | M4 | M4 BASE | 3.5m-4m | 16-52716 | PASS | |
| 06/12/2016 | M5 | M5 BASE | 3.5m-4m | 16-52716 | PASS | |
| 28/11/2016 | M6 | M6 BASE | 3.5m-4m | 16-52472 | PASS | |
| 28/11/2016 | M7 | M7 BASE | 3.5m-4m | 16-52472 | PASS | |
| 28/11/2016 | M8 | M8 BASE | 3.5m-4m | 16-52472 | PASS | |
| 28/11/2016 | M8 | AREA 2/SF3 | 2.5m-3.5m | 16-52472 | PASS | |
| 28/11/2016 | N1 | AREA 2/NF4 | 2.5m-3.5m | 16-52472 | PASS | |
| 28/11/2016 | N1 | N1 BASE | 3.5m-4m | 16-52472 | PASS | |
| 28/11/2016 | N2 | N2 BASE | 3.5m-4m | 16-52472 | PASS | |
| 28/11/2016 | N3 | N3 BASE | 3.5m-4m | 16-52472 | PASS | |
| 06/12/2016 | N4 | N4 BASE | 3.5m-4m | 16-52716 | PASS | |
| 06/12/2016 | N5 | N5 BASE | 3.5m-4m | 16-52716 | PASS | |
| 06/12/2016 | N6 | N6 BASE | 3.5m-4m | 16-52716 | PASS | |
| 28/11/2016 | N7 | N7 BASE | 3.5m-4m | 16-52472 | PASS | |
| 28/11/2016 | N8 | N8 BASE | 3.5m-4m | 16-52472 | PASS | |
| 28/11/2016 | N8 | AREA 2/SF4 | 2.5m-3.5m | 16-52472 | PASS | |
| 29/11/2016 | O8 | AREA 2/SF5 | 2.5m-3.5m | 16-52472 | PASS | |
| 29/11/2016 | O8 | O8 BASE | 3.5m-4m | 16-52472 | PASS | |
| 06/12/2016 | O7 | O7 BASE | 3.5m-4m | 16-52716 | PASS | |
| 06/12/2016 | P8 | AREA 2/SF6 | 2.5m-3.5m | 16-52716 | PASS | |

GJ079 Nash Road, Redditch

Tested at 1 per 10m linear length on walls and 1 per grid square on bases

Summary of Soil Validation



| | |
|------|---|
| Area | 2 |
|------|---|

| Date | Grid Square | Sample Number | Depth (m) | Test Certificate | Test Result | Further Actions / Comments |
|------------|-------------|---------------|-----------|------------------|-------------|----------------------------|
| 06/12/2016 | P8 | P8 BASE | 3.5m-4m | 16-52716 | PASS | |
| 06/12/2016 | P7 | P7 BASE | 3.5m-4m | 16-52716 | PASS | |
| 06/12/2016 | O1 | O1 BASE | 3.5m-4m | 16-52716 | PASS | |
| 06/12/2016 | O1 | AREA 2/NF5 | 2.5m-3.5m | 16-52716 | PASS | |
| 06/12/2016 | O2 | O2 BASE | 3.5m-4m | 16-52716 | PASS | |
| 06/12/2016 | O3 | O3 BASE | 3.5m-4m | 16-52716 | PASS | |
| 08/12/2016 | O4 | O4 BASE | 3.5m-4m | 16-52716 | PASS | |
| 08/12/2016 | O5 | O5 BASE | 3.5m-4m | 16-52716 | PASS | |
| 08/12/2016 | O6 | O6 BASE | 3.5m-4m | 16-52716 | PASS | |
| 04/01/2017 | P1 | P1 BASE | 3.5m-4m | 17-53382 | PASS | |
| 04/01/2017 | P1 | AREA 2/NF6 | 2.5m-3.5m | 17-53382 | PASS | |
| 04/01/2017 | P2 | P2 BASE | 3.5m-4m | 17-53382 | PASS | |
| 04/01/2017 | P3 | P3 BASE | 3.5m-4m | 17-53382 | PASS | |
| 04/01/2017 | P4 | P4 BASE | 3.5m-4m | 17-53382 | PASS | |
| 04/01/2017 | P5 | P5 BASE | 3.5m-4m | 17-53382 | PASS | |
| 04/01/2017 | P6 | P6 BASE | 3.5m-4m | 17-53382 | PASS | |
| 12/01/2017 | Q1 | AREA 2/NF7 | 2.5m-3.5m | 17-53641 | PASS | |
| 12/01/2017 | Q1 | Q1 BASE | 3.5m-4m | 17-53641 | PASS | |
| 12/01/2017 | Q2 | Q2 BASE | 3.5m-4m | 17-53641 | PASS | |
| 12/01/2017 | Q3 | Q3 BASE | 3.5m-4m | 17-53641 | PASS | |
| 12/01/2017 | Q4 | Q4 BASE | 3.5m-4m | 17-53641 | PASS | |
| 12/01/2017 | Q5 | Q5 BASE | 3.5m-4m | 17-53641 | PASS | |
| 12/01/2017 | Q6 | Q6 BASE | 3.5m-4m | 17-53641 | PASS | |
| 12/01/2017 | Q7 | Q7 BASE | 3.5m-4m | 17-53641 | PASS | |
| 12/01/2017 | Q8 | Q8 BASE | 3.5m-4m | 17-53641 | PASS | |
| 12/01/2017 | Q8 | AREA 2/SF7 | 2.5m-3.5m | 17-53641 | PASS | |
| 17/01/2017 | R3 | R3 BASE | 3.5m-4m | 17-53778 | PASS | |
| 17/01/2017 | R4 | R4 BASE | 3.5m-4m | 17-53778 | PASS | |
| 17/01/2017 | R5 | R5 BASE | 3.5m-4m | 17-53778 | PASS | |
| 17/01/2017 | R6 | R6 BASE | 3.5m-4m | 17-53778 | PASS | |
| 17/01/2017 | R7 | R7 BASE | 3.5m-4m | 17-53778 | PASS | |
| 17/01/2017 | R8 | R8 BASE | 3.5m-4m | 17-53778 | PASS | |
| 17/01/2017 | R8 | AREA 2/SF8 | 2.5m-3.5m | 17-53778 | PASS | |
| 25/01/2017 | R2 | R2 BASE | 3.5m-4m | 17-54303 | PASS | |
| 25/01/2017 | R1 | R1 BASE | 3.5m-4m | 17-54303 | PASS | |
| 25/01/2017 | R1 | AREA 2/NF8 | 2.5m-3.5m | 17-54303 | PASS | |
| 25/01/2017 | S8 | S8 BASE | 3.5m-4m | 17-54303 | PASS | |
| 25/01/2017 | S8 | AREA 2/SF9 | 2.5m-3.5m | 17-54303 | PASS | |
| 25/01/2017 | S7 | S7 BASE | 3.5m-4m | 17-54303 | PASS | |
| 25/01/2017 | S6 | S6 BASE | 3.5m-4m | 17-54303 | PASS | |
| 25/01/2017 | S5 | S5 BASE | 3.5m-4m | 17-54303 | PASS | |
| 25/01/2017 | S4 | S4 BASE | 3.5m-4m | 17-54303 | PASS | |
| 25/01/2017 | S3 | S3 BASE | 3.5m-4m | 17-54303 | PASS | |
| 08/02/2017 | S1 | S1 BASE | 3.5m-4m | 17-54958 | PASS | |
| 08/02/2017 | S1 | AREA 2/NF9 | 2.5m-3.5m | 17-54958 | PASS | |
| 08/02/2017 | S2 | S2 BASE | 3.5m-4m | 17-54958 | PASS | |
| 08/02/2017 | T1 | T1 BASE | 3.5m-4m | 17-54958 | PASS | |
| 08/02/2017 | T2 | T2 BASE | 3.5m-4m | 17-54958 | PASS | |
| 08/02/2017 | T3 | T3 BASE | 3.5m-4m | 17-54958 | PASS | |

GJ079 Nash Road, Redditch

Tested at 1 per 10m linear length on walls and 1 per grid square on bases

Summary of Soil Validation



| | |
|------|---|
| Area | 2 |
|------|---|

| Date | Grid Square | Sample Number | Depth (m) | Test Certificate | Test Result | Further Actions / Comments |
|------------|-------------|---------------|-----------|------------------|-------------|----------------------------|
| 08/02/2017 | T4 | T4 BASE | 3.5m-4m | 17-54958 | PASS | |
| 08/02/2017 | T5 | T5 BASE | 3.5m-4m | 17-54958 | PASS | |
| 08/02/2017 | T6 | T6 BASE | 3.5m-4m | 17-54958 | PASS | |
| 08/02/2017 | T7 | T7 BASE | 3.5m-4m | 17-54958 | PASS | |
| 08/02/2017 | T8 | T8 BASE | 3.5m-4m | 17-54958 | PASS | |
| 08/02/2017 | T1 | AREA 2/NF10 | 2.5m-3.5m | 17-54958 | PASS | |
| 08/02/2017 | T8 | AREA 2/SF10 | 2.5m-3.5m | 17-54958 | PASS | |
| 08/02/2017 | T1 | AREA 2/EF1 | 2.5m-3.5m | 17-54958 | PASS | |
| 08/02/2017 | T2 | AREA 2/EF2 | 2.5m-3.5m | 17-54958 | PASS | |
| 08/02/2017 | T3 | AREA 2/EF3 | 2.5m-3.5m | 17-54958 | PASS | |
| 08/02/2017 | T4 | AREA 2/EF4 | 2.5m-3.5m | 17-54958 | PASS | |
| 08/02/2017 | T5 | AREA 2/EF5 | 2.5m-3.5m | 17-54958 | PASS | |
| 08/02/2017 | T6 | AREA 2/EF6 | 2.5m-3.5m | 17-54958 | PASS | |
| 08/02/2017 | T7 | AREA 2/EF7 | 2.5m-3.5m | 17-54958 | PASS | |
| 08/02/2017 | T8 | AREA 2/EF8 | 2.5m-3.5m | 17-54958 | PASS | |

| | |
|------------------------|-------|
| Maximum concentration: | 9.311 |
| Minimum concentration: | BLDL |
| Average concentration: | 1.036 |



Appendix F – Laboratory certificates



Gareth Thornton
G & J Geoenvironmental Consultants Ltd
35-37 High Street
Barrow-upon-Soar
Loughborough
Leicestershire
LE12 8PY

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Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410
russell.jarvis@qtsevenvironmental.com

QTS Environmental Report No: 16-47533

Site Reference: Nash Road, Redditch (St Francis Group)

Project / Job Ref: GJ079

Order No: 138

Sample Receipt Date: 03/08/2016

Sample Scheduled Date: 03/08/2016

Report Issue Number: 2

Reporting Date: 10/08/2016

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Russell Jarvis
Associate Director of Client Services



QTS Environmental Ltd
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 Lenham Heath
 Maidstone
 Kent ME17 2JN
 Tel : 01622 850410



| Soil Analysis Certificate | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-47533 | Date Sampled | 02/08/16 | 02/08/16 | 02/08/16 | 02/08/16 | 02/08/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU1 | SFU2 | SFU3 | SFU4 | SFU5 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 10/08/2016 | QTSE Sample No | 220750 | 220751 | 220752 | 220753 | 220754 |

| Determinand | Unit | RL | Accreditation | | | | | |
|----------------|-------|-------|---------------|-------|-------|-------|-------|-------|
| Arsenic (As) | mg/kg | < 2 | MCERTS | 8 | 5 | 4 | 7 | 8 |
| Barium (Ba) | mg/kg | < 5 | NONE | 189 | 180 | 104 | 134 | 145 |
| Beryllium (Be) | mg/kg | < 0.5 | NONE | 1.3 | 1.2 | 0.7 | 1.2 | 0.9 |
| Cadmium (Cd) | mg/kg | < 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Chromium (Cr) | mg/kg | < 2 | MCERTS | 46 | 40 | 22 | 36 | 28 |
| Copper (Cu) | mg/kg | < 4 | MCERTS | 20 | 15 | 11 | 16 | 14 |
| Lead (Pb) | mg/kg | < 3 | MCERTS | 21 | 4 | 7 | 7 | 10 |
| Mercury (Hg) | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | < 1 | < 1 |
| Nickel (Ni) | mg/kg | < 3 | MCERTS | 39 | 37 | 16 | 28 | 23 |
| Selenium (Se) | mg/kg | < 3 | NONE | < 3 | < 3 | < 3 | < 3 | < 3 |
| Vanadium (V) | mg/kg | < 2 | NONE | 48 | 41 | 29 | 41 | 36 |
| Zinc (Zn) | mg/kg | < 3 | MCERTS | 81 | 60 | 48 | 57 | 51 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
 Analysis carried out on the dried sample is corrected for the stone content
 Subcontracted analysis ⁽⁵⁾



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 Lenham Heath
 Maidstone
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| Soil Analysis Certificate | | | | | | |
|--|-----------------|---------------|--|--|--|--|
| QTS Environmental Report No: 16-47533 | Date Sampled | 02/08/16 | | | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | | | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU6 | | | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | | | | |
| Order No: 138 | Depth (m) | None Supplied | | | | |
| Reporting Date: 10/08/2016 | QTSE Sample No | 220755 | | | | |

| Determinand | Unit | RL | Accreditation | | | | |
|----------------|-------|-------|---------------|-------|--|--|--|
| Arsenic (As) | mg/kg | < 2 | MCERTS | 5 | | | |
| Barium (Ba) | mg/kg | < 5 | NONE | 80 | | | |
| Beryllium (Be) | mg/kg | < 0.5 | NONE | 0.6 | | | |
| Cadmium (Cd) | mg/kg | < 0.2 | MCERTS | < 0.2 | | | |
| Chromium (Cr) | mg/kg | < 2 | MCERTS | 21 | | | |
| Copper (Cu) | mg/kg | < 4 | MCERTS | 11 | | | |
| Lead (Pb) | mg/kg | < 3 | MCERTS | 12 | | | |
| Mercury (Hg) | mg/kg | < 1 | NONE | < 1 | | | |
| Nickel (Ni) | mg/kg | < 3 | MCERTS | 16 | | | |
| Selenium (Se) | mg/kg | < 3 | NONE | < 3 | | | |
| Vanadium (V) | mg/kg | < 2 | NONE | 25 | | | |
| Zinc (Zn) | mg/kg | < 3 | MCERTS | 40 | | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
 Analysis carried out on the dried sample is corrected for the stone content
 Subcontracted analysis ⁽⁵⁾



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| Soil Analysis Certificate - Speciated PAHs | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-47533 | Date Sampled | 02/08/16 | 02/08/16 | 02/08/16 | 02/08/16 | 02/08/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU1 | SFU2 | SFU3 | SFU4 | SFU5 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 10/08/2016 | QTSE Sample No | 220750 | 220751 | 220752 | 220753 | 220754 |

| Determinand | Unit | RL | Accreditation | | | | | |
|------------------------|-------|-------|---------------|-------|-------|-------|-------|-------|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | < 1.6 | < 1.6 | < 1.6 | < 1.6 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Speciated PAHs | | | | | | |
|--|-----------------|---------------|--|--|--|--|
| QTS Environmental Report No: 16-47533 | Date Sampled | 02/08/16 | | | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | | | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU6 | | | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | | | | |
| Order No: 138 | Depth (m) | None Supplied | | | | |
| Reporting Date: 10/08/2016 | QTSE Sample No | 220755 | | | | |

| Determinand | Unit | RL | Accreditation | | | | |
|------------------------|-------|-------|---------------|-------|--|--|--|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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Soil Analysis Certificate - TPH CWG Banded

| | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-47533 | Date Sampled | 02/08/16 | 02/08/16 | 02/08/16 | 02/08/16 | 02/08/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU1 | SFU2 | SFU3 | SFU4 | SFU5 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 10/08/2016 | QTSE Sample No | 220750 | 220751 | 220752 | 220753 | 220754 |

| Determinand | Unit | RL | Accreditation | 02/08/16 | 02/08/16 | 02/08/16 | 02/08/16 | 02/08/16 |
|----------------------|-------|--------|---------------|----------|----------|----------|----------|----------|
| Aliphatic >C5 - C6 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Aliphatic >C6 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Aliphatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aliphatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aliphatic >C12 - C16 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | < 3 | < 3 |
| Aliphatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | < 3 | < 3 |
| Aliphatic >C21 - C34 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| Aliphatic (C5 - C34) | mg/kg | < 21 | NONE | < 21 | < 21 | < 21 | < 21 | < 21 |
| Aromatic >C5 - C7 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Aromatic >C7 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Aromatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aromatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aromatic >C12 - C16 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aromatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | < 3 | < 3 |
| Aromatic >C21 - C35 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| Aromatic (C5 - C35) | mg/kg | < 21 | NONE | < 21 | < 21 | < 21 | < 21 | < 21 |
| Total >C5 - C35 | mg/kg | < 42 | NONE | < 42 | < 42 | < 42 | < 42 | < 42 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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Soil Analysis Certificate - TPH CWG Banded

| | | | | | | |
|--|-----------------|---------------|--|--|--|--|
| QTS Environmental Report No: 16-47533 | Date Sampled | 02/08/16 | | | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | | | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU6 | | | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | | | | |
| Order No: 138 | Depth (m) | None Supplied | | | | |
| Reporting Date: 10/08/2016 | QTSE Sample No | 220755 | | | | |

| Determinand | Unit | RL | Accreditation | | | | |
|----------------------|-------|--------|---------------|--------|--|--|--|
| Aliphatic >C5 - C6 | mg/kg | < 0.01 | NONE | < 0.01 | | | |
| Aliphatic >C6 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | | | |
| Aliphatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | | | |
| Aliphatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | | | |
| Aliphatic >C12 - C16 | mg/kg | < 3 | MCERTS | < 3 | | | |
| Aliphatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | | | |
| Aliphatic >C21 - C34 | mg/kg | < 10 | MCERTS | < 10 | | | |
| Aliphatic (C5 - C34) | mg/kg | < 21 | NONE | < 21 | | | |
| Aromatic >C5 - C7 | mg/kg | < 0.01 | NONE | < 0.01 | | | |
| Aromatic >C7 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | | | |
| Aromatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | | | |
| Aromatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | | | |
| Aromatic >C12 - C16 | mg/kg | < 2 | MCERTS | < 2 | | | |
| Aromatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | | | |
| Aromatic >C21 - C35 | mg/kg | < 10 | MCERTS | < 10 | | | |
| Aromatic (C5 - C35) | mg/kg | < 21 | NONE | < 21 | | | |
| Total >C5 - C35 | mg/kg | < 42 | NONE | < 42 | | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - BTEX / MTBE | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-47533 | Date Sampled | 02/08/16 | 02/08/16 | 02/08/16 | 02/08/16 | 02/08/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU1 | SFU2 | SFU3 | SFU4 | SFU5 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 10/08/2016 | QTSE Sample No | 220750 | 220751 | 220752 | 220753 | 220754 |

| Determinand | Unit | RL | Accreditation | | | | | |
|--------------|-------|-----|---------------|-----|-----|-----|-----|-----|
| Benzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Ethylbenzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| p & m-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| o-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - BTEX / MTBE | | | | | | |
|--|-----------------|---------------|--|--|--|--|
| QTS Environmental Report No: 16-47533 | Date Sampled | 02/08/16 | | | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | | | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU6 | | | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | | | | |
| Order No: 138 | Depth (m) | None Supplied | | | | |
| Reporting Date: 10/08/2016 | QTSE Sample No | 220755 | | | | |

| Determinand | Unit | RL | Accreditation | | | | |
|--------------|-------|-----|---------------|-----|--|--|--|
| Benzene | ug/kg | < 2 | MCERTS | < 2 | | | |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | | | |
| Ethylbenzene | ug/kg | < 2 | MCERTS | < 2 | | | |
| p & m-xylene | ug/kg | < 2 | MCERTS | < 2 | | | |
| o-xylene | ug/kg | < 2 | MCERTS | < 2 | | | |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-47533 | Date Sampled | 02/08/16 | 02/08/16 | 02/08/16 | 02/08/16 | 02/08/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU1 | SFU2 | SFU3 | SFU4 | SFU5 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 10/08/2016 | QTSE Sample No | 220750 | 220751 | 220752 | 220753 | 220754 |

| Determinand | Unit | RL | Accreditation | | | | | |
|---------------------------|-------|------|---------------|------|------|------|------|------|
| Dichlorodifluoromethane | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Vinyl Chloride | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Chloromethane | ug/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| Chloroethane | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromomethane | ug/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| Trichlorofluoromethane | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloroethene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| trans-1,2-Dichloroethene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloroethane | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| cis-1,2-Dichloroethene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| 2,2-Dichloropropane | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Chloroform | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromochloromethane | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1,1-Trichloroethane | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1-Dichloropropene | ug/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| Carbon Tetrachloride | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dichloroethane | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Benzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| 1,2-Dichloropropane | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Trichloroethene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromodichloromethane | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Dibromomethane | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| TAME | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| cis-1,3-Dichloropropene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| trans-1,3-Dichloropropene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1,2-Trichloroethane | ug/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| 1,3-Dichloropropane | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Tetrachloroethene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Dibromochloromethane | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dibromoethane | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Chlorobenzene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1,1,2-Tetrachloroethane | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Ethyl Benzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| m,p-Xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| o-Xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Styrene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromoform | ug/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| Isopropylbenzene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,1,2,2-Tetrachloroethane | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2,3-Trichloropropane | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| n-Propylbenzene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Bromobenzene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| 2-Chlorotoluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,3,5-Trimethylbenzene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| 4-Chlorotoluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| tert-Butylbenzene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2,4-Trimethylbenzene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| sec-Butylbenzene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| p-Isopropyltoluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,3-Dichlorobenzene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,4-Dichlorobenzene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| n-Butylbenzene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| 1,2-Dichlorobenzene | ug/kg | < 5 | MCERTS | 20 | < 5 | < 5 | < 5 | < 5 |
| 2-Dibromo-3-chloropropane | ug/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| Hexachlorobutadiene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | |
|--|-----------------|---------------|--|
| QTS Environmental Report No: 16-47533 | Date Sampled | 02/08/16 | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU6 | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | |
| Order No: 138 | Depth (m) | None Supplied | |
| Reporting Date: 10/08/2016 | QTSE Sample No | 220755 | |

| Determinand | Unit | RL | Accreditation | | | | |
|----------------------------|-------|------|---------------|------|--|--|--|
| Dichlorodifluoromethane | ug/kg | < 5 | MCERTS | < 5 | | | |
| Vinyl Chloride | ug/kg | < 5 | MCERTS | < 5 | | | |
| Chloromethane | ug/kg | < 10 | MCERTS | < 10 | | | |
| Chloroethane | ug/kg | < 5 | MCERTS | < 5 | | | |
| Bromomethane | ug/kg | < 10 | MCERTS | < 10 | | | |
| Trichlorofluoromethane | ug/kg | < 5 | MCERTS | < 5 | | | |
| 1,1-Dichloroethene | ug/kg | < 5 | MCERTS | < 5 | | | |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | | | |
| trans-1,2-Dichloroethene | ug/kg | < 5 | MCERTS | < 5 | | | |
| 1,1-Dichloroethane | ug/kg | < 5 | MCERTS | < 5 | | | |
| cis-1,2-Dichloroethene | ug/kg | < 5 | MCERTS | < 5 | | | |
| 2,2-Dichloropropane | ug/kg | < 5 | MCERTS | < 5 | | | |
| Chloroform | ug/kg | < 5 | MCERTS | < 5 | | | |
| Bromochloromethane | ug/kg | < 5 | MCERTS | < 5 | | | |
| 1,1,1-Trichloroethane | ug/kg | < 5 | MCERTS | < 5 | | | |
| 1,1-Dichloropropene | ug/kg | < 10 | MCERTS | < 10 | | | |
| Carbon Tetrachloride | ug/kg | < 5 | MCERTS | < 5 | | | |
| 1,2-Dichloroethane | ug/kg | < 5 | MCERTS | < 5 | | | |
| Benzene | ug/kg | < 2 | MCERTS | < 2 | | | |
| 1,2-Dichloropropane | ug/kg | < 5 | MCERTS | < 5 | | | |
| Trichloroethene | ug/kg | < 5 | MCERTS | < 5 | | | |
| Bromodichloromethane | ug/kg | < 5 | MCERTS | < 5 | | | |
| Dibromomethane | ug/kg | < 5 | MCERTS | < 5 | | | |
| TAME | ug/kg | < 5 | MCERTS | < 5 | | | |
| cis-1,3-Dichloropropene | ug/kg | < 5 | MCERTS | < 5 | | | |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | | | |
| trans-1,3-Dichloropropene | ug/kg | < 5 | MCERTS | < 5 | | | |
| 1,1,2-Trichloroethane | ug/kg | < 10 | MCERTS | < 10 | | | |
| 1,3-Dichloropropane | ug/kg | < 5 | MCERTS | < 5 | | | |
| Tetrachloroethene | ug/kg | < 5 | MCERTS | < 5 | | | |
| Dibromochloromethane | ug/kg | < 5 | MCERTS | < 5 | | | |
| 1,2-Dibromoethane | ug/kg | < 5 | MCERTS | < 5 | | | |
| Chlorobenzene | ug/kg | < 5 | MCERTS | < 5 | | | |
| 1,1,1,2-Tetrachloroethane | ug/kg | < 5 | MCERTS | < 5 | | | |
| Ethyl Benzene | ug/kg | < 2 | MCERTS | < 2 | | | |
| m,p-Xylene | ug/kg | < 2 | MCERTS | < 2 | | | |
| o-Xylene | ug/kg | < 2 | MCERTS | < 2 | | | |
| Styrene | ug/kg | < 5 | MCERTS | < 5 | | | |
| Bromoform | ug/kg | < 10 | MCERTS | < 10 | | | |
| Isopropylbenzene | ug/kg | < 5 | MCERTS | < 5 | | | |
| 1,1,2,2-Tetrachloroethane | ug/kg | < 5 | MCERTS | < 5 | | | |
| 1,2,3-Trichloropropane | ug/kg | < 5 | MCERTS | < 5 | | | |
| n-Propylbenzene | ug/kg | < 5 | MCERTS | < 5 | | | |
| Bromobenzene | ug/kg | < 5 | MCERTS | < 5 | | | |
| 2-Chlorotoluene | ug/kg | < 5 | MCERTS | < 5 | | | |
| 1,3,5-Trimethylbenzene | ug/kg | < 5 | MCERTS | < 5 | | | |
| 4-Chlorotoluene | ug/kg | < 5 | MCERTS | < 5 | | | |
| tert-Butylbenzene | ug/kg | < 5 | MCERTS | < 5 | | | |
| 1,2,4-Trimethylbenzene | ug/kg | < 5 | MCERTS | < 5 | | | |
| sec-Butylbenzene | ug/kg | < 5 | MCERTS | < 5 | | | |
| p-Isopropyltoluene | ug/kg | < 5 | MCERTS | < 5 | | | |
| 1,3-Dichlorobenzene | ug/kg | < 5 | MCERTS | < 5 | | | |
| 1,4-Dichlorobenzene | ug/kg | < 5 | MCERTS | < 5 | | | |
| n-Butylbenzene | ug/kg | < 5 | MCERTS | < 5 | | | |
| 1,2-Dichlorobenzene | ug/kg | < 5 | MCERTS | < 5 | | | |
| ,2-Dibromo-3-chloropropane | ug/kg | < 10 | MCERTS | < 10 | | | |
| Hexachlorobutadiene | ug/kg | < 5 | MCERTS | < 5 | | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Sample Descriptions | |
|--|--|
| QTS Environmental Report No: 16-47533 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (St Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 10/08/2016 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|------------|-----------------|---------------|----------------------|---------------------------|
| 220750 | SFU1 | Composite | None Supplied | 17.3 | Red clay |
| 220751 | SFU2 | Composite | None Supplied | 15.3 | Red clay |
| 220752 | SFU3 | Composite | None Supplied | 13.3 | Brown clay |
| 220753 | SFU4 | Composite | None Supplied | 13 | Red clay |
| 220754 | SFU5 | Composite | None Supplied | 14.1 | Red clay |
| 220755 | SFU6 | Composite | None Supplied | 11 | Red clay with stones |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{1/5}

