Contaminated Land Air Quality Environmental Audit



Partnership No: OC 300776

New Settlement Area, Heyford Park, Oxfordshire

Dorchester Phase 5, Contamination Hotspot: Remediation Works Verification Report

For: Urban Regen Ltd.

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Contents

- 1 Introduction
- 2 Remediation Strategy
- 3 Description of Works
- 4 Inspections and Testing
- 5 Conclusions and Recommendations

Drawings

D01	Excavation Extents and Sample Location Plan
D02	Hydrocarbon Concentrations of Samples Relative to Remediation Target Values
0521-PH5C-102	Proposed Development Layout Plan

Appendices

- A Remediation Earthworks Photolog
- B Laboratory Analysis Reports

1. Introduction

- 1.1. Planning permission for the redevelopment of the former RAF/USAF Upper Heyford airbase was granted by Cherwell District Council (CDC) on the 2nd November 2012, reference 10/01642/OUT. The site, which is being converted to commercial and residential uses, is known as Heyford Park and is divided between the Flying Field Area (FFA) and New Settlement Area (NSA). Urban Regen Ltd. (URL) was instructed by the consortium of Dorchester Heyford Park Group Ltd and Bovis Homes to carry out demolition, remediation and preparatory earthworks across the NSA to prepare various zones for residential development. Dorchester Group and Bovis have divided the site into a number of development phases, and the URL works are referenced to these various phases.
- 1.2. The above planning consent contains the following conditions relating to contamination remediation; particularly pertinent to the works detailed in this report is Condition 26.
- 24 No operational development approved by this planning permission shall take place (or such other date or stage in development as may be agreed in writing with the Local Planning Authority), until the following components of a scheme to deal with the risks associated with contamination of the site shall each be submitted to and approved, in writing, by the local planning authority:
- a. A preliminary risk assessment which has identified:
- (i) all previous uses.
- (ii) potential contaminants associated with those uses.
- b. A conceptual model of the site indicating sources, pathways and receptors.
- c. Potentially unacceptable risks arising from contamination at the site.
- d. A site investigation scheme, based on (1) to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off site.
- e. The site investigation results and the detailed risk assessment (2) and, based on these, an options appraisal and remediation strategy giving full details of the remediation measures required and how they are to be undertaken.
- f. A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in (3) are complete and identifying any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action. Any changes to these components require the express consent of the local planning authority. The scheme shall be implemented as approved.
- 25 Prior to occupation of any new build dwellings, a verification report demonstrating completion of the works set out in the approved remediation strategy and the effectiveness of the remediation shall be submitted to and approved, in writing, by the local planning authority. The report shall include results of sampling and monitoring carried out in accordance with the approved verification plan to demonstrate that the site remediation criteria have been met. It shall also include any plan (a "long-term monitoring and maintenance plan") for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action, as identified in the verification plan, and for the reporting of this to the local planning authority.

- 26 If during development contamination not previously identified is found to be present at the site then no further development within 20m of the contamination shall be carried out until the developer has submitted to and obtained written approval from the local planning authority for an addendum to the method statement. This addendum to the method statement shall detail how this unsuspected contamination will be remediated (if necessary) and thereafter this will be carried out as approved before any development within 20m recommences. Following completion of any such additional remediation, a verification report shall be submitted within 3 months of the completion of the works for the approval of the Local Planning Authority in writing.
- 1.3. A Remediation Strategy (ref: EED10658-109_S_12.2.3_FA, September 2012) prepared by Waterman Energy, Environment and Design Ltd. (Waterman) on behalf of Dorchester Group, together with a Demolition and Remediation Method Statement produced by Vertase F.L.I. Ltd. were submitted to the Local Planning Authority (Cherwell District Council). The Council subsequently approved the discharge of Condition 24 on the 02nd November 2012. Whilst the role of Waterman has changed within the remediation Scheme, and Vertase FLI is no longer involved with the site, the principles of the Remediation Strategy remain the same and have been adopted by URL in their role as Principal Remediation Contractor to Dorchester Group and Bovis.
- 1.4. For clarity, SGP re-submitted an updated Remediation Strategy (R1742-R01-v3) in April 2014 that reflects the changed contractual circumstances with respect to contamination remediation. Approval of the revised Strategy was received from the CDC EHO in October 2014.
- 1.5. Smith Grant LLP (SGP) has been instructed by URL to advise upon the implementation of the remediation works, carry out all necessary inspections and monitoring of the works, and to produce verification reports as the preparatory earthworks in each phase are completed by URL to assist in the discharge of Condition 25 and, if required, Condition 26.
- 1.6. An area of previously unidentified contamination has been discovered within Phase 5 of the development; in order to fulfil the requirements of Condition 26 SGP has notified CDC in writing of the presence of the unexpected contamination (letter ref: R1742-190618, issued 20th June 2018). Characterisation of the contamination indicated that it could be managed under the provisions of the existing Remediation Strategy, no amendments were therefore required.
- 1.7. SGP has since inspected the URL remediation earthworks carried out in relation to the discovered contamination hotspot and has collected validation samples of the stripped soil surfaces and replaced soils for determination of compliance with the agreed remediation target values (RTVs). This report describes the works carried out in the area (the extents of which are shown on Drawing D01) and the analysis undertaken, drawing conclusions and making recommendations concerning the further works required by Dorchester Homes in order to fully discharge Planning Conditions 25 and 26. A proposed development layout plan corresponding to the impacted and surrounding area has been provided (0521-PH5C-102).

2. Remediation Strategy

2.1. Expected Contamination

- 2.1.1. The wider development comprises an area of the former Upper Heyford Airbase, latterly developed and used by the United States Airforce, which has been decommissioned and is used in part for civilian purposes, including commercial and residential uses as part of Heyford Park. Identified known or potential contamination sources determined from the historical uses of the site and site investigations were generally found to be minor, consisting of low-level but pervasive contamination by metals / metalloids and PAHs, with localised hydrocarbons associated with bulk fuel storage tanks and the potential for asbestos in pipe laggings and gaskets, insulation board and cement-bound products, or as dispersed fibre in made ground. The key identified potential contamination hot-spots in the wider site were fuel hydrocarbons associated with bulk underground fuel storage tanks (USTs).
- 2.1.2. Natural background contamination may be present in the bedrock and soils. The site lies within or adjacent to the "ironstone domain" as described in DEFRA Technical Guidance Sheet TGS01 "Arsenic", July 2012; the site lies within 1km of mapped outcrops of ironstones within the Jurassic sedimentary rocks. Within the ironstone domain, the normal background concentration (NBC) of arsenic is reported to be 220 mg/kg; the NBC is defined as the upper 95% confidence limit of the 95th percentile of topsoil concentrations. The normal background concentration of vanadium within the ironstone domain is reported by BGS to be >128 mg/kg. Both values substantially exceed the Remediation Strategy 'Table B1' criteria for cover soils.

2.2. <u>Unexpected Contamination – Hydrocarbon Hotspots</u>

- 2.2.1. Condition 26 of the Planning Permission for the site contains the requirement that when unexpected contamination is encountered an addendum remediation method statement is to be produced for implementation. This is then to be followed by a verification plan which is to be submitted to the Local Planning Authority within 3 months of completion of the works. Provision has therefore been made within the Remediation Strategy for the discovery of unexpected contamination which includes the investigation of any such materials by a suitably qualified Environmental Consultant, with subsequent verification reporting to be issued to CDC as necessary.
- 2.2.2. The removal of hydrocarbon contamination is already detailed within the approved Strategy and as such it is considered that revision of the Strategy is not required if unexpected hydrocarbon hotspots are encountered. Hydrocarbon contaminated soils can therefore be dealt with via the techniques described in the Strategy, comprising of the key following actions:

- excavation of hydrocarbon contaminated soils under supervision of a suitably qualified Environmental Consultant up to either site boundaries, retained buildings, services or intact bedrock;
- removal of contaminated soils offsite to a secure bunded stockpile which is to be placed on an impermeable membrane / paved surface until the material is either suitably disposed of or treated;
- collection of verification samples from the side walls and bases of excavations where contaminated materials are removed at a frequency of 1 composite sample per 15m² of exposed surface (minimum 3 samples) for submission to an accredited laboratory for fractionated hydrocarbon analysis, and;
- the assessment and recording of any residual contamination present on intact rock surfaces, for which there is no requirement to excavate.
- 2.2.3. Verification sampling, as described above, is necessary to demonstrate that any residual hydrocarbon contamination does not pose a significant risk to controlled waters by reference to the soil standards agreed by Waterman with the Environment Agency (Waterman Remediation Strategy: Tables B2 and B3). The criteria are organised in two tiers according to the distance of hot-spots from the southern / southeastern (down-gradient) boundary of the site. As the hydrocarbon hotspot detailed in this report is greater than 250m from the southeast boundary the results of the verification sampling are to be compared with the criteria set out in Table B3 of the Waterman Strategy, which is reproduced in table 2.1 below.

Petroleum Hydrocarbon Fraction	Target Concentration >250m (mg/kg)
Aliphatic C8-C10	240
Aliphatic C10-C12	1000
Aliphatic C12-C16	1000
Aliphatic C16-C21	1000
Aliphatic C21-C35	1000
Aromatic C10-C12	23
Aromatic C12-C16	1000
Aromatic C16-C21	1000
Aromatic C21-C35	1000

 Table 2.1. Screening Criteria, Hydrocarbon Hot-spots >250m from southeastern site boundary (from Waterman Table B3)

3. Description of Works

3.1. Preliminary Investigation

- 3.1.1. Following the discovery of additional underground storage tanks (USTs) within the area of the former petrol station in Phase 5 (the removal and validation of which will be reported separately in the main UST Validation Report), a trial-pitting exercise was carried out on the 07th June 2018 to ensure that no further tanks were present in the immediate vicinity. In the two trial pits excavated to the west / northwest of the USTs, suspected hydrocarbon contamination (described as bitumen impacted soils and diesel impacted gravels) was encountered, as discussed in letter 'R1742-190618' issued to CDC.
- 3.1.2. The presence of hydrocarbon contamination within the suspect materials was subsequently confirmed by laboratory analysis (Exova report ref: 18/8828), which is discussed in more detail in Section 4. It was therefore considered that further investigation was required to determine the extents of the contamination hotspot, with the removal of gross hydrocarbon contamination where encountered.

3.2 Hydrocarbon Contamination Removal

- 3.2.1 The works initially consisted of a surface strip of soils not exhibiting any significant contamination indicators by URL under the guidance of SGP. These soils typically comprised a thin veneer of weathered limestone bedrock fill and an underlying stratum of light brown clay, which was presumedly placed to act as a capping layer over the buried soils. These soils were inspected for visual and olfactory indicators of contamination and were screened using a photoionization detector (PID) for the presence of volatile organic compounds (VOCs). Materials that did not display significant contamination indicators and demonstrated VOC concentrations below 10ppm were deemed potentially suitable for replacement. These soils were stockpiled adjacent to the excavation and were sampled for hydrocarbon analysis in order to assess their suitability for replacement, as discussed in section 4.
- 3.2.2 Following removal and segregation of the clean soil cover, excavation of the grossly contaminated soils commenced. Observed contamination indicators included moderate to strong hydrocarbon odours, grey stained soils, black viscous product (often amongst degraded metal drums), and PID readings of soils above 10ppm (the highest reading observed exceeded 400ppm). Where hydrocarbon contamination was present, this tended to extend to the underlying weathered limestone bedrock or rockhead (encountered at between approximately 2.5m and 4m bgl, deepening to the west), where the excavation would cease.
- 3.2.3 The eastern extent of the excavation comprised natural weathered bedrock demonstrating some residual staining, for which there is no requirement for removal, and the excavation ceased on the western extent due to the consistent absence of any significant contamination indicators. The northern and southern extents of the excavation were constrained by the

presence of roads and services and contamination indicators, as described earlier, were apparent on the eastern sides of these wall faces implying that impacted materials may extend beyond the treated area. The extents of the excavation (which had a total area of approximately 1,200m²) are shown on Drawing D01.