Unsuitable Sample ^{u/s}

| Soil Analysis Certificate - Methodology & Miscellaneous Information | |
|--|--|
| QTS Environmental Report No: 16-47533 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (St Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 10/08/2016 | |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCS | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

D Dried
AR As Received



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QTS Environmental Report No: 16-48570

Site Reference: Nash Road, Redditch (St Francis Group)

Project / Job Ref: GJ079

Order No: 138

Sample Receipt Date: 30/08/2016

Sample Scheduled Date: 30/08/2016

Report Issue Number: 2

Reporting Date: 06/09/2016

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Russell Jarvis
Associate Director of Client Services



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| Soil Analysis Certificate | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-48570 | Date Sampled | 24/08/16 | 24/08/16 | 26/08/16 | 26/08/16 | 26/08/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU7 | SFU8 | SFU9 | SFU10 | SFU11 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 06/09/2016 | QTSE Sample No | 225208 | 225209 | 225210 | 225211 | 225212 |

| Determinand | Unit | RL | Accreditation | | | | | |
|----------------|-------|-------|---------------|-------|-------|-------|-------|-------|
| Arsenic (As) | mg/kg | < 2 | MCERTS | 6 | 6 | 7 | 13 | 7 |
| Barium (Ba) | mg/kg | < 5 | NONE | 232 | 228 | 107 | 173 | 100 |
| Beryllium (Be) | mg/kg | < 0.5 | NONE | 1.1 | 1.1 | 0.8 | 1 | 0.7 |
| W/S Boron | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | < 1 | < 1 |
| Cadmium (Cd) | mg/kg | < 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Chromium (Cr) | mg/kg | < 2 | MCERTS | 44 | 40 | 24 | 32 | 21 |
| Copper (Cu) | mg/kg | < 4 | MCERTS | 11 | 13 | 12 | 16 | 13 |
| Lead (Pb) | mg/kg | < 3 | MCERTS | 4 | 5 | 12 | 15 | 12 |
| Mercury (Hg) | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | < 1 | < 1 |
| Nickel (Ni) | mg/kg | < 3 | MCERTS | 47 | 43 | 21 | 32 | 19 |
| Selenium (Se) | mg/kg | < 3 | NONE | < 3 | < 3 | < 3 | < 3 | < 3 |
| Vanadium (V) | mg/kg | < 2 | NONE | 41 | 39 | 33 | 45 | 30 |
| Zinc (Zn) | mg/kg | < 3 | MCERTS | 62 | 66 | 51 | 72 | 45 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
 Analysis carried out on the dried sample is corrected for the stone content
 Subcontracted analysis ⁽⁵⁾



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| Soil Analysis Certificate | | | | | |
|--|-----------------|---------------|--|--|--|
| QTS Environmental Report No: 16-48570 | Date Sampled | 26/08/16 | | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU12 | | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | | | |
| Order No: 138 | Depth (m) | None Supplied | | | |
| Reporting Date: 06/09/2016 | QTSE Sample No | 225213 | | | |

| Determinand | Unit | RL | Accreditation | | | | |
|----------------|-------|-------|---------------|-------|--|--|--|
| Arsenic (As) | mg/kg | < 2 | MCERTS | 9 | | | |
| Barium (Ba) | mg/kg | < 5 | NONE | 141 | | | |
| Beryllium (Be) | mg/kg | < 0.5 | NONE | 0.8 | | | |
| W/S Boron | mg/kg | < 1 | NONE | < 1 | | | |
| Cadmium (Cd) | mg/kg | < 0.2 | MCERTS | < 0.2 | | | |
| Chromium (Cr) | mg/kg | < 2 | MCERTS | 27 | | | |
| Copper (Cu) | mg/kg | < 4 | MCERTS | 12 | | | |
| Lead (Pb) | mg/kg | < 3 | MCERTS | 8 | | | |
| Mercury (Hg) | mg/kg | < 1 | NONE | < 1 | | | |
| Nickel (Ni) | mg/kg | < 3 | MCERTS | 29 | | | |
| Selenium (Se) | mg/kg | < 3 | NONE | < 3 | | | |
| Vanadium (V) | mg/kg | < 2 | NONE | 33 | | | |
| Zinc (Zn) | mg/kg | < 3 | MCERTS | 55 | | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
 Analysis carried out on the dried sample is corrected for the stone content
 Subcontracted analysis ⁽⁵⁾



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| Soil Analysis Certificate - Speciated PAHs | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-48570 | Date Sampled | 24/08/16 | 24/08/16 | 26/08/16 | 26/08/16 | 26/08/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU7 | SFU8 | SFU9 | SFU10 | SFU11 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 06/09/2016 | QTSE Sample No | 225208 | 225209 | 225210 | 225211 | 225212 |

| Determinand | Unit | RL | Accreditation | | | | | |
|------------------------|-------|-------|---------------|-------|-------|-------|-------|-------|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | < 1.6 | < 1.6 | < 1.6 | < 1.6 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Speciated PAHs | | | | | | |
|--|-----------------|---------------|--|--|--|--|
| QTS Environmental Report No: 16-48570 | Date Sampled | 26/08/16 | | | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | | | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU12 | | | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | | | | |
| Order No: 138 | Depth (m) | None Supplied | | | | |
| Reporting Date: 06/09/2016 | QTSE Sample No | 225213 | | | | |

| Determinand | Unit | RL | Accreditation | | | | |
|------------------------|-------|-------|---------------|-------|--|--|--|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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Soil Analysis Certificate - TPH CWG Banded

| | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-48570 | Date Sampled | 24/08/16 | 24/08/16 | 26/08/16 | 26/08/16 | 26/08/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU7 | SFU8 | SFU9 | SFU10 | SFU11 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 06/09/2016 | QTSE Sample No | 225208 | 225209 | 225210 | 225211 | 225212 |

| Determinand | Unit | RL | Accreditation | 24/08/16 | 24/08/16 | 26/08/16 | 26/08/16 | 26/08/16 |
|----------------------|-------|--------|---------------|----------|----------|----------|----------|----------|
| Aliphatic >C5 - C6 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Aliphatic >C6 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Aliphatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aliphatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aliphatic >C12 - C16 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | < 3 | < 3 |
| Aliphatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | < 3 | < 3 |
| Aliphatic >C21 - C34 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| Aliphatic (C5 - C34) | mg/kg | < 21 | NONE | < 21 | < 21 | < 21 | < 21 | < 21 |
| Aromatic >C5 - C7 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Aromatic >C7 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Aromatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aromatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aromatic >C12 - C16 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aromatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | < 3 | < 3 |
| Aromatic >C21 - C35 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| Aromatic (C5 - C35) | mg/kg | < 21 | NONE | < 21 | < 21 | < 21 | < 21 | < 21 |
| Total >C5 - C35 | mg/kg | < 42 | NONE | < 42 | < 42 | < 42 | < 42 | < 42 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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Soil Analysis Certificate - TPH CWG Banded

| | | | | | | |
|--|-----------------|---------------|--|--|--|--|
| QTS Environmental Report No: 16-48570 | Date Sampled | 26/08/16 | | | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | | | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU12 | | | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | | | | |
| Order No: 138 | Depth (m) | None Supplied | | | | |
| Reporting Date: 06/09/2016 | QTSE Sample No | 225213 | | | | |

| Determinand | Unit | RL | Accreditation | | | | |
|----------------------|-------|--------|---------------|--------|--|--|--|
| Aliphatic >C5 - C6 | mg/kg | < 0.01 | NONE | < 0.01 | | | |
| Aliphatic >C6 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | | | |
| Aliphatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | | | |
| Aliphatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | | | |
| Aliphatic >C12 - C16 | mg/kg | < 3 | MCERTS | < 3 | | | |
| Aliphatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | | | |
| Aliphatic >C21 - C34 | mg/kg | < 10 | MCERTS | < 10 | | | |
| Aliphatic (C5 - C34) | mg/kg | < 21 | NONE | < 21 | | | |
| Aromatic >C5 - C7 | mg/kg | < 0.01 | NONE | < 0.01 | | | |
| Aromatic >C7 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | | | |
| Aromatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | | | |
| Aromatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | | | |
| Aromatic >C12 - C16 | mg/kg | < 2 | MCERTS | < 2 | | | |
| Aromatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | | | |
| Aromatic >C21 - C35 | mg/kg | < 10 | MCERTS | < 10 | | | |
| Aromatic (C5 - C35) | mg/kg | < 21 | NONE | < 21 | | | |
| Total >C5 - C35 | mg/kg | < 42 | NONE | < 42 | | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - BTEX / MTBE | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-48570 | Date Sampled | 24/08/16 | 24/08/16 | 26/08/16 | 26/08/16 | 26/08/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU7 | SFU8 | SFU9 | SFU10 | SFU11 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 06/09/2016 | QTSE Sample No | 225208 | 225209 | 225210 | 225211 | 225212 |

| Determinand | Unit | RL | Accreditation | | | | | |
|--------------|-------|-----|---------------|-----|-----|-----|-----|-----|
| Benzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Ethylbenzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| p & m-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| o-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - BTEX / MTBE | | | | | | |
|--|-----------------|---------------|--|--|--|--|
| QTS Environmental Report No: 16-48570 | Date Sampled | 26/08/16 | | | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | | | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU12 | | | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | | | | |
| Order No: 138 | Depth (m) | None Supplied | | | | |
| Reporting Date: 06/09/2016 | QTSE Sample No | 225213 | | | | |

| Determinand | Unit | RL | Accreditation | | | | |
|--------------|-------|-----|---------------|-----|--|--|--|
| Benzene | ug/kg | < 2 | MCERTS | < 2 | | | |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | | | |
| Ethylbenzene | ug/kg | < 2 | MCERTS | < 2 | | | |
| p & m-xylene | ug/kg | < 2 | MCERTS | < 2 | | | |
| o-xylene | ug/kg | < 2 | MCERTS | < 2 | | | |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-48570 | Date Sampled | 24/08/16 | 24/08/16 | 26/08/16 | 26/08/16 | 26/08/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU7 | SFU8 | SFU9 | SFU10 | SFU11 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 06/09/2016 | QTSE Sample No | 225208 | 225209 | 225210 | 225211 | 225212 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|-----|-----|-----|-----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|--|--|--|--|
| QTS Environmental Report No: 16-48570 | Date Sampled | 26/08/16 | | | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | | | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU12 | | | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | | | | |
| Order No: 138 | Depth (m) | None Supplied | | | | |
| Reporting Date: 06/09/2016 | QTSE Sample No | 225213 | | | | |

| Determinand | Unit | RL | Accreditation | | | |
|-----------------|-------|-----|---------------|-----|--|--|
| Trichloroethene | ug/kg | < 5 | MCERTS | < 5 | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Sample Descriptions | |
|--|--|
| QTS Environmental Report No: 16-48570 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (St Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 06/09/2016 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|------------|-----------------|---------------|----------------------|---------------------------|
| 225208 | SFU7 | Composite | None Supplied | 10.7 | Red clay |
| 225209 | SFU8 | Composite | None Supplied | 5.1 | Brown clay |
| 225210 | SFU9 | Composite | None Supplied | 11.6 | Brown clay with stones |
| 225211 | SFU10 | Composite | None Supplied | 10.2 | Brown clay with stones |
| 225212 | SFU11 | Composite | None Supplied | 10.3 | Brown clay with stones |
| 225213 | SFU12 | Composite | None Supplied | 12.1 | Brown clay with stones |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{I/S}

Unsuitable Sample ^{U/S}

| | |
|--|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information | |
| QTS Environmental Report No: 16-48570 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (St Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 06/09/2016 | |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCs | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

D Dried
AR As Received



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russell.jarvis@qtsevenvironmental.com

QTS Environmental Report No: 16-48868

Site Reference: Nash Road, Redditch (St Francis Group)

Project / Job Ref: GJ079

Order No: 138

Sample Receipt Date: 07/09/2016

Sample Scheduled Date: 07/09/2016

Report Issue Number: 1

Reporting Date: 13/09/2016

Authorised by:

Russell Jarvis
Associate Director of Client Services

Authorised by:

Ela Mysiara
Inorganics & ICP Section Head



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 Lenham Heath
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 Tel : 01622 850410



| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-48868 | Date Sampled | 02/09/16 | 02/09/16 | 02/09/16 | 02/09/16 | 02/09/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | Area1/NF1 | Area1/WF1 | Area1/WF2 | Area1/WF3 | Area1/WF4 |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 |
| Reporting Date: 13/09/2016 | QTSE Sample No | 226316 | 226317 | 226318 | 226319 | 226320 |

| Determinand | Unit | RL | Accreditation | | | | |
|-----------------|-------|-----|---------------|-----|---|-----|----|
| Trichloroethene | ug/kg | < 5 | MCERTS | < 5 | 7 | < 5 | 10 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-48868 | Date Sampled | 02/09/16 | 02/09/16 | 02/09/16 | 02/09/16 | 02/09/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | Area1/WF5 | A1 Base | A2 base | A3 Base | A4 Base |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 |
| Reporting Date: 13/09/2016 | QTSE Sample No | 226321 | 226322 | 226323 | 226324 | 226325 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|----|----|-----|-----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 61 | 29 | < 5 | < 5 | < 5 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-48868 | Date Sampled | 02/09/16 | 02/09/16 | 02/09/16 | 02/09/16 | 02/09/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | A5 Base | Area1/NF2 | B1 Base | B2 Base | B3 Base |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 |
| Reporting Date: 13/09/2016 | QTSE Sample No | 226326 | 226327 | 226328 | 226329 | 226330 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|-----|-----|-----|----|---|
| Trichloroethene | ug/kg | < 5 | MCERTS | 170 | < 5 | < 5 | 23 | 9 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | |
|--|-----------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-48868 | Date Sampled | 02/09/16 | 02/09/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | B4 Base | B5 Base | | |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | | |
| Order No: 138 | Depth (m) | 3.50 - 4.50 | 3.50 - 4.00 | | |
| Reporting Date: 13/09/2016 | QTSE Sample No | 226331 | 226332 | | |

| Determinand | Unit | RL | Accreditation | | |
|-----------------|-------|-----|---------------|---|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 9 | < 5 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Sample Descriptions | |
|--|--|
| QTS Environmental Report No: 16-48868 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (St Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 13/09/2016 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|------------|-----------------|-------------|----------------------|---------------------------|
| 226316 | Area1/NF1 | None Supplied | 2.50 - 3.50 | 19.1 | Brown sandy clay |
| 226317 | Area1/WF1 | None Supplied | 2.50 - 3.50 | 20.4 | Brown sandy clay |
| 226318 | Area1/WF2 | None Supplied | 2.50 - 3.50 | 19.1 | Brown sandy clay |
| 226319 | Area1/WF3 | None Supplied | 2.50 - 3.50 | 20.9 | Brown sandy clay |
| 226320 | Area1/WF4 | None Supplied | 2.50 - 3.50 | 15.1 | Brown gravelly clay |
| 226321 | Area1/WF5 | None Supplied | 2.50 - 3.50 | 17.3 | Brown gravelly clay |
| 226322 | A1 Base | None Supplied | 3.50 - 4.00 | 19.7 | Brown sandy clay |
| 226323 | A2 base | None Supplied | 3.50 - 4.00 | 19.5 | Brown sandy clay |
| 226324 | A3 Base | None Supplied | 3.50 - 4.00 | 21.2 | Brown gravelly sand |
| 226325 | A4 Base | None Supplied | 3.50 - 4.00 | 13.6 | Brown gravelly clay |
| 226326 | A5 Base | None Supplied | 3.50 - 4.00 | 20.1 | Brown clay |
| 226327 | Area1/NF2 | None Supplied | 2.50 - 3.50 | 18.1 | Brown clay |
| 226328 | B1 Base | None Supplied | 3.50 - 4.00 | 18.8 | Brown clay |
| 226329 | B2 Base | None Supplied | 3.50 - 4.00 | 20.7 | Brown sandy clay |
| 226330 | B3 Base | None Supplied | 3.50 - 4.00 | 20.9 | Brown gravelly clay |
| 226331 | B4 Base | None Supplied | 3.50 - 4.50 | 18.6 | Brown gravelly clay |
| 226332 | B5 Base | None Supplied | 3.50 - 4.00 | 20.3 | Brown sandy clay |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{IS}

Unsuitable Sample ^{US}

| Soil Analysis Certificate - Methodology & Miscellaneous Information | |
|---|--|
| QTS Environmental Report No: 16-48868 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (St Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 13/09/2016 | |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphénylcarbazine followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCs | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

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QTS Environmental Report No: 16-49272

Site Reference: Nash Road, Redditch (Saint Francis Group)

Project / Job Ref: GJ079

Order No: PO~138

Sample Receipt Date: 19/09/2016

Sample Scheduled Date: 19/09/2016

Report Issue Number: 1

Reporting Date: 22/09/2016

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Russell Jarvis
Associate Director of Client Services



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-49272 | Date Sampled | 09/09/16 | 09/09/16 | 09/09/16 | 09/09/16 | 09/09/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | AREA1/WF6 | A6 BASE | B6 BASE | AREA1/WF7 | A7 BASE |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: PO-138 | Depth (m) | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 | 2.50 - 3.50 | 3.50 - 4.00 |
| Reporting Date: 22/09/2016 | QTSE Sample No | 228076 | 228077 | 228078 | 228079 | 228080 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|-----|-----|-----|-----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-49272 | Date Sampled | 09/09/16 | 09/09/16 | 09/09/16 | 09/09/16 | 14/09/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | B7 BASE | AREA1/WF8 | A8 BASE | B8 BASE | SFU13 |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | COMPOSITE |
| Order No: PO-138 | Depth (m) | 3.50 - 4.00 | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 | None Supplied |
| Reporting Date: 22/09/2016 | QTSE Sample No | 228081 | 228082 | 228083 | 228084 | 228085 |

| Determinand | Unit | RL | Accreditation | | | | |
|-----------------|-------|-----|---------------|-----|----|---|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | < 5 | 12 | 6 | < 5 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-49272 | Date Sampled | 14/09/16 | 16/09/16 | 16/09/16 | 16/09/16 | 15/09/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | SFU14 | AREA1/SF1 | AREA1/SF2 | AREA1/SF3 | AREA1/NF3 |
| Project / Job Ref: GJ079 | Additional Refs | COMPOSITE | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: PO-138 | Depth (m) | None Supplied | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 |
| Reporting Date: 22/09/2016 | QTSE Sample No | 228086 | 228087 | 228088 | 228089 | 228090 |

| Determinand | Unit | RL | Accreditation | | | | |
|-----------------|-------|-----|---------------|----|-----|---|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 63 | < 5 | 7 | < 5 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-49272 | Date Sampled | 15/09/16 | 15/09/16 | 15/09/16 | 15/09/16 | 16/09/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | C1 BASE | C2 BASE | C3 BASE | C4 BASE | C5 BASE |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: PO-138 | Depth (m) | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 |
| Reporting Date: 22/09/2016 | QTSE Sample No | 228091 | 228092 | 228093 | 228094 | 228095 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|-----|-----|-----|----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | 16 | < 5 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-49272 | Date Sampled | 16/09/16 | 16/09/16 | 16/09/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | C6 BASE | C7 BASE | C8 BASE | | |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | | |
| Order No: PO-138 | Depth (m) | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | | |
| Reporting Date: 22/09/2016 | QTSE Sample No | 228096 | 228097 | 228098 | | |

| Determinand | Unit | RL | Accreditation | | | |
|-----------------|-------|-----|---------------|-----|----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | < 5 | 20 | < 5 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Sample Descriptions | |
|---|--|
| QTS Environmental Report No: 16-49272 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: PO-138 | |
| Reporting Date: 22/09/2016 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|------------|-----------------|---------------|----------------------|------------------------------------|
| 228076 | AREA1/WF6 | None Supplied | 2.50 - 3.50 | 13.4 | Light brown clay with stones |
| 228077 | A6 BASE | None Supplied | 3.50 - 4.00 | 12.3 | Light brown clay with stones |
| 228078 | B6 BASE | None Supplied | 3.50 - 4.00 | 11.8 | Light brown clay with stones |
| 228079 | AREA1/WF7 | None Supplied | 2.50 - 3.50 | 11.8 | Light brown clay with stones |
| 228080 | A7 BASE | None Supplied | 3.50 - 4.00 | 10 | Light brown clay |
| 228081 | B7 BASE | None Supplied | 3.50 - 4.00 | 12.9 | Light brown clay |
| 228082 | AREA1/WF8 | None Supplied | 2.50 - 3.50 | 10.4 | Brown clay with brick and concrete |
| 228083 | A8 BASE | None Supplied | 3.50 - 4.00 | 9.8 | Brown clay with stones |
| 228084 | B8 BASE | None Supplied | 3.50 - 4.00 | 11.4 | Light brown clay with stones |
| 228085 | SFU13 | COMPOSITE | None Supplied | 11.5 | Light brown clay |
| 228086 | SFU14 | COMPOSITE | None Supplied | 13.4 | Brown clay with stones |
| 228087 | AREA1/SF1 | None Supplied | 2.50 - 3.50 | 11.3 | Light brown clay with stones |
| 228088 | AREA1/SF2 | None Supplied | 2.50 - 3.50 | 14.4 | Light brown clay |
| 228089 | AREA1/SF3 | None Supplied | 2.50 - 3.50 | 11.6 | Light brown clay with stones |
| 228090 | AREA1/NF3 | None Supplied | 2.50 - 3.50 | 19.3 | Light brown clay |
| 228091 | C1 BASE | None Supplied | 3.50 - 4.00 | 19.5 | Light brown clay |
| 228092 | C2 BASE | None Supplied | 3.50 - 4.00 | 18.9 | Light brown clay |
| 228093 | C3 BASE | None Supplied | 3.50 - 4.00 | 20.1 | Light brown clay |
| 228094 | C4 BASE | None Supplied | 3.50 - 4.00 | 15.2 | Light brown clay |
| 228095 | C5 BASE | None Supplied | 3.50 - 4.00 | 17.9 | Light brown clay |
| 228096 | C6 BASE | None Supplied | 3.50 - 4.00 | 17.1 | Light brown clay |
| 228097 | C7 BASE | None Supplied | 3.50 - 4.00 | 12.4 | Light brown clay with stones |
| 228098 | C8 BASE | None Supplied | 3.50 - 4.00 | 14.1 | Light brown clay |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{U/S}

Unsuitable Sample ^{U/S}

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 16-49272 |
| G & J Geoenvironmental Consultants Ltd |
| Site Reference: Nash Road, Redditch (Saint Francis Group) |
| Project / Job Ref: GJ079 |
| Order No: PO~138 |
| Reporting Date: 22/09/2016 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCs | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

D Dried
AR As Received



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QTS Environmental Report No: 16-49729

Site Reference: Nash Road, Redditch (St. Francis Group)

Project / Job Ref: GJ079

Order No: PO~138

Sample Receipt Date: 28/09/2016

Sample Scheduled Date: 28/09/2016

Report Issue Number: 1

Reporting Date: 04/10/2016

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Russell Jarvis
Associate Director of Client Services



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 Tel : 01622 850410



| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-49729 | Date Sampled | 23/09/16 | 19/09/16 | 19/09/16 | 20/09/16 | 20/09/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St. Francis Group) | TP / BH No | Area 1/SF4 | Area 1/NF4 | D1 BASE | D2 BASE | D3 BASE |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: PO-138 | Depth (m) | 2.50-3.50 | 2.50-3.50 | 3.50-4.00 | 3.50-4.00 | 3.50-4.00 |
| Reporting Date: 04/10/2016 | QTSE Sample No | 229785 | 229786 | 229787 | 229788 | 229789 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|-----|---|----|----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | < 5 | 8 | 14 | 30 | 622 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-49729 | Date Sampled | 20/09/16 | 21/09/16 | 21/09/16 | 22/09/16 | 22/09/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St. Francis Group) | TP / BH No | D4 BASE | D5 BASE | D6 BASE | D7 BASE | D8 BASE |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: PO-138 | Depth (m) | 3.50-4.00 | 3.50-4.00 | 3.50-4.00 | 3.50-4.00 | 3.50-4.00 |
| Reporting Date: 04/10/2016 | QTSE Sample No | 229790 | 229791 | 229792 | 229793 | 229794 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|-----|-----|------|-----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | < 5 | < 5 | 1386 | < 5 | < 5 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Sample Descriptions | |
|---|--|
| QTS Environmental Report No: 16-49729 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (St. Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: PO-138 | |
| Reporting Date: 04/10/2016 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|------------|-----------------|-----------|----------------------|---------------------------|
| 229785 | Area 1/SF4 | None Supplied | 2.50-3.50 | 18 | Light brown clay |
| 229786 | Area 1/NF4 | None Supplied | 2.50-3.50 | 17.5 | Light brown clay |
| 229787 | D1 BASE | None Supplied | 3.50-4.00 | 17.2 | Light brown clay |
| 229788 | D2 BASE | None Supplied | 3.50-4.00 | 12.8 | Light brown clay |
| 229789 | D3 BASE | None Supplied | 3.50-4.00 | 15 | Light brown clay |
| 229790 | D4 BASE | None Supplied | 3.50-4.00 | 12.3 | Light brown clay |
| 229791 | D5 BASE | None Supplied | 3.50-4.00 | 14.8 | Light brown clay |
| 229792 | D6 BASE | None Supplied | 3.50-4.00 | 16.3 | Red clay |
| 229793 | D7 BASE | None Supplied | 3.50-4.00 | 13.6 | Red clay |
| 229794 | D8 BASE | None Supplied | 3.50-4.00 | 12.4 | Light brown clay |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{1/S}

Unsuitable Sample ^{U/S}

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 16-49729 |
| G & J Geoenvironmental Consultants Ltd |
| Site Reference: Nash Road, Redditch (St. Francis Group) |
| Project / Job Ref: GJ079 |
| Order No: PO~138 |
| Reporting Date: 04/10/2016 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCs | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

D Dried
AR As Received



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QTS Environmental Report No: 16-49810

Site Reference: Nash Road, Redditch (St Francis Group)

Project / Job Ref: GJ079

Order No: 138

Sample Receipt Date: 30/09/2016

Sample Scheduled Date: 30/09/2016

Report Issue Number: 1

Reporting Date: 06/10/2016

Authorised by:

Russell Jarvis
Associate Director of Client Services

Authorised by:

Ela Mysiara
Inorganics & ICP Section Head



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| Soil Analysis Certificate | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-49810 | Date Sampled | 28/09/16 | 28/09/06 | 28/09/16 | 28/09/16 | 28/09/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU15 | SFU16 | W1/T1.1 | W1/T2.1 | W1/T3.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 06/10/2016 | QTSE Sample No | 230195 | 230196 | 230197 | 230198 | 230199 |

| Determinand | Unit | RL | Accreditation | | | | | |
|----------------|-------|-------|---------------|-------|-------|-------|-------|-------|
| Arsenic (As) | mg/kg | < 2 | MCERTS | 5 | 4 | 8 | 9 | 6 |
| Barium (Ba) | mg/kg | < 5 | NONE | 113 | 79 | 140 | 165 | 116 |
| Beryllium (Be) | mg/kg | < 0.5 | NONE | 0.9 | 0.5 | 0.7 | 0.9 | 0.6 |
| W/S Boron | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | < 1 | < 1 |
| Cadmium (Cd) | mg/kg | < 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Chromium (Cr) | mg/kg | < 2 | MCERTS | 24 | 14 | 20 | 23 | 16 |
| Copper (Cu) | mg/kg | < 4 | MCERTS | 16 | 9 | 12 | 13 | 10 |
| Lead (Pb) | mg/kg | < 3 | MCERTS | 9 | 5 | 13 | 14 | 8 |
| Mercury (Hg) | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | < 1 | < 1 |
| Nickel (Ni) | mg/kg | < 3 | MCERTS | 22 | 13 | 18 | 21 | 14 |
| Selenium (Se) | mg/kg | < 3 | NONE | < 3 | < 3 | < 3 | < 3 | < 3 |
| Vanadium (V) | mg/kg | < 2 | NONE | 32 | 18 | 31 | 37 | 22 |
| Zinc (Zn) | mg/kg | < 3 | MCERTS | 48 | 28 | 48 | 59 | 38 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
 Analysis carried out on the dried sample is corrected for the stone content
 Subcontracted analysis ^(S)



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| Soil Analysis Certificate | | | | | |
|--|-----------------|---------------|---------------|---------------|--|
| QTS Environmental Report No: 16-49810 | Date Sampled | 28/09/16 | 28/09/16 | 28/09/16 | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W2/T4.1 | W2/T5.1 | W2/T6.1 | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | |
| Reporting Date: 06/10/2016 | QTSE Sample No | 230200 | 230201 | 230202 | |

| Determinand | Unit | RL | Accreditation | | | |
|----------------|-------|-------|---------------|-------|-------|-------|
| Arsenic (As) | mg/kg | < 2 | MCERTS | 5 | 10 | 5 |
| Barium (Ba) | mg/kg | < 5 | NONE | 105 | 201 | 223 |
| Beryllium (Be) | mg/kg | < 0.5 | NONE | 0.8 | 1 | 1.1 |
| W/S Boron | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 |
| Cadmium (Cd) | mg/kg | < 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 |
| Chromium (Cr) | mg/kg | < 2 | MCERTS | 27 | 24 | 42 |
| Copper (Cu) | mg/kg | < 4 | MCERTS | 11 | 19 | 11 |
| Lead (Pb) | mg/kg | < 3 | MCERTS | 8 | 8 | 5 |
| Mercury (Hg) | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 |
| Nickel (Ni) | mg/kg | < 3 | MCERTS | 24 | 23 | 50 |
| Selenium (Se) | mg/kg | < 3 | NONE | < 3 | < 3 | < 3 |
| Vanadium (V) | mg/kg | < 2 | NONE | 30 | 45 | 37 |
| Zinc (Zn) | mg/kg | < 3 | MCERTS | 46 | 48 | 63 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
 Analysis carried out on the dried sample is corrected for the stone content
 Subcontracted analysis ^(S)



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| Soil Analysis Certificate - Speciated PAHs | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-49810 | Date Sampled | 28/09/16 | 28/09/06 | 28/09/16 | 28/09/16 | 28/09/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU15 | SFU16 | W1/T1.1 | W1/T2.1 | W1/T3.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 06/10/2016 | QTSE Sample No | 230195 | 230196 | 230197 | 230198 | 230199 |

| Determinand | Unit | RL | Accreditation | | | | | |
|------------------------|-------|-------|---------------|-------|-------|-------|-------|-------|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | 0.21 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | < 1.6 | < 1.6 | < 1.6 | < 1.6 |

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| Soil Analysis Certificate - Speciated PAHs | | | | | |
|--|-----------------|---------------|---------------|---------------|--|
| QTS Environmental Report No: 16-49810 | Date Sampled | 28/09/16 | 28/09/16 | 28/09/16 | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W2/T4.1 | W2/T5.1 | W2/T6.1 | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | |
| Reporting Date: 06/10/2016 | QTSE Sample No | 230200 | 230201 | 230202 | |

| Determinand | Unit | RL | Accreditation | | | | |
|------------------------|-------|-------|---------------|-------|-------|-------|--|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | < 1.6 | < 1.6 | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - TPH CWG Banded | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-49810 | Date Sampled | 28/09/16 | 28/09/06 | 28/09/16 | 28/09/16 | 28/09/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU15 | SFU16 | W1/T1.1 | W1/T2.1 | W1/T3.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 06/10/2016 | QTSE Sample No | 230195 | 230196 | 230197 | 230198 | 230199 |

| Determinand | Unit | RL | Accreditation | | | | | |
|----------------------|-------|--------|---------------|--------|--------|--------|--------|--------|
| Aliphatic >C5 - C6 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Aliphatic >C6 - C8 | mg/kg | < 0.05 | NONE | 1.60 | 3.83 | 0.47 | 4.28 | 0.37 |
| Aliphatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | 5 | 10 | 4 |
| Aliphatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | 27 | 41 | 26 |
| Aliphatic >C12 - C16 | mg/kg | < 3 | MCERTS | < 3 | < 3 | 44 | 52 | 48 |
| Aliphatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | < 3 | 3 |
| Aliphatic >C21 - C34 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| Aliphatic (C5 - C34) | mg/kg | < 21 | NONE | < 21 | < 21 | 76 | 107 | 82 |
| Aromatic >C5 - C7 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Aromatic >C7 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Aromatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | 4 | < 2 |
| Aromatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | 6 | 21 | 8 |
| Aromatic >C12 - C16 | mg/kg | < 2 | MCERTS | < 2 | < 2 | 18 | 35 | 23 |
| Aromatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | 3 | < 3 |
| Aromatic >C21 - C35 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | 20 | < 10 |
| Aromatic (C5 - C35) | mg/kg | < 21 | NONE | < 21 | < 21 | 24 | 82 | 31 |
| Total >C5 - C35 | mg/kg | < 42 | NONE | < 42 | < 42 | 100 | 190 | 112 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - TPH CWG Banded | | | | | |
|--|-----------------|---------------|---------------|---------------|--|
| QTS Environmental Report No: 16-49810 | Date Sampled | 28/09/16 | 28/09/16 | 28/09/16 | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W2/T4.1 | W2/T5.1 | W2/T6.1 | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | |
| Reporting Date: 06/10/2016 | QTSE Sample No | 230200 | 230201 | 230202 | |

| Determinand | Unit | RL | Accreditation | | | | |
|----------------------|-------|--------|---------------|--------|--------|--------|--|
| Aliphatic >C5 - C6 | mg/kg | < 0.01 | NONE | 0.01 | < 0.01 | < 0.01 | |
| Aliphatic >C6 - C8 | mg/kg | < 0.05 | NONE | 0.26 | 0.08 | 0.14 | |
| Aliphatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aliphatic >C10 - C12 | mg/kg | < 2 | MCERTS | 14 | < 2 | < 2 | |
| Aliphatic >C12 - C16 | mg/kg | < 3 | MCERTS | 24 | < 3 | < 3 | |
| Aliphatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | |
| Aliphatic >C21 - C34 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | |
| Aliphatic (C5 - C34) | mg/kg | < 21 | NONE | 38 | < 21 | < 21 | |
| Aromatic >C5 - C7 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | |
| Aromatic >C7 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | |
| Aromatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aromatic >C10 - C12 | mg/kg | < 2 | MCERTS | 3 | < 2 | < 2 | |
| Aromatic >C12 - C16 | mg/kg | < 2 | MCERTS | 11 | < 2 | < 2 | |
| Aromatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | |
| Aromatic >C21 - C35 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | |
| Aromatic (C5 - C35) | mg/kg | < 21 | NONE | < 21 | < 21 | < 21 | |
| Total >C5 - C35 | mg/kg | < 42 | NONE | 52 | < 42 | < 42 | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - BTEX / MTBE | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-49810 | Date Sampled | 28/09/16 | 28/09/06 | 28/09/16 | 28/09/16 | 28/09/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU15 | SFU16 | W1/T1.1 | W1/T2.1 | W1/T3.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 06/10/2016 | QTSE Sample No | 230195 | 230196 | 230197 | 230198 | 230199 |

| Determinand | Unit | RL | Accreditation | | | | | |
|--------------|-------|-----|---------------|-----|-----|-----|-----|-----|
| Benzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Ethylbenzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | 17 | < 2 |
| p & m-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | 72 | < 2 |
| o-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | 54 | < 2 |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |

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| Soil Analysis Certificate - BTEX / MTBE | | | | | | |
|--|-----------------|---------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-49810 | Date Sampled | 28/09/16 | 28/09/16 | 28/09/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W2/T4.1 | W2/T5.1 | W2/T6.1 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | | |
| Reporting Date: 06/10/2016 | QTSE Sample No | 230200 | 230201 | 230202 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|--------------|-------|-----|---------------|-----|-----|-----|--|
| Benzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | |
| Ethylbenzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| p & m-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| o-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-49810 | Date Sampled | 23/09/16 | 26/09/16 | 26/09/16 | 26/09/16 | 26/09/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | Area 1/SF5 | Area 1/NF5 | E1 Base | E2 Base | E3 Base |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 2.50 - 3.50 | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 |
| Reporting Date: 06/10/2016 | QTSE Sample No | 230185 | 230186 | 230187 | 230188 | 230189 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|-----|----|----|----|----|
| Trichloroethene | ug/kg | < 5 | MCERTS | < 5 | 67 | 67 | 34 | 97 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-49810 | Date Sampled | 27/09/16 | 27/09/16 | 27/09/16 | 27/09/16 | 23/09/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | E4 Base | E5 Base | E6 Base | E7 Base | E8 Base |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 |
| Reporting Date: 06/10/2016 | QTSE Sample No | 230190 | 230191 | 230192 | 230193 | 230194 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|-----|----|----|----|----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 697 | 69 | 45 | 30 | 29 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-49810 | Date Sampled | 28/09/16 | 28/09/06 | 28/09/16 | 28/09/16 | 28/09/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU15 | SFU16 | W1/T1.1 | W1/T2.1 | W1/T3.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 06/10/2016 | QTSE Sample No | 230195 | 230196 | 230197 | 230198 | 230199 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|------|------|-----|------|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 1860 | 3703 | 434 | 4035 | 349 |

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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-49810 | Date Sampled | 28/09/16 | 28/09/16 | 28/09/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W2/T4.1 | W2/T5.1 | W2/T6.1 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | | |
| Reporting Date: 06/10/2016 | QTSE Sample No | 230200 | 230201 | 230202 | | |

| Determinand | Unit | RL | Accreditation | | | |
|-----------------|-------|-----|---------------|-----|----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 219 | 67 | 116 |

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Soil Analysis Certificate - Sample Descriptions

| | |
|--|--|
| QTS Environmental Report No: 16-49810 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (St Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 06/10/2016 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|------------|-----------------|---------------|----------------------|-------------------------------------|
| 230185 | Area 1/SF5 | None Supplied | 2.50 - 3.50 | 13.9 | Light brown clay |
| 230186 | Area 1/NF5 | None Supplied | 2.50 - 3.50 | 14.9 | Light brown clay |
| 230187 | E1 Base | None Supplied | 3.50 - 4.00 | 15.7 | Light brown clay |
| 230188 | E2 Base | None Supplied | 3.50 - 4.00 | 14.4 | Light brown clay |
| 230189 | E3 Base | None Supplied | 3.50 - 4.00 | 18.9 | Light brown clay with stones |
| 230190 | E4 Base | None Supplied | 3.50 - 4.00 | 14.9 | Light brown clay |
| 230191 | E5 Base | None Supplied | 3.50 - 4.00 | 16.8 | Light brown clay |
| 230192 | E6 Base | None Supplied | 3.50 - 4.00 | 14.2 | Light brown clay with stones |
| 230193 | E7 Base | None Supplied | 3.50 - 4.00 | 11.3 | Light brown clay |
| 230194 | E8 Base | None Supplied | 3.50 - 4.00 | 21 | Light brown clay |
| 230195 | SFU15 | Composite | None Supplied | 12.9 | Light brown clay with stones |
| 230196 | SFU16 | Composite | None Supplied | 10.3 | Light brown clay with stones |
| 230197 | W1/T1.1 | Composite | None Supplied | 10.1 | Brown clay with stones and concrete |
| 230198 | W1/T2.1 | Composite | None Supplied | 12 | Brown clay with stones |
| 230199 | W1/T3.1 | Composite | None Supplied | 9.9 | Brown clay with stones |
| 230200 | W2/T4.1 | Composite | None Supplied | 11.9 | Light brown clay with stones |
| 230201 | W2/T5.1 | Composite | None Supplied | 13.1 | Light brown clay with stones |
| 230202 | W2/T6.1 | Composite | None Supplied | 18.7 | Light brown clay |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{I/S}

Unsuitable Sample ^{U/S}

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 16-49810 |
| G & J Geoenvironmental Consultants Ltd |
| Site Reference: Nash Road, Redditch (St Francis Group) |
| Project / Job Ref: GJ079 |
| Order No: 138 |
| Reporting Date: 06/10/2016 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCs | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

D Dried
AR As Received



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QTS Environmental Report No: 16-50174

Site Reference: Nash Road, Redditch (St Francis Group)

Project / Job Ref: GJ079

Order No: 138

Sample Receipt Date: 10/10/2016

Sample Scheduled Date: 10/10/2016

Report Issue Number: 1

Reporting Date: 14/10/2016

Authorised by:

Russell Jarvis
Associate Director of Client Services

Authorised by:

Ela Mysiara
Inorganics & ICP Section Head



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| Soil Analysis Certificate | | | | | | |
|--|-----------------|---------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-50174 | Date Sampled | 05/10/16 | 05/10/16 | 05/10/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU 17 | SFU 18 | SFU 19 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | | |
| Reporting Date: 14/10/2016 | QTSE Sample No | 231649 | 231650 | 231651 | | |

| Determinand | Unit | RL | Accreditation | | | |
|----------------|-------|-------|---------------|-------|-------|-------|
| Arsenic (As) | mg/kg | < 2 | MCERTS | 5 | 5 | 3 |
| Barium (Ba) | mg/kg | < 5 | NONE | 98 | 123 | 88 |
| Beryllium (Be) | mg/kg | < 0.5 | NONE | 1 | 1.1 | 0.9 |
| W/S Boron | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 |
| Cadmium (Cd) | mg/kg | < 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 |
| Chromium (Cr) | mg/kg | < 2 | MCERTS | 41 | 44 | 43 |
| Copper (Cu) | mg/kg | < 4 | MCERTS | 12 | 13 | 10 |
| Lead (Pb) | mg/kg | < 3 | MCERTS | 6 | 4 | 3 |
| Mercury (Hg) | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 |
| Nickel (Ni) | mg/kg | < 3 | MCERTS | 38 | 40 | 39 |
| Selenium (Se) | mg/kg | < 3 | NONE | < 3 | < 3 | < 3 |
| Vanadium (V) | mg/kg | < 2 | NONE | 38 | 43 | 32 |
| Zinc (Zn) | mg/kg | < 3 | MCERTS | 56 | 58 | 52 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
 Analysis carried out on the dried sample is corrected for the stone content
 Subcontracted analysis ^(S)



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| Soil Analysis Certificate - Speciated PAHs | | | | | |
|--|-----------------|---------------|---------------|---------------|--|
| QTS Environmental Report No: 16-50174 | Date Sampled | 05/10/16 | 05/10/16 | 05/10/16 | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU 17 | SFU 18 | SFU 19 | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | |
| Reporting Date: 14/10/2016 | QTSE Sample No | 231649 | 231650 | 231651 | |

| Determinand | Unit | RL | Accreditation | | | | |
|------------------------|-------|-------|---------------|-------|-------|-------|--|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | < 1.6 | < 1.6 | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - TPH CWG Banded | | | | | |
|--|-----------------|---------------|---------------|---------------|--|
| QTS Environmental Report No: 16-50174 | Date Sampled | 05/10/16 | 05/10/16 | 05/10/16 | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU 17 | SFU 18 | SFU 19 | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | |
| Reporting Date: 14/10/2016 | QTSE Sample No | 231649 | 231650 | 231651 | |

| Determinand | Unit | RL | Accreditation | | | | |
|----------------------|-------|--------|---------------|--------|--------|--------|--|
| Aliphatic >C5 - C6 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | |
| Aliphatic >C6 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | |
| Aliphatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aliphatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aliphatic >C12 - C16 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | |
| Aliphatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | |
| Aliphatic >C21 - C34 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | |
| Aliphatic (C5 - C34) | mg/kg | < 21 | NONE | < 21 | < 21 | < 21 | |
| Aromatic >C5 - C7 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | |
| Aromatic >C7 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | |
| Aromatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aromatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aromatic >C12 - C16 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aromatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | |
| Aromatic >C21 - C35 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | |
| Aromatic (C5 - C35) | mg/kg | < 21 | NONE | < 21 | < 21 | < 21 | |
| Total >C5 - C35 | mg/kg | < 42 | NONE | < 42 | < 42 | < 42 | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - BTEX / MTBE | | | | | | |
|--|-----------------|---------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-50174 | Date Sampled | 05/10/16 | 05/10/16 | 05/10/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU 17 | SFU 18 | SFU 19 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | | |
| Reporting Date: 14/10/2016 | QTSE Sample No | 231649 | 231650 | 231651 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|--------------|-------|-----|---------------|-----|-----|-----|--|
| Benzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | |
| Ethylbenzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| p & m-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| o-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | |

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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-50174 | Date Sampled | 30/09/16 | 30/09/16 | 30/09/16 | 30/09/16 | 30/09/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | Area 1 / NF6 | F1 Base | F2 Base | F3 Base | F4 Base |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 |
| Reporting Date: 14/10/2016 | QTSE Sample No | 231639 | 231640 | 231641 | 231642 | 231643 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|-----|-----|-----|-----|---|
| Trichloroethene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | 6 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-50174 | Date Sampled | 05/10/16 | 06/10/16 | 06/10/16 | 05/10/16 | 05/10/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | F5 Base | F6 Base | F7 Base | F8 Base | Area 1 / SF6 |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 2.50 - 3.50 |
| Reporting Date: 14/10/2016 | QTSE Sample No | 231644 | 231645 | 231646 | 231647 | 231648 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|-----|----|-----|---|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | < 5 | 13 | < 5 | 7 | < 5 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-50174 | Date Sampled | 05/10/16 | 05/10/16 | 05/10/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU 17 | SFU 18 | SFU 19 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | | |
| Reporting Date: 14/10/2016 | QTSE Sample No | 231649 | 231650 | 231651 | | |

| Determinand | Unit | RL | Accreditation | | | |
|-----------------|-------|-----|---------------|-----|-----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Sample Descriptions | |
|--|--|
| QTS Environmental Report No: 16-50174 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (St Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 14/10/2016 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|--------------|-----------------|---------------|----------------------|------------------------------|
| 231639 | Area 1 / NF6 | None Supplied | 2.50 - 3.50 | 14.8 | Light brown clay |
| 231640 | F1 Base | None Supplied | 3.50 - 4.00 | 15.7 | Light brown clay |
| 231641 | F2 Base | None Supplied | 3.50 - 4.00 | 15.8 | Light brown clay with stones |
| 231642 | F3 Base | None Supplied | 3.50 - 4.00 | 15.2 | Light brown clay |
| 231643 | F4 Base | None Supplied | 3.50 - 4.00 | 12.2 | Light brown clay with stones |
| 231644 | F5 Base | None Supplied | 3.50 - 4.00 | 18.9 | Light brown clay |
| 231645 | F6 Base | None Supplied | 3.50 - 4.00 | 17.8 | Light brown clay |
| 231646 | F7 Base | None Supplied | 3.50 - 4.00 | 18.2 | Light brown clay |
| 231647 | F8 Base | None Supplied | 3.50 - 4.00 | 17.6 | Light brown clay |
| 231648 | Area 1 / SF6 | None Supplied | 2.50 - 3.50 | 14.5 | Light brown clay |
| 231649 | SFU 17 | Composite | None Supplied | 15.8 | Light brown clay with stones |
| 231650 | SFU 18 | Composite | None Supplied | 16.7 | Light brown clay |
| 231651 | SFU 19 | Composite | None Supplied | 18.8 | Light brown clay |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{I/S}

Unsuitable Sample ^{U/S}

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 16-50174 |
| G & J Geoenvironmental Consultants Ltd |
| Site Reference: Nash Road, Redditch (St Francis Group) |
| Project / Job Ref: GJ079 |
| Order No: 138 |
| Reporting Date: 14/10/2016 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCs | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

D Dried
AR As Received



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russell.jarvis@qtsevenvironmental.com

QTS Environmental Report No: 16-50793

Site Reference: Nash Road, Redditch (Saint Francis Group)

Project / Job Ref: GJ079

Order No: 138

Sample Receipt Date: 24/10/2016

Sample Scheduled Date: 24/10/2016

Report Issue Number: 1

Reporting Date: 28/10/2016

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Russell Jarvis
Associate Director of Client Services



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| Soil Analysis Certificate | | | | | | |
|---|-----------------|---------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-50793 | Date Sampled | 20/10/16 | 20/10/16 | 20/10/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | SFU 20 | SFU 21 | SFU 22 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | | |
| Reporting Date: 28/10/2016 | QTSE Sample No | 234735 | 234736 | 234737 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|----------------|-------|-------|---------------|-------|-------|-------|--|
| Arsenic (As) | mg/kg | < 2 | MCERTS | 6 | 6 | 12 | |
| Barium (Ba) | mg/kg | < 5 | NONE | 124 | 172 | 189 | |
| Beryllium (Be) | mg/kg | < 0.5 | NONE | 0.8 | 1 | 1.1 | |
| W/S Boron | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | |
| Cadmium (Cd) | mg/kg | < 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | |
| Chromium (Cr) | mg/kg | < 2 | MCERTS | 18 | 28 | 32 | |
| Copper (Cu) | mg/kg | < 4 | MCERTS | 19 | 19 | 19 | |
| Lead (Pb) | mg/kg | < 3 | MCERTS | 23 | 11 | 17 | |
| Mercury (Hg) | mg/kg | < 1 | NONE | 2.4 | < 1 | < 1 | |
| Nickel (Ni) | mg/kg | < 3 | MCERTS | 16 | 24 | 28 | |
| Selenium (Se) | mg/kg | < 3 | NONE | < 3 | < 3 | < 3 | |
| Vanadium (V) | mg/kg | < 2 | NONE | 32 | 35 | 48 | |
| Zinc (Zn) | mg/kg | < 3 | MCERTS | 67 | 51 | 70 | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
 Analysis carried out on the dried sample is corrected for the stone content
 Subcontracted analysis ⁽⁵⁾