- 3.2.4 Situated amongst the hydrocarbon impacted soils a number of small caches of broken asbestos cement sheeting was encountered temporarily causing the excavation to cease. The area was dampened down using water which had collected within the excavation and suitably qualified URL staff proceeded to handpick the visible asbestos containing materials (ACM) wearing protective masks and latex lined gloves. The ACM was double-bagged in appropriate bags which were then zip-tied. A total of five bags were filled with ACM which were removed from site for disposal. The excavation of hydrocarbon contaminated soils then re-commenced.
- 3.2.5 Following the excavation of the contaminated soils, URL removed the materials to a quarantine area within the wider NSA where it will remain stockpiled until a decision is made to either treat the material or dispose of it to a suitable receiving facility. Two stockpiles are present within the area: the main stockpile of hydrocarbon contaminated materials, and a smaller stockpile of material excavated in the vicinity of the identified ACM.
- 3.2.6 During removal of the contaminated materials a significant inflow of water entered the excavation from the west. Black product and an iridescent sheen was observed on the pooled water, likely due to having flowed through hydrocarbon impacted soils. Following the excavation of all feasibly removable contaminated soils (i.e. not constrained by the presence of roads / services to the north and south), the water was pumped into the recently emptied USTs directly to the east of the hotspot.
- 3.2.7 It was considered that the existing acceptability criteria for hydrocarbons set out in the approved Remediation Strategy remained applicable and that no significant modification to the Strategy was required. Subsequent to the removal of the grossly contaminated soils, SGP collected validation samples from the sidewalls and the base of the excavation to assess the potential for any residual hydrocarbon contamination that could present a risk to either current or future receptors. The locations from where validation samples were collected are indicated on Drawing D01.
- 3.2.8 Upon receipt of laboratory results confirming that the soils stockpiled adjacent to the hotspot were suitable to be retained these were replaced within the excavated area and compacted.

4. Inspections and Testing

4.1. Subsequent to the preliminary investigation carried out on the 07th June 2018, SGP attended the site on twelve occasions during the remediation earthworks carried out in relation to the Phase 5 contamination hotspot. The dates and activities undertaken during SGP attendance, cross referenced to the site inspection photographic record (Appendix A) and Laboratory Analysis Reports (Appendix B) are summarised in Table 4.1 below.

Table 4.1 SGP Inspection Summary

Date	SGP Activities	Record
07/06/2018	Attendance to oversee the excavation of two trial pits to determine the potential presence of USTs; samples collected from suspected hydrocarbon contamination observed within the trial pits.	Appendix B - 18/8828
12/06/2018	Observation of hydrocarbon hotspot removal, directing which soils may potentially be retained and which require removal based on the absence/presence of contamination indicators.	Appendix A - Photos: 1-4
13/06/2018	Observation of hydrocarbon hotspot removal, directing which soils may potentially be retained and which require removal based on the absence/presence of contamination indicators; collection of validation samples from excavation extents.	Appendix A - Photos: 5-8 Appendix B - 18/9273
14/06/2018	Observation of hydrocarbon hotspot removal, directing which soils may potentially be retained and which require removal based on the absence/presence of contamination indicators; collection of validation samples from potentially recoverable material.	Appendix A - Photos: 9-11 Appendix B - 18/9273
20/06/2018	Observation of hydrocarbon hotspot removal, directing which soils may potentially be retained and which require removal based on the absence/presence of contamination indicators.	Appendix A - Photos: 12-18
21/06/2018	Observation of hydrocarbon hotspot and ACM removal, directing which soils may potentially be retained and which require removal based on the absence/presence of contamination indicators; collection of sample of suspected ACM.	Appendix A - Photos: 19-22 Appendix B - 18/9818
22/06/2018	Observation of hotspot excavation, directing which soils may potentially be retained and which require removal based on the absence/presence of contamination indicators; collection of validation samples from potentially recoverable material.	Appendix A - Photos: 23-25 Appendix B - 18/9818
25/06/2018	Observation of hydrocarbon hotspot removal, directing which soils may potentially be retained and which require removal based on the absence/presence of contamination indicators.	Appendix A - Photos: 26-28
26/06/2018	Observation of hydrocarbon hotspot removal, directing which soils may potentially be retained and which require removal based on the absence/presence of contamination indicators.	Appendix A - Photos: 29-32
27/06/2018	Observation of hydrocarbon hotspot removal, directing which soils may potentially be retained and which require removal based on the absence/presence of contamination indicators; collection of validation samples from potentially recoverable material and from excavation extents.	Appendix A - Photos: 33-37 Appendix B - 18/10066

Date	SGP Activities	Record
28/06/2018	Observation of hydrocarbon hotspot removal, directing which soils may potentially be retained and which require removal based on the absence/presence of contamination indicators; collection of validation samples from potentially recoverable material and from excavation extents.	Appendix A - Photos: 38-42 Appendix B - 18/10241
29/06/2018	Observation of hydrocarbon hotspot removal, directing which soils may potentially be retained and which require removal based on the absence/presence of contamination indicators; collection of validation samples from excavation extents.	Appendix A - Photos: 43-46 Appendix B - 18/10241
02/07/2018	Observation of hydrocarbon hotspot removal, directing which soils may potentially be retained and which require removal based on the absence/presence of contamination indicators; collection of validation samples from potentially recoverable material and from excavation extents.	Appendix A - Photos: 47-53 Appendix B - 18/10441

4.2 <u>Preliminary Investigation</u>

- 4.2.1 As described previously, suspected hydrocarbon contamination was encountered within Phase 5 of the development during a trial pitting exercise carried out on the 07th June 2018. The contamination was variable and comprised both black product contained within clay soils at between 2-2.5m bgl, and a black sandy gravel with a strong hydrocarbon odour and PID readings up to 20ppm at between 0.8-1.6m bgl. Samples of both the product and suspected hydrocarbon impacted gravels (Exova report ref: 18/8828; 'TP1-S1-PRODUCT' and 'TP2-S1, respectively) were collected and analysed for a range of determinants which confirmed that the former was a viscous tar, possibly bitumen, and the latter contained elevated hydrocarbon concentrations across multiple fractions. VOC and SVOC analysis was also undertaken on the tar product which demonstrated low to negligible concentrations.
- 4.2.2 The confirmed presence of hydrocarbon contamination by diesel and bitumen tar warranted further investigation and the removal of all soils in the area that demonstrated significant indicators of contamination, including both visual and olfactory, or the detection of elevated VOCs with a PID.

4.3 Validation Samples Analysis: Retained Soils

- 4.3.1 URL initially stripped potentially clean soils overlying the hotspot which did not exhibit visual or olfactory indicators of contamination. These soils were then screened with a PID and providing the reading was below 10ppm the material was side-cast for potential replacement following receipt of laboratory analysis carried out on samples of the material which were collected at an approximate frequency of 1 composite per 250m³.
- 4.3.2 Sixteen samples were submitted to accredited laboratory, Exova Jones, Flintshire, for full TPHCWG banding and BTEX analysis. The results of the validation testing (Exova report refs: 18-9273 (S1-S3), 18-10066 (S5), 18-10241 (S6-S16) and 18-10441 (S17)) are compared to the assessment criteria set out table B3 of the approved Remediation Strategy, as summarised in Table 4.2 below.

		Range of	Table B3	
Contaminant Samples		Concentrations (mg/kg unless stated)	Screening criteria* (mg/kg unless stated)	Exceedance Concentration & location
Aliphatic C5-C6	16	<0.1	-	-
Aliphatic C6-C8	16	<0.1-0.6	-	-
Aliphatic C8-C10	16	<0.1-0.9	240	None
Aliphatic C10-C12	16	<0.2-129.6	1000	None
Aliphatic C12-C16	16	<4-193	1000	None
Aliphatic C16-C21	16	<7-34	1000	None
Aliphatic C21-C35	16	<7-319	1000	None
Aromatic C6-C7	16	<0.1	-	-
Aromatic C7-C8	16	<0.1	-	-
Aromatic C8-C10	16	<0.1	-	-
Aromatic C10-C12	16	<0.2-15.7	23	None
Aromatic C12-C16	16	<4-39	1000	None
Aromatic C16-C21	16	<7-81	1000	None
Aromatic C21-C35	16	<7-469	1000	None
Benzene	16	<0.005	0.08 (Table B1)	None
Toluene	16	<0.005	120 (Table B1)	None
Ethylbenzene	16	<0.005-0.012	65 (Table B1)	None
m/p-Xylene	16	<0.005-0.012	42 (Table B1)	None
o-xylene	16	<0.005	44 (Table B1)	None

- 4.3.3 Hydrocarbon concentrations were below the assessment criteria for all 16 of the validation samples collected from the soils stockpiled for potential replacement. No criteria are derived within Table B3 for BTEX compounds and so screening thresholds were utilised from Table B1 of the Waterman Strategy (chemical criteria for material in the capping layer), none of which were exceeded. These soils were therefore deemed suitable for replacement within the excavation.
- 4.3.4 Sample 'PH5-HS-S4' (Exova report ref: 18-9818) was collected from material that appeared to be uncontaminated by hydrocarbon contamination but within the area of ACM deposits within the hotspot. This material was therefore isolated from the other recovered soils and was sampled for an asbestos screen. Chrysotile fibre bundles were detected within the sample and it was therefore decided that this material should be removed to the contamination stockpile area. These soils were then added to the smaller stockpile of contaminated materials excavated in the vicinity of the ACM deposits.

4.4 Validation Samples Analysis: Excavation Walls and Base

4.4.1 Contaminated soils determined through visual and olfactory assessment or with elevated PID readings were removed by mechanical excavator and were temporarily stockpiled within the wider NSA area pending further assessment. Hydrocarbon impacted soils were typically present above the bedrock and therefore the impacted soils were removed down to bedrock

in accordance with the Strategy. A detailed photographic record during the remedial works is presented in Appendix B.

- 4.4.2 SGP collected validation samples from the extents of the excavation sidewalls in order to confirm that residual contamination was not present at unacceptable concentrations. Samples were also collected from the base of the excavation from weathered bedrock in order to assess whether the bedrock had been significantly impacted by the observed hydrocarbon contamination. Samples were collected at an approximate frequency of 1 sample per 15m² of exposed sidewall in accordance with the strategy, with a reduced frequency of 1 sample per 67m² collected from the base of the excavation. Validation sample locations are indicated on Drawing D01.
- 4.4.3 Forty-five samples were submitted to accredited laboratory, Exova Jones, Flintshire, for full TPHCWG banding and BTEX analysis. The results of the validation testing (Exova report refs: 18-9273 (SS1-SS6), 18-10066 (SS7-SS15), 18-10241 (SS16-SS33) and 18-10441(SS34-45)) are compared to assessment criteria set out table B3 of the approved Remediation Strategy, as summarised within Table 4.3 below:

		Range of	Table B3	
Contaminant	Samples	Concentrations (mg/kg unless stated)	Screening criteria* (mg/kg unless stated)	Exceedance Concentration & location
Aliphatic C5-C6	45	<0.1-6.5	-	-
Aliphatic C6-C8	45	<0.1-34.5	-	-
Aliphatic C8-C10	45	<0.1-29.7	240	None
Aliphatic C10-C12	45	<0.2-342.6	1000	None
Aliphatic C12-C16	45	<4-479	1000	None
Aliphatic C16-C21	45	<7-384	1000	None
Aliphatic C21-C35	45	<7-7752	1000	10 (SS1, SS5, SS31-34, SS36. SS38-39 & SS44)
Aromatic C6-C7	45	<0.1	-	-
Aromatic C7-C8	45	<0.1	-	-
Aromatic C8-C10	45	<0.1-2.4	-	-
Aromatic C10-C12	45	<0.2-136.6	23	9 (SS1, SS3-6, SS31-33 & SS36)
Aromatic C12-C16	45	<4-126	1000	None
Aromatic C16-C21	45	<7-361	1000	None
Aromatic C21-C35	45	<7-3358	1000	6 (SS1, SS31-33, SS36 & SS38)
Benzene	45	<0.005	0.08 (Table B1)	None
Toluene	45	<0.005-0.029	120 (Table B1)	None
Ethylbenzene	45	<0.005-0.728	65 (Table B1)	None
m/p-Xylene	45	<0.005-1.622	42 (Table B1)	None
o-xylene	45	<0.005-0.075	44 (Table B1)	None

Table 4.3 Validation Screening Summary for Excavation Side Walls and Base

- 4.4.4 Hydrocarbon concentrations were below the assessment criteria within the majority of the validation samples collected with the exceptions of samples SS1, SS3, SS4, SS5, SS6, SS31, SS32, SS34, SS35, SS36, SS38, SS39 and SS44 with respect to the Aliphatic hydrocarbon range C21-35 and/or the Aromatic hydrocarbon ranges C10-12 and C21-35. The majority of the exceedances were detected within samples collected from the eastern ends of the northern and southern sidewalls where contamination was observed but was unable to be excavated due to the presence of roads and services constraining the excavation. The only exceptions to this were relatively minor exceedances detected in samples SS39 and SS44 of the Aliphatic carbon range C21-35 at concentrations of 1,540mg/kg and 2,123mg/kg, respectively. These samples were collected from the eastern sidewall where residual contamination was observed on natural weathered bedrock; they are not, however, considered to be indicative of the presence of unacceptable levels of contamination and in any case, it is not a requirement of the strategy to remove impacted bedrock.
- 4.4.5 None of the samples collected from either the base or western sidewall exceeded the screening criteria for any of the hydrocarbon ranges tested for.
- 4.4.6 No criteria are derived within Table B3 for BTEX compounds and so screening thresholds were utilised from Table B1 of the Waterman Strategy (chemical criteria for material in the capping layer), none of which were exceeded.
- 4.4.7 Drawing D02 indicates the locations of the samples with the concentrations of hydrocarbons relative to the RTVs.

5. Conclusions and Recommendations

5.1. Verification of Remediation

- 5.1.1. Contamination indicators identified during a preliminary inspection were further investigated and confirmed an area of at least 1,200m² to be potentially impacted by hydrocarbons within a layer of soils above bedrock. URL has remediated the hydrocarbon hotspot in the Phase 5 area by removing impacted soils for ex-situ treatment or disposal to the extents currently feasible, however, due to the presence of roads constraining the excavation to the north and south residual contamination remains in these areas.
- 5.1.2. Validation samples collected from the base and western sidewall of the excavation confirmed residual concentrations below the assessment criteria, whereas 2 samples collected from the eastern sidewall demonstrated minor exceedances; these are not, considered to be indicative of the presence of unacceptable levels of contamination requiring removal, however more significant exceedances in the eastern parts of the northern and southern extent of the remediation excavation contained moderate exceedances indicating the contaminated extends beyond the treated area at these locations.
- 5.1.3. Soils overlying the hydrocarbon hotspot that did not display contamination indicators or PID readings over 10ppm have been stripped, sampled at a frequency approximating 1 sample per 250m³ and tested for fractionated hydrocarbon analysis. All of the samples recorded hydrocarbon concentrations below the accepted screening criteria therefore the soils have been replaced within the excavation.

5.2. Ground Gas / Vapour Hazards

- 5.2.1. URL have completed remediation of the hydrocarbon impacted soils within the Phase 5 area to the extents currently feasible. Residual vapours may remain within either the impacted bedrock, the retained soils and/or the impacted soils underlying the roads to the north and south. Whilst no visible evidence of mobile contaminants was observed (i.e. free product) the potential for vapour migration exists, or further liquid / dissolved phase migration if sources underlying the roads to the north or south are mobilised.
- 5.2.2. It is therefore recommended that further risk assessment is completed through the installation of monitoring wells to determine the risk associated with residual vapours, or alternatively a precautionary approach should be adopted through the installation of a ventilated void within the floor construction and installation of a gas membrane specific for hydrocarbon resistance within all new buildings in the area; this corresponds to future Plots 861-868 and 874-881 according to the development layout plan provided by Dorchester Homes (Ref: 0521-PH5C-102). This precautionary measure is outside the scope of the approved Remediation Strategy and so will require approval from the EHO before implementation.

- 5.2.3. Should the preferred option be the installation of a precautionary hydrocarbon resistant membrane, this should be specified, installed and verified in accordance with CIRIA C748 (Guidance on the use of plastic membranes as VOC vapour barriers) and CIRIA C635 (Good practice on the testing and verification of protection systems for buildings against hazardous ground gases).
- 5.2.4. A number of partially constructed buildings are present to the south of the impacted area: as these are within 20m of the hotspot (on the side where exceedances of the criteria were recorded) the vapour assessment should consider the potential for lateral migration to impact these dwellings.
- 5.2.5. SGP concludes that the remedial works carried out to date with respect to the Phase 5 contamination hotspot have been completed in accordance with the agreed strategy, although it is anticipated that further excavation of contaminated materials will occur to the north of the excavated area which should be undertaken using the same approach described in this report.
- 5.2.6. United Utilities guidelines require production of a water pipeline risk assessment (WRAS) to evaluate whether there is a requirement for protected water supply pipes on the development. This should be carried out upon completion of the remediation works within Phase 5 and should utilise the investigation findings detailed in this report.
- 5.3. Limitations
- 5.3.1. SGP reserves the right to alter any of the foregoing information in the event of new information being disclosed or provided and in the light of changes to legislation, guidelines and responses by the statutory and regulatory authorities.
- 5.4. This report has been prepared by Smith Grant LLP, for the sole and exclusive use of Urban Regen Ltd. and Dorchester Homes, and the benefit of this report may not be assigned to any third party without the prior agreement in writing of Smith Grant LLP.
- 5.5. Reasonable skill, care and diligence have been exercised within the timescale and budget available, and in accordance with the technical requirements of the brief. Notwithstanding the efforts made by the professional team in undertaking the assessment and preparing this report, it is possible that other ground conditions and contamination as yet undetected may exist. Reliance on the findings of this report must therefore be limited accordingly. Such reliance must be based on the whole report and not on extracts which may lead to incomplete or incorrect conclusions when taken out of context. This report reviews and relies upon site investigations largely conducted by others. If errors or omissions in previous work have been noted then these have been duly noted, however SGP accepts no responsibility for advice given on the basis of incorrect factual information provided to it.

DRAWINGS







Gross sqft	No. Of Units
888ft ²	3
858ft ²	6
1023ft ²	3
1038ft ²	2
1400ft ²	1
1400ft ²	1
1523ft*	7
	23

APPENDIX A

Remediation Earthworks Photolog



12.06.18 - Initial strip of surface soils not demonstrating contamination indicators along southern extent of excavation.



12.06.18 - Excavation of hydrocarbon contaminated soils along southern extent down to weathered bedrock.



12.06.18 - Stockpile of recovered soils retained for replacement after contamination removal.



12.06.18 - Hydrocarbon contaminated soils temporarily stockpiled within excavation pending removal offsite; residual staining present on lower reaches of southern sidewall.



13.06.18 - Continuation of soil strip of materials not demonstrating contamination indicators.



soils down to weathered bedrock.





20.06.18 – Iridescent sheen observed on pooled water within excavation.



20.06.18 – Cache of broken fragments of ACM cement sheeting discovered within contamination hotspot.



20.06.18 – Soils excavated from area above ACM sheeting dampened down using pooled water.



20.06.18 – Removal of hydrocarbon impacted soils to quarantine area within wider NSA area.



20.06.18 – Pooled water used to dampen down discovered ACM cement sheeting to reduce potential for fibre dispersal. 18.



20.06.18 – View of eastern extent of excavation following removal of hydrocarbon contaminated soils.



22.06.18 – Black floating product observed on pooled water within excavation.











APPENDIX B

Laboratory Analysis Reports



Smith Grant LLP Station House

Station Road

Ruabon Wrexham LL14 6DL

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point Zone 3 Deeside Industrial Park Deeside CH5 2UA

Tel: +44 (0) 1244 833780 Fax: +44 (0) 1244 833781





Attention :	Scott Miller
Date :	14th June, 2018
Your reference :	R1742B
Our reference :	Test Report 18/8828 Batch 1
Location :	Heyford Dorchester
Date samples received :	7th June, 2018
Status :	Final report
Issue :	1

Two samples were received for analysis on 7th June, 2018 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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



Phil Sommerton BSc Project Manager

Client Name: Reference: Location: Contact: Smith Grant LLP R1742B Heyford Dorchester Scott Miller