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| Soil Analysis Certificate - Speciated PAHs | | | | | | |
|---|-----------------|---------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-50793 | Date Sampled | 20/10/16 | 20/10/16 | 20/10/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | SFU 20 | SFU 21 | SFU 22 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | | |
| Reporting Date: 28/10/2016 | QTSE Sample No | 234735 | 234736 | 234737 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|------------------------|-------|-------|---------------|-------|-------|-------|--|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | < 1.6 | < 1.6 | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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Soil Analysis Certificate - TPH CWG Banded

| | | | | |
|---|-----------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-50793 | Date Sampled | 20/10/16 | 20/10/16 | 20/10/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | SFU 20 | SFU 21 | SFU 22 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied |
| Reporting Date: 28/10/2016 | QTSE Sample No | 234735 | 234736 | 234737 |

| Determinand | Unit | RL | Accreditation | | | | |
|----------------------|-------|--------|---------------|--------|--------|--------|--|
| Aliphatic >C5 - C6 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | |
| Aliphatic >C6 - C8 | mg/kg | < 0.05 | NONE | 0.40 | 0.49 | 0.31 | |
| Aliphatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aliphatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | 6 | |
| Aliphatic >C12 - C16 | mg/kg | < 3 | MCERTS | < 3 | < 3 | 9 | |
| Aliphatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | 9 | |
| Aliphatic >C21 - C34 | mg/kg | < 10 | MCERTS | < 10 | < 10 | 78 | |
| Aliphatic (C5 - C34) | mg/kg | < 21 | NONE | < 21 | < 21 | 102 | |
| Aromatic >C5 - C7 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | |
| Aromatic >C7 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | |
| Aromatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aromatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aromatic >C12 - C16 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aromatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | |
| Aromatic >C21 - C35 | mg/kg | < 10 | MCERTS | < 10 | < 10 | 42 | |
| Aromatic (C5 - C35) | mg/kg | < 21 | NONE | < 21 | < 21 | 42 | |
| Total >C5 - C35 | mg/kg | < 42 | NONE | < 42 | < 42 | 145 | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - BTEX / MTBE | | | | | | |
|---|-----------------|---------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-50793 | Date Sampled | 20/10/16 | 20/10/16 | 20/10/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | SFU 20 | SFU 21 | SFU 22 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | | |
| Reporting Date: 28/10/2016 | QTSE Sample No | 234735 | 234736 | 234737 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|--------------|-------|-----|---------------|-----|-----|-----|--|
| Benzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | |
| Ethylbenzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| p & m-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| o-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | |

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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-50793 | Date Sampled | 17/10/16 | 17/10/16 | 17/10/16 | 17/10/16 | 17/10/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | AREA 1/NF7 | G1 BASE | G2 BASE | G3 BASE | G4 BASE |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 |
| Reporting Date: 28/10/2016 | QTSE Sample No | 234716 | 234717 | 234718 | 234719 | 234720 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|----|---|---|----|----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 13 | 8 | 8 | 10 | 17 |

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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-50793 | Date Sampled | 18/10/16 | 18/10/16 | 18/10/16 | 19/10/16 | 19/10/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | G5 BASE | G6 BASE | G7 BASE | G8 BASE | AREA 1/SF7 |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 2.50 - 3.00 |
| Reporting Date: 28/10/2016 | QTSE Sample No | 234721 | 234722 | 234723 | 234724 | 234725 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|----|----|-----|----|------|
| Trichloroethene | ug/kg | < 5 | MCERTS | 50 | 11 | < 5 | 10 | 8859 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-50793 | Date Sampled | 19/10/16 | 19/10/16 | 19/10/16 | 19/10/16 | 20/10/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | H8 BASE | AREA 1/SF8 | H7 BASE | H6 BASE | I8 BASE |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 |
| Reporting Date: 28/10/2016 | QTSE Sample No | 234726 | 234727 | 234728 | 234729 | 234730 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|----|-----|----|----|------|
| Trichloroethene | ug/kg | < 5 | MCERTS | 23 | 122 | 10 | 10 | 2054 |

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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-50793 | Date Sampled | 20/10/16 | 20/10/16 | 20/10/16 | 20/10/16 | 20/10/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | AREA 1/SF9 | AREA 1/EF8 | I7 BASE | AREA 1/EF7 | SFU 20 |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | Composite |
| Order No: 138 | Depth (m) | 2.50 - 3.50 | 2.50 - 3.50 | 3.50 - 4.00 | 2.50 - 3.50 | None Supplied |
| Reporting Date: 28/10/2016 | QTSE Sample No | 234731 | 234732 | 234733 | 234734 | 234735 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|-----|-----|-----|-----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 117 | 629 | 341 | 350 | 342 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|--|--|--|
| QTS Environmental Report No: 16-50793 | Date Sampled | 20/10/16 | 20/10/16 | | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | | | |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | SFU 21 | SFU 22 | | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | | | |
| Reporting Date: 28/10/2016 | QTSE Sample No | 234736 | 234737 | | | |

| Determinand | Unit | RL | Accreditation | | | |
|-----------------|-------|-----|---------------|-----|-----|--|
| Trichloroethene | ug/kg | < 5 | MCERTS | 457 | 266 | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C

| Soil Analysis Certificate - Sample Descriptions | |
|---|--|
| QTS Environmental Report No: 16-50793 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 28/10/2016 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|------------|-----------------|---------------|----------------------|---------------------------------------|
| 234716 | AREA 1/NF7 | None Supplied | 2.50 - 3.50 | 10 | Light brown gravelly clay |
| 234717 | G1 BASE | None Supplied | 3.50 - 4.00 | 11.3 | Light brown gravelly clay |
| 234718 | G2 BASE | None Supplied | 3.50 - 4.00 | 12.7 | Light brown gravelly clay |
| 234719 | G3 BASE | None Supplied | 3.50 - 4.00 | 17.4 | Light brown clay |
| 234720 | G4 BASE | None Supplied | 3.50 - 4.00 | 16.2 | Light brown sandy clay |
| 234721 | G5 BASE | None Supplied | 3.50 - 4.00 | 15.1 | Light brown sandy clay |
| 234722 | G6 BASE | None Supplied | 3.50 - 4.00 | 16 | Light brown sandy clay |
| 234723 | G7 BASE | None Supplied | 3.50 - 4.00 | 16.6 | Light brown clay |
| 234724 | G8 BASE | None Supplied | 3.50 - 4.00 | 15.1 | Light brown gravelly clay |
| 234725 | AREA 1/SF7 | None Supplied | 2.50 - 3.00 | 12 | Light brown clay with stones |
| 234726 | H8 BASE | None Supplied | 3.50 - 4.00 | 14.8 | Light brown gravelly clay |
| 234727 | AREA 1/SF8 | None Supplied | 2.50 - 3.50 | 19.2 | Light brown gravelly clay |
| 234728 | H7 BASE | None Supplied | 3.50 - 4.00 | 13 | Light brown gravelly clay |
| 234729 | H6 BASE | None Supplied | 3.50 - 4.00 | 14 | Light brown gravelly clay |
| 234730 | I8 BASE | None Supplied | 3.50 - 4.00 | 16.6 | Light brown clay with stones |
| 234731 | AREA 1/SF9 | None Supplied | 2.50 - 3.50 | 14.5 | Light brown clay |
| 234732 | AREA 1/EF8 | None Supplied | 2.50 - 3.50 | 19.2 | Light brown sandy clay |
| 234733 | I7 BASE | None Supplied | 3.50 - 4.00 | 16.4 | Light brown gravelly clay |
| 234734 | AREA 1/EF7 | None Supplied | 2.50 - 3.50 | 15.2 | Light brown gravelly clay with stones |
| 234735 | SFU 20 | Composite | None Supplied | 6.3 | Light brown gravelly clay with stones |
| 234736 | SFU 21 | Composite | None Supplied | 13.5 | Light brown clay |
| 234737 | SFU 22 | Composite | None Supplied | 12.1 | Light brown gravelly clay with stones |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{U/S}

Unsuitable Sample ^{U/S}

| Soil Analysis Certificate - Methodology & Miscellaneous Information | |
|---|--|
| QTS Environmental Report No: 16-50793 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 28/10/2016 | |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCS | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

D Dried
AR As Received



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QTS Environmental Report No: 16-50916

Site Reference: Nash Road, Redditch (Saint Francis Group)

Project / Job Ref: GJ079

Order No: 138

Sample Receipt Date: 26/10/2016

Sample Scheduled Date: 26/10/2016

Report Issue Number: 1

Reporting Date: 01/11/2016

Authorised by:

Russell Jarvis
Associate Director of Client Services

Authorised by:

Ela Mysiara
Inorganics & ICP Section Head



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-50916 | Date Sampled | 24/10/16 | 24/10/16 | 24/10/16 | 25/10/16 | 25/10/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | H3 Base | H4 Base | H5 Base | I5 Base | I6 Base |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 |
| Reporting Date: 01/11/2016 | QTSE Sample No | 235200 | 235201 | 235202 | 235203 | 235204 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|------|-----|-----|-----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 1624 | 160 | < 5 | < 5 | < 5 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-50916 | Date Sampled | 21/10/16 | 21/10/16 | 24/10/16 | 25/10/16 | 25/10/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | Area 1 / EF1 | Area 1 / EF2 | Area 1 / EF3 | Area 1 / EF4 | Area 1 / EF5 |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 |
| Reporting Date: 01/11/2016 | QTSE Sample No | 235205 | 235206 | 235207 | 235208 | 235209 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|------|------|---|----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 3025 | 1185 | 9 | 95 | < 5 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|--|--|--|--|
| QTS Environmental Report No: 16-50916 | Date Sampled | 25/10/16 | | | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | | | | |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | Area 1 / EF6 | | | | |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | | | | |
| Order No: 138 | Depth (m) | 2.50 - 3.50 | | | | |
| Reporting Date: 01/11/2016 | QTSE Sample No | 235210 | | | | |

| Determinand | Unit | RL | Accreditation | | | | |
|-----------------|-------|-----|---------------|----|--|--|--|
| Trichloroethene | ug/kg | < 5 | MCERTS | 81 | | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Sample Descriptions | |
|---|--|
| QTS Environmental Report No: 16-50916 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 01/11/2016 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|--------------|-----------------|-------------|----------------------|------------------------------------|
| 235200 | H3 Base | None Supplied | 3.50 - 4.00 | 16.8 | Light brown clay |
| 235201 | H4 Base | None Supplied | 3.50 - 4.00 | 19.3 | Red clay |
| 235202 | H5 Base | None Supplied | 3.50 - 4.00 | 15.7 | Light brown clay |
| 235203 | I5 Base | None Supplied | 3.50 - 4.00 | 8.5 | Light brown sand with stones |
| 235204 | I6 Base | None Supplied | 3.50 - 4.00 | 10.4 | Light brown sandy clay with stones |
| 235205 | Area 1 / EF1 | None Supplied | 2.50 - 3.50 | 14.9 | Light brown clay |
| 235206 | Area 1 / EF2 | None Supplied | 2.50 - 3.50 | 14.6 | Light brown clay |
| 235207 | Area 1 / EF3 | None Supplied | 2.50 - 3.50 | 15.7 | Light brown clay |
| 235208 | Area 1 / EF4 | None Supplied | 2.50 - 3.50 | 11.3 | Light brown clay with stones |
| 235209 | Area 1 / EF5 | None Supplied | 2.50 - 3.50 | 16.6 | Red clay |
| 235210 | Area 1 / EF6 | None Supplied | 2.50 - 3.50 | 12.6 | Brown clay with brick |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{I/S}

Unsuitable Sample ^{U/S}

| Soil Analysis Certificate - Methodology & Miscellaneous Information | |
|---|--|
| QTS Environmental Report No: 16-50916 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 01/11/2016 | |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCS | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

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QTS Environmental Report No: 16-51122

Site Reference: Nash Road, Redditch (St Francis Group)

Project / Job Ref: GJ079

Order No: 138

Sample Receipt Date: 31/10/2016

Sample Scheduled Date: 31/10/2016

Report Issue Number: 1

Reporting Date: 03/11/2016

Authorised by:

Russell Jarvis
Associate Director of Client Services

Authorised by:

Ela Mysiara
Inorganics & ICP Section Head



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| Soil Analysis Certificate | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-51122 | Date Sampled | 27/10/16 | 27/10/16 | 27/10/16 | 27/10/16 | 27/10/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W3/T7.1 | W3/T8.1 | W3/T9.1 | W3/T10.1 | W3/T11.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 03/11/2016 | QTSE Sample No | 235939 | 235940 | 235941 | 235942 | 235943 |

| Determinand | Unit | RL | Accreditation | | | | | |
|----------------|-------|-------|---------------|-------|-------|-------|-------|-------|
| Arsenic (As) | mg/kg | < 2 | MCERTS | 3 | 7 | 4 | < 2 | 2 |
| Barium (Ba) | mg/kg | < 5 | NONE | 119 | 133 | 134 | 99 | 89 |
| Beryllium (Be) | mg/kg | < 0.5 | NONE | 1.1 | 1 | 0.8 | 0.8 | 0.8 |
| W/S Boron | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | < 1 | < 1 |
| Cadmium (Cd) | mg/kg | < 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Chromium (Cr) | mg/kg | < 2 | MCERTS | 41 | 32 | 28 | 29 | 25 |
| Copper (Cu) | mg/kg | < 4 | MCERTS | 29 | 26 | 25 | 23 | 25 |
| Lead (Pb) | mg/kg | < 3 | MCERTS | 30 | 16 | 51 | 9 | 9 |
| Mercury (Hg) | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | < 1 | < 1 |
| Nickel (Ni) | mg/kg | < 3 | MCERTS | 43 | 31 | 27 | 30 | 25 |
| Selenium (Se) | mg/kg | < 3 | NONE | < 3 | < 3 | < 3 | < 3 | < 3 |
| Vanadium (V) | mg/kg | < 2 | NONE | 40 | 43 | 34 | 31 | 28 |
| Zinc (Zn) | mg/kg | < 3 | MCERTS | 79 | 76 | 68 | 51 | 52 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C

Analysis carried out on the dried sample is corrected for the stone content

Subcontracted analysis ^(S)



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| Soil Analysis Certificate | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-51122 | Date Sampled | 27/10/16 | 27/10/16 | 27/10/16 | 27/10/16 | 27/10/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W4/T12.1 | W4/T13.1 | W4/T14.1 | W4/T15.1 | W4/T16.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 03/11/2016 | QTSE Sample No | 235944 | 235945 | 235946 | 235947 | 235948 |

| Determinand | Unit | RL | Accreditation | | | | | |
|----------------|-------|-------|---------------|-------|-------|-------|-------|-------|
| Arsenic (As) | mg/kg | < 2 | MCERTS | 5 | 4 | < 2 | 3 | < 2 |
| Barium (Ba) | mg/kg | < 5 | NONE | 155 | 113 | 95 | 95 | 119 |
| Beryllium (Be) | mg/kg | < 0.5 | NONE | 1 | 0.8 | 0.8 | 0.7 | 1.1 |
| W/S Boron | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | < 1 | < 1 |
| Cadmium (Cd) | mg/kg | < 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Chromium (Cr) | mg/kg | < 2 | MCERTS | 33 | 28 | 24 | 26 | 43 |
| Copper (Cu) | mg/kg | < 4 | MCERTS | 25 | 34 | 22 | 20 | 26 |
| Lead (Pb) | mg/kg | < 3 | MCERTS | 10 | 7 | 4 | 6 | 5 |
| Mercury (Hg) | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | < 1 | < 1 |
| Nickel (Ni) | mg/kg | < 3 | MCERTS | 31 | 27 | 22 | 24 | 41 |
| Selenium (Se) | mg/kg | < 3 | NONE | < 3 | < 3 | < 3 | < 3 | < 3 |
| Vanadium (V) | mg/kg | < 2 | NONE | 39 | 36 | 28 | 29 | 40 |
| Zinc (Zn) | mg/kg | < 3 | MCERTS | 58 | 49 | 44 | 40 | 57 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
 Analysis carried out on the dried sample is corrected for the stone content
 Subcontracted analysis ^(S)



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| Soil Analysis Certificate | | | | | |
|--|-----------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-51122 | Date Sampled | 27/10/16 | 27/10/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W4/T17.1 | SFU 23 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 03/11/2016 | QTSE Sample No | 235949 | 235950 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|----------------|-------|-------|---------------|-------|-------|--|--|
| Arsenic (As) | mg/kg | < 2 | MCERTS | 4 | 3 | | |
| Barium (Ba) | mg/kg | < 5 | NONE | 133 | 101 | | |
| Beryllium (Be) | mg/kg | < 0.5 | NONE | 1.1 | 1 | | |
| W/S Boron | mg/kg | < 1 | NONE | < 1 | < 1 | | |
| Cadmium (Cd) | mg/kg | < 0.2 | MCERTS | < 0.2 | < 0.2 | | |
| Chromium (Cr) | mg/kg | < 2 | MCERTS | 37 | 44 | | |
| Copper (Cu) | mg/kg | < 4 | MCERTS | 30 | 24 | | |
| Lead (Pb) | mg/kg | < 3 | MCERTS | 6 | 6 | | |
| Mercury (Hg) | mg/kg | < 1 | NONE | < 1 | < 1 | | |
| Nickel (Ni) | mg/kg | < 3 | MCERTS | 33 | 39 | | |
| Selenium (Se) | mg/kg | < 3 | NONE | < 3 | < 3 | | |
| Vanadium (V) | mg/kg | < 2 | NONE | 47 | 37 | | |
| Zinc (Zn) | mg/kg | < 3 | MCERTS | 59 | 58 | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
 Analysis carried out on the dried sample is corrected for the stone content
 Subcontracted analysis ^(S)



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| Soil Analysis Certificate - Speciated PAHs | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-51122 | Date Sampled | 27/10/16 | 27/10/16 | 27/10/16 | 27/10/16 | 27/10/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W3/T7.1 | W3/T8.1 | W3/T9.1 | W3/T10.1 | W3/T11.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 03/11/2016 | QTSE Sample No | 235939 | 235940 | 235941 | 235942 | 235943 |

| Determinand | Unit | RL | Accreditation | | | | | |
|------------------------|-------|-------|---------------|-------|-------|-------|-------|-------|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | 0.27 |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | < 1.6 | < 1.6 | < 1.6 | < 1.6 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Speciated PAHs | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-51122 | Date Sampled | 27/10/16 | 27/10/16 | 27/10/16 | 27/10/16 | 27/10/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W4/T12.1 | W4/T13.1 | W4/T14.1 | W4/T15.1 | W4/T16.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 03/11/2016 | QTSE Sample No | 235944 | 235945 | 235946 | 235947 | 235948 |

| Determinand | Unit | RL | Accreditation | | | | | |
|------------------------|-------|-------|---------------|-------|-------|-------|-------|-------|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | 0.74 |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | 0.33 |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | < 1.6 | < 1.6 | < 1.6 | < 1.6 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Speciated PAHs | | | | | |
|--|-----------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-51122 | Date Sampled | 27/10/16 | 27/10/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W4/T17.1 | SFU 23 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 03/11/2016 | QTSE Sample No | 235949 | 235950 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|------------------------|-------|-------|---------------|-------|-------|--|--|
| Naphthalene | mg/kg | < 0.1 | MCERTS | 0.15 | < 0.1 | | |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | < 1.6 | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - TPH CWG Banded | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-51122 | Date Sampled | 27/10/16 | 27/10/16 | 27/10/16 | 27/10/16 | 27/10/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W3/T7.1 | W3/T8.1 | W3/T9.1 | W3/T10.1 | W3/T11.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 03/11/2016 | QTSE Sample No | 235939 | 235940 | 235941 | 235942 | 235943 |

| Determinand | Unit | RL | Accreditation | | | | | |
|----------------------|-------|--------|---------------|--------|--------|--------|--------|--------|
| Aliphatic >C5 - C6 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Aliphatic >C6 - C8 | mg/kg | < 0.05 | NONE | 2.72 | 35.80 | 3.83 | 5.31 | 21.10 |
| Aliphatic >C8 - C10 | mg/kg | < 2 | MCERTS | 4 | 5 | 19 | 8 | 14 |
| Aliphatic >C10 - C12 | mg/kg | < 2 | MCERTS | 8 | 9 | 51 | 20 | 39 |
| Aliphatic >C12 - C16 | mg/kg | < 3 | MCERTS | 5 | 6 | 58 | 19 | 40 |
| Aliphatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | < 3 | < 3 |
| Aliphatic >C21 - C34 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| Aliphatic (C5 - C34) | mg/kg | < 21 | NONE | < 21 | 56 | 132 | 51 | 115 |
| Aromatic >C5 - C7 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Aromatic >C7 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Aromatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | 7 | 2 | 6 |
| Aromatic >C10 - C12 | mg/kg | < 2 | MCERTS | 7 | 8 | 36 | 11 | 27 |
| Aromatic >C12 - C16 | mg/kg | < 2 | MCERTS | 11 | 7 | 62 | 16 | 38 |
| Aromatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | < 3 | < 3 |
| Aromatic >C21 - C35 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| Aromatic (C5 - C35) | mg/kg | < 21 | NONE | < 21 | < 21 | 106 | 29 | 72 |
| Total >C5 - C35 | mg/kg | < 42 | NONE | < 42 | 71 | 238 | 80 | 187 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - TPH CWG Banded | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-51122 | Date Sampled | 27/10/16 | 27/10/16 | 27/10/16 | 27/10/16 | 27/10/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W4/T12.1 | W4/T13.1 | W4/T14.1 | W4/T15.1 | W4/T16.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 03/11/2016 | QTSE Sample No | 235944 | 235945 | 235946 | 235947 | 235948 |

| Determinand | Unit | RL | Accreditation | | | | | |
|----------------------|-------|--------|---------------|--------|--------|--------|--------|--------|
| Aliphatic >C5 - C6 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Aliphatic >C6 - C8 | mg/kg | < 0.05 | NONE | 0.47 | 0.32 | 0.49 | 6.28 | 0.22 |
| Aliphatic >C8 - C10 | mg/kg | < 2 | MCERTS | 18 | < 2 | 23 | 15 | < 2 |
| Aliphatic >C10 - C12 | mg/kg | < 2 | MCERTS | 87 | 15 | 157 | 71 | 119 |
| Aliphatic >C12 - C16 | mg/kg | < 3 | MCERTS | 171 | 25 | 362 | 111 | 1019 |
| Aliphatic >C16 - C21 | mg/kg | < 3 | MCERTS | 14 | < 3 | 47 | < 3 | 58 |
| Aliphatic >C21 - C34 | mg/kg | < 10 | MCERTS | < 10 | < 10 | 48 | < 10 | < 10 |
| Aliphatic (C5 - C34) | mg/kg | < 21 | NONE | 290 | 40 | 637 | 204 | 1196 |
| Aromatic >C5 - C7 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Aromatic >C7 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Aromatic >C8 - C10 | mg/kg | < 2 | MCERTS | 3 | < 2 | 5 | 3 | < 2 |
| Aromatic >C10 - C12 | mg/kg | < 2 | MCERTS | 25 | < 2 | 30 | 14 | 22 |
| Aromatic >C12 - C16 | mg/kg | < 2 | MCERTS | 63 | < 2 | 67 | 38 | 265 |
| Aromatic >C16 - C21 | mg/kg | < 3 | MCERTS | 6 | < 3 | < 3 | < 3 | < 3 |
| Aromatic >C21 - C35 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| Aromatic (C5 - C35) | mg/kg | < 21 | NONE | 97 | < 21 | 102 | 55 | 286 |
| Total >C5 - C35 | mg/kg | < 42 | NONE | 387 | < 42 | 739 | 259 | 1483 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - TPH CWG Banded | | | | | |
|--|-----------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-51122 | Date Sampled | 27/10/16 | 27/10/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W4/T17.1 | SFU 23 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 03/11/2016 | QTSE Sample No | 235949 | 235950 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|----------------------|-------|--------|---------------|--------|--------|--|--|
| Aliphatic >C5 - C6 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | | |
| Aliphatic >C6 - C8 | mg/kg | < 0.05 | NONE | 2.02 | 3.40 | | |
| Aliphatic >C8 - C10 | mg/kg | < 2 | MCERTS | 19 | < 2 | | |
| Aliphatic >C10 - C12 | mg/kg | < 2 | MCERTS | 109 | < 2 | | |
| Aliphatic >C12 - C16 | mg/kg | < 3 | MCERTS | 193 | < 3 | | |
| Aliphatic >C16 - C21 | mg/kg | < 3 | MCERTS | 24 | < 3 | | |
| Aliphatic >C21 - C34 | mg/kg | < 10 | MCERTS | < 10 | < 10 | | |
| Aliphatic (C5 - C34) | mg/kg | < 21 | NONE | 347 | < 21 | | |
| Aromatic >C5 - C7 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | | |
| Aromatic >C7 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | | |
| Aromatic >C8 - C10 | mg/kg | < 2 | MCERTS | 4 | < 2 | | |
| Aromatic >C10 - C12 | mg/kg | < 2 | MCERTS | 24 | < 2 | | |
| Aromatic >C12 - C16 | mg/kg | < 2 | MCERTS | 26 | < 2 | | |
| Aromatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | | |
| Aromatic >C21 - C35 | mg/kg | < 10 | MCERTS | < 10 | < 10 | | |
| Aromatic (C5 - C35) | mg/kg | < 21 | NONE | 53 | < 21 | | |
| Total >C5 - C35 | mg/kg | < 42 | NONE | 400 | < 42 | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - BTEX / MTBE | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-51122 | Date Sampled | 27/10/16 | 27/10/16 | 27/10/16 | 27/10/16 | 27/10/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W3/T7.1 | W3/T8.1 | W3/T9.1 | W3/T10.1 | W3/T11.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 03/11/2016 | QTSE Sample No | 235939 | 235940 | 235941 | 235942 | 235943 |