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

JE JOD NO.:	18/8828							_				
J E Sample No.	1-2	3-4										
Sample ID	TP1-S1- PRODUCT	TP2-S1										
Denth		0.00.4.00						Please see attached notes for al				
Deptil		0.00-1.00										
COC No / misc												
Containers	V J	٧J										
Sample Date	07/06/2018	07/06/2018										
Sample Type	Product	Clayey Sand										
Batch Number	1	1										
								LOD/LOR	Units	Method No.		
Date of Receipt	07/06/2018	07/06/2018	 									
PAH MS												
Naphthalene	<0.40 _{AA}	-						<0.04	mg/kg	TM4/PM6		
Acenaphthana	3.87 AA	-						<0.03	mg/kg			
Eluoropo	4.88AA	-						<0.05	mg/kg			
Phononthrono	13.00AA	-						<0.04	mg/kg			
Anthracene	7.50.	-						<0.03	mg/kg	TM4/PIVIO		
Fluoranthene	16.17.							<0.04	mg/kg	TM4/PM6		
Pyrene	42 92	_						<0.03	ma/ka	TM4/PM6		
Benzo(a)anthracene	10.51							<0.05	mg/kg	TM4/PM6		
Chrysene	8.07.44	-						<0.00	ma/ka	TM4/PM6		
Benzo(bk)fluoranthene	9.04	-						<0.02	ma/ka	TM4/PM6		
Benzo(a)pyrene	7.32	-						<0.04	ma/ka	TM4/PM6		
Indeno(123cd)pyrene	3.78	-						< 0.04	ma/ka	TM4/PM6		
Dibenzo(ah)anthracene	1.12	-						<0.04	mg/kg	TM4/PM6		
Benzo(ghi)perylene	15.45 _{AA}	-						<0.04	mg/kg	TM4/PM6		
PAH 16 Total	175.6 _{AA}	-						<0.6	mg/kg	TM4/PM6		
Benzo(b)fluoranthene	6.51 _{AA}	-						<0.05	mg/kg	TM4/PM6		
Benzo(k)fluoranthene	2.53 _{AA}	-						<0.02	mg/kg	TM4/PM6		
TPH CWG												
Aliphatics												
>C5-C6 #M	-	0.2 ^{SV}						<0.1	mg/kg	TM36/PM12		
>C6-C8 ^{#M}	-	3.4 ^{SV}						<0.1	mg/kg	TM36/PM12		
>C8-C10	-	17.7 ^{SV}						<0.1	mg/kg	TM36/PM12		
>C10-C12 ^{#M}	-	953.5						<0.2	mg/kg	TM5/PM8/PM16		
>C12-C16 ^{#M}	-	923						<4	mg/kg	TM5/PM8/PM16		
>C16-C21 #M	-	637						<7	mg/kg	TM5/PM8/PM16		
>C21-C35 #M	-	17557						<7	mg/kg	TM5/PM8/PM16		
Total aliphatics C5-35	-	20092						<19	mg/kg	TM5/TM38/PM8/PM12/PM16		
Aromatics		ev/										
>C5-EC7 *	-	<0.1 sv						<0.1	mg/kg	TM36/PM12		
>EC7-EC8"	-	<0.1 sv						<0.1	mg/kg	TM36/PM12		
>EC8-EC10""	-	0.4						<0.1	mg/kg			
>EC10-EC12"	-	262.9						<0.2	mg/kg	TM5/PM8/PM16		
>EC16 EC21#	-	610						<4	mg/kg	TM5/PM8/PM16		
>EC10-EC21		6020						<7	mg/kg	TM5/PM8/PM16		
Total aromatics C5-35 #	_	7278						<19	ma/ka	TM5/TM38/PM8/PM12/PM16		
Total aliphatics and aromatics(C5-35)	-	27370						<38	ma/ka	TM5/TM38/PM8/PM12/PM16		
		2.010										
MTBE [#]	-	<5 ^{SV}						<5	uq/ka	TM31/PM12		
Benzene [#]	-	<5 ^{sv}						<5	ug/kg	TM31/PM12		
Toluene [#]	-	<5 ^{SV}						<5	ug/kg	TM31/PM12		

Client Name: Reference: Location: Contact: JE Job No.: Smith Grant LLP R1742B Heyford Dorchester Scott Miller 18/8828

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-2	3-4									
Sample ID	TP1-S1- PRODUCT	TP2-S1									
Depth	1	0.80-1.60					Please se	e attached n	otes for all		
COC No / misc							abbreviations and acronyms				
Containers	٧J	٧J									
Sample Date	07/06/2018	07/06/2018									
Sample Type	Product	Clavey Sand									
Botoh Numbor	Tioddoct										
Batch Number	1	1					LOD/LOR	Units	Method No.		
Date of Receipt	07/06/2018	07/06/2018 SV			 	 			The ((D) (()		
Ethylbenzene"	-	117°°					<5	ug/kg	TM31/PM12		
m/p-xylene	-	239 . 					<0	ug/kg	TM31/PM12		
0-Xylene	_	<0					25	ug/kg	11001/11012		
SEM	443369	-					<110	mg/kg	TM7/PM6		
Saturates (Aliphatics)	27.02	-					<0.01	%	TM13/PM6		
Aromatics	29.29	-					<0.01	%	TM13/PM6		
Resins (Heterocyclics)	23.30	-					<0.01	%	TM13/PM6		
Asphaltenes	20.39	-					<0.01	%	TM13/PM6		
Natural Moisture Content	10.9	22.1					<0.1	%	PM4/PM0		
Triternanes 191m/z	Present	_						None	TM16/PM6		
Triaromatic Steranes 231m/z	Present	-						None	TM16/PM6		
Coal Tar	<0.1	-					<0.1	%	TM16/PM6		
Sample Type	-	Clayey Sand						None	PM13/PM0		
Sample Colour	-	Dark Brown						None	PM13/PM0		
Other Items	-	stones						None	PM13/PM0		

Client Name:	Smith Grant LLP
Reference:	R1742B
Location:	Heyford Dorchester
Contact:	Scott Miller
JE Job No.:	18/8828

Report : Product

 $\label{eq:Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle H=H_2SO_4, Z=ZnAc, N=NaOH, HN=HN0_3$

J E Sample No.	1-2								
Sample ID	TP1-S1- PRODUCT								
Depth							Please se	e attached no	otes for all
COC No / misc							abbreviations and acronyms		
Containers	٧J								
Sample Date	07/06/2018								
Sample Type	Product								
Batch Number	1								Method
Date of Receipt	07/06/2018						LOD/LOR	Units	No.
Whole Oil Trace	See Attached							None	TM1/PM0
									l

Client Name: Reference: Location: Contact:	Smith Gran R1742B Heyford D Scott Mille	nt LLP orchester r			SVOC Re	port :	Product						
JE Job No.:	18/8828	-											
I E Comula Na	1.2							I					
J E Sample NO.	1-2												
Sample ID	TP1-S1- PRODUCT												
Depth								Please se	e attached n	otes for all			
COC No / misc								abbrevia	ations and a	cronyms			
Containers	V J												
Sample Date	07/06/2018												
Sample Type	Product												
Date of Receipt	1							LOD/LOR	Units	Method No.			
SVOC MS	01/00/2010												
Phenols													
2-Chlorophenol	<0.01							<0.01	%	TM16/PM0			
2-Methylphenol	<0.01							<0.01	%	TM16/PM0			
2-Nitrophenol	<0.01							<0.01	%	TM16/PM0			
2,4-Dichlorophenol	<0.01							<0.01	%	TM16/PM0			
2,4-Dimethylphenol	<0.01							<0.01	%	TM16/PM0			
2,4,5-Trichlorophenol	<0.01		 					<0.01	%	TM16/PM0			
2,4,6-Trichlorophenol	<0.01							<0.01	%	TM16/PM0			
4-Chloro-3-methylphenol	<0.01		 					<0.01	%	TM16/PM0			
4-ivietnyipnenol	<0.01							<0.01	%	TM40/PM0			
4-ivitrophenol	<0.01							<0.01	%	TM16/PM0			
Phenol	<0.01							<0.01	70 9/2	TM16/PM0			
PAHs	-0.01							-0.01	70				
2-Chloronaphthalene	<0.01							<0.01	%	TM16/PM0			
2-Methylnaphthalene	<0.01							<0.01	%	TM16/PM0			
Naphthalene	<0.01							<0.01	%	TM16/PM0			
Acenaphthylene	<0.01							<0.01	%	TM16/PM0			
Acenaphthene	<0.01							<0.01	%	TM16/PM0			
Fluorene	<0.01							<0.01	%	TM16/PM0			
Phenanthrene	0.01							<0.01	%	TM16/PM0			
Anthracene	<0.01							<0.01	%	TM16/PM0			
Fluoranthene	0.02							<0.01	%	TM16/PM0			
Pyrene	0.02							<0.01	%	TM16/PM0			
Benzo(a)anthracene	<0.01							<0.01	%	TM16/PM0			
Chrysene Bonzo(bk)fluoranthono	<0.01							<0.01	%	TM16/PM0			
Benzo(a)pyrene	0.01							<0.01	70 0/_	TM16/PM0			
Indeno(123cd)pyrene	0.07							<0.01	%	TM16/PM0			
Dibenzo(ah)anthracene	0.07							<0.01	%	TM16/PM0			
Benzo(ghi)perylene	0.01							<0.01	%	TM16/PM0			
Phthalates													
Bis(2-ethylhexyl) phthalate	<0.01							<0.01	%	TM16/PM0			
Butylbenzyl phthalate	<0.01							<0.01	%	TM16/PM0			
Di-n-butyl phthalate	0.02							<0.01	%	TM16/PM0			
Di-n-Octyl phthalate	<0.01							<0.01	%	TM16/PM0			
Diethyl phthalate	<0.01							<0.01	%	TM16/PM0			
Dimethyl phthalate	<0.01							<0.01	%	1M16/PM0			
										-			
										İ			
										-			
										1			
										i			
										l I			
Client Name: Reference: Location:	Smith Gra R1742B Heyford D	nt LLP orchester					SVOC Re	port :	Product				
-----------------------------------------	----------------------------------	---------------------	---	---	---	---	---------	--------	---------	---	-----------	---------------	----------------------
JE Job No ·	SCOTT MILLE	1											
I E Comula Ma	10,0020										l .		
J E Sample No.	1-2												
Sample ID	TP1-S1- PRODUCT												
Depth											Please se	e attached n	otes for all
COC No / misc											abbrevi	ations and ad	cronyms
Containers	V J												
Sample Date Sample Type	07/06/2018 Product												
Batch Number	1											Linite	Method
Date of Receipt	07/06/2018										LOD/LOR	Units	No.
SVOC MS													
1 2-Dichlorobenzene	<0.01										<0.01	%	TM16/PM0
1,2,4-Trichlorobenzene	<0.01										<0.01	%	TM16/PM0
1,3-Dichlorobenzene	<0.01										<0.01	%	TM16/PM0
1,4-Dichlorobenzene	<0.01										<0.01	%	TM16/PM0
2-Nitroaniline	<0.01										<0.01	%	TM16/PM0
2,4-Dinitrotoluene	<0.01										<0.01	%	TM16/PM0
3-Nitroaniline	<0.01										<0.01	%	TM16/PM0
4-Bromophenylphenylether	<0.01										<0.01	%	TM16/PM0
4-Chloroaniline	<0.01										<0.01	%	TM16/PM0
4-Chlorophenylphenylether	<0.01										<0.01	%	TM16/PM0
4-Nitroaniline	<0.01										<0.01	%	TM16/PM0
Bis(2-chloroethoxy)methane	<0.01										<0.01	%	TM16/PM0
Bis(2-chloroethyl)ether	<0.01										<0.01	%	TM16/PM0
Carbazole	<0.01										<0.01	%	TM16/PM0
Dibenzofuran	<0.01										<0.01	%	TM16/PM0
Hexachlorobenzene	<0.01										<0.01	%	TM16/PM0
Hexachlorocyclopentadiene	<0.01										<0.01	%	TM16/PM0 TM16/PM0
Hexachloroethane	<0.01										<0.01	%	TM16/PM0
Isophorone	<0.01										<0.01	%	TM16/PM0
N-nitrosodi-n-propylamine	<0.01										<0.01	%	TM16/PM0
Nitrobenzene	<0.01										<0.01	%	TM16/PM0
													İ
									l				
													İ
			1	1	1	1	1	1		1			1