| Determinand | Unit | RL | Accreditation | | | | | |
|--------------|-------|-----|---------------|-----|-----|-----|-----|-----|
| Benzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Ethylbenzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | 19 | 25 | 71 |
| p & m-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | 55 | 77 | 217 |
| o-xylene | ug/kg | < 2 | MCERTS | 11 | 11 | 144 | 90 | 244 |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - BTEX / MTBE | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-51122 | Date Sampled | 27/10/16 | 27/10/16 | 27/10/16 | 27/10/16 | 27/10/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W4/T12.1 | W4/T13.1 | W4/T14.1 | W4/T15.1 | W4/T16.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 03/11/2016 | QTSE Sample No | 235944 | 235945 | 235946 | 235947 | 235948 |

| Determinand | Unit | RL | Accreditation | | | | | |
|--------------|-------|-----|---------------|-----|-----|-----|-----|-----|
| Benzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Ethylbenzene | ug/kg | < 2 | MCERTS | 24 | < 2 | < 2 | 38 | < 2 |
| p & m-xylene | ug/kg | < 2 | MCERTS | 33 | < 2 | 3 | 57 | < 2 |
| o-xylene | ug/kg | < 2 | MCERTS | 85 | 9 | 9 | 153 | < 2 |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - BTEX / MTBE | | | | | |
|--|-----------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-51122 | Date Sampled | 27/10/16 | 27/10/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W4/T17.1 | SFU 23 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 03/11/2016 | QTSE Sample No | 235949 | 235950 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|--------------|-------|-----|---------------|-----|-----|--|--|
| Benzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | | |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | | |
| Ethylbenzene | ug/kg | < 2 | MCERTS | 99 | < 2 | | |
| p & m-xylene | ug/kg | < 2 | MCERTS | 203 | < 2 | | |
| o-xylene | ug/kg | < 2 | MCERTS | 168 | < 2 | | |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | < 5 | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-51122 | Date Sampled | 27/10/16 | 27/10/16 | 27/10/16 | 27/10/16 | 27/10/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | Area 2/NF1 | Area 2/WF1 | K1 Base | W3/T7.1 | W3/T8.1 |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | Composite | Composite |
| Order No: 138 | Depth (m) | 2.50 - 3.50 | 2.50 - 3.50 | 3.50 - 4.00 | None Supplied | None Supplied |
| Reporting Date: 03/11/2016 | QTSE Sample No | 235936 | 235937 | 235938 | 235939 | 235940 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|------|-----|-----|------|-------|
| Trichloroethene | ug/kg | < 5 | MCERTS | 1451 | 413 | 944 | 2381 | 30490 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-51122 | Date Sampled | 27/10/16 | 27/10/16 | 27/10/16 | 27/10/16 | 27/10/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W3/T9.1 | W3/T10.1 | W3/T11.1 | W4/T12.1 | W4/T13.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 03/11/2016 | QTSE Sample No | 235941 | 235942 | 235943 | 235944 | 235945 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|------|------|-------|-----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 3371 | 5019 | 20100 | 473 | 318 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-51122 | Date Sampled | 27/10/16 | 27/10/16 | 27/10/16 | 27/10/16 | 27/10/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W4/T14.1 | W4/T15.1 | W4/T16.1 | W4/T17.1 | SFU 23 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 03/11/2016 | QTSE Sample No | 235946 | 235947 | 235948 | 235949 | 235950 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|-----|------|-----|-----|------|
| Trichloroethene | ug/kg | < 5 | MCERTS | 444 | 5994 | 215 | 289 | 3386 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Sample Descriptions | |
|--|--|
| QTS Environmental Report No: 16-51122 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (St Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 03/11/2016 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|------------|-----------------|---------------|----------------------|---------------------------------|
| 235936 | Area 2/NF1 | None Supplied | 2.50 - 3.50 | 20.4 | Brown gravelly clay |
| 235937 | Area 2/WF1 | None Supplied | 2.50 - 3.50 | 13.8 | Brown gravelly clay |
| 235938 | K1 Base | None Supplied | 3.50 - 4.00 | 19.5 | Brown gravelly clay |
| 235939 | W3/T7.1 | Composite | None Supplied | 14.4 | Brown gravelly clay |
| 235940 | W3/T8.1 | Composite | None Supplied | 13.9 | Brown gravelly clay |
| 235941 | W3/T9.1 | Composite | None Supplied | 12.3 | Brown gravelly clay |
| 235942 | W3/T10.1 | Composite | None Supplied | 13.5 | Brown gravelly clay with stones |
| 235943 | W3/T11.1 | Composite | None Supplied | 12.9 | Brown gravelly clay |
| 235944 | W4/T12.1 | Composite | None Supplied | 7.8 | Light brown gravelly clay |
| 235945 | W4/T13.1 | Composite | None Supplied | 15.5 | Brown gravelly clay |
| 235946 | W4/T14.1 | Composite | None Supplied | 10.7 | Brown gravelly clay |
| 235947 | W4/T15.1 | Composite | None Supplied | 12.7 | Brown gravelly clay |
| 235948 | W4/T16.1 | Composite | None Supplied | 14 | Brown gravelly clay |
| 235949 | W4/T17.1 | Composite | None Supplied | 12 | Brown gravelly clay |
| 235950 | SFU 23 | Composite | None Supplied | 19.4 | Brown clay |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{U/S}

Unsuitable Sample ^{U/S}

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 16-51122 |
| G & J Geoenvironmental Consultants Ltd |
| Site Reference: Nash Road, Redditch (St Francis Group) |
| Project / Job Ref: GJ079 |
| Order No: 138 |
| Reporting Date: 03/11/2016 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCs | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

D Dried
AR As Received



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QTS Environmental Report No: 16-51393

Site Reference: Nash Road, Redditch (St Francis Group)

Project / Job Ref: GJ079

Order No: 138

Sample Receipt Date: 07/11/2016

Sample Scheduled Date: 07/11/2016

Report Issue Number: 1

Reporting Date: 11/11/2016

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Ela Mysiara
Inorganics & ICP Section Head



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-51393 | Date Sampled | 04/11/16 | 04/11/16 | 04/11/16 | 04/11/16 | 04/11/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | Area 2/WF2 | Area 2/WF3 | Area 2/WF4 | K2 base | K3 Base |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 |
| Reporting Date: 11/11/2016 | QTSE Sample No | 236934 | 236935 | 236936 | 236937 | 236938 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|-----|-----|----|-----|----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 244 | < 5 | 41 | 310 | 21 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | |
|--|-----------------|---------------|--|--|--|
| QTS Environmental Report No: 16-51393 | Date Sampled | 04/11/16 | | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | K4 Base | | | |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | | | |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | | | |
| Reporting Date: 11/11/2016 | QTSE Sample No | 236939 | | | |

| Determinand | Unit | RL | Accreditation | | | |
|-----------------|-------|-----|---------------|-----|--|--|
| Trichloroethene | ug/kg | < 5 | MCERTS | 756 | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Sample Descriptions | |
|--|--|
| QTS Environmental Report No: 16-51393 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (St Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 11/11/2016 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|------------|-----------------|-------------|----------------------|---------------------------|
| 236934 | Area 2/WF2 | None Supplied | 2.50 - 3.50 | 12.4 | Light brown sandy clay |
| 236935 | Area 2/WF3 | None Supplied | 2.50 - 3.50 | 15.2 | Light brown clay |
| 236936 | Area 2/WF4 | None Supplied | 2.50 - 3.50 | 14.4 | Light brown sandy clay |
| 236937 | K2 base | None Supplied | 3.50 - 4.00 | 18 | Brown clay |
| 236938 | K3 Base | None Supplied | 3.50 - 4.00 | 14.6 | Light brown clay |
| 236939 | K4 Base | None Supplied | 3.50 - 4.00 | 15.8 | Light brown sandy clay |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{I/S}

Unsuitable Sample ^{U/S}

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 16-51393 |
| G & J Geoenvironmental Consultants Ltd |
| Site Reference: Nash Road, Redditch (St Francis Group) |
| Project / Job Ref: GJ079 |
| Order No: 138 |
| Reporting Date: 11/11/2016 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCs | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

D Dried
AR As Received



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QTS Environmental Report No: 16-51730

Site Reference: Nash Road, Redditch (St Francis Group)

Project / Job Ref: GJ079

Order No: 138

Sample Receipt Date: 15/11/2016

Sample Scheduled Date: 15/11/2016

Report Issue Number: 1

Reporting Date: 21/11/2016

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Russell Jarvis
Associate Director of Client Services



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-51730 | Date Sampled | 08/11/16 | 08/11/16 | 08/11/16 | 08/11/16 | 08/11/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | Area 2/WF5 | Area 2/WF6 | Area 2/WF7 | Area 2/WF8 | Area 2/SF1 |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 |
| Reporting Date: 21/11/2016 | QTSE Sample No | 238219 | 238220 | 238221 | 238222 | 238223 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|----|----|----|----|----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 27 | 36 | 31 | 19 | 81 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|----------------|---------------|----------------|----------------|----------------|
| QTS Environmental Report No: 16-51730 | Date Sampled | 14/11/16 | 14/11/16 | 14/11/16 | 14/11/16 | 14/11/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | Area 2/K5 Base | Area 2/NF2 | Area 2/L1 Base | Area 2/L2 Base | Area 2/L3 Base |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 |
| Reporting Date: 21/11/2016 | QTSE Sample No | 238224 | 238225 | 238226 | 238227 | 238228 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|----|-----|----|-----|------|
| Trichloroethene | ug/kg | < 5 | MCERTS | 24 | 303 | 42 | 510 | 2190 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Sample Descriptions | |
|--|--|
| QTS Environmental Report No: 16-51730 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (St Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 21/11/2016 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|----------------|-----------------|-------------|----------------------|--|
| 238219 | Area 2/WF5 | None Supplied | 2.50 - 3.50 | 11.5 | Brown clay with stones and concrete |
| 238220 | Area 2/WF6 | None Supplied | 2.50 - 3.50 | 8.1 | Brown sandy clay with stones and brick |
| 238221 | Area 2/WF7 | None Supplied | 2.50 - 3.50 | 7.9 | Brown sandy gravel with stones and brick |
| 238222 | Area 2/WF8 | None Supplied | 2.50 - 3.50 | 8.4 | Brown sandy clay with stones |
| 238223 | Area 2/SF1 | None Supplied | 2.50 - 3.50 | 9.8 | Brown sandy gravel with stones |
| 238224 | Area 2/K5 Base | None Supplied | 3.50 - 4.00 | 12.2 | Light brown sand |
| 238225 | Area 2/NF2 | None Supplied | 2.50 - 3.50 | 12.1 | Light brown clayey sand with stones |
| 238226 | Area 2/L1 Base | None Supplied | 3.50 - 4.00 | 11.5 | Light brown clayey sand with stones |
| 238227 | Area 2/L2 Base | None Supplied | 3.50 - 4.00 | 15.1 | Red clay |
| 238228 | Area 2/L3 Base | None Supplied | 3.50 - 4.00 | 10.7 | Light brown clay |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{U/S}

Unsuitable Sample ^{U/S}

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 16-51730 |
| G & J Geoenvironmental Consultants Ltd |
| Site Reference: Nash Road, Redditch (St Francis Group) |
| Project / Job Ref: GJ079 |
| Order No: 138 |
| Reporting Date: 21/11/2016 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCs | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

D Dried
AR As Received



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QTS Environmental Report No: 16-51959

Site Reference: Nash Road, Redditch (St Francis Group)

Project / Job Ref: GJ079

Order No: 138

Sample Receipt Date: 21/11/2016

Sample Scheduled Date: 21/11/2016

Report Issue Number: 1

Reporting Date: 25/11/2016

Authorised by:

Russell Jarvis
Associate Director of Client Services

Authorised by:

Ela Mysiara
Inorganics & ICP Section Head

| Soil Analysis Certificate | | | | | |
|--|-----------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-51959 | Date Sampled | 16/11/16 | 16/11/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU24 | SFU25 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 25/11/2016 | QTSE Sample No | 239249 | 239250 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|----------------|-------|-------|---------------|-------|-------|--|--|
| Arsenic (As) | mg/kg | < 2 | MCERTS | 6 | 6 | | |
| Barium (Ba) | mg/kg | < 5 | NONE | 107 | 129 | | |
| Beryllium (Be) | mg/kg | < 0.5 | NONE | 0.5 | 0.6 | | |
| W/S Boron | mg/kg | < 1 | NONE | < 1 | < 1 | | |
| Cadmium (Cd) | mg/kg | < 0.2 | MCERTS | < 0.2 | < 0.2 | | |
| Chromium (Cr) | mg/kg | < 2 | MCERTS | 14 | 17 | | |
| Copper (Cu) | mg/kg | < 4 | MCERTS | 10 | 12 | | |
| Lead (Pb) | mg/kg | < 3 | MCERTS | 6 | 10 | | |
| Mercury (Hg) | mg/kg | < 1 | NONE | < 1 | < 1 | | |
| Nickel (Ni) | mg/kg | < 3 | MCERTS | 11 | 13 | | |
| Selenium (Se) | mg/kg | < 3 | NONE | < 3 | < 3 | | |
| Vanadium (V) | mg/kg | < 2 | NONE | 29 | 37 | | |
| Zinc (Zn) | mg/kg | < 3 | MCERTS | 29 | 37 | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
 Analysis carried out on the dried sample is corrected for the stone content
 Subcontracted analysis ^(S)



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| Soil Analysis Certificate - Speciated PAHs | | | | | |
|--|-----------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-51959 | Date Sampled | 16/11/16 | 16/11/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU24 | SFU25 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 25/11/2016 | QTSE Sample No | 239249 | 239250 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|------------------------|-------|-------|---------------|-------|-------|--|--|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | < 1.6 | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - TPH CWG Banded | | | | | |
|--|-----------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-51959 | Date Sampled | 16/11/16 | 16/11/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU24 | SFU25 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 25/11/2016 | QTSE Sample No | 239249 | 239250 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|----------------------|-------|--------|---------------|--------|--------|--|--|
| Aliphatic >C5 - C6 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | | |
| Aliphatic >C6 - C8 | mg/kg | < 0.05 | NONE | 0.13 | 0.07 | | |
| Aliphatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | | |
| Aliphatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | | |
| Aliphatic >C12 - C16 | mg/kg | < 3 | MCERTS | < 3 | < 3 | | |
| Aliphatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | | |
| Aliphatic >C21 - C34 | mg/kg | < 10 | MCERTS | < 10 | < 10 | | |
| Aliphatic (C5 - C34) | mg/kg | < 21 | NONE | < 21 | < 21 | | |
| Aromatic >C5 - C7 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | | |
| Aromatic >C7 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | | |
| Aromatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | | |
| Aromatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | | |
| Aromatic >C12 - C16 | mg/kg | < 2 | MCERTS | < 2 | < 2 | | |
| Aromatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | | |
| Aromatic >C21 - C35 | mg/kg | < 10 | MCERTS | < 10 | < 10 | | |
| Aromatic (C5 - C35) | mg/kg | < 21 | NONE | < 21 | < 21 | | |
| Total >C5 - C35 | mg/kg | < 42 | NONE | < 42 | < 42 | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - BTEX / MTBE | | | | | |
|--|-----------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-51959 | Date Sampled | 16/11/16 | 16/11/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU24 | SFU25 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 25/11/2016 | QTSE Sample No | 239249 | 239250 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|--------------|-------|-----|---------------|-----|-----|--|--|
| Benzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | | |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | | |
| Ethylbenzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | | |
| p & m-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | | |
| o-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | | |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | < 5 | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-51959 | Date Sampled | 15/11/16 | 15/11/16 | 15/11/16 | 15/11/16 | 15/11/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | L4 Base | L5 Base | L6 Base | L7 Base | L8 Base |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 |
| Reporting Date: 25/11/2016 | QTSE Sample No | 239243 | 239244 | 239245 | 239246 | 239247 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|------|------|------|------|------|
| Trichloroethene | ug/kg | < 5 | MCERTS | 6670 | 4796 | 5887 | 9311 | 6516 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | |
|--|-----------------|---------------|---------------|---------------|--|
| QTS Environmental Report No: 16-51959 | Date Sampled | 15/11/16 | 16/11/16 | 16/11/16 | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | Area 2/SF2 | SFU24 | SFU25 | |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | Composite | Composite | |
| Order No: 138 | Depth (m) | 2.50 - 3.50 | None Supplied | None Supplied | |
| Reporting Date: 25/11/2016 | QTSE Sample No | 239248 | 239249 | 239250 | |

| Determinand | Unit | RL | Accreditation | | | |
|-----------------|-------|-----|---------------|------|-----|----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 4552 | 115 | 57 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Sample Descriptions | |
|--|--|
| QTS Environmental Report No: 16-51959 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (St Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 25/11/2016 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|------------|-----------------|---------------|----------------------|---------------------------|
| 239243 | L4 Base | None Supplied | 3.50 - 4.00 | 18.7 | Red clay |
| 239244 | L5 Base | None Supplied | 3.50 - 4.00 | 15.5 | Red clay |
| 239245 | L6 Base | None Supplied | 3.50 - 4.00 | 17 | Red clay |
| 239246 | L7 Base | None Supplied | 3.50 - 4.00 | 17.9 | Red clay |
| 239247 | L8 Base | None Supplied | 3.50 - 4.00 | 16.5 | Red clay |
| 239248 | Area 2/SF2 | None Supplied | 2.50 - 3.50 | 15.1 | Red clay |
| 239249 | SFU24 | Composite | None Supplied | 9.9 | Brown clay with stones |
| 239250 | SFU25 | Composite | None Supplied | 9.4 | Brown clay with stones |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{I/S}

Unsuitable Sample ^{U/S}

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 16-51959 |
| G & J Geoenvironmental Consultants Ltd |
| Site Reference: Nash Road, Redditch (St Francis Group) |
| Project / Job Ref: GJ079 |
| Order No: 138 |
| Reporting Date: 25/11/2016 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCs | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

D Dried
AR As Received



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QTS Environmental Report No: 16-52472

Site Reference: Nash Road, Redditch (St Francis Group)

Project / Job Ref: GJ079

Order No: 138

Sample Receipt Date: 05/12/2016

Sample Scheduled Date: 05/12/2016

Report Issue Number: 1

Reporting Date: 09/12/2016

Authorised by:

Russell Jarvis
Associate Director of Client Services

Authorised by:

Ela Mysiara
Inorganics & ICP Section Head



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| Soil Analysis Certificate | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-52472 | Date Sampled | 23/11/16 | 23/11/16 | 23/11/16 | 23/11/16 | 29/11/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU26 | SFU27 | SFU28 | SFU29 | SFU30 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 09/12/2016 | QTSE Sample No | 241511 | 241512 | 241513 | 241514 | 241530 |

| Determinand | Unit | RL | Accreditation | | | | | |
|----------------|-------|-------|---------------|-------|-------|-------|-------|-------|
| Arsenic (As) | mg/kg | < 2 | MCERTS | 2 | 10 | 6 | 5 | 4 |
| Barium (Ba) | mg/kg | < 5 | NONE | 117 | 201 | 132 | 134 | 132 |
| Beryllium (Be) | mg/kg | < 0.5 | NONE | 1.1 | 1 | 1 | 1 | 1.2 |
| W/S Boron | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | < 1 | < 1 |
| Cadmium (Cd) | mg/kg | < 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Chromium (Cr) | mg/kg | < 2 | MCERTS | 41 | 27 | 39 | 40 | 49 |
| Copper (Cu) | mg/kg | < 4 | MCERTS | 17 | 19 | 18 | 18 | 18 |
| Lead (Pb) | mg/kg | < 3 | MCERTS | 16 | 8 | 25 | 12 | 5 |
| Mercury (Hg) | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | < 1 | < 1 |
| Nickel (Ni) | mg/kg | < 3 | MCERTS | 41 | 24 | 38 | 40 | 55 |
| Selenium (Se) | mg/kg | < 3 | NONE | < 3 | < 3 | < 3 | < 3 | < 3 |
| Vanadium (V) | mg/kg | < 2 | NONE | 36 | 29 | 34 | 34 | 41 |
| Zinc (Zn) | mg/kg | < 3 | MCERTS | 78 | 52 | 74 | 75 | 65 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
 Analysis carried out on the dried sample is corrected for the stone content
 Subcontracted analysis ⁽⁵⁾



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| Soil Analysis Certificate | | | | | |
|--|-----------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-52472 | Date Sampled | 29/11/16 | 29/11/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU31 | SFU32 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 09/12/2016 | QTSE Sample No | 241531 | 241532 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|----------------|-------|-------|---------------|-------|-------|--|--|
| Arsenic (As) | mg/kg | < 2 | MCERTS | 3 | 3 | | |
| Barium (Ba) | mg/kg | < 5 | NONE | 110 | 137 | | |
| Beryllium (Be) | mg/kg | < 0.5 | NONE | 1.2 | 1.2 | | |
| W/S Boron | mg/kg | < 1 | NONE | < 1 | < 1 | | |
| Cadmium (Cd) | mg/kg | < 0.2 | MCERTS | < 0.2 | < 0.2 | | |
| Chromium (Cr) | mg/kg | < 2 | MCERTS | 49 | 48 | | |
| Copper (Cu) | mg/kg | < 4 | MCERTS | 19 | 18 | | |
| Lead (Pb) | mg/kg | < 3 | MCERTS | 6 | 5 | | |
| Mercury (Hg) | mg/kg | < 1 | NONE | < 1 | < 1 | | |
| Nickel (Ni) | mg/kg | < 3 | MCERTS | 57 | 55 | | |
| Selenium (Se) | mg/kg | < 3 | NONE | < 3 | < 3 | | |
| Vanadium (V) | mg/kg | < 2 | NONE | 42 | 40 | | |
| Zinc (Zn) | mg/kg | < 3 | MCERTS | 67 | 65 | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
 Analysis carried out on the dried sample is corrected for the stone content
 Subcontracted analysis ⁽⁵⁾



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| Soil Analysis Certificate - Speciated PAHs | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-52472 | Date Sampled | 23/11/16 | 23/11/16 | 23/11/16 | 23/11/16 | 29/11/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU26 | SFU27 | SFU28 | SFU29 | SFU30 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 09/12/2016 | QTSE Sample No | 241511 | 241512 | 241513 | 241514 | 241530 |

| Determinand | Unit | RL | Accreditation | | | | | |
|------------------------|-------|-------|---------------|-------|-------|-------|-------|-------|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | < 1.6 | < 1.6 | < 1.6 | < 1.6 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Speciated PAHs | | | | | |
|--|-----------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-52472 | Date Sampled | 29/11/16 | 29/11/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU31 | SFU32 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 09/12/2016 | QTSE Sample No | 241531 | 241532 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|------------------------|-------|-------|---------------|-------|-------|--|--|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | < 1.6 | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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Soil Analysis Certificate - TPH CWG Banded

| | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-52472 | Date Sampled | 23/11/16 | 23/11/16 | 23/11/16 | 23/11/16 | 29/11/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU26 | SFU27 | SFU28 | SFU29 | SFU30 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 09/12/2016 | QTSE Sample No | 241511 | 241512 | 241513 | 241514 | 241530 |

| Determinand | Unit | RL | Accreditation | 23/11/16 | 23/11/16 | 23/11/16 | 23/11/16 | 29/11/16 |
|----------------------|-------|--------|---------------|----------|----------|----------|----------|----------|
| Aliphatic >C5 - C6 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Aliphatic >C6 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | 0.43 | < 0.05 | < 0.05 |
| Aliphatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aliphatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aliphatic >C12 - C16 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | < 3 | < 3 |
| Aliphatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | 25 | < 3 | < 3 |
| Aliphatic >C21 - C34 | mg/kg | < 10 | MCERTS | < 10 | < 10 | 835 | < 10 | < 10 |
| Aliphatic (C5 - C34) | mg/kg | < 21 | NONE | < 21 | < 21 | 861 | < 21 | < 21 |
| Aromatic >C5 - C7 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Aromatic >C7 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Aromatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aromatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aromatic >C12 - C16 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aromatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | 19 | < 3 | < 3 |
| Aromatic >C21 - C35 | mg/kg | < 10 | MCERTS | < 10 | < 10 | 484 | < 10 | < 10 |
| Aromatic (C5 - C35) | mg/kg | < 21 | NONE | < 21 | < 21 | 503 | < 21 | < 21 |
| Total >C5 - C35 | mg/kg | < 42 | NONE | < 42 | < 42 | 1364 | < 42 | < 42 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - TPH CWG Banded | | | | | |
|--|-----------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-52472 | Date Sampled | 29/11/16 | 29/11/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU31 | SFU32 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 09/12/2016 | QTSE Sample No | 241531 | 241532 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|----------------------|-------|--------|---------------|--------|--------|--|--|
| Aliphatic >C5 - C6 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | | |
| Aliphatic >C6 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | | |
| Aliphatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | | |
| Aliphatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | | |
| Aliphatic >C12 - C16 | mg/kg | < 3 | MCERTS | < 3 | < 3 | | |
| Aliphatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | | |
| Aliphatic >C21 - C34 | mg/kg | < 10 | MCERTS | < 10 | < 10 | | |
| Aliphatic (C5 - C34) | mg/kg | < 21 | NONE | < 21 | < 21 | | |
| Aromatic >C5 - C7 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | | |
| Aromatic >C7 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | | |
| Aromatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | | |
| Aromatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | | |
| Aromatic >C12 - C16 | mg/kg | < 2 | MCERTS | < 2 | < 2 | | |
| Aromatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | | |
| Aromatic >C21 - C35 | mg/kg | < 10 | MCERTS | < 10 | < 10 | | |
| Aromatic (C5 - C35) | mg/kg | < 21 | NONE | < 21 | < 21 | | |
| Total >C5 - C35 | mg/kg | < 42 | NONE | < 42 | < 42 | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - BTEX / MTBE | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-52472 | Date Sampled | 23/11/16 | 23/11/16 | 23/11/16 | 23/11/16 | 29/11/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU26 | SFU27 | SFU28 | SFU29 | SFU30 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 09/12/2016 | QTSE Sample No | 241511 | 241512 | 241513 | 241514 | 241530 |

| Determinand | Unit | RL | Accreditation | | | | | |
|--------------|-------|-----|---------------|-----|-----|-----|-----|-----|
| Benzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Ethylbenzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| p & m-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| o-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - BTEX / MTBE | | | | | | |
|--|-----------------|---------------|---------------|--|--|--|
| QTS Environmental Report No: 16-52472 | Date Sampled | 29/11/16 | 29/11/16 | | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU31 | SFU32 | | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | | | |
| Reporting Date: 09/12/2016 | QTSE Sample No | 241531 | 241532 | | | |

| Determinand | Unit | RL | Accreditation | | | | |
|--------------|-------|-----|---------------|-----|-----|--|--|
| Benzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | | |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | | |
| Ethylbenzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | | |
| p & m-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | | |
| o-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | | |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | < 5 | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-52472 | Date Sampled | 23/11/16 | 23/11/16 | 23/11/16 | 23/11/16 | 28/11/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU26 | SFU27 | SFU28 | SFU29 | Area 2/NF3 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | None Supplied |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | 2.50 - 3.50 |
| Reporting Date: 09/12/2016 | QTSE Sample No | 241511 | 241512 | 241513 | 241514 | 241515 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|----|----|-----|----|------|
| Trichloroethene | ug/kg | < 5 | MCERTS | 21 | 23 | 406 | 23 | 7260 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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 Tel : 01622 850410



| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-52472 | Date Sampled | 28/11/16 | 28/11/16 | 28/11/16 | 28/11/16 | 28/11/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | M1 Base | M2 Base | M3 Base | M6 Base | M7 Base |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | Composite | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 3.50 - 4.00 | None Supplied | 3.50 - 4.00 | 3.50 - 4.00 |
| Reporting Date: 09/12/2016 | QTSE Sample No | 241516 | 241517 | 241518 | 241519 | 241520 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|------|------|------|----|------|
| Trichloroethene | ug/kg | < 5 | MCERTS | 8270 | 1436 | 4383 | 17 | 8930 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-52472 | Date Sampled | 28/11/16 | 28/11/16 | 28/11/16 | 28/11/16 | 28/11/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | M8 Base | Area 2/SF3 | Area 2/NF4 | N1 Base | N2 Base |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 2.50 - 3.50 | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 |
| Reporting Date: 09/12/2016 | QTSE Sample No | 241521 | 241522 | 241523 | 241524 | 241525 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|----|----|-----|-----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 26 | 27 | 335 | 452 | 164 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-52472 | Date Sampled | 28/11/16 | 28/11/16 | 28/11/16 | 28/11/16 | 29/11/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | N3 Base | N7 Base | N8 Base | Area 2/SF4 | SFU30 |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | Composite |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 2.50 - 3.50 | None Supplied |
| Reporting Date: 09/12/2016 | QTSE Sample No | 241526 | 241527 | 241528 | 241529 | 241530 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|------|-----|----|----|----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 2582 | 108 | 16 | 22 | 23 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|--|
| QTS Environmental Report No: 16-52472 | Date Sampled | 29/11/16 | 29/11/16 | 29/11/16 | 29/11/16 | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU31 | SFU32 | Area 2/SF5 | O8 Base | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | None Supplied | None Supplied | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | 2.50 - 3.50 | 3.50 - 4.00 | |
| Reporting Date: 09/12/2016 | QTSE Sample No | 241531 | 241532 | 241533 | 241534 | |

| Determinand | Unit | RL | Accreditation | | | | |
|-----------------|-------|-----|---------------|----|----|----|----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 21 | 30 | 19 | 17 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C

| Soil Analysis Certificate - Sample Descriptions | |
|--|--|
| QTS Environmental Report No: 16-52472 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (St Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 09/12/2016 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|------------|-----------------|---------------|----------------------|--------------------------------------|
| \$ 241511 | SFU26 | Composite | None Supplied | 18.3 | Red sandy gravel |
| \$ 241512 | SFU27 | Composite | None Supplied | 15.7 | Red clay |
| \$ 241513 | SFU28 | Composite | None Supplied | 14.8 | Red clayey gravel |
| \$ 241514 | SFU29 | Composite | None Supplied | 15 | Red clayey gravel |
| 241515 | Area 2/NF3 | None Supplied | 2.50 - 3.50 | 13.5 | Light grey clayey gravel with stones |
| 241516 | M1 Base | None Supplied | 3.50 - 4.00 | 17.3 | Red clayey gravel with stones |
| 241517 | M2 Base | None Supplied | 3.50 - 4.00 | 12.8 | Red clayey gravel |
| 241518 | M3 Base | Composite | None Supplied | 20 | Red clay |
| 241519 | M6 Base | None Supplied | 3.50 - 4.00 | 23.1 | Red clayey sand |
| 241520 | M7 Base | None Supplied | 3.50 - 4.00 | 14.4 | Red clay with stones |
| 241521 | M8 Base | None Supplied | 3.50 - 4.00 | 20.9 | Red clay |
| 241522 | Area 2/SF3 | None Supplied | 2.50 - 3.50 | 22.1 | Red clay |
| 241523 | Area 2/NF4 | None Supplied | 2.50 - 3.50 | 19 | Red clay |
| 241524 | N1 Base | None Supplied | 3.50 - 4.00 | 18.2 | Red clay |
| 241525 | N2 Base | None Supplied | 3.50 - 4.00 | 17.1 | Red clay |
| 241526 | N3 Base | None Supplied | 3.50 - 4.00 | 18.8 | Red clay |
| 241527 | N7 Base | None Supplied | 3.50 - 4.00 | 19.9 | Red clay |
| 241528 | N8 Base | None Supplied | 3.50 - 4.00 | 19.1 | Red clay |
| 241529 | Area 2/SF4 | None Supplied | 2.50 - 3.50 | 18.4 | Red clay |
| 241530 | SFU30 | Composite | None Supplied | 15.7 | Red clayey sand |
| 241531 | SFU31 | Composite | None Supplied | 20.5 | Red clayey sand |
| 241532 | SFU32 | Composite | None Supplied | 23.3 | Red clayey sand |
| 241533 | Area 2/SF5 | None Supplied | 2.50 - 3.50 | 19.9 | Brown clay |
| 241534 | O8 Base | None Supplied | 3.50 - 4.00 | 15.6 | Brown clay |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{I/S}

Unsuitable Sample ^{U/S}

\$ samples exceeded recommended holding times

| Soil Analysis Certificate - Methodology & Miscellaneous Information | |
|--|--|
| QTS Environmental Report No: 16-52472 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (St Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 09/12/2016 | |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCS | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

D Dried
AR As Received



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QTS Environmental Report No: 16-52716

Site Reference: Nash Road, Redditch (Saint Francis Group)

Project / Job Ref: GJ079

Order No: 138

Sample Receipt Date: 09/12/2016

Sample Scheduled Date: 09/12/2016

Report Issue Number: 1

Reporting Date: 15/12/2016

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Ela Mysiara
Inorganics & ICP Section Head



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 Tel : 01622 850410



| Soil Analysis Certificate | | | | | |
|---|-----------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-52716 | Date Sampled | 08/12/16 | 08/12/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | SFU33 | SFU34 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 15/12/2016 | QTSE Sample No | 242389 | 242390 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|----------------|-------|-------|---------------|-------|-------|--|--|
| Arsenic (As) | mg/kg | < 2 | MCERTS | < 2 | 5 | | |
| Barium (Ba) | mg/kg | < 5 | NONE | 70 | 115 | | |
| Beryllium (Be) | mg/kg | < 0.5 | NONE | 0.7 | 1.4 | | |
| W/S Boron | mg/kg | < 1 | NONE | < 1 | < 1 | | |
| Cadmium (Cd) | mg/kg | < 0.2 | MCERTS | < 0.2 | < 0.2 | | |
| Chromium (Cr) | mg/kg | < 2 | MCERTS | 22 | 55 | | |
| Copper (Cu) | mg/kg | < 4 | MCERTS | 18 | 19 | | |
| Lead (Pb) | mg/kg | < 3 | MCERTS | 8 | 6 | | |
| Mercury (Hg) | mg/kg | < 1 | NONE | < 1 | < 1 | | |
| Nickel (Ni) | mg/kg | < 3 | MCERTS | 18 | 60 | | |
| Selenium (Se) | mg/kg | < 3 | NONE | < 3 | < 3 | | |
| Vanadium (V) | mg/kg | < 2 | NONE | 28 | 46 | | |
| Zinc (Zn) | mg/kg | < 3 | MCERTS | 44 | 70 | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
 Analysis carried out on the dried sample is corrected for the stone content
 Subcontracted analysis ^(S)



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| Soil Analysis Certificate - Speciated PAHs | | | | | |
|---|-----------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-52716 | Date Sampled | 08/12/16 | 08/12/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | SFU33 | SFU34 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 15/12/2016 | QTSE Sample No | 242389 | 242390 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|------------------------|-------|-------|---------------|-------|-------|--|--|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | | |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | < 1.6 | | |

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| Soil Analysis Certificate - TPH CWG Banded | | | | | |
|---|-----------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-52716 | Date Sampled | 08/12/16 | 08/12/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | SFU33 | SFU34 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 15/12/2016 | QTSE Sample No | 242389 | 242390 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|----------------------|-------|--------|---------------|--------|--------|--|--|
| Aliphatic >C5 - C6 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | | |
| Aliphatic >C6 - C8 | mg/kg | < 0.05 | NONE | 1.86 | 0.15 | | |
| Aliphatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | | |
| Aliphatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | | |
| Aliphatic >C12 - C16 | mg/kg | < 3 | MCERTS | < 3 | < 3 | | |
| Aliphatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | | |
| Aliphatic >C21 - C34 | mg/kg | < 10 | MCERTS | < 10 | < 10 | | |
| Aliphatic (C5 - C34) | mg/kg | < 21 | NONE | < 21 | < 21 | | |
| Aromatic >C5 - C7 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | | |
| Aromatic >C7 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | | |
| Aromatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | | |
| Aromatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | | |
| Aromatic >C12 - C16 | mg/kg | < 2 | MCERTS | < 2 | < 2 | | |
| Aromatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | | |
| Aromatic >C21 - C35 | mg/kg | < 10 | MCERTS | < 10 | < 10 | | |
| Aromatic (C5 - C35) | mg/kg | < 21 | NONE | < 21 | < 21 | | |
| Total >C5 - C35 | mg/kg | < 42 | NONE | < 42 | < 42 | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - BTEX / MTBE | | | | | |
|---|-----------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-52716 | Date Sampled | 08/12/16 | 08/12/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | SFU33 | SFU34 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | | |
| Reporting Date: 15/12/2016 | QTSE Sample No | 242389 | 242390 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|--------------|-------|-----|---------------|-----|-----|--|--|
| Benzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | | |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | | |
| Ethylbenzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | | |
| p & m-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | | |
| o-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | | |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | < 5 | | |

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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-52716 | Date Sampled | 06/12/16 | 06/12/16 | 06/12/16 | 06/12/16 | 06/12/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | M4 Base | M5 Base | N4 Base | N5 Base | N6 Base |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 |
| Reporting Date: 15/12/2016 | QTSE Sample No | 242373 | 242374 | 242375 | 242376 | 242377 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|----|-----|----|----|----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 20 | 101 | 35 | 15 | 12 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-52716 | Date Sampled | 06/12/16 | 06/12/16 | 06/12/16 | 06/12/16 | 06/12/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | 07 Base | P7 Base | P8 Base | Area 2/SF6 | O1 Base |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 2.50 - 3.50 | 3.50 - 4.00 |
| Reporting Date: 15/12/2016 | QTSE Sample No | 242378 | 242379 | 242380 | 242381 | 242382 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|----|-----|----|-----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 11 | < 5 | 11 | < 5 | 468 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-52716 | Date Sampled | 06/12/16 | 06/12/16 | 06/12/16 | 08/12/16 | 08/12/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | O2 Base | O3 Base | Area 2/NF5 | O4 Base | O5 Base |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 3.50 - 4.00 | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 |
| Reporting Date: 15/12/2016 | QTSE Sample No | 242383 | 242384 | 242385 | 242386 | 242387 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|-----|-----|-----|------|------|
| Trichloroethene | ug/kg | < 5 | MCERTS | 818 | 248 | < 5 | 1817 | 2158 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-52716 | Date Sampled | 08/12/16 | 08/12/16 | 08/12/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | O6 Base | SFU33 | SFU34 | | |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | Composite | Composite | | |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | None Supplied | None Supplied | | |
| Reporting Date: 15/12/2016 | QTSE Sample No | 242388 | 242389 | 242390 | | |

| Determinand | Unit | RL | Accreditation | | | |
|-----------------|-------|-----|---------------|-----|------|----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 137 | 1747 | 86 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Sample Descriptions | |
|---|--|
| QTS Environmental Report No: 16-52716 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 15/12/2016 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|------------|-----------------|---------------|----------------------|---------------------------|
| 242373 | M4 Base | None Supplied | 3.50 - 4.00 | 22.3 | Red clay |
| 242374 | M5 Base | None Supplied | 3.50 - 4.00 | 22.4 | Red clay |
| 242375 | N4 Base | None Supplied | 3.50 - 4.00 | 21.7 | Red clay |
| 242376 | N5 Base | None Supplied | 3.50 - 4.00 | 22 | Red clay |
| 242377 | N6 Base | None Supplied | 3.50 - 4.00 | 21.1 | Red clay |
| 242378 | O7 Base | None Supplied | 3.50 - 4.00 | 18.8 | Red clay |
| 242379 | P7 Base | None Supplied | 3.50 - 4.00 | 18.8 | Red clay |
| 242380 | P8 Base | None Supplied | 3.50 - 4.00 | 19.1 | Red clay |
| 242381 | Area 2/SF6 | None Supplied | 2.50 - 3.50 | 18.9 | Red clay |
| 242382 | O1 Base | None Supplied | 3.50 - 4.00 | 15.6 | Red clay with stones |
| 242383 | O2 Base | None Supplied | 3.50 - 4.00 | 18.1 | Red clay |
| 242384 | O3 Base | None Supplied | 3.50 - 4.00 | 17 | Red clay |
| 242385 | Area 2/NF5 | None Supplied | 2.50 - 3.50 | 16.7 | Red clay |
| 242386 | O4 Base | None Supplied | 3.50 - 4.00 | 21.9 | Red clay |
| 242387 | O5 Base | None Supplied | 3.50 - 4.00 | 23.7 | Red clay |
| 242388 | O6 Base | None Supplied | 3.50 - 4.00 | 23.6 | Red clay |
| 242389 | SFU33 | Composite | None Supplied | 14.4 | Light brown clay |
| 242390 | SFU34 | Composite | None Supplied | 23.1 | Red clay |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{I/S}

Unsuitable Sample ^{U/S}

Soil Analysis Certificate - Methodology & Miscellaneous Information

QTS Environmental Report No: 16-52716

G & J Geoenvironmental Consultants Ltd

Site Reference: Nash Road, Redditch (Saint Francis Group)

Project / Job Ref: GJ079

Order No: 138

Reporting Date: 15/12/2016

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCs | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

D Dried
AR As Received



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QTS Environmental Report No: 16-52964

Site Reference: Nash Road, Redditch (Saint Francis Group)

Project / Job Ref: GJ079

Order No: 138

Sample Receipt Date: 15/12/2016

Sample Scheduled Date: 15/12/2016

Report Issue Number: 1

Reporting Date: 21/12/2016

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Ela Mysiara
Inorganics & ICP Section Head



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| Soil Analysis Certificate | | | | | | |
|---|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-52964 | Date Sampled | 13/12/16 | 13/12/16 | 13/12/16 | 13/12/16 | 13/12/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | SFU35 | SFU36 | SFU37 | W5/T18.1 | W5/T19.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 21/12/2016 | QTSE Sample No | 243587 | 243588 | 243589 | 243590 | 243591 |

| Determinand | Unit | RL | Accreditation | | | | | |
|----------------|-------|-------|---------------|-------|-------|-------|-------|-------|
| Arsenic (As) | mg/kg | < 2 | MCERTS | 8 | 6 | 4 | 8 | 7 |
| Barium (Ba) | mg/kg | < 5 | NONE | 51 | 52 | 52 | 79 | 129 |
| Beryllium (Be) | mg/kg | < 0.5 | NONE | 1.1 | 1.2 | 1.2 | 0.9 | 0.9 |
| W/S Boron | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | < 1 | < 1 |
| Cadmium (Cd) | mg/kg | < 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Chromium (Cr) | mg/kg | < 2 | MCERTS | 32 | 32 | 34 | 24 | 24 |
| Copper (Cu) | mg/kg | < 4 | MCERTS | 16 | 16 | 17 | 23 | 25 |
| Lead (Pb) | mg/kg | < 3 | MCERTS | 13 | 10 | 10 | 9 | 5 |
| Mercury (Hg) | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | < 1 | < 1 |
| Nickel (Ni) | mg/kg | < 3 | MCERTS | 27 | 28 | 29 | 22 | 23 |
| Selenium (Se) | mg/kg | < 3 | NONE | < 3 | < 3 | < 3 | < 3 | < 3 |
| Vanadium (V) | mg/kg | < 2 | NONE | 25 | 29 | 32 | 32 | 26 |
| Zinc (Zn) | mg/kg | < 3 | MCERTS | 72 | 76 | 76 | 49 | 47 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
 Analysis carried out on the dried sample is corrected for the stone content
 Subcontracted analysis ^(S)



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| Soil Analysis Certificate | | | | | |
|---|-----------------|---------------|---------------|---------------|--|
| QTS Environmental Report No: 16-52964 | Date Sampled | 13/12/16 | 13/12/16 | 13/12/16 | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | W5/T20.1 | W5/T21.1 | W5/T22.1 | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | |
| Reporting Date: 21/12/2016 | QTSE Sample No | 243592 | 243593 | 243594 | |

| Determinand | Unit | RL | Accreditation | | | |
|----------------|-------|-------|---------------|-------|-------|-------|
| Arsenic (As) | mg/kg | < 2 | MCERTS | 2 | 6 | 6 |
| Barium (Ba) | mg/kg | < 5 | NONE | 130 | 113 | 129 |
| Beryllium (Be) | mg/kg | < 0.5 | NONE | 1 | 0.9 | 1 |
| W/S Boron | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 |
| Cadmium (Cd) | mg/kg | < 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 |
| Chromium (Cr) | mg/kg | < 2 | MCERTS | 24 | 24 | 26 |
| Copper (Cu) | mg/kg | < 4 | MCERTS | 25 | 26 | 25 |
| Lead (Pb) | mg/kg | < 3 | MCERTS | 5 | 7 | 8 |
| Mercury (Hg) | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 |
| Nickel (Ni) | mg/kg | < 3 | MCERTS | 23 | 23 | 23 |
| Selenium (Se) | mg/kg | < 3 | NONE | < 3 | < 3 | < 3 |
| Vanadium (V) | mg/kg | < 2 | NONE | 26 | 25 | 28 |
| Zinc (Zn) | mg/kg | < 3 | MCERTS | 46 | 50 | 53 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
 Analysis carried out on the dried sample is corrected for the stone content
 Subcontracted analysis ^(S)



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| Soil Analysis Certificate - Speciated PAHs | | | | | | |
|---|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-52964 | Date Sampled | 13/12/16 | 13/12/16 | 13/12/16 | 13/12/16 | 13/12/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | SFU35 | SFU36 | SFU37 | W5/T18.1 | W5/T19.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 21/12/2016 | QTSE Sample No | 243587 | 243588 | 243589 | 243590 | 243591 |

| Determinand | Unit | RL | Accreditation | | | | | |
|------------------------|-------|-------|---------------|-------|-------|-------|-------|-------|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | < 1.6 | < 1.6 | < 1.6 | < 1.6 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Speciated PAHs | | | | | |
|---|-----------------|---------------|---------------|---------------|--|
| QTS Environmental Report No: 16-52964 | Date Sampled | 13/12/16 | 13/12/16 | 13/12/16 | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | W5/T20.1 | W5/T21.1 | W5/T22.1 | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | |
| Reporting Date: 21/12/2016 | QTSE Sample No | 243592 | 243593 | 243594 | |

| Determinand | Unit | RL | Accreditation | | | | |
|------------------------|-------|-------|---------------|-------|-------|-------|--|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | < 1.6 | < 1.6 | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - TPH CWG Banded | | | | | | |
|---|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-52964 | Date Sampled | 13/12/16 | 13/12/16 | 13/12/16 | 13/12/16 | 13/12/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | SFU35 | SFU36 | SFU37 | W5/T18.1 | W5/T19.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 21/12/2016 | QTSE Sample No | 243587 | 243588 | 243589 | 243590 | 243591 |

| Determinand | Unit | RL | Accreditation | | | | | |
|----------------------|-------|--------|---------------|--------|--------|--------|--------|--------|
| Aliphatic >C5 - C6 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Aliphatic >C6 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | 7.17 | 0.86 |
| Aliphatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aliphatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aliphatic >C12 - C16 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | < 3 | < 3 |
| Aliphatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | < 3 | < 3 |
| Aliphatic >C21 - C34 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| Aliphatic (C5 - C34) | mg/kg | < 21 | NONE | < 21 | < 21 | < 21 | < 21 | < 21 |
| Aromatic >C5 - C7 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Aromatic >C7 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Aromatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aromatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aromatic >C12 - C16 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aromatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | < 3 | < 3 |
| Aromatic >C21 - C35 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| Aromatic (C5 - C35) | mg/kg | < 21 | NONE | < 21 | < 21 | < 21 | < 21 | < 21 |
| Total >C5 - C35 | mg/kg | < 42 | NONE | < 42 | < 42 | < 42 | < 42 | < 42 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - TPH CWG Banded | | | | | |
|---|-----------------|---------------|---------------|---------------|--|
| QTS Environmental Report No: 16-52964 | Date Sampled | 13/12/16 | 13/12/16 | 13/12/16 | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | W5/T20.1 | W5/T21.1 | W5/T22.1 | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | |
| Reporting Date: 21/12/2016 | QTSE Sample No | 243592 | 243593 | 243594 | |

| Determinand | Unit | RL | Accreditation | | | | |
|----------------------|-------|--------|---------------|--------|--------|--------|--|
| Aliphatic >C5 - C6 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | |
| Aliphatic >C6 - C8 | mg/kg | < 0.05 | NONE | 2.27 | 1.03 | < 0.05 | |
| Aliphatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aliphatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aliphatic >C12 - C16 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | |
| Aliphatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | |
| Aliphatic >C21 - C34 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | |
| Aliphatic (C5 - C34) | mg/kg | < 21 | NONE | < 21 | < 21 | < 21 | |
| Aromatic >C5 - C7 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | |
| Aromatic >C7 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | |
| Aromatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aromatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aromatic >C12 - C16 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aromatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | |
| Aromatic >C21 - C35 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | |
| Aromatic (C5 - C35) | mg/kg | < 21 | NONE | < 21 | < 21 | < 21 | |
| Total >C5 - C35 | mg/kg | < 42 | NONE | < 42 | < 42 | < 42 | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - BTEX / MTBE | | | | | | |
|---|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-52964 | Date Sampled | 13/12/16 | 13/12/16 | 13/12/16 | 13/12/16 | 13/12/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | SFU35 | SFU36 | SFU37 | W5/T18.1 | W5/T19.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 21/12/2016 | QTSE Sample No | 243587 | 243588 | 243589 | 243590 | 243591 |

| Determinand | Unit | RL | Accreditation | | | | | |
|--------------|-------|-----|---------------|-----|-----|-----|-----|-----|
| Benzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Ethylbenzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| p & m-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| o-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |

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| Soil Analysis Certificate - BTEX / MTBE | | | | | | |
|---|-----------------|---------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-52964 | Date Sampled | 13/12/16 | 13/12/16 | 13/12/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | W5/T20.1 | W5/T21.1 | W5/T22.1 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | | |
| Reporting Date: 21/12/2016 | QTSE Sample No | 243592 | 243593 | 243594 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|--------------|-------|-----|---------------|-----|-----|-----|--|
| Benzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | |
| Ethylbenzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| p & m-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| o-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 16-52964 | Date Sampled | 13/12/16 | 13/12/16 | 13/12/16 | 13/12/16 | 13/12/16 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | SFU35 | SFU36 | SFU37 | W5/T18.1 | W5/T19.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 21/12/2016 | QTSE Sample No | 243587 | 243588 | 243589 | 243590 | 243591 |

| Determinand | Unit | RL | Accreditation | | | | |
|-----------------|-------|-----|---------------|-----|-----|-----|----------|
| Trichloroethene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | 7135 815 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|--|--|
| QTS Environmental Report No: 16-52964 | Date Sampled | 13/12/16 | 13/12/16 | 13/12/16 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | TP / BH No | W5/T20.1 | W5/T21.1 | W5/T22.1 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | | |
| Reporting Date: 21/12/2016 | QTSE Sample No | 243592 | 243593 | 243594 | | |

| Determinand | Unit | RL | Accreditation | | | |
|-----------------|-------|-----|---------------|------|------|----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 2137 | 1009 | 40 |