Client Name: Reference: Location: Contact:	Smith Grant LLP R1742B Heyford Dorchester Scott Miller			VOC Rep	ort :	Product			
JE Job No.:	18/8828								
J E Sample No.	1-2								
Sample ID	TP1-S1- PRODUCT								
Depth							Please se	e attached r	notes for all
COC No / misc							abbrevia	ations and a	cronyms
Containers	V J								
Sample Date	07/06/2018 Product								
Batch Number	1								Method
Date of Receipt	07/06/2018						LOD/LOR	Units	No.
VOC MS									
Dichlorodifluoromethane	<0.01						<0.01	%	TM124/PM0
Methyl Tertiary Butyl Ether	<0.05						< 0.05	%	TM124/PM0
Uniorometnane	<0.01						<0.01	%	TM124/PM0
Bromomethane	<0.01						<0.01	%	TM124/PM0
Chloroethane	<0.01						<0.01	%	TM124/PM0
Trichlorofluoromethane	<0.01						<0.01	%	TM124/PM0
1,1-Dichloroethene (1,1 DCE)	<0.01						<0.01	%	TM124/PM0
Dichloromethane (DCM)	<0.01						<0.01	%	TM124/PM0
trans-1-2-Dichloroethene	<0.01						<0.01	%	TM124/PM0
1,1-Dichloroethane	<0.01						<0.01	%	TM124/PM0
2 2-Dichloropropane	<0.01						<0.01	70 %	TM124/PM0
Bromochloromethane	<0.01						<0.01	%	TM124/PM0
Chloroform	<0.01						<0.01	%	TM124/PM0
1,1,1-Trichloroethane	<0.01						<0.01	%	TM124/PM0
1,1-Dichloropropene	<0.01						<0.01	%	TM124/PM0
Carbon tetrachloride	<0.01						<0.01	%	TM124/PM0
1,2-Dichloroethane	<0.01						<0.01	%	TM124/PM0
Trichloroethene (TCE)	<0.01						<0.01	70 %	TM124/PM0
1,2-Dichloropropane	<0.01						<0.01	%	TM124/PM0
Dibromomethane	<0.01						<0.01	%	TM124/PM0
Bromodichloromethane	<0.01						<0.01	%	TM124/PM0
cis-1-3-Dichloropropene	<0.01						<0.01	%	TM124/PM0
Toluene	<0.01						<0.01	%	TM124/PM0
trans-1-3-Dichloropropene	<0.01						<0.01	%	TM124/PM0
Tetrachloroethene (PCE)	<0.01						<0.01	70 %	TM124/PM0
1.3-Dichloropropane	<0.01						<0.01	%	TM124/PM0
Dibromochloromethane	<0.01						<0.01	%	TM124/PM0
1,2-Dibromoethane	<0.01						<0.01	%	TM124/PM0
Chlorobenzene	<0.01						<0.01	%	TM124/PM0
1,1,1,2-Tetrachloroethane	<0.01						<0.01	%	TM124/PM0
Ethylbenzene	<0.01						< 0.01	%	TM124/PM0
p/m-xylene	<0.01						<0.01	%	TM124/PM0
Styrene	<0.01						<0.01	%	TM124/PM0
Bromoform	<0.01						<0.01	%	TM124/PM0
Isopropylbenzene	<0.01						<0.01	%	TM124/PM0
1,1,2,2-Tetrachloroethane	<0.01						<0.01	%	TM124/PM0
Bromobenzene	<0.01						<0.01	%	TM124/PM0
1,2,3-Trichloropropane	<0.01						<0.01	%	TM124/PM0
Propylbenzene	<0.01						<0.01	%	TM124/PM0
2-Chlorotoluene	<0.01						<0.01	%	TM124/PM0
4-Chlorotoluene	<0.01						<0.01	%	TM124/PM0
tert-Butylbenzene	<0.01						<0.01	%	TM124/PM0
1,2,4-Trimethylbenzene	0.02						<0.01	%	TM124/PM0
sec-Butylbenzene	<0.01						<0.01	%	TM124/PM0
4-Isopropyltoluene	<0.01						<0.01	%	TM124/PM0
1,3-Dichlorobenzene	<0.01						<0.01	%	TM124/PM0
1,4-DICNIOROBENZENE	<0.01						<0.01	%	TM124/PM0
1.2-Dichlorobenzene	<0.01						<0.01	70 %	TM124/PM0
1,2-Dibromo-3-chloropropane	<0.01						<0.01	%	TM124/PM0
1,2,4-Trichlorobenzene	<0.01						<0.01	%	TM124/PM0
Hexachlorobutadiene	<0.01						<0.01	%	TM124/PM0
Naphthalene	<0.01						<0.01	%	TM124/PM0
1,2,3-Trichlorobenzene	<0.01						<0.01	%	TM124/PM0
									1

Whole Oil

Exova Jones Environmental

Client Name:	Smith Grant LLP
Reference:	R1742B
Location:	Heyford Dorchester
Contact:	Scott Miller
Description:	Black Viscous Tar
Carbon Range:	5-40+
Boiling Point Range (°C):	36-525+
Pristane/Phytane Ratio:	N/A
nC ₁₇ /Pristane Ratio:	N/A
Age of Diesel (+/- 2 years)*:	N/A
Interpretation:	Possible Bitumen

JE Job No.: 18/8828 JE Sample No.: 1 Sample Identity: TP1-S1-PRODUCT Depth:

Chromatogram:



*The age of release estimated in this report is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996). Age estimation should be treated with caution as it can be influenced by site specific factors that the laboratory are not aware of.

Client Name:	Smith Grant LLP
Reference:	R1742B
Location:	Heyford Dorchester
Contact:	Scott Miller

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason					
	No deviating sample report results for job 18/8828										

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/8828

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

ABBREVIATIONS and ACRONYMS USED

SA ISO17025 (SANAS Ref No.T0729) accredited - South Africa. B Indicates analyte found in associated method blank. DR Dilution required. M MCERTS accredited. NA Not applicable NAD No Asbestos Detected. ND None Detected (usually refers to VOC and/SVOC TICs). NDP No Detected (usually refers to VOC and/SVOC TICs). NDP No Detected (usually refers to VOC and/SVOC TICs). NDP No Detected (usually refers to VOC and/SVOC TICs). NDP No Detected (usually refers to VOC and/SVOC TICs). NDP No Detected (usually refers to VOC and/SVOC TICs). NDP No Detected (usually refers to VOC and/SVOC TICs). NDP No Detected (usually refers to VOC and/SVOC TICs). ND None Detected (usually refers to VOC and/SVOC TICs). ND Suppose the adjainst a single substance SV Surrogate recovery outside performance criteria. This may be due to a matrix effect. W Results expressed on as received basis. + AQC failure, accreditation nange, results should be considered as indicative only and are not accredited. +++ Result outside calibration range, results should be considered as indicative only and	#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
B Indicates analyte found in associated method blank. DR Dilution required. M MCERTS accredited. NA Not applicable NAD No Asbestos Detected. ND None Detected (usually refers to VOC and/SVOC TICs). NDP No Detected (usually refers to VOC and/SVOC TICs). NDP No Detected (usually refers to VOC and/SVOC TICs). NDP No Detected signation Possible SS Calibrated against a single substance SV Surrogate recovery outside performance criteria. This may be due to a matrix effect. W Results expressed on as received basis. + ACC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page. +++ Result outside calibration range, results should be considered as indicative only and are not accredited. * Analysis subcontracted to an Exova Jones Environmental approved laboratory. AD Samples are drived at 35°C ±5°C CO Suspected carry over LOD/LOR Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS ME Matrix Effect NFD No Fibres Detected BS AQC Sample	SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
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COSuspected carry overLOD/LORLimit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTSMEMatrix EffectNFDNo Fibres DetectedBSAQC SampleLBBlank SampleNClient SampleTBTrip Blank SampleOCOutside Calibration RangeAAx10 Dilution	AD	Samples are dried at 35°C ±5°C
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ME Matrix Effect NFD No Fibres Detected BS AQC Sample LB Blank Sample N Client Sample TB Trip Blank Sample OC Outside Calibration Range AA x10 Dilution	LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
NFD No Fibres Detected BS AQC Sample LB Blank Sample N Client Sample TB Trip Blank Sample OC Outside Calibration Range AA x10 Dilution	ME	Matrix Effect
BS AQC Sample LB Blank Sample N Client Sample TB Trip Blank Sample OC Outside Calibration Range AA x10 Dilution	NFD	No Fibres Detected
LB Blank Sample N Client Sample TB Trip Blank Sample OC Outside Calibration Range AA x10 Dilution	BS	AQC Sample
N Client Sample TB Trip Blank Sample OC Outside Calibration Range AA x10 Dilution	LB	Blank Sample
TB Trip Blank Sample OC Outside Calibration Range AA x10 Dilution	N	Client Sample
OC Outside Calibration Range AA x10 Dilution	ТВ	Trip Blank Sample
AA x10 Dilution	OC	Outside Calibration Range
	AA	x10 Dilution

Method Code Appendix

JE Job No: 18/8828

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM1	Modified USEPA 8015B method for the determination of carbon banding in oil and product samples by GC-FID.	PM0	No preparation is required.			AR	
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM6	Samples are extracted using Soxtec apparatus and solvent.			AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes	Yes	AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
TM7	Modified USEPA 3540 and 9071 for oily wastes. In house method for the gravimetric determination of a sample following solvent extraction.	PM6	Samples are extracted using Soxtec apparatus and solvent.			AR	Yes
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	
TM13	Determination of Saturates, Aromatics, Resins and Asphaltenes by Thin Layer Chromatography with Flame Ionisation Detection.	PM6	Samples are extracted using Soxtec apparatus and solvent.			AR	Yes

Method Code Appendix

JE Job No: 18/8828

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM0	No preparation is required.			AR	
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM6	Samples are extracted using Soxtec apparatus and solvent.			AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM6	Samples are extracted using Soxtec apparatus and solvent.			AR	
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes
TM124	Modified USEPA 8260. Semi- Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM0	No preparation is required.			AR	



Smith Grant LLP Station House

Station Road

Ruabon Wrexham LL14 6DL

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point Zone 3 Deeside Industrial Park Deeside CH5 2UA

Tel: +44 (0) 1244 833780 Fax: +44 (0) 1244 833781





Attention :	Scott Miller
Date :	25th June, 2018
Your reference :	R1742B
Our reference :	Test Report 18/9273 Batch 1
Location :	Upper Heyford (Dorchester)
Date samples received :	14th June, 2018
Status :	Final report
Issue :	1

Twelve samples were received for analysis on 14th June, 2018 of which nine were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Compiled By:



Bruce Leslie Project Co-ordinator

Client Name:
Reference:
Location:
Contact:
JE Job No.:

R1742B Upper Heyford (Dorchester) Scott Miller

18/9273

Smith Grant LLP

Report : Solid

J E Sample No.	1-2	3-4	5-6	7-8	9-10	11-12	19-20	21-22	23-24			
Sample ID	PH5-HS-SS1	PH5-HS-SS2	PH5-HS-SS3	PH5-HS-SS4	PH5-HS-SS5	PH5-HS-SS6	PH5-HS-S1	PH5-HS-S2	PH5-HS-S3			
Depth	2.00-2.60	2.00-2.60	2.00-2.60	2.00-2.60	2.00-2.60	2.00-2.60				Please se	e attached n	otes for all
COC No / misc										abbrevi	ations and a	cronyms
Containers	٧J	٧J	٧J	٧J	٧J	٧J	٧J	٧J	٧J			
Sample Date	12/06/2019	12/06/2018	12/06/2018	12/06/2019	12/06/2019	12/06/2018	14/06/2018	14/06/2018	14/06/2018			
Sample Date	13/00/2018	13/00/2018	13/00/2018	13/00/2018	13/00/2018	13/00/2018	14/00/2018	14/00/2018	14/00/2018			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Sand	Clay	Clayey Sand			
Batch Number	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method
Date of Receipt	14/06/2018	14/06/2018	14/06/2018	14/06/2018	14/06/2018	14/06/2018	14/06/2018	14/06/2018	14/06/2018			No.
TPH CWG												
Aliphatics												
>C5-C6 #M	0.5	<0.1	<0.1	<0.1	6.5	0.4	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 ^{#M}	1.6	0.2	0.6	2.6	34.5	1.6	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10	3.1	0.7	5.2	29.7	23.5	2.6	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 ***	88.8	<0.2	315.9	216.2	110.7	114.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 ""	164	<4	326	266	53	122	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 ***	384	</th <th>34</th> <th>721</th> <th>1220</th> <th>34</th> <th>17</th> <th><7</th> <th><1</th> <th><7</th> <th>mg/kg</th> <th>TM5/PM8/PM16</th>	34	721	1220	34	17	<7	<1	<7	mg/kg	TM5/PM8/PM16
>021-035	7240	134	921	1289	1499	673	120	65	62	<19	ma/ka	TM5/TM38/PM8/PM12/PM16
Aromatics	1030	104	321	1203	1455	015	157	00	02	<15	ilig/kg	
>C5-EC7#	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8 [#]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 ^{#M}	<0.1	<0.1	<0.1	<0.1	2.4	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 [#]	46.2	<0.2	48.5	29.9	136.6	27.6	0.6	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 [#]	126	<4	79	48	59	32	13	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	361	<7	27	42	89	26	81	37	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 [#]	3358	92	152	313	630	188	469	174	103	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	ME	92	307	433	917	274	564	211	103	<19	mg/kg	TM5/TM38/PM8/PM12/PM18
Total aliphatics and aromatics(C5-35)	ME	226	1228	1722	2416	947	701	276	165	<38	mg/kg	TM5/TM38/PM8/PM12/PM16
	_	-	-	-	-	-	-	-	-	-		TH: (D) ((D)
MTBE"	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
Benzene	<0	<5	<5	<0	<0	<5	<5	<5	<0	<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5	<5	<5	728	24	<5	<5	<5	<5	ug/kg	TM31/PM12
m/p-Xvlene #	29	<5	36	<5	1622	49	<5	<5	<5	<5	ug/kg	TM31/PM12
o-Xylene [#]	<5	<5	<5	<5	66	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
Natural Moisture Content	29.8	24.1	23.2	22.2	27.2	22.1	6.5	11.3	9.2	<0.1	%	PM4/PM0
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Sand	Clay	Clayey Sand		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones	sand, stone	vegetation, stones	roots, stones, slate	stones, carbon, roots	sand, stones	stones, carbon	sand, stones, carbon	stones, roots		None	PM13/PM0

Client Name:	Smith Grant LLP
Reference:	R1742B
Location:	Upper Heyford (Dorchester)
Contact:	Scott Miller

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
			•		No deviating sample report results for job 18/9273	

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/9273

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

ABBREVIATIONS and ACRONYMS USED

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

Method Code Appendix

JE Job No: 18/9273

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes	Yes	AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	
TM31	Modified USEPA 8015B. Determination of Methyltenbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes



Smith Grant LLP Station House

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Ruabon Wrexham LL14 6DL

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point Zone 3 Deeside Industrial Park Deeside CH5 2UA

Tel: +44 (0) 1244 833780 Fax: +44 (0) 1244 833781



Attention : Scott Miller	
Date : 26th June, 2018	
Your reference : R17426	
Our reference : Test Report 18/9818 Batc	h 1
Location : Heycord (Dorchester)	
Date samples received : 22nd June, 2018	
Status : Final report	
Issue : 1	

Two samples were received for analysis on 22nd June, 2018 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Compiled By:

Phil Sommerton BSc Project Manager

Exova Jones Environmental Smith Grant LLP Client Name: Report : Solid R17426 Reference: Heycord (Dorchester) Location: Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub Contact: Scott Miller JE Job No.: 18/9818 J E Sample No. 1-2 Sample ID PH5-H5-S4 Depth Please see attached notes for all abbreviations and acronyms COC No / misc Containers V.I

Sample Date	22/06/2018							
Sample Type	Soil							
Batch Number	1							Method
Date of Receipt	22/06/2018					LOD/LOR	Units	No.
Natural Moisture Content	36.7					<0.1	%	PM4/PM0
Sample Type	NDP						None	PM13/PM0
Sample Colour	NDP						None	PM13/PM0
Other Items	NDP						None	PM13/PM0

Client Name:	Smith Grant LLP
Reference:	R17426
Location:	Heycord (Dorchester)
Contact:	Scott Miller

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/9818	1	PH5-H5-S4		2	26/06/2018	General Description (Bulk Analysis)	Soil/Stones
					26/06/2018	Asbestos Fibres	Fibre Bundles
					26/06/2018	Asbestos Fibres (2)	NAD
					26/06/2018	Asbestos ACM	NAD
					26/06/2018	Asbestos ACM (2)	NAD
					26/06/2018	Asbestos Type	NAD
					26/06/2018	Asbestos Type (2)	NAD
					26/06/2018	Asbestos Level Screen	NAD
18/9818	1	PH5-ASB-S1		3	26/06/2018	General Description (Bulk Analysis)	Asbestos cement
					26/06/2018	Asbestos Fibres	Fibre Bundles
					26/06/2018	Asbestos ACM	Asbestos Cement
					26/06/2018	Asbestos Type	Chrysotile
					26/06/2018	Asbestos Level Screen	Asbestos level cannot be determined from Screen. Quantification required.

Client Name:	Smith Grant LLP
Reference:	R17426
Location:	Heycord (Dorchester)
Contact:	Scott Miller

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	NDP Reason
18/9818	1	PH5-H5-S4		1-2	Asbestos detected in sample

NDP Reason Report

Matrix : Solid

Client Name:	Smith Grant LLP
Reference:	R17426
Location:	Heycord (Dorchester)
Contact:	Scott Miller

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
					No deviating sample report results for job 18/9818	

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/9818

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

ABBREVIATIONS and ACRONYMS USED

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

Method Code Appendix

JE Job No: 18/9818

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	



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Attention :	Scott Miller
Date :	10th July, 2018
Your reference :	R1742B
Our reference :	Test Report 18/10066 Batch 1
Location :	Heyford
Date samples received :	27th June, 2018
Status :	Final report
Issue :	1

Ten samples were received for analysis on 27th June, 2018 of which ten were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Compiled By:



Bruce Leslie Project Co-ordinator

Client Name: Reference: Location: Contact: JE Job No.:

Smith Grant LLP R1742B Heyford Scott Miller 18/10066

Report : Solid

J E Sample No.	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	19-20	1		
Sample ID	Ph5-HS-SS7	Ph5-HS-SS8	Ph5-HS-SS9	Ph5-HS-SS10	Ph5-HS-SS11	Ph5-HS-SS12	Ph5-HS-SS13	Ph5-HS-SS14	Ph5-HS-SS15	Ph5-HS-S5			
Depth	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50		Disease	- 11 - altra d. a.	to the ell
COC No / misc											abbrevi	e attached he ations and ac	otes for all pronyms
Containers	V I	V I	V I	V I	N I	N I	N I	V I	V I	V I	1		
Containera	VJ	VJ	VJ	VJ	V J	V J	VJ	VJ	VJ	VJ	1		
Sample Date	27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018			
Sample Type	Clayey Sand	Clayey Sand	Clayey Sand	Clayey Sand	Clayey Sand	Clayey Sand	Clayey Sand	Clayey Sand	Clay	Clay	L		•
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method
Date of Receipt	27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018			No.
TPH CWG													
Aliphatics													
>C5-C6 ***	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	ma/ka	TM36/PM12
>C10-C12 ^{#M}	<0.2	<0.2	<0.2	60.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #M	<4	<4	<4	80	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	<7	<7	<7	43	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	<7	60	<7	663	<7	<7	<7	171	<7	24	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	60	<19	846	<19	<19	<19	171	<19	24	<19	mg/kg	TM5/TM38/PM8/PM12/PM16
Aromatics	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	ma/ka	TM26/DM12
>C5-EC7" >EC7-EC8#	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 ^{#M}	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12#	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35#	<7	<7	<7	150	<7	<7	<7	<7	<7	66	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 [#]	<19	<19	<19	150	<19	<19	<19	<19	<19	66	<19	mg/kg	TM5/TM38/PM8/PM12/PM16
Total aliphatics and aromatics(U5-35)	<38	60	<38	996	<38	<38	<38	1/1	<38	90	<38	mg/kg	TM5/TM38/PM8/PM12/PM18
MTBE [#]	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
Benzene "	<5 <5	<5 <5	ug/kg	TM31/PM12									
Ethvlbenzene #	<5	<5	~~ <5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
o-Xylene [#]	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
Natural Moisture Content	18.3	13.5	16.2	17.2	16.1	16.9	17.4	21.8	16.3	13.7	<0.1	%	PM4/PM0
Sample Type	Clayey Sand	Clayey Sand	Clayey Sand	Clayey Sand	Clayey Sand	Clayey Sand	Clayey Sand	Clayey Sand	Clay	Clay		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones	sand, stones	stones, clinker,		None	PM13/PM0							
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Client Name:Smith Grant LLPReference:R1742BLocation:HeyfordContact:Scott Miller

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
18/10066	1	Ph5-HS-SS7	2.50	1-2	GRO	Solid Samples were received at a temperature above 9°C.
18/10066	1	Ph5-HS-SS8	2.50	3-4	GRO	Solid Samples were received at a temperature above 9°C.
18/10066	1	Ph5-HS-SS9	2.50	5-6	GRO	Solid Samples were received at a temperature above 9°C.
18/10066	1	Ph5-HS-SS10	2.50	7-8	GRO	Solid Samples were received at a temperature above 9°C.
18/10066	1	Ph5-HS-SS11	2.50	9-10	GRO	Solid Samples were received at a temperature above 9°C.
18/10066	1	Ph5-HS-SS12	2.50	11-12	GRO	Solid Samples were received at a temperature above 9°C.
18/10066	1	Ph5-HS-SS13	2.50	13-14	GRO	Solid Samples were received at a temperature above 9°C.
18/10066	1	Ph5-HS-SS14	2.50	15-16	GRO	Solid Samples were received at a temperature above 9°C.
18/10066	1	Ph5-HS-SS15	2.50	17-18	GRO	Solid Samples were received at a temperature above 9°C.
18/10066	1	Ph5-HS-S5		19-20	GRO	Solid Samples were received at a temperature above 9°C.