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| Soil Analysis Certificate - Sample Descriptions | |
|---|--|
| QTS Environmental Report No: 16-52964 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (Saint Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 21/12/2016 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|------------|-----------------|---------------|----------------------|---------------------------|
| 243587 | SFU35 | Composite | None Supplied | 21.5 | Brown gravelly clay |
| 243588 | SFU36 | Composite | None Supplied | 21.2 | Brown gravelly clay |
| 243589 | SFU37 | Composite | None Supplied | 21.2 | Brown gravelly clay |
| 243590 | W5/T18.1 | Composite | None Supplied | 15.6 | Brown gravelly clay |
| 243591 | W5/T19.1 | Composite | None Supplied | 16.4 | Brown gravelly clay |
| 243592 | W5/T20.1 | Composite | None Supplied | 16.5 | Brown gravelly clay |
| 243593 | W5/T21.1 | Composite | None Supplied | 15.4 | Brown gravelly clay |
| 243594 | W5/T22.1 | Composite | None Supplied | 16.4 | Brown gravelly clay |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{I/S}

Unsuitable Sample ^{U/S}

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 16-52964 |
| G & J Geoenvironmental Consultants Ltd |
| Site Reference: Nash Road, Redditch (Saint Francis Group) |
| Project / Job Ref: GJ079 |
| Order No: 138 |
| Reporting Date: 21/12/2016 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCs | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

D Dried
AR As Received



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QTS Environmental Report No: 17-53382

Site Reference: Nash Road, Redditch (St Francis Group)

Project / Job Ref: GJ079

Order No: 138

Sample Receipt Date: 09/01/2017

Sample Scheduled Date: 09/01/2017

Report Issue Number: 1

Reporting Date: 13/01/2017

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Russell Jarvis
Associate Director of Client Services

QTSE is the trading name of DETS Ltd, company registration number 03705645



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-53382 | Date Sampled | 04/01/17 | 04/01/17 | 04/01/17 | 04/01/17 | 04/01/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | P1 Base | P2 Base | P3 Base | P4 Base | P5 Base |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 |
| Reporting Date: 13/01/2017 | QTSE Sample No | 245448 | 245449 | 245450 | 245451 | 245452 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|----|-----|----|----|---|
| Trichloroethene | ug/kg | < 5 | MCERTS | 73 | 690 | 18 | 40 | 9 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | |
|--|-----------------|---------------|---------------|--|--|
| QTS Environmental Report No: 17-53382 | Date Sampled | 04/01/17 | 04/01/17 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | P6 Base | Area 2/NF6 | | |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | | |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 2.50 - 3.50 | | |
| Reporting Date: 13/01/2017 | QTSE Sample No | 245453 | 245454 | | |

| Determinand | Unit | RL | Accreditation | | | |
|-----------------|-------|-----|---------------|----|----|--|
| Trichloroethene | ug/kg | < 5 | MCERTS | 48 | 25 | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Sample Descriptions | |
|--|--|
| QTS Environmental Report No: 17-53382 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (St Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 13/01/2017 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|------------|-----------------|-------------|----------------------|---------------------------|
| 245448 | P1 Base | None Supplied | 3.50 - 4.00 | 23.1 | Brown clay |
| 245449 | P2 Base | None Supplied | 3.50 - 4.00 | 22.3 | Brown clay |
| 245450 | P3 Base | None Supplied | 3.50 - 4.00 | 16.4 | Brown clay |
| 245451 | P4 Base | None Supplied | 3.50 - 4.00 | 11.3 | Brown clay |
| 245452 | P5 Base | None Supplied | 3.50 - 4.00 | 19.6 | Brown clay |
| 245453 | P6 Base | None Supplied | 3.50 - 4.00 | 20.7 | Brown clay |
| 245454 | Area 2/NF6 | None Supplied | 2.50 - 3.50 | 22.4 | Brown clay |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{I/S}

Unsuitable Sample ^{U/S}

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 17-53382 |
| G & J Geoenvironmental Consultants Ltd |
| Site Reference: Nash Road, Redditch (St Francis Group) |
| Project / Job Ref: GJ079 |
| Order No: 138 |
| Reporting Date: 13/01/2017 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCs | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

D Dried
AR As Received



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QTS Environmental Report No: 17-53641

Site Reference: Nash Road, Redditch (St Francis Group)

Project / Job Ref: GJ079

Order No: 138

Sample Receipt Date: 16/01/2017

Sample Scheduled Date: 16/01/2017

Report Issue Number: 1

Reporting Date: 20/01/2017

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Russell Jarvis
Associate Director of Client Services

QTSE is the trading name of DETS Ltd, company registration number 03705645



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-53641 | Date Sampled | 12/01/17 | 12/01/17 | 12/01/17 | 12/01/17 | 12/01/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | Q1 BASE | Q2 BASE | Q3 BASE | Q4 BASE | Q5 BASE |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 |
| Reporting Date: 20/01/2017 | QTSE Sample No | 246451 | 246452 | 246453 | 246454 | 246455 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|-----|----|----|------|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 199 | 45 | 34 | 1000 | 445 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-53641 | Date Sampled | 12/01/17 | 12/01/17 | 12/01/17 | 12/01/17 | 12/01/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | Q6 BASE | Q7 BASE | Q8 BASE | AREA2/NF7 | AREA2/SF7 |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 2.50 - 3.50 | 2.50 - 3.50 |
| Reporting Date: 20/01/2017 | QTSE Sample No | 246456 | 246457 | 246458 | 246459 | 246460 |

| Determinand | Unit | RL | Accreditation | | | | |
|-----------------|-------|-----|---------------|----|-----|-----|--------|
| Trichloroethene | ug/kg | < 5 | MCERTS | 32 | < 5 | < 5 | 26 < 5 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Sample Descriptions | |
|--|--|
| QTS Environmental Report No: 17-53641 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (St Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 20/01/2017 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|------------|-----------------|-------------|----------------------|----------------------------|
| 246451 | Q1 BASE | None Supplied | 3.50 - 4.00 | 14.9 | Red sandy clay with stones |
| 246452 | Q2 BASE | None Supplied | 3.50 - 4.00 | 17.5 | Red sandy clay with stones |
| 246453 | Q3 BASE | None Supplied | 3.50 - 4.00 | 17.2 | Red sandy clay |
| 246454 | Q4 BASE | None Supplied | 3.50 - 4.00 | 18.3 | Red sandy clay |
| 246455 | Q5 BASE | None Supplied | 3.50 - 4.00 | 15.4 | Red sandy clay |
| 246456 | Q6 BASE | None Supplied | 3.50 - 4.00 | 17.1 | Red sandy clay |
| 246457 | Q7 BASE | None Supplied | 3.50 - 4.00 | 18.6 | Red sandy clay |
| 246458 | Q8 BASE | None Supplied | 3.50 - 4.00 | 16.8 | Red sandy clay |
| 246459 | AREA2/NF7 | None Supplied | 2.50 - 3.50 | 15.8 | Red sandy clay |
| 246460 | AREA2/SF7 | None Supplied | 2.50 - 3.50 | 17.4 | Red sandy clay |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{U/S}

Unsuitable Sample ^{U/S}

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 17-53641 |
| G & J Geoenvironmental Consultants Ltd |
| Site Reference: Nash Road, Redditch (St Francis Group) |
| Project / Job Ref: GJ079 |
| Order No: 138 |
| Reporting Date: 20/01/2017 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCs | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

D Dried
AR As Received



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QTS Environmental Report No: 17-53778

Site Reference: Nash Road, Redditch (St Francis Group)

Project / Job Ref: GJ079

Order No: 138

Sample Receipt Date: 18/01/2017

Sample Scheduled Date: 18/01/2017

Report Issue Number: 1

Reporting Date: 24/01/2017

Authorised by:

Russell Jarvis
Associate Director of Client Services

Authorised by:

Ela Mysiara
Inorganics & ICP Section Head

QTSE is the trading name of DETS Ltd, company registration number 03705645



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 Tel : 01622 850410



| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-53778 | Date Sampled | 17/01/17 | 17/01/17 | 17/01/17 | 17/01/17 | 17/01/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | R8 Base | Area 2 / SF8 | R7 Base | R6 Base | R5 Base |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 |
| Reporting Date: 24/01/2017 | QTSE Sample No | 247126 | 247127 | 247128 | 247129 | 247130 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|-----|-----|-----|----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 271 | 227 | 352 | 73 | 293 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-53778 | Date Sampled | 17/01/17 | 17/01/17 | 17/01/17 | 17/01/17 | 17/01/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | R4 Base | R3 Base | SFU38 | SFU39 | SFU40 |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 3.50 - 4.00 | None Supplied | None Supplied | None Supplied |
| Reporting Date: 24/01/2017 | QTSE Sample No | 247131 | 247132 | 247133 | 247134 | 247135 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|-----|------|-----|-----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 579 | 5762 | 270 | 135 | 171 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Sample Descriptions | |
|--|--|
| QTS Environmental Report No: 17-53778 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (St Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 24/01/2017 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|--------------|-----------------|---------------|----------------------|-------------------------------|
| 247126 | R8 Base | None Supplied | 3.50 - 4.00 | 18.6 | Red clay |
| 247127 | Area 2 / SF8 | None Supplied | 2.50 - 3.50 | 19.1 | Red clay |
| 247128 | R7 Base | None Supplied | 3.50 - 4.00 | 18.6 | Red clay |
| 247129 | R6 Base | None Supplied | 3.50 - 4.00 | 21.4 | Red clay |
| 247130 | R5 Base | None Supplied | 3.50 - 4.00 | 20.7 | Red clay |
| 247131 | R4 Base | None Supplied | 3.50 - 4.00 | 18.6 | Red clay |
| 247132 | R3 Base | None Supplied | 3.50 - 4.00 | 13 | Brown sandy clay with stones |
| 247133 | SFU38 | Composite | None Supplied | 14.5 | Brown clayey sand with stones |
| 247134 | SFU39 | Composite | None Supplied | 14.6 | Brown clay with stones |
| 247135 | SFU40 | Composite | None Supplied | 15 | Brown clay with stones |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{U/S}

Unsuitable Sample ^{U/S}

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 17-53778 |
| G & J Geoenvironmental Consultants Ltd |
| Site Reference: Nash Road, Redditch (St Francis Group) |
| Project / Job Ref: GJ079 |
| Order No: 138 |
| Reporting Date: 24/01/2017 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCs | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

D Dried
AR As Received



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QTS Environmental Report No: 17-54167

Site Reference: Nash Road, Redditch (Francis Group)

Project / Job Ref: GJ079

Order No: 138

Sample Receipt Date: 18/01/2017

Sample Scheduled Date: 26/01/2017

Report Issue Number: 1

Reporting Date: 01/02/2017

Authorised by:

Russell Jarvis
Associate Director of Client Services

Authorised by:

Ela Mysiara
Inorganics & ICP Section Head

QTSE is the trading name of DETS Ltd, company registration number 03705645

| Soil Analysis Certificate | | | | | |
|---|-----------------|---------------|---------------|---------------|--|
| QTS Environmental Report No: 17-54167 | Date Sampled | 17/01/17 | 17/01/17 | 17/01/17 | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | |
| Site Reference: Nash Road, Redditch (Francis Group) | TP / BH No | SFU41 | SFU42 | SFU43 | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | |
| Reporting Date: 01/02/2017 | QTSE Sample No | 248811 | 248812 | 248813 | |

| Determinand | Unit | RL | Accreditation | | | |
|----------------|-------|-------|---------------|-------|-------|-------|
| Arsenic (As) | mg/kg | < 2 | MCERTS | 3 | 5 | 3 |
| Barium (Ba) | mg/kg | < 5 | NONE | 69 | 105 | 98 |
| Beryllium (Be) | mg/kg | < 0.5 | NONE | < 0.5 | 0.6 | 0.6 |
| W/S Boron | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 |
| Cadmium (Cd) | mg/kg | < 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 |
| Chromium (Cr) | mg/kg | < 2 | MCERTS | 16 | 25 | 24 |
| Copper (Cu) | mg/kg | < 4 | MCERTS | 10 | 14 | 12 |
| Lead (Pb) | mg/kg | < 3 | MCERTS | 6 | 10 | 9 |
| Mercury (Hg) | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 |
| Nickel (Ni) | mg/kg | < 3 | MCERTS | 16 | 21 | 21 |
| Selenium (Se) | mg/kg | < 3 | NONE | < 3 | < 3 | < 3 |
| Vanadium (V) | mg/kg | < 2 | NONE | 23 | 37 | 33 |
| Zinc (Zn) | mg/kg | < 3 | MCERTS | 35 | 53 | 46 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
 Analysis carried out on the dried sample is corrected for the stone content
 Subcontracted analysis ^(S)

| Soil Analysis Certificate - Speciated PAHs | | | | | | |
|--|-----------------|---------------|---------------|---------------|--|--|
| QTS Environmental Report No: 17-54167 | Date Sampled | 17/01/17 | 17/01/17 | 17/01/17 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (Francis Group) | TP / BH No | SFU41 | SFU42 | SFU43 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | | |
| Reporting Date: 01/02/2017 | QTSE Sample No | 248811 | 248812 | 248813 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|------------------------|-------|-------|---------------|-------|-------|-------|--|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | < 1.6 | < 1.6 | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C

| Soil Analysis Certificate - TPH CWG Banded | | | | | |
|---|-----------------|---------------|---------------|---------------|--|
| QTS Environmental Report No: 17-54167 | Date Sampled | 17/01/17 | 17/01/17 | 17/01/17 | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | |
| Site Reference: Nash Road, Redditch (Francis Group) | TP / BH No | SFU41 | SFU42 | SFU43 | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | |
| Reporting Date: 01/02/2017 | QTSE Sample No | 248811 | 248812 | 248813 | |

| Determinand | Unit | RL | Accreditation | | | | |
|----------------------|-------|--------|---------------|--------|--------|--------|--|
| Aliphatic >C5 - C6 | mg/kg | < 0.01 | NONE | < 0.01 | 0.01 | < 0.01 | |
| Aliphatic >C6 - C8 | mg/kg | < 0.05 | NONE | 0.11 | 0.09 | 0.08 | |
| Aliphatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aliphatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aliphatic >C12 - C16 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | |
| Aliphatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | |
| Aliphatic >C21 - C34 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | |
| Aliphatic (C5 - C34) | mg/kg | < 21 | NONE | < 21 | < 21 | < 21 | |
| Aromatic >C5 - C7 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | |
| Aromatic >C7 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | |
| Aromatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aromatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aromatic >C12 - C16 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aromatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | |
| Aromatic >C21 - C35 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | |
| Aromatic (C5 - C35) | mg/kg | < 21 | NONE | < 21 | < 21 | < 21 | |
| Total >C5 - C35 | mg/kg | < 42 | NONE | < 42 | < 42 | < 42 | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - BTEX / MTBE | | | | | | |
|--|-----------------|---------------|---------------|---------------|--|--|
| QTS Environmental Report No: 17-54167 | Date Sampled | 17/01/17 | 17/01/17 | 17/01/17 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (Francis Group) | TP / BH No | SFU41 | SFU42 | SFU43 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | | |
| Reporting Date: 01/02/2017 | QTSE Sample No | 248811 | 248812 | 248813 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|--------------|-------|-----|---------------|-----|-----|-----|--|
| Benzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | |
| Ethylbenzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| p & m-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| o-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|--|--|
| QTS Environmental Report No: 17-54167 | Date Sampled | 17/01/17 | 17/01/17 | 17/01/17 | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (Francis Group) | TP / BH No | SFU41 | SFU42 | SFU43 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | | |
| Reporting Date: 01/02/2017 | QTSE Sample No | 248811 | 248812 | 248813 | | |

| Determinand | Unit | RL | Accreditation | | | |
|-----------------|-------|-----|---------------|----|----|----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 91 | 58 | 63 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Sample Descriptions | |
|---|--|
| QTS Environmental Report No: 17-54167 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 01/02/2017 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|------------|-----------------|---------------|----------------------|------------------------------|
| 248811 | SFU41 | Composite | None Supplied | 12.8 | Light brown clay with stones |
| 248812 | SFU42 | Composite | None Supplied | 13.7 | Brown clay with stones |
| 248813 | SFU43 | Composite | None Supplied | 13.9 | Light brown clay with stones |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{U/S}

Unsuitable Sample ^{U/S}

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 17-54167 |
| G & J Geoenvironmental Consultants Ltd |
| Site Reference: Nash Road, Redditch (Francis Group) |
| Project / Job Ref: GJ079 |
| Order No: 138 |
| Reporting Date: 01/02/2017 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCs | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

D Dried
AR As Received



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QTS Environmental Report No: 17-54303

Site Reference: Nash Road, Reditch (St Francis Group)

Project / Job Ref: GJ079

Order No: 138

Sample Receipt Date: 30/01/2017

Sample Scheduled Date: 30/01/2017

Report Issue Number: 1

Reporting Date: 03/02/2017

Authorised by:

Russell Jarvis
Associate Director of Client Services

Authorised by:

Ela Mysiara
Inorganics & ICP Section Head

QTSE is the trading name of DETS Ltd, company registration number 03705645



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 Tel : 01622 850410



| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-54303 | Date Sampled | 25/01/17 | 25/01/17 | 25/01/17 | 25/01/17 | 25/01/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Reditch (St Francis Group) | TP / BH No | R2 Base | R1 Base | Area 2/NF8 | S8 Base | Area 2/SF9 |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 3.50 - 4.00 | 2.50 - 3.50 | 3.50 - 4.00 | 2.50 - 3.50 |
| Reporting Date: 03/02/2017 | QTSE Sample No | 249388 | 249389 | 249390 | 249391 | 249392 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|----|-----|-----|----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 42 | 255 | 431 | 13 | 183 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-54303 | Date Sampled | 25/01/17 | 25/01/17 | 25/01/17 | 25/01/17 | 25/01/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Reditch (St Francis Group) | TP / BH No | S7 Base | S6 Base | S5 Base | S4 Base | S3 Base |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 |
| Reporting Date: 03/02/2017 | QTSE Sample No | 249393 | 249394 | 249395 | 249396 | 249397 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|----|-----|----|----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 56 | 155 | 14 | 89 | 494 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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Tel : 01622 850410



| Soil Analysis Certificate - Sample Descriptions | |
|---|--|
| QTS Environmental Report No: 17-54303 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Reditch (St Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 03/02/2017 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|------------|-----------------|-------------|----------------------|---------------------------|
| 249388 | R2 Base | None Supplied | 3.50 - 4.00 | 23.7 | Red clay |
| 249389 | R1 Base | None Supplied | 3.50 - 4.00 | 6.8 | Red clay |
| 249390 | Area 2/NF8 | None Supplied | 2.50 - 3.50 | 24.9 | Red clay |
| 249391 | S8 Base | None Supplied | 3.50 - 4.00 | 24.2 | Red clay |
| 249392 | Area 2/SF9 | None Supplied | 2.50 - 3.50 | 22.7 | Red clay |
| 249393 | S7 Base | None Supplied | 3.50 - 4.00 | 22.6 | Red clay |
| 249394 | S6 Base | None Supplied | 3.50 - 4.00 | 21.7 | Red clay |
| 249395 | S5 Base | None Supplied | 3.50 - 4.00 | 21.2 | Red clay |
| 249396 | S4 Base | None Supplied | 3.50 - 4.00 | 18 | Red clay |
| 249397 | S3 Base | None Supplied | 3.50 - 4.00 | 20 | Red clay |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{I/S}

Unsuitable Sample ^{U/S}

| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 17-54303 |
| G & J Geoenvironmental Consultants Ltd |
| Site Reference: Nash Road, Reditch (St Francis Group) |
| Project / Job Ref: GJ079 |
| Order No: 138 |
| Reporting Date: 03/02/2017 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCs | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

D Dried
AR As Received



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QTS Environmental Report No: 17-54958

Site Reference: Nash Road, Redditch (St Francis Group)

Project / Job Ref: GJ079

Order No: 138

Sample Receipt Date: 13/02/2017

Sample Scheduled Date: 13/02/2017

Report Issue Number: 1

Reporting Date: 17/02/2017

Authorised by:

Russell Jarvis
Associate Director of Client Services

Authorised by:

Ela Mysiara
Inorganics & ICP Section Head

QTSE is the trading name of DETS Ltd, company registration number 03705645



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| Soil Analysis Certificate | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-54958 | Date Sampled | 08/02/17 | 08/02/17 | 08/02/17 | 08/02/17 | 08/02/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W6/T23.1 | W6/T24.1 | W6/T25.1 | SFU44 | SFU45 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 17/02/2017 | QTSE Sample No | 252488 | 252489 | 252490 | 252491 | 252492 |

| Determinand | Unit | RL | Accreditation | | | | | |
|----------------|-------|-------|---------------|-------|-------|-------|-------|-------|
| Arsenic (As) | mg/kg | < 2 | MCERTS | 6 | 5 | 4 | 6 | 4 |
| Barium (Ba) | mg/kg | < 5 | NONE | 80 | 108 | 80 | 73 | 65 |
| Beryllium (Be) | mg/kg | < 0.5 | NONE | < 0.5 | 0.6 | < 0.5 | 1.2 | 1.1 |
| W/S Boron | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | < 1 | < 1 |
| Cadmium (Cd) | mg/kg | < 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Chromium (Cr) | mg/kg | < 2 | MCERTS | 15 | 18 | 12 | 35 | 33 |
| Copper (Cu) | mg/kg | < 4 | MCERTS | 10 | 11 | 7 | 10 | 9 |
| Lead (Pb) | mg/kg | < 3 | MCERTS | 9 | 10 | 9 | 10 | 9 |
| Mercury (Hg) | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | < 1 | < 1 |
| Nickel (Ni) | mg/kg | < 3 | MCERTS | 12 | 16 | 10 | 31 | 29 |
| Selenium (Se) | mg/kg | < 3 | NONE | < 3 | < 3 | < 3 | < 3 | < 3 |
| Vanadium (V) | mg/kg | < 2 | NONE | 25 | 32 | 20 | 31 | 28 |
| Zinc (Zn) | mg/kg | < 3 | MCERTS | 30 | 40 | 30 | 74 | 68 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
 Analysis carried out on the dried sample is corrected for the stone content
 Subcontracted analysis ^(S)



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| Soil Analysis Certificate - Speciated PAHs | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-54958 | Date Sampled | 08/02/17 | 08/02/17 | 08/02/17 | 08/02/17 | 08/02/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W6/T23.1 | W6/T24.1 | W6/T25.1 | SFU44 | SFU45 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 17/02/2017 | QTSE Sample No | 252488 | 252489 | 252490 | 252491 | 252492 |

| Determinand | Unit | RL | Accreditation | | | | | |
|------------------------|-------|-------|---------------|-------|-------|-------|-------|-------|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | < 1.6 | < 1.6 | < 1.6 | < 1.6 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - TPH CWG Banded | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-54958 | Date Sampled | 08/02/17 | 08/02/17 | 08/02/17 | 08/02/17 | 08/02/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W6/T23.1 | W6/T24.1 | W6/T25.1 | SFU44 | SFU45 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 17/02/2017 | QTSE Sample No | 252488 | 252489 | 252490 | 252491 | 252492 |

| Determinand | Unit | RL | Accreditation | | | | | |
|----------------------|-------|--------|---------------|--------|--------|--------|--------|--------|
| Aliphatic >C5 - C6 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Aliphatic >C6 - C8 | mg/kg | < 0.05 | NONE | 0.36 | 0.35 | 0.10 | < 0.05 | < 0.05 |
| Aliphatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aliphatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aliphatic >C12 - C16 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | < 3 | < 3 |
| Aliphatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | < 3 | < 3 |
| Aliphatic >C21 - C34 | mg/kg | < 10 | MCERTS | < 10 | < 10 | 12 | < 10 | < 10 |
| Aliphatic (C5 - C34) | mg/kg | < 21 | NONE | < 21 | < 21 | < 21 | < 21 | < 21 |
| Aromatic >C5 - C7 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Aromatic >C7 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Aromatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aromatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aromatic >C12 - C16 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aromatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | < 3 | < 3 |
| Aromatic >C21 - C35 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| Aromatic (C5 - C35) | mg/kg | < 21 | NONE | < 21 | < 21 | < 21 | < 21 | < 21 |
| Total >C5 - C35 | mg/kg | < 42 | NONE | < 42 | < 42 | < 42 | < 42 | < 42 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - BTEX / MTBE | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-54958 | Date Sampled | 08/02/17 | 08/02/17 | 08/02/17 | 08/02/17 | 08/02/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W6/T23.1 | W6/T24.1 | W6/T25.1 | SFU44 | SFU45 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 17/02/2017 | QTSE Sample No | 252488 | 252489 | 252490 | 252491 | 252492 |

| Determinand | Unit | RL | Accreditation | | | | | |
|--------------|-------|-----|---------------|-----|-----|-----|-----|-----|
| Benzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Ethylbenzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| p & m-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| o-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |

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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-54958 | Date Sampled | 08/02/17 | 08/02/17 | 08/02/17 | 08/02/17 | 08/02/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | S1 Base | Area 2/NF9 | S2 Base | T1 Base | T2 Base |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 2.50 - 3.50 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 |
| Reporting Date: 17/02/2017 | QTSE Sample No | 252467 | 252468 | 252469 | 252470 | 252471 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|-----|------|-----|-----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 739 | 2893 | 482 | 103 | 182 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-54958 | Date Sampled | 08/02/17 | 08/02/17 | 08/02/17 | 08/02/17 | 08/02/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | T3 Base | T4 Base | T5 Base | T6 Base | T7 Base |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 | 3.50 - 4.00 |
| Reporting Date: 17/02/2017 | QTSE Sample No | 252472 | 252473 | 252474 | 252475 | 252476 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|-----|-----|-----|-----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 500 | 614 | 483 | 240 | 367 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-54958 | Date Sampled | 08/02/17 | 08/02/17 | 08/02/17 | 08/02/17 | 08/02/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | T8 Base | Area 2/NF10 | Area 2/SF10 | Area 2/EF1 | Area 2/EF2 |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 3.50 - 4.00 | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 |
| Reporting Date: 17/02/2017 | QTSE Sample No | 252477 | 252478 | 252479 | 252480 | 252481 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|-----|-----|-----|-----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 289 | 155 | 355 | 154 | 108 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-54958 | Date Sampled | 08/02/17 | 08/02/17 | 08/02/17 | 08/02/17 | 08/02/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | Area 2/EF3 | Area 2/EF4 | Area 2/EF5 | Area 2/EF6 | Area 2/EF7 |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Order No: 138 | Depth (m) | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 | 2.50 - 3.50 |
| Reporting Date: 17/02/2017 | QTSE Sample No | 252482 | 252483 | 252484 | 252485 | 252486 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|-----|------|------|----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 217 | 1970 | 2655 | 57 | 105 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-54958 | Date Sampled | 08/02/17 | 08/02/17 | 08/02/17 | 08/02/17 | 08/02/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | Area 2/EF8 | W6/T23.1 | W6/T24.1 | W6/T25.1 | SFU44 |
| Project / Job Ref: GJ079 | Additional Refs | None Supplied | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | 2.50 - 3.50 | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 17/02/2017 | QTSE Sample No | 252487 | 252488 | 252489 | 252490 | 252491 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|----|-----|-----|----|----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 88 | 340 | 343 | 96 | 32 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | |
|--|-----------------|---------------|--|--|--|
| QTS Environmental Report No: 17-54958 | Date Sampled | 08/02/17 | | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | SFU45 | | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | | | |
| Order No: 138 | Depth (m) | None Supplied | | | |
| Reporting Date: 17/02/2017 | QTSE Sample No | 252492 | | | |

| Determinand | Unit | RL | Accreditation | | | |
|-----------------|-------|-----|---------------|----|--|--|
| Trichloroethene | ug/kg | < 5 | MCERTS | 32 | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Sample Descriptions | |
|--|--|
| QTS Environmental Report No: 17-54958 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (St Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 17/02/2017 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|-------------|-----------------|---------------|----------------------|------------------------------|
| 252467 | S1 Base | None Supplied | 3.50 - 4.00 | 16.9 | Red clay |
| 252468 | Area 2/NF9 | None Supplied | 2.50 - 3.50 | 15.4 | Red clay |
| 252469 | S2 Base | None Supplied | 3.50 - 4.00 | 16.3 | Red clay |
| 252470 | T1 Base | None Supplied | 3.50 - 4.00 | 15.5 | Light brown sand |
| 252471 | T2 Base | None Supplied | 3.50 - 4.00 | 15.1 | Light brown sand |
| 252472 | T3 Base | None Supplied | 3.50 - 4.00 | 17.9 | Light brown sandy clay |
| 252473 | T4 Base | None Supplied | 3.50 - 4.00 | 15.8 | Red clay |
| 252474 | T5 Base | None Supplied | 3.50 - 4.00 | 16.2 | Red clay |
| 252475 | T6 Base | None Supplied | 3.50 - 4.00 | 17.7 | Red clay |
| 252476 | T7 Base | None Supplied | 3.50 - 4.00 | 19 | Red clay |
| 252477 | T8 Base | None Supplied | 3.50 - 4.00 | 19.4 | Red clay |
| 252478 | Area 2/NF10 | None Supplied | 2.50 - 3.50 | 15.1 | Red sand |
| 252479 | Area 2/SF10 | None Supplied | 2.50 - 3.50 | 19.3 | Red clay |
| 252480 | Area 2/EF1 | None Supplied | 2.50 - 3.50 | 15.3 | Red sand |
| 252481 | Area 2/EF2 | None Supplied | 2.50 - 3.50 | 14.4 | Red sand |
| 252482 | Area 2/EF3 | None Supplied | 2.50 - 3.50 | 15.4 | Red sand |
| 252483 | Area 2/EF4 | None Supplied | 2.50 - 3.50 | 15.6 | Red clay |
| 252484 | Area 2/EF5 | None Supplied | 2.50 - 3.50 | 17.1 | Red clay |
| 252485 | Area 2/EF6 | None Supplied | 2.50 - 3.50 | 18.9 | Red clay |
| 252486 | Area 2/EF7 | None Supplied | 2.50 - 3.50 | 20 | Red clay |
| 252487 | Area 2/EF8 | None Supplied | 2.50 - 3.50 | 17.3 | Red clay |
| & 252488 | W6/T23.1 | Composite | None Supplied | 9.4 | Brown sandy clay with stones |
| & 252489 | W6/T24.1 | Composite | None Supplied | 10.3 | Brown sandy clay with stones |
| & 252490 | W6/T25.1 | Composite | None Supplied | 9.4 | Brown sandy clay with stones |
| & 252491 | SFU44 | Composite | None Supplied | 19.5 | Red clay with stones |
| & 252492 | SFU45 | Composite | None Supplied | 16.7 | Red clay |

Moisture content is part of procedure E003 & is not an accredited test
 Insufficient Sample ^{1/5}
 & samples received in inappropriate containers for hydrocarbon analysis



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| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 17-54958 |
| G & J Geoenvironmental Consultants Ltd |
| Site Reference: Nash Road, Redditch (St Francis Group) |
| Project / Job Ref: GJ079 |
| Order No: 138 |
| Reporting Date: 17/02/2017 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCs | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

D Dried
 AR As Received



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russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 17-55729

Site Reference: Nash Road, Redditch (St Francis Group)

Project / Job Ref: GJ079

Order No: 138

Sample Receipt Date: 28/02/2017

Sample Scheduled Date: 28/02/2017

Report Issue Number: 1

Reporting Date: 06/03/2017

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Russell Jarvis
Associate Director of Client Services

QTSE is the trading name of DETS Ltd, company registration number 03705645



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 Maidstone
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| Soil Analysis Certificate | | | | | |
|--|-----------------|---------------|---------------|---------------|--|
| QTS Environmental Report No: 17-55729 | Date Sampled | None Supplied | None Supplied | None Supplied | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W7/T26.1 | W7/T27.1 | W7/T28.1 | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | |
| Reporting Date: 06/03/2017 | QTSE Sample No | 255491 | 255492 | 255493 | |

| Determinand | Unit | RL | Accreditation | | | |
|----------------|-------|-------|---------------|-------|-------|-------|
| Arsenic (As) | mg/kg | < 2 | MCERTS | 6 | 7 | 7 |
| Barium (Ba) | mg/kg | < 5 | NONE | 141 | 151 | 152 |
| Beryllium (Be) | mg/kg | < 0.5 | NONE | 0.6 | 0.8 | 0.6 |
| W/S Boron | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 |
| Cadmium (Cd) | mg/kg | < 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 |
| Chromium (Cr) | mg/kg | < 2 | MCERTS | 18 | 22 | 18 |
| Copper (Cu) | mg/kg | < 4 | MCERTS | 18 | 19 | 15 |
| Lead (Pb) | mg/kg | < 3 | MCERTS | 41 | 20 | 10 |
| Mercury (Hg) | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 |
| Nickel (Ni) | mg/kg | < 3 | MCERTS | 16 | 20 | 15 |
| Selenium (Se) | mg/kg | < 3 | NONE | < 3 | < 3 | < 3 |
| Vanadium (V) | mg/kg | < 2 | NONE | 32 | 42 | 34 |
| Zinc (Zn) | mg/kg | < 3 | MCERTS | 59 | 61 | 46 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
 Analysis carried out on the dried sample is corrected for the stone content
 Subcontracted analysis ^(S)



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| Soil Analysis Certificate - Speciated PAHs | | | | | | |
|--|-----------------|---------------|---------------|---------------|--|--|
| QTS Environmental Report No: 17-55729 | Date Sampled | None Supplied | None Supplied | None Supplied | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W7/T26.1 | W7/T27.1 | W7/T28.1 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | | |
| Reporting Date: 06/03/2017 | QTSE Sample No | 255491 | 255492 | 255493 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|------------------------|-------|-------|---------------|-------|-------|-------|--|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | < 1.6 | < 1.6 | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - TPH CWG Banded | | | | | |
|--|-----------------|---------------|---------------|---------------|--|
| QTS Environmental Report No: 17-55729 | Date Sampled | None Supplied | None Supplied | None Supplied | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W7/T26.1 | W7/T27.1 | W7/T28.1 | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | |
| Reporting Date: 06/03/2017 | QTSE Sample No | 255491 | 255492 | 255493 | |

| Determinand | Unit | RL | Accreditation | | | | |
|----------------------|-------|--------|---------------|--------|--------|--------|--|
| Aliphatic >C5 - C6 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | |
| Aliphatic >C6 - C8 | mg/kg | < 0.05 | NONE | 1.21 | 0.47 | 0.46 | |
| Aliphatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aliphatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aliphatic >C12 - C16 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | |
| Aliphatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | |
| Aliphatic >C21 - C34 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | |
| Aliphatic (C5 - C34) | mg/kg | < 21 | NONE | < 21 | < 21 | < 21 | |
| Aromatic >C5 - C7 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | |
| Aromatic >C7 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | |
| Aromatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aromatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aromatic >C12 - C16 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Aromatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | |
| Aromatic >C21 - C35 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | |
| Aromatic (C5 - C35) | mg/kg | < 21 | NONE | < 21 | < 21 | < 21 | |
| Total >C5 - C35 | mg/kg | < 42 | NONE | < 42 | < 42 | < 42 | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - BTEX / MTBE | | | | | | |
|--|-----------------|---------------|---------------|---------------|--|--|
| QTS Environmental Report No: 17-55729 | Date Sampled | None Supplied | None Supplied | None Supplied | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W7/T26.1 | W7/T27.1 | W7/T28.1 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | | |
| Reporting Date: 06/03/2017 | QTSE Sample No | 255491 | 255492 | 255493 | | |

| Determinand | Unit | RL | Accreditation | | | | |
|--------------|-------|-----|---------------|-----|-----|-----|--|
| Benzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | |
| Ethylbenzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| p & m-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| o-xylene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|--|--|
| QTS Environmental Report No: 17-55729 | Date Sampled | None Supplied | None Supplied | None Supplied | | |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | | |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W7/T26.1 | W7/T27.1 | W7/T28.1 | | |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | | |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | | |
| Reporting Date: 06/03/2017 | QTSE Sample No | 255491 | 255492 | 255493 | | |

| Determinand | Unit | RL | Accreditation | | | |
|-----------------|-------|-----|---------------|------|-----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 1182 | 454 | 443 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Sample Descriptions | |
|--|--|
| QTS Environmental Report No: 17-55729 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (St Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 06/03/2017 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|------------|-----------------|---------------|----------------------|-------------------------------|
| \$ 255491 | W7/T26.1 | Composite | None Supplied | 10.4 | Brown sandy clay with stones |
| \$ 255492 | W7/T27.1 | Composite | None Supplied | 11.7 | Brown sandy clay with brick |
| \$ 255493 | W7/T28.1 | Composite | None Supplied | 14.1 | Brown clayey sand with stones |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{U/S}

Unsuitable Sample ^{U/S}

\$ samples exceeded recommended holding times



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| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 17-55729 |
| G & J Geoenvironmental Consultants Ltd |
| Site Reference: Nash Road, Redditch (St Francis Group) |
| Project / Job Ref: GJ079 |
| Order No: 138 |
| Reporting Date: 06/03/2017 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCs | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

D Dried
AR As Received



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QTS Environmental Report No: 17-56163

Site Reference: Nash Road, Redditch (St Francis Group)

Project / Job Ref: GJ079

Order No: 138

Sample Receipt Date: 09/03/2017

Sample Scheduled Date: 09/03/2017

Report Issue Number: 1

Reporting Date: 15/03/2017

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Russell Jarvis
Associate Director of Client Services

QTSE is the trading name of DETS Ltd, company registration number 03705645



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| Soil Analysis Certificate | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-56163 | Date Sampled | 08/03/17 | 08/03/17 | 08/03/17 | 08/03/17 | 08/03/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W8 / T29.1 | W8 / T30.1 | W8 / T31.1 | W8 / T32.1 | W8 / T33.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 15/03/2017 | QTSE Sample No | 257271 | 257272 | 257273 | 257274 | 257275 |

| Determinand | Unit | RL | Accreditation | | | | | |
|----------------|-------|-------|---------------|-------|-------|-------|-------|-------|
| Arsenic (As) | mg/kg | < 2 | MCERTS | 5 | 7 | 7 | 8 | 9 |
| Barium (Ba) | mg/kg | < 5 | NONE | 129 | 173 | 170 | 201 | 236 |
| Beryllium (Be) | mg/kg | < 0.5 | NONE | 0.5 | 0.7 | 0.7 | 0.9 | 0.9 |
| W/S Boron | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | < 1 | < 1 |
| Cadmium (Cd) | mg/kg | < 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Chromium (Cr) | mg/kg | < 2 | MCERTS | 15 | 21 | 20 | 27 | 27 |
| Copper (Cu) | mg/kg | < 4 | MCERTS | 11 | 19 | 20 | 22 | 21 |
| Lead (Pb) | mg/kg | < 3 | MCERTS | 38 | 79 | 102 | 89 | 62 |
| Mercury (Hg) | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | < 1 | < 1 |
| Nickel (Ni) | mg/kg | < 3 | MCERTS | 11 | 17 | 15 | 20 | 21 |
| Selenium (Se) | mg/kg | < 3 | NONE | < 3 | < 3 | < 3 | < 3 | < 3 |
| Vanadium (V) | mg/kg | < 2 | NONE | 23 | 31 | 29 | 36 | 44 |
| Zinc (Zn) | mg/kg | < 3 | MCERTS | 59 | 94 | 88 | 131 | 148 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
 Analysis carried out on the dried sample is corrected for the stone content
 Subcontracted analysis ^(S)



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| Soil Analysis Certificate | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-56163 | Date Sampled | 08/03/17 | 08/03/17 | 08/03/17 | 08/03/17 | 08/03/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W8 / T34.1 | W9 / T35.1 | W9 / T36.1 | W10 / T37.1 | W10 / T38.2 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 15/03/2017 | QTSE Sample No | 257276 | 257277 | 257278 | 257279 | 257280 |

| Determinand | Unit | RL | Accreditation | | | | | |
|----------------|-------|-------|---------------|-------|-----|-----|-----|-----|
| Arsenic (As) | mg/kg | < 2 | MCERTS | 10 | 108 | 82 | 29 | 9 |
| Barium (Ba) | mg/kg | < 5 | NONE | 205 | 300 | 280 | 473 | 231 |
| Beryllium (Be) | mg/kg | < 0.5 | NONE | 0.9 | 0.9 | 0.8 | 1.5 | 0.9 |
| W/S Boron | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | < 1 | < 1 |
| Cadmium (Cd) | mg/kg | < 0.2 | MCERTS | < 0.2 | 0.7 | 0.5 | 0.2 | 0.5 |
| Chromium (Cr) | mg/kg | < 2 | MCERTS | 25 | 21 | 16 | 33 | 27 |
| Copper (Cu) | mg/kg | < 4 | MCERTS | 21 | 9 | 7 | 31 | 38 |
| Lead (Pb) | mg/kg | < 3 | MCERTS | 72 | 11 | 9 | 38 | 118 |
| Mercury (Hg) | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | < 1 | < 1 |
| Nickel (Ni) | mg/kg | < 3 | MCERTS | 20 | 16 | 12 | 32 | 21 |
| Selenium (Se) | mg/kg | < 3 | NONE | < 3 | < 3 | < 3 | < 3 | < 3 |
| Vanadium (V) | mg/kg | < 2 | NONE | 37 | 49 | 43 | 106 | 36 |
| Zinc (Zn) | mg/kg | < 3 | MCERTS | 107 | 37 | 33 | 102 | 174 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
 Analysis carried out on the dried sample is corrected for the stone content
 Subcontracted analysis ^(S)



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Soil Analysis Certificate - Speciated PAHs

| | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-56163 | Date Sampled | 08/03/17 | 08/03/17 | 08/03/17 | 08/03/17 | 08/03/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W8 / T29.1 | W8 / T30.1 | W8 / T31.1 | W8 / T32.1 | W8 / T33.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 15/03/2017 | QTSE Sample No | 257271 | 257272 | 257273 | 257274 | 257275 |

| Determinand | Unit | RL | Accreditation | | | | | |
|------------------------|-------|-------|---------------|-------|-------|-------|-------|-------|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | 0.14 | < 0.1 | < 0.1 |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | 0.14 | 0.15 | 0.36 | 0.17 | 0.21 |
| Pyrene | mg/kg | < 0.1 | MCERTS | 0.14 | 0.14 | 0.32 | 0.17 | 0.20 |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | 0.13 | < 0.1 | < 0.1 |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | 0.15 | < 0.1 | < 0.1 |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | 0.18 | 0.11 | 0.13 |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | 0.11 | < 0.1 | < 0.1 |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | < 1.6 | < 1.6 | < 1.6 | < 1.6 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - Speciated PAHs | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-56163 | Date Sampled | 08/03/17 | 08/03/17 | 08/03/17 | 08/03/17 | 08/03/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W8 / T34.1 | W9 / T35.1 | W9 / T36.1 | W10 / T37.1 | W10 / T38.2 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 15/03/2017 | QTSE Sample No | 257276 | 257277 | 257278 | 257279 | 257280 |

| Determinand | Unit | RL | Accreditation | | | | | |
|------------------------|-------|-------|---------------|-------|-------|-------|-------|-------|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | 0.24 | < 0.1 | < 0.1 | < 0.1 | 0.26 |
| Pyrene | mg/kg | < 0.1 | MCERTS | 0.22 | < 0.1 | < 0.1 | < 0.1 | 0.24 |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | 0.14 | < 0.1 | < 0.1 | < 0.1 | 0.18 |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | < 1.6 | < 1.6 | < 1.6 | < 1.6 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - TPH CWG Banded | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-56163 | Date Sampled | 08/03/17 | 08/03/17 | 08/03/17 | 08/03/17 | 08/03/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W8 / T29.1 | W8 / T30.1 | W8 / T31.1 | W8 / T32.1 | W8 / T33.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 15/03/2017 | QTSE Sample No | 257271 | 257272 | 257273 | 257274 | 257275 |

| Determinand | Unit | RL | Accreditation | | | | | |
|----------------------|-------|--------|---------------|--------|--------|--------|--------|--------|
| Aliphatic >C5 - C6 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Aliphatic >C6 - C8 | mg/kg | < 0.05 | NONE | 0.29 | 0.05 | 0.14 | 0.15 | 0.24 |
| Aliphatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aliphatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aliphatic >C12 - C16 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | < 3 | < 3 |
| Aliphatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | < 3 | < 3 |
| Aliphatic >C21 - C34 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| Aliphatic (C5 - C34) | mg/kg | < 21 | NONE | < 21 | < 21 | < 21 | < 21 | < 21 |
| Aromatic >C5 - C7 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Aromatic >C7 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Aromatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aromatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aromatic >C12 - C16 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aromatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | 6 | 3 |
| Aromatic >C21 - C35 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| Aromatic (C5 - C35) | mg/kg | < 21 | NONE | < 21 | < 21 | < 21 | < 21 | < 21 |
| Total >C5 - C35 | mg/kg | < 42 | NONE | < 42 | < 42 | < 42 | < 42 | < 42 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - TPH CWG Banded | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-56163 | Date Sampled | 08/03/17 | 08/03/17 | 08/03/17 | 08/03/17 | 08/03/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W8 / T34.1 | W9 / T35.1 | W9 / T36.1 | W10 / T37.1 | W10 / T38.2 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 15/03/2017 | QTSE Sample No | 257276 | 257277 | 257278 | 257279 | 257280 |

| Determinand | Unit | RL | Accreditation | | | | | |
|----------------------|-------|--------|---------------|--------|--------|--------|--------|--------|
| Aliphatic >C5 - C6 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Aliphatic >C6 - C8 | mg/kg | < 0.05 | NONE | 0.13 | < 0.05 | < 0.05 | < 0.05 | 1.52 |
| Aliphatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aliphatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | 14 |
| Aliphatic >C12 - C16 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | < 3 | 20 |
| Aliphatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | 10 | 18 |
| Aliphatic >C21 - C34 | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | 129 | 405 |
| Aliphatic (C5 - C34) | mg/kg | < 21 | NONE | < 21 | < 21 | < 21 | 139 | 458 |
| Aromatic >C5 - C7 | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Aromatic >C7 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Aromatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Aromatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | 4 |
| Aromatic >C12 - C16 | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | 7 |
| Aromatic >C16 - C21 | mg/kg | < 3 | MCERTS | 5 | < 3 | < 3 | < 3 | 11 |
| Aromatic >C21 - C35 | mg/kg | < 10 | MCERTS | 42 | < 10 | < 10 | 26 | 287 |
| Aromatic (C5 - C35) | mg/kg | < 21 | NONE | 47 | < 21 | < 21 | 26 | 309 |
| Total >C5 - C35 | mg/kg | < 42 | NONE | 47 | < 42 | < 42 | 165 | 767 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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| Soil Analysis Certificate - BTEX / MTBE | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-56163 | Date Sampled | 08/03/17 | 08/03/17 | 08/03/17 | 08/03/17 | 08/03/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W8 / T29.1 | W8 / T30.1 | W8 / T31.1 | W8 / T32.1 | W8 / T33.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 15/03/2017 | QTSE Sample No | 257271 | 257272 | 257273 | 257274 | 257275 |

| Determinand | Unit | RL | Accreditation | | | | | |
|--------------|-------|-----|---------------|-----|-----|-----|-----|-----|
| Benzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Ethylbenzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| p & m-xylene | ug/kg | < 2 | MCERTS | < 2 | 16 | 28 | 10 | < 2 |
| o-xylene | ug/kg | < 2 | MCERTS | < 2 | 6 | 12 | 5 | < 2 |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |

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| Soil Analysis Certificate - BTEX / MTBE | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-56163 | Date Sampled | 08/03/17 | 08/03/17 | 08/03/17 | 08/03/17 | 08/03/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W8 / T34.1 | W9 / T35.1 | W9 / T36.1 | W10 / T37.1 | W10 / T38.2 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 15/03/2017 | QTSE Sample No | 257276 | 257277 | 257278 | 257279 | 257280 |

| Determinand | Unit | RL | Accreditation | | | | | |
|--------------|-------|-----|---------------|-----|-----|-----|-----|-----|
| Benzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | < 2 |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |
| Ethylbenzene | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | < 2 | 24 |
| p & m-xylene | ug/kg | < 2 | MCERTS | 8 | < 2 | < 2 | < 2 | 85 |
| o-xylene | ug/kg | < 2 | MCERTS | 5 | < 2 | < 2 | < 2 | 61 |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | < 5 | < 5 |

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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-56163 | Date Sampled | 08/03/17 | 08/03/17 | 08/03/17 | 08/03/17 | 08/03/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W8 / T29.1 | W8 / T30.1 | W8 / T31.1 | W8 / T32.1 | W8 / T33.1 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 15/03/2017 | QTSE Sample No | 257271 | 257272 | 257273 | 257274 | 257275 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|-----|----|-----|-----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 209 | 53 | 126 | 139 | 225 |

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| Soil Analysis Certificate - Volatile Organic Compounds (VOC) | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|
| QTS Environmental Report No: 17-56163 | Date Sampled | 08/03/17 | 08/03/17 | 08/03/17 | 08/03/17 | 08/03/17 |
| G & J Geoenvironmental Consultants Ltd | Time Sampled | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Site Reference: Nash Road, Redditch (St Francis Group) | TP / BH No | W8 / T34.1 | W9 / T35.1 | W9 / T36.1 | W10 / T37.1 | W10 / T38.2 |
| Project / Job Ref: GJ079 | Additional Refs | Composite | Composite | Composite | Composite | Composite |
| Order No: 138 | Depth (m) | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Reporting Date: 15/03/2017 | QTSE Sample No | 257276 | 257277 | 257278 | 257279 | 257280 |

| Determinand | Unit | RL | Accreditation | | | | | |
|-----------------|-------|-----|---------------|-----|-----|-----|----|-----|
| Trichloroethene | ug/kg | < 5 | MCERTS | 113 | < 5 | < 5 | 13 | 688 |

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Soil Analysis Certificate - Sample Descriptions

| | |
|--|--|
| QTS Environmental Report No: 17-56163 | |
| G & J Geoenvironmental Consultants Ltd | |
| Site Reference: Nash Road, Redditch (St Francis Group) | |
| Project / Job Ref: GJ079 | |
| Order No: 138 | |
| Reporting Date: 15/03/2017 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|-------------|-----------------|---------------|----------------------|---|
| 257271 | W8 / T29.1 | Composite | None Supplied | 12 | Brown clayey sand with stones |
| 257272 | W8 / T30.1 | Composite | None Supplied | 12.3 | Brown sandy gravel with stones |
| 257273 | W8 / T31.1 | Composite | None Supplied | 12 | Brown sandy gravel with stones and brick |
| 257274 | W8 / T32.1 | Composite | None Supplied | 12.7 | Brown sandy gravel with concrete and stones |
| 257275 | W8 / T33.1 | Composite | None Supplied | 15.2 | Brown sandy clay with stones and brick |
| 257276 | W8 / T34.1 | Composite | None Supplied | 13.7 | Brown sandy gravel with stones |
| 257277 | W9 / T35.1 | Composite | None Supplied | 22.3 | Light brown clay with stones |
| 257278 | W9 / T36.1 | Composite | None Supplied | 20 | Light brown clay |
| 257279 | W10 / T37.1 | Composite | None Supplied | 23.1 | Blue clay |
| 257280 | W10 / T38.2 | Composite | None Supplied | 15.8 | Brown sandy clay |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{U/S}

Unsuitable Sample ^{U/S}



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| |
|--|
| Soil Analysis Certificate - Methodology & Miscellaneous Information |
| QTS Environmental Report No: 17-56163 |
| G & J Geoenvironmental Consultants Ltd |
| Site Reference: Nash Road, Redditch (St Francis Group) |
| Project / Job Ref: GJ079 |
| Order No: 138 |
| Reporting Date: 15/03/2017 |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|--------|-------------|---|--|-----------|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 - C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCs | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

D Dried
AR As Received