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

Matrix : Solid

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/10066

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

ABBREVIATIONS and ACRONYMS USED

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

Method Code Appendix

JE Job No: 18/10066

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes	Yes	AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes



Smith Grant LLP Station House

Station Road

Ruabon Wrexham LL14 6DL

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point Zone 3 Deeside Industrial Park Deeside CH5 2UA

Tel: +44 (0) 1244 833780 Fax: +44 (0) 1244 833781





Attention :	Ben Thomas
Date :	12th July, 2018
Your reference :	R1742B
Our reference :	Test Report 18/10241 Batch 1
Location :	Heyford
Date samples received :	29th June, 2018
Status :	Final report
Issue :	1

Twenty nine samples were received for analysis on 29th June, 2018 of which twenty nine were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Compiled By:



Phil Sommerton BSc Project Manager

Client Name: Reference: Location: Contact: JE Job No.:

Smith Grant LLP R1742B Heyford Ben Thomas 18/10241

Report : Solid

J E Sample No.	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	19-20	ĺ		
Sample ID	PH5-HS-S6	PH5-HS-S7	PH5-HS-S8	PH5-HS-S9	PH5-HS-S10	PH5-HS-S11	PH5-HS-S12	PH5-HS-S13	PH5-HS-S14	PH5-HS-S15			
Depth											Please se	e attached n	otes for all
COC No / misc											abbrevi	ations and ac	cronyms
Containers	V I	V I	V I	V I	V I	V I	VI	VI	V I	V I	1		
Containers	VJ	v J	v 5	V J	V J	V J	v 5	v 5	v 5	VJ	1		
Sample Date	28/06/2018	28/06/2018	28/06/2018	28/06/2018	28/06/2018	28/06/2018	28/06/2018	28/06/2018	28/06/2018	29/06/2018	1		
Sample Type	Clay	Clay	Clay	Clay	Clayey Sand	Clay	Clayey Sand	Clay	Clay	Clay			-
Batch Number	1	1	1	1	1	1	1	1	1	1		Unite	Method
Date of Receipt	29/06/2018	29/06/2018	29/06/2018	29/06/2018	29/06/2018	29/06/2018	29/06/2018	29/06/2018	29/06/2018	29/06/2018	LODIEON	Office	No.
TPH CWG													
Aliphatics													
>C5-C6 #M	<0.1 ^{SV}	<0.1	<0.1	<0.1	<0.1 ^{SV}	<0.1	<0.1 ^{SV}	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 #M	<0.1 ^{SV}	<0.1	<0.1	<0.1	<0.1 ^{5v}	0.6	0.2 ^{SV}	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	<0.1	<0.1	0.9	0.2	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 ""	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM10
>C12-C16	<4 -7	<4	<4	<4 ~7	<4 ~7	<4 ~7	<4	<4 ~7	<4	<4 -7	<4	mg/kg	TM5/PM8/PM16
>016-021	<7	61	<7	<7	9	<7	52	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	61	<19	<19	<19	<19	52	<19	<19	<19	<19	mg/kg	TM5/TM38/PM8/PM12/PM16
Aromatics		-					-					5.5	
>C5-EC7#	<0.1 ^{SV}	<0.1	<0.1	<0.1	<0.1 ^{sv}	<0.1	<0.1 ^{SV}	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8#	<0.1 ^{SV}	<0.1	<0.1	<0.1	<0.1 ^{SV}	<0.1	<0.1 ^{SV}	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 ^{#M}	<0.1 ^{SV}	<0.1	<0.1	<0.1	<0.1 ^{SV}	<0.1	<0.1 ^{SV}	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 [#]	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 [#]	<4	7	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	31	<7	<7	56	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35*	37	135	<7	<7	154	<7	37	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35"	37	173	<19	<19	210	<19	37	<19	<19	<19	<19	mg/kg	TM5/TM38/PM8/PM12/PM16
I otal aliphatics and aromalics (00-00)	<38 SV	234	<30	<30	210 SV	<30	89 SV	<38	<30	<38	<38	mg/kg	TMS/TM384*M8/Fail.20194-10
MTBE *	<5°°	<5	<5	<5	<5°°	<5	<5°°	<5	<5	<5	<5	ug/kg	TM31/PM12
Benzene "	<5 sv	<5	<5 ~5	<5	<5 sv	<5	<5 sv	<5 ~5	<5 ~5	<5	<5	ug/kg	TM31/PM12
Fthylbenzene [#]	<ə _5 SV	<5	<5	<5	<ə \$V	12	<> _5	<5	<5	<5	<5	ua/ka	TM31/PM12
m/p-Xvlene #	<5 <5 ^{SV}	<5	<5	<5	<5 <5 ^{SV}	12	<5 <5 ^{sv}	<5	<5	<5	<5	ug/kg	TM31/PM12
o-Xylene [#]	<5 ^{sv}	<5	<5	<5	<5 ^{SV}	<5	<5 ^{sv}	<5	<5	<5	<5	ug/kg	TM31/PM12
Natural Moisture Content	20.7	19.3	23.5	21.4	18.1	22.9	53.1	29.0	20.7	24.9	<0.1	%	PM4/PM0
Sample Type	Clay	Clay	Clay	Clay	Clayey Sand	Clay	Clayey Sand	Clay	Clay	Clay		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Dark Brown	Medium Brown	Dark Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, carbon	carbon, stones	stones, carbon, clincker	stones, roots	stones, carbon	stones	stones	stones	stones	stones		None	PM13/PM0

Smith Grant LLP

R1742B

Heyford

18/10241

Ben Thomas

Client Name: Reference: Location: Contact: JE Job No.:

Report : Solid

J E Sample No.	21-22	23-24	25-26	27-28	29-30	31-32	33-34	35-36	37-38	39-40			
Sample ID	PH5-HS-S16	PH5-HS-SS16	PH5-HS-SS17	PH5-HS-SS18	PH5-HS-SS19	PH5-HS-SS20	PH5-HS-SS21	PH5-HS-SS22	PH5-HS-SS23	PH5-HS-SS24			
Depth		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			
COC No / misc											Please se abbrevi	e attached ne ations and ac	otes for all cronyms
Containers	٧J	٧J	VJ	VJ	VJ	VJ	VJ	VJ	٧J	٧J			
Sample Date	29/06/2018	28/06/2018	28/06/2018	28/06/2018	28/06/2018	28/06/2018	28/06/2018	28/06/2018	28/06/2018	28/06/2018			
Sample Type	Clay	Clay	Clay	Clay	Clayey Sand	Clayey Sand	Clay	Clay	Clayey Sand	Clayey Sand			
Batch Number	1	1	1	1	1	1	1	1	1	1		Linita	Method
Date of Receipt	29/06/2018	29/06/2018	29/06/2018	29/06/2018	29/06/2018	29/06/2018	29/06/2018	29/06/2018	29/06/2018	29/06/2018	LOD/LOR	Units	No.
TPH CWG													
Aliphatics													
>C5-C6 #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 ^{#M}	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10	0.7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 #M	129.6	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 ***	193	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 ***	34	</th <th><!--</th--><th><7</th><th><!--</th--><th><!--</th--><th><!--</th--><th><!--</th--><th><!--</th--><th><!--</th--><th><!--</th--><th>mg/kg</th><th>TM5/PM8/PM16</th></th></th></th></th></th></th></th></th>	</th <th><7</th> <th><!--</th--><th><!--</th--><th><!--</th--><th><!--</th--><th><!--</th--><th><!--</th--><th><!--</th--><th>mg/kg</th><th>TM5/PM8/PM16</th></th></th></th></th></th></th></th>	<7	</th <th><!--</th--><th><!--</th--><th><!--</th--><th><!--</th--><th><!--</th--><th><!--</th--><th>mg/kg</th><th>TM5/PM8/PM16</th></th></th></th></th></th></th>	</th <th><!--</th--><th><!--</th--><th><!--</th--><th><!--</th--><th><!--</th--><th>mg/kg</th><th>TM5/PM8/PM16</th></th></th></th></th></th>	</th <th><!--</th--><th><!--</th--><th><!--</th--><th><!--</th--><th>mg/kg</th><th>TM5/PM8/PM16</th></th></th></th></th>	</th <th><!--</th--><th><!--</th--><th><!--</th--><th>mg/kg</th><th>TM5/PM8/PM16</th></th></th></th>	</th <th><!--</th--><th><!--</th--><th>mg/kg</th><th>TM5/PM8/PM16</th></th></th>	</th <th><!--</th--><th>mg/kg</th><th>TM5/PM8/PM16</th></th>	</th <th>mg/kg</th> <th>TM5/PM8/PM16</th>	mg/kg	TM5/PM8/PM16
>U21-U3D	676	<19	<19	<1	<10	<19	<19	<19	<19	<10	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics	0/0	<13	<15	<15	<15	<15	<15	<15	<15	<15	<15	iiig/kg	
>C5-EC7#	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8 [#]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 ^{#M}	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 [#]	15.7	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 [#]	39	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	16	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 [#]	143	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 [#]	214	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	mg/kg	TM5/TM38/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	890	<38	<38	<38	<38	<38	<38	<38	<38	<38	<38	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE [#]	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
Benzene [#]	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
Toluene"	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
Ethylbenzene	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
o-Xvlene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
												-33	
Natural Moisture Content	17.2	18.8	17.1	21.3	19.3	25.9	22.7	9.7	18.0	14.7	<0.1	%	PM4/PM0
Sample Type	Clav	Clav	Clav	Clav	Clayey Sand	Clayey Sand	Clav	Clav	Clayey Sand	Clayey Sand		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	brick fragment, stones, roots	chalk, stones	sand, stone	stones, carbon	STONES	stones, chalk	vegetation, stones, sand	sand, stones	stones	stones		None	PM13/PM0

Client Name: Reference: Location: Contact: JE Job No.:

Smith Grant LLP R1742B Heyford Ben Thomas 18/10241

Report : Solid

J E Sample No.	41-42	43-44	45-46	47-48	49-50	51-52	53-54	55-56	57-58			
Sample ID	PH5-HS-SS25	PH5-HS-SS26	PH5-HS-SS27	PH5-HS-SS28	PH5-HS-SS29	PH5-HS-SS30	PH5-HS-SS31	PH5-HS-SS32	PH5-HS-SS33			
Depth	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0	3.0	Ploase se	o attachad a	otos for all
COC No / misc										abbrevi	ations and a	cronyms
Containers	VJ	VJ	VJ	VJ	VJ	VJ	VJ	VJ	VJ			
Sample Date	28/06/2018	28/06/2018	28/06/2018	28/06/2018	28/06/2018	28/06/2018	29/06/2018	29/06/2018	29/06/2018			
Sample Type	Clayey Sand	Clayey Sand	Sand	Clayey Sand	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1			Method
Date of Receipt	29/06/2018	29/06/2018	29/06/2018	29/06/2018	29/06/2018	29/06/2018	29/06/2018	29/06/2018	29/06/2018	LOD/LOR	Units	No.
TPH CWG												
Aliphatics												
>C5-C6 #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 ^{sv}	<0.1 ^{sv}	<0.1	mg/kg	TM36/PM12
>C6-C8 #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.4	0.6 ^{sv}	0.3 ^{sv}	<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	6.4	6.5 ^{SV}	4.2 ^{SV}	<0.1	mg/kg	TM36/PM12
>C10-C12 #M	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	342.6	178.0	173.8	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #M	<4	<4	<4	<4	<4	<4	479	204	173	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	<7	<7	<7	<7	<7	<7	239	302	186	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	<7	<7	<7	<7	<7	<7	4612	6501	4650	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	<19	<19	<19	<19	<19	5679	7192	5187	<19	mg/kg	TM5/TM38/PM8/PM12/PM16
Aromatics												
>C5-EC7#	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 ^{SV}	<0.1 ^{SV}	<0.1	mg/kg	TM36/PM12
>EC7-EC8 [#]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 ^{SV}	<0.1 ^{SV}	<0.1	mg/kg	TM36/PM12
>EC8-EC10 ^{#M}	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12#	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	26.1	57.7	42.0	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 *	<4	<4	<4	<4	<4	<4	98	93	51	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 *	<7	<7	<7	<7	<7	<7	165	225	105	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35"	</th <th><!--</th--><th><!--</th--><th><!--</th--><th><!--</th--><th><!--</th--><th>1611</th><th>2151</th><th>1789</th><th><!--</th--><th>mg/kg</th><th>TM5/PM8/PM16</th></th></th></th></th></th></th>	</th <th><!--</th--><th><!--</th--><th><!--</th--><th><!--</th--><th>1611</th><th>2151</th><th>1789</th><th><!--</th--><th>mg/kg</th><th>TM5/PM8/PM16</th></th></th></th></th></th>	</th <th><!--</th--><th><!--</th--><th><!--</th--><th>1611</th><th>2151</th><th>1789</th><th><!--</th--><th>mg/kg</th><th>TM5/PM8/PM16</th></th></th></th></th>	</th <th><!--</th--><th><!--</th--><th>1611</th><th>2151</th><th>1789</th><th><!--</th--><th>mg/kg</th><th>TM5/PM8/PM16</th></th></th></th>	</th <th><!--</th--><th>1611</th><th>2151</th><th>1789</th><th><!--</th--><th>mg/kg</th><th>TM5/PM8/PM16</th></th></th>	</th <th>1611</th> <th>2151</th> <th>1789</th> <th><!--</th--><th>mg/kg</th><th>TM5/PM8/PM16</th></th>	1611	2151	1789	</th <th>mg/kg</th> <th>TM5/PM8/PM16</th>	mg/kg	TM5/PM8/PM16
Total alionatics and aromatics(C5-35)	<19	<19	<19	<19	<19	<19	7579	2527	7174	<19	mg/kg	TMS/TM36/PM6/PM12/PM16
	100	100	100	200		100	1010	0110	1114	100	ilig/itg	
MTBE#	<5	<5	<5	<5	<5	<5	<5	<5 ^{sv}	<5 ^{sv}	<5	ug/kg	TM31/PM12
Benzene [#]	<5	<5	<5	<5	<5	<5	<5	<5 ^{sv}	<5 ^{sv}	<5	ug/kg	TM31/PM12
Toluene [#]	<5	<5	<5	<5	<5	<5	<5	<5 ^{\$V}	<5 ^{SV}	<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5	<5	42 ^{sv}	38 ^{sv}	<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5	86 ^{sv}	45 ^{sv}	<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5 ^{\$V}	<5 ^{SV}	<5	ug/kg	TM31/PM12
Natural Moisture Content	20.5	16.3	17.7	14.7	23.0	26.9	22.4	22.2	14.4	<0.1	%	PM4/PM0
	Olavara Oarad	01	01	0	0	01	01	01	01-		Need	DM40/DM0
Sample Type	Clayey Sand	Clayey Sand	Sand	Clayey Sand	Clay Madium Braum	Clay Madium Braum	Clay	Clay	Clay		None	PM13/PM0
Other Items	stones	stones	stones	stones	carbon stones	chalk stones	stones	stones	stones sand		None	PM13/PM0
Other items	stones	Stories	Stories	Stories	carbon, stones	chaik, stones	Stories	Stories	3101103, 38110		NONE	FIVIT3/FIVIO

Client Name:	Smith Grant LLP
Reference:	R1742B
Location:	Heyford
Contact:	Ben Thomas

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
			•		No deviating sample report results for job 18/10241	

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/10241

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

ABBREVIATIONS and ACRONYMS USED

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

Method Code Appendix

JE Job No: 18/10241

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes	Yes	AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	
TM31	Modified USEPA 8015B. Determination of Methyltenbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes


Smith Grant LLP Station House

Station Road

Ruabon Wrexham LL14 6DL

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point Zone 3 Deeside Industrial Park Deeside CH5 2UA

Tel: +44 (0) 1244 833780 Fax: +44 (0) 1244 833781





Attention :	Scott Miller
Date :	16th July, 2018
Your reference :	R1742B
Our reference :	Test Report 18/10441 Batch 1
Location :	Heyford (Dorchester)
Date samples received :	3rd July, 2018
Status :	Final report
Issue :	1

Thirteen samples were received for analysis on 3rd July, 2018 of which thirteen were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Compiled By:



Bruce Leslie Project Co-ordinator

Client Name: Reference: Location: Contact: JE Job No.:

R1742B Heyford (Dorchester) Scott Miller 18/10441

Smith Grant LLP

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	19-20			
Sample ID	PH5-HS-SS34	PH5-HS-SS35	PH5-HS-SS36	PH5-HS-SS37	PH5-HS-SS38	PH5-HS-SS39	PH5-HS-SS40	PH5-HS-SS41	PH5-HS-SS42	PH5-HS-SS43			
Depth	1.5-2.5	2.5	1.5-2.5	2.5	1.2-2.5	1-2.5	1-2.5	1-2.5	1-2.5	1.5-2.5	Please see attached notes for a		otes for all
COC No / misc											abbreviations and acronyms		cronyms
Containers	V.I	V.I	V.I	V.I	V.I	V.I	V.I	V.I	V.I	V.I			
Oceanda Dete		00/07/00/0											
Sample Date	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018	02/07/2018			
Sample Type	Clay	Clay	Clay	Sand	Clay	Clay	Clayey Sand	Clay	Clayey Sand	Clay		1	
Batch Number	1	1	1	1	1	1	1	1	1	1		Unite	Method
Date of Receipt	03/07/2018	03/07/2018	03/07/2018	03/07/2018	03/07/2018	03/07/2018	03/07/2018	03/07/2018	03/07/2018	03/07/2018	LOD/LOK	Onits	No.
TPH CWG													
Aliphatics													
>C5-C6 #M	<0.1 ^{SV}	<0.1	<0.1 ^{SV}	0.4	0.2 ^{SV}	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 #M	0.2 ^{SV}	<0.1	1.5 ^{SV}	1.7	2.4 ^{SV}	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10	1.3 ^{SV}	<0.1	7.9 ^{SV}	7.6	4.5 ^{SV}	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 #M	29.5	14.9	133.7	45.3	65.6	<0.2	<0.2	9.3	30.3	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #M	43	32	142	48	67	<4	<4	22	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	108	43	171	15	293	56	10	23	44	18	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	2587	900	4312	770	7752	1540	191	668	627	643	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	2769	990	4768	888	8185	1596	201	722	701	661	<19	mg/kg	TM5/TM38/PM8/PM12/PM16
Aromatics													
>C5-EC7 *	<0.1 ^{SV}	<0.1	<0.1 ^{SV}	<0.1	<0.1 ^{SV}	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8 [#]	<0.1 ^{SV}	<0.1	<0.1 ^{SV}	<0.1	<0.1 ^{SV}	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 ^{#M}	<0.1 ^{SV}	<0.1	0.1 ^{SV}	1.0	0.1 ^{SV}	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 [#]	16.6	5.2	46.8	<0.2	62.0	6.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 [#]	33	17	66	<4	63	15	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	92	34	132	<7	229	53	<7	14	17	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35#	996	310	1439	271	2824	642	98	317	288	412	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 [#]	1138	366	1684	272	3178	716	98	331	305	412	<19	mg/kg	TM5/TM38/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	3907	1356	6452	1160	11363	2312	299	1053	1006	1073	<38	mg/kg	TM5/TM38/PM8/PM12/PM16
MTBE [#]	<5 ^{SV}	<5	<5 ^{SV}	<5	<5 ^{\$V}	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
Benzene [#]	<5 ^{SV}	<5	<5 ^{SV}	<5	<5 ^{SV}	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
Toluene #	<5 ^{\$V}	<5	26 ^{SV}	<5	29 ^{sv}	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
Ethylbenzene #	<5 ^{SV}	<5	48 ^{sv}	40	22 ^{SV}	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
m/p-Xylene [#]	13 ^{sv}	<5	89 ^{sv}	866	79 ^{sv}	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
o-Xylene [#]	<5 ^{\$V}	<5	<5 ^{\$V}	57	75 ^{SV}	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
Natural Moisture Content	20.4	2.8	23.7	109.8	19.7	10.7	7.3	9.9	11.7	13.2	<0.1	%	PM4/PM0
Sample Type	Clay	Clay	Clay	Sand	Clay	Clay	Clayey Sand	Clay	Clayey Sand	Clay		None	PM13/PM0
Sample Colour	Medium Brown	Light Grey	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones	stones	stones	stones, wet	stones	sand, stones	stones, chalk	sand, carbon, stones, roots	stones	stones, sand		None	PM13/PM0

Client Name: Reference: Location: Contact: JE Job No.:

R1742B Heyford (Dorchester) Scott Miller 18/10441

Smith Grant LLP

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	21-22	23-24	25-26						
Sample ID	PH5-HS-SS44	PH5-HS-SS45	PH5-HS-S17						
Depth	1.5-2.5	1.5-2.5					Please se	e attached n	otes for all
COC No / misc							abbrevi	ations and ad	cronyms
Containers	٧J	٧J	٧J						
Sample Date	02/07/2018	02/07/2018	02/07/2018						
Sample Tune	Claugu Cand	Clau	Clau						
Sample Type	Clayey Sand	Clay	Clay						
Batch Number	1	1	1				LOD/LOR	Units	Method
Date of Receipt	03/07/2018	03/07/2018	03/07/2018			 			140.
TPH CWG									
Aliphatics	-0.1	-0.1	-0.1				-0.1	malka	TM26/DM42
>C5-C6 ***	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1				<0.1	ma/ka	TM36/PM12
>C10-C12 ^{#M}	1.2	<0.2	<0.2				<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #M	80	<4	<4				<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	106	8	<7				<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	2123	267	<7				<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	2310	275	<19				<19	mg/kg	TM5/TM38/PM8/PM12/PM16
Aromatics									
>C5-EC7#	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC7-EC8*	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC8-EC10""	<0.1	<0.1	<0.1				<0.1	mg/kg	TM5/PM12
>EC10-EC12	<0.2	<0.2	<0.2				<0.2	mg/kg	TM5/PM8/PM16
>EC16-EC21#	74	<7	<7				<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 [#]	815	109	<7				<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	921	109	<19				<19	mg/kg	TM5/TM38/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	3231	384	<38				<38	mg/kg	TM5/TM38/PM8/PM12/PM16
MTBE [#]	<5	<5	<5				<5	ug/kg	TM31/PM12
Benzene [#]	<5	<5	<5				<5	ug/kg	TM31/PM12
Toluene [#]	<5	<5	<5				<5	ug/kg	TM31/PM12
Ethylbenzene *	<5	<5	<5				<5	ug/kg	TM31/PM12
m/p-Xylene "	<5	<5	<5				<5	ug/kg	TM31/PM12
o-Xylene	<0	<0	<0				<0	ug/kg	110131/F10112
Natural Moisture Content	1.4	0.9	18.6				<0.1	%	PM4/PM0
Sample Type	Clayey Sand	Clay	Clay					None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown					None	PM13/PM0
Other Items	stones, carbon	stones	stones, carbon					None	PM13/PM0
								l	

Client Name:	Smith Grant LLP
Reference:	R1742B
Location:	Heyford (Dorchester)
Contact:	Scott Miller

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason					
	No deviating sample report results for job 18/10441										

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/10441

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

ABBREVIATIONS and ACRONYMS USED

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

Method Code Appendix

JE Job No: 18/10441

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes	Yes	AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	
TM31	Modified USEPA 8015B. Determination of Methyltenbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes