Contaminated Land
Air Quality
Environmental Audit

Partnership No: OC 300776

Heyford Park

Dorchester Living: Phase 9 – Baseball Pitch

Remediation Earthworks Completion Report

For Urban Regen Ltd.

June 2021

Report Ref: R1742-R22-v1

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1. Introduction

1.1. Planning Consent for the redevelopment of the area referred to as Phase 9 within the former RAF/USAF Upper Heyford Airbase New Settlement Area (NSA) was granted by Cherwell District Council (CDC) on 7th December 2016 (ref. 16/02446/F). Dorchester Living (DL) intend to redevelop the site with the construction of 296 residential dwellings with associated infrastructure and areas of landscaping and public open space.

1.2. Urban Regen Ltd. (URL) was instructed by DL to carry out demolition, remediation and preparatory earthworks within Phase 9 to allow construction works to commence. URL duly instructed Smith Grant LLP (SGP) to carry out the verification works and produce the earthworks completion reporting.

1.3. The above planning consent contains the following conditions relating to contamination remediation:

	Pre-Commencement Conditions (phased)
10	*No development shall take place within a phase or sub-phase hereby approved until a Remediation Strategy that includes the following components to deal with the risks associated with contamination of that phase or sub-phase has been submitted to and approved, in writing, by the Local Planning Authority:*
a).	*A preliminary risk assessment which has identified:* • *All previous uses.* • *Potential contaminants associated with those uses.* • *A conceptual model of the site indicating sources, pathways and receptors.* • *Potentially unacceptable risks arisings from contamination affecting that phase or sub-phase.*
b).	*A site investigation scheme, based on (a) to provide information for a detailed assessment of the risks to all receptors that may be affected, including those off-site.*
c).	*The results of the site investigation and the detailed risk assessment referred to in (b) 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.*
d).	*A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in the remediation strategy in (c) are complete and identifying and requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action.* *Any changes to these components require the express written consent from the Local Planning Authority. The scheme shall be implemented as approved.*
	Conditions Requiring Approval or Compliance Before Specific Construction Stages
19	*If, during development, contamination not previously identified is found to be present, no further development shall take place until full details of a remediation strategy detailing how the unsuspected contamination shall be dealt with has been submitted to*

	and approved in writing by the Local Planning Authority. Thereafter the remediation strategy shall be carried out in accordance with the approved details.
	<u>Conditions Requiring Approval or Compliance Before Occupation</u>
22	*Prior to the first use or occupation of any phase or sub-phase of the development hereby approved, a verification report for that phase or sub-phase, demonstrating completion of works set out in the remediation strategy approved under Condition 10 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. The long-term monitoring and maintenance plan shall be implemented as approved.*

1.4. It is understood that Condition 10a has been approved following consultation between planning and the Local Authority Environmental Protection Officer (EPO) on 16.06.18 where it was acknowledged that an intrusive investigation and Remediation Strategy is required.

1.5. A site investigation report was produced by Hydrock (ref. HPW-HYD-MS-ZZ-RP-G-0001) in February 2017 which has been submitted to satisfy Condition 10b. LA EPO approval of this report was received on 04.11.20 under application of discharge condition 20/02729/DISC. Commentary was provided by the Environment Agency (EA) on 26.03.21 with general agreement of the findings of the site investigation but with requirements of further groundwater investigation within Phase 9 following building demolition and tank removal. The request for additional groundwater investigation was limited to the area of BH01 and BH02, both of which are located outside the area covered by this report.

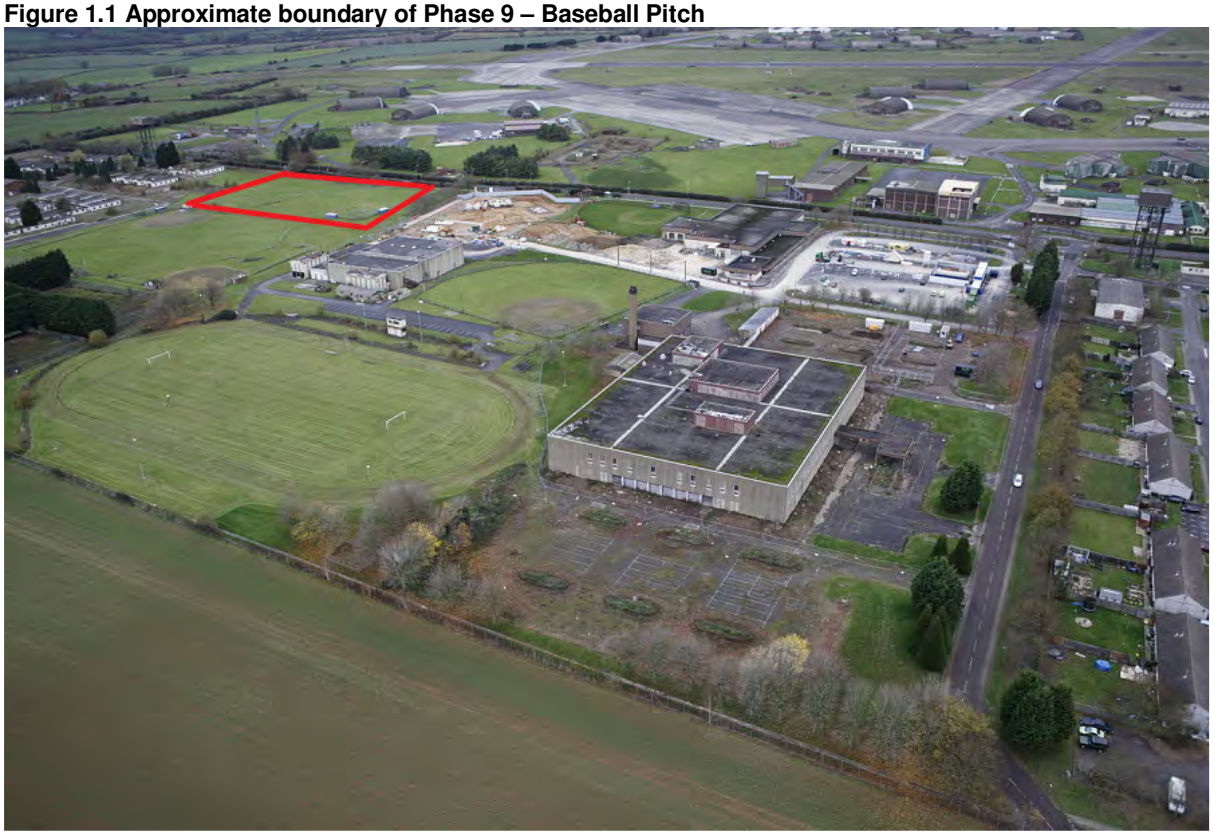
1.6. A Remediation Statement (10c) which covered Phase 9 and other development phases was prepared by Hydrock (ref. HPW-HYD-PX-REM-RP-GE-P1-S2, April 2017), however it was decided that a revised Strategy should be produced to align remedial and verification works to the SGP Remediation Strategy which was produced to cover the neighbouring NSA areas (R1742-R01-v1; May 2014) under Planning Consent 10/1642/OUT for consistency. Approval of the Strategy was received from the LA on 26.03.21, however formal approval by the EA is currently outstanding pending the further groundwater investigation works within the main Phase 9 area. These works are currently on-going and will be reported separately.

1.7. This verification report is intended to assist in the discharge of Condition 10d (although some aspects can only be completed by the developers).

1.8. This report deals with the completion of preparatory remedial works by URL for DL across the former baseball pitch within Phase 9 (referred to as the Phase 9 Baseball Pitch). The site location is shown below with the approximate site boundary also indicated on Drawing D01. A separate Completion Report will be submitted in due course for the remaining Phase 9 area.

1.9. A development layout plan has not been provided however it is anticipated that the development will consist of a variety of detached, semi-detached and terraced housing with private gardens, areas of public open space and associated infrastructure.

Figure 1.1 Approximate boundary of Phase 9 – Baseball Pitch



1.10. SGP has regularly inspected the URL preparatory earthworks carried out to date and has collected samples of the stripped or replaced soil surfaces and aggregate for determination of compliance with the agreed quality standards. This report describes the works carried out, drawing conclusions and making recommendations concerning the further works required by Dorchester in order to fully discharge Planning Conditions 10.

2. Remediation Strategy

2.1. Expected Contamination

2.1.1. The Phase 9 area formed part of the wider Upper Heyford Airbase, developed and used by the United States Airforce. It is understood that the site originally formed housing for families living on the airbase, but once expansion of the base took place, the buildings were converted into the 'Upper Heyford American High School' with playing fields and a boiler house. The area of the site covered by this report relates to the playing field (later referred to as the baseball pitch) whilst the school site was located within the remaining Phase 9 area to the west.

2.1.2. 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 / PAHs with localised areas of made ground and the potential for localised hydrocarbon associated with bulk fuel storage tanks within the area of the former boiler house.

2.1.3. Two localised hotspots (TP102 and TP104) were identified by Hydrock where black staining / tar odours were reported, however no source could be attributed to these observations so further investigation within both areas was recommended. These are not located within the Baseball pitch.

2.1.4. More recent supplementary works undertaken by SGP identified that the former POL (Petroleum Oil Lubricant) pipeline extended beneath the eastern portion of the Phase 9 area including the baseball pitch. The POL system was a supply pipe present on the Upper Heyford Flying Field which connected to the National Fuel Pipeline (NFP) located to the south of Phase 9 and transported fuel around the airbase. Decommissioning of the POL pipeline was undertaken and reported by Vertase (ref. 1246DOR) in 2012 but it was recognised that there was potential for fuel contamination around the pipeline. SGP undertook a supplementary investigation along the POL pipeline in January 2021 (ref. R1742b-R21) and identified a hydrocarbon hotspot attributed to the fuel pipeline in the north of the baseball pitch.

2.1.5. 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. This value substantially exceeds the criteria for garden soils (Remediation Strategy, Table 3.3).

2.2. Remediation Objectives and Approach

2.2.1. The key contamination remediation objectives are to:

- create a significant betterment of the groundwater environment thereby protecting groundwater quality at and beyond the site boundary;
- remove / remediate significant pollution sources such as hydrocarbon hot-spots, if present, that pose a risk to man and the environment, to the extent feasible;
- break significant or potentially significant future pollutant linkages resulting from the change of land use, in particular related to shallow garden soils and human exposure;
- carry out further soil investigations / inspections to complete gaps in the existing investigation coverage;
- respond appropriately to contingencies, in particular the discovery of previously undisclosed contamination;
- remove development constraints and prepare the site physically to enable residential development;
- manage all emissions to air and water to protect surface waters, groundwater and the atmosphere during the remediation works;
- provide appropriate additional protection measures, where necessary, to be implemented during construction - including building gas barriers, water mains protection, and garden / open space soil quality and thickness.

2.2.2. The general requirements for garden and landscaped soils taken from the Remediation Strategy are as follows:

- provision of 600mm of clean soil cover within garden areas / 300mm in soft landscaping where the underlying soils contain one or more concentrations of substances in excess of contamination targets set out in Table 3.3 of the Strategy;
- materials to be used as the garden/landscape soils must be suitable for use, validated, and comply with contamination targets set out in the Remediation Strategy at a rate of 1 sample per 500m^3;
- imported soils used for cover purposes to comply with contamination targets set out in the approved Remediation Strategy at a rate of 1 sample per 250m^3 with a minimum of 3 samples per source;
- in areas where natural uncontaminated soils are present following the site re-grade, clean topsoil may be required as a growing medium but there will be no requirement for a full 600mm of placed soil cover.

2.2.3. It is confirmed that Phase 9 may be generally classed as “Green” under the NHBC classification scheme with no special measures required to address risks posed by ground gas. Localised areas of hydrocarbon contamination such as around USTs / fuel pipeline

where it is not feasible to remove impacted soils (such as adsorption into bedrock etc) then post-remediation vapour monitoring may be necessary to assess whether vapour protection measures are required. In the absence of further monitoring or assessment then precautionary VOC protection measures may be required.

2.3. Site Characterisation

2.3.1. The former baseball pitch has remained undeveloped throughout its mapped history, originally forming part of a wider agricultural field with a surface watercourse (Gallos Brook) in the east. The wider Phase 9 area to the west was developed by 1996 with housing during which period the site remained as a field. It wasn't until 1980-1982 when the high school was developed to the west that the site was turned into a baseball pitch. It is assumed during this period Gallos Brook was culverted.

2.3.2. The POL pipeline crosses the site via two routes, the first extends through the centre of the baseball pitch in a north to south direction whilst a second runs north to south along the western boundary before running east where it joins the other pipeline. They then extend north beneath Camp Road.

2.3.3. SGP carried out supplementary investigation works along the POL pipeline in December 2020 and excavated 7 entries (TP1-TP7) within the baseball pitch to confirm the presence / depth of the pipeline and assess the presence of any fuel impacted soils.

2.3.4. One pipeline consisted of a bitumen bound pipe which was present in all entries, whilst several entries (TP1, TP5 and TP6) recorded a second cast iron pipe. The pipes were laid within bedding sand or pea gravel and appeared in a good condition with no cracks of breakages where observed.

2.3.5. Fuel impacted soils were encountered in TP1 with a slight hydrocarbon odour and a maximum PID reading of 6.3 ppm. A second entry, TP4 was excavated 25m to the west of TP1 and encountered strong fuel odours directly below the pipeline at 1.3m. A maximum PID reading of 990 ppm was recorded at 1.8m bgl with a black stained gravel present from 1.8 to 2.3m bgl. Trial-pit 4 was then extended into a trench, running approximately 30m to the south where moderate hydrocarbon odours and elevated PID readings remained. Samples submitted from each entry for hydrocarbon analysis, however only samples from TP4 (1.3-1.6 & 1.9m bgl) reported exceedances of the assessment criteria.

2.4. Phase-specific Strategy

2.4.1. It was concluded that the Phase 9 baseball pitch posed a localised risk of contamination associated with a fuel hotspot around the former POL pipeline in the north of the site.

2.4.2. The site-wide strategy of ensuring clean cover soils to 600mm depth (subject to formation testing), the requirement to remove the decommissioned POL pipeline and the remediation of the identified hydrocarbon hotspot is considered to be an appropriate approach. The verification measures specific to dealing with hydrocarbon contamination as set down in the approved Remediation Strategy were to be invoked with regard to the POL pipeline hotspot.

3. Description of Works

3.1. General Approach

3.1.1. Preparatory works within the Phase 9 baseball pitch included:

- soft strip and vegetation clearance;
- recovery of topsoil

3.1.2. Remediation earthworks within the Phase 9 baseball pitch included:

- Removal of decommissioned POL pipeline;
- Removal / treatment of hydrocarbon hotspot in accordance with the Remediation Strategy.

3.1.3. The works within the Phase 9 baseball pitch, including remediation of the hydrocarbon hotspot, were carried out over the period of January to February 2021 with subsequent post-remediation vapour monitoring completed in April 2021.

3.1.4. Approximately 3,700m^3 of topsoil was recovered from the baseball pitch and temporarily stockpiled within the wider Phase 9 area. Shallow natural deposits of sandy clay or reworked natural deposits with rare inert materials (brick etc.) were present at surface levels following the recovery of topsoil. In-situ testing of the topsoil and underlying formation soils were completed in 2018 and were reported at the time. The findings are reproduced within this report and a copy of the initial report is provided in Appendix B. It is understood that this information has been submitted to the regulators previously with no adverse comments received.

3.2 Contamination Hot-Spots

3.2.1 A single contamination hotspot had been identified through previous investigation works on the baseball pitch site, associated with the POL pipeline in the north where fuel impacted soils had been encountered.

3.2.2 The removal of fuel impacted soils followed by validation testing is described in detail in Sections 4 and 5. Approximately 2,604m^3 of fuel impacted soils were removed from the baseball pitch and placed in a temporary lined quarantine area within the wider Phase 9 area. It is understood that given the highly volatile nature of the fuel contamination present that it is proposed to retain the impacted soils within the quarantine area and form into a series of windrows to allow mechanical turning and allow natural attenuation / volatilisation to take place. The stockpile will then be re-tested to establish whether sufficient degradation has occurred to allow re-use of the soils within the wider Phase 9 development. This will be subject to further reporting and assessment at a later date.

3.2.3 Validation testing on the base and sidewalls of the excavations following removal of contaminated soils was carried out by SGP in accordance with the Remediation Strategy with a period of post-remediation vapour monitoring completed to establish whether vapour protection measures would be required within future dwellings on and around the remediated area.

3.3 Validation of Formation Level Strata

3.3.1 It is a requirement under the Remediation Strategy that a 600mm cover of clean soils over made ground is placed in garden areas; however, due to the requirement to trim development areas by -200mm below existing ground levels, made ground was largely absent due to the shallowness of natural strata. This meant that a 400mm depth of natural soil/ reworked natural soils with occasional inert inclusion (brick etc.) will be left which could form part of the full 600mm of garden soil cover after placement of garden topsoil.

3.3.2 In-situ sampling of the formation level strata was carried out by sampling of the upper 400mm at a test frequency of 1 sample per 500m^3, the residual 400mm depth equating to 1 sample per 1,250m^2 plan area of development. Formation testing was undertaken by SGP in 2018 and reported at the time of completion (ref. R1742b-L07) prior to the recovery of topsoil, however the assessment and conclusions made remain valid and have been reproduced within this report for completeness. A total of 12 samples were collected from subsoils directly below the topsoil with depth validation photos showing the 0-400mm soil profile beneath the topsoil. Samples were analysed for a suite of contaminants as specified within the Remediation Strategy.

3.3.3 Several minor exceedances were reported, and further assessment was provided at the time of reporting, this has also been reproduced within this report and it is considered that the assessment and conclusions made remain valid.

3.4 Site Waste Management

3.4.1 Waste materials were limited to the two fuel pipelines which have been removed across the full extent of the baseball pitch site. These materials were included with those of the wider Phase 9 area and were disposed to a waste disposal / recycling facility. URL maintain copies of all waste transfer records which can be provided on request.

3.4.2 Hydrocarbon impacted arisings generated from the remediation of the POL hotspot area have been temporarily placed within a quarantine holding area within the wider Phase 9 area. The quarantine area is underlain by a geotextile membrane and is surrounded by a clay bund to limit any leaching / run-off. The stockpile is to undergo re-profiling into a series of windrows to facilitate turning and mixing by a mechanical excavator to allow further aeration of soils. This stockpile will be subject further testing and assessment at a later date to establish whether

sufficient reduction of hydrocarbon concentrations has taken place to allow reuse within Phase 9.

3.5 Constraints and Limitations

3.5.1 Constraints to the remediation earthworks within the baseball pitch were limited to the presence of several trees along the northern boundary which have Tree Preservation Orders placed on them. An appropriate stand-off had to be adopted to ensure no damage to the roots during the removal of impacted soils. This is not considered to significantly impact the effectiveness of the remediation, however the area where soils could not be fully removed due to this constraint was subject to post-vapour monitoring.

3.6 Unforeseen Contamination

3.6.1 No unforeseen contamination was identified or encountered during the remediation earthworks.

4. Inspections and Testing

4.1. SGP attended the site on 1 occasion in 2018 to carry out in-situ testing for topsoil and formation soils (prior to preparatory earthworks), 11 visits during the remediation of the hotspot area, and 2 visits after the completion of remedial works to carry out vapour monitoring. The dates and activities carried out in the Phase 9 Baseball pitch area during SGP attendance cross-referenced to the site inspection photographic record (Appendix A), topsoil, the 2018 formation validation report (Appendix B) and analysis results (Appendix C) are summarised in the table below.

Table 4.1 SGP Inspection Summary

Date	SGP Activities	Record
22.05.18	Collection of in-situ topsoil and formation samples prior to the commencement of preparatory works	Appendix A – Photo 1-3 Appendix B – R1742b-L07 Appendix C - Lab Ref: 18-7823 & 18-14613
15.12.20	Site walkover / POL pipeline supplementary site investigation (reported separately – R1742b-R21)	Appendix A - Photos: 4-5
14.01.21	Site attendance during recovery of clean overlying soils and delineation of fuel impacted soils. Sample GW ingress into excavation	Appendix A - Photos: 6-11 Appendix C - Lab Ref: 453
02.02.21	Site attendance during recovery of clean overlying soils and delineation of fuel impacted soils	Appendix A – Photos 12-16
03.02.21	Site attendance during recovery of clean overlying soils, delineation and removal of fuel impacted soils, collection of validation samples	Appendix A – Photos 17-18 Appendix C - Lab Ref: 21-1520
04.02.21	Site attendance during recovery of clean overlying soils and removal of fuel impacted soils, collection of validation samples	Appendix A – Photos 19-20 Appendix C - Lab Ref: 21-1520
08.02.21	Site attendance during recovery of clean overlying soils and removal of fuel impacted soils, collection of validation samples	Appendix A – Photos 21-23 Appendix C - Lab Ref: 21-1878
09.02.21	Site attendance during recovery of clean overlying soils and removal of fuel impacted soils, collection of validation samples	Appendix A – Photos 24-30 Appendix C - Lab Ref: 21-1878
10.02.21	Site attendance during recovery of clean overlying soils and removal of fuel impacted soils, collection of validation samples	Appendix A – Photos 31-34 Appendix C - Lab Ref: 21-1878
16.02.21	Site attendance during removal of fuel impacted soils, collection of validation samples; sample aggregate	Appendix A – Photos 35-37 Appendix C - Lab Ref: 21-2315, 21-05371, 21-57487
17.02.21	Site attendance during removal of fuel impacted soils, collection of validation samples	Appendix A – Photos 38-41 Appendix C - Lab Ref: 21-2315
18.02.21	Site attendance during removal of fuel impacted soils, collection of validation samples	Appendix A – Photos 42-47 Appendix C - Lab Ref: 21-2315
06.04.21	Deployment of vapour probes	Appendix A – Photos 48-49
28.04.21	Collection of vapour probes	Appendix C - Lab Ref: PO3089R

4.2. POL Pipeline Contamination Hotspot – Retained Soils Validation

4.2.1. Prior to the excavation and removal of fuel impacted soils within the identified hotspot area in the north of the baseball pitch, URL stripped off potentially clean soils overlying the hotspot which did not exhibit visual of olfactory indicators of contamination. These soils were then screened with a PID for VOCs and providing readings were below 10ppm, the material was relocated to a temporary stockpiling area in the south of the wider Phase 9 area to undergo chemical testing to determine the suitability for reuse. Validation samples were collected at an approximate frequency of 1 composite sample per 250m^3.

4.2.2. Two stockpiles were produced (SP1 and SP2) both containing approximately 1,000m^3 of soil each, 8 validation samples (4 from each stockpile) were collected and submitted to Element Materials Technology (formerly Exova-Jones) for full TPHCWG banding and BTEX analysis. The results of the validation testing (lab ref. 21-2315) are compared to the assessment criteria for hydrocarbon remediation as set out in Table 3.4 of the Remediation Strategy (adopted from Table B2 of the Watermans Controlled Waters DQRA, ref. EED10658-14.1.7_FA) and the garden soils criteria in Table 3.3 of the Strategy to assess the suitability for reuse.

Table 4.2 Validation Screening Summary for Replacement Soils (Phase 9 Baseball Pitch)

Contaminant	Samples	Range of Concentrations (mg/kg unless stated)	Hotspot Criteria (Table 3.4)	Garden Soils Criteria (Table 3.3)	Exceedance Concentration & location
			Screening criteria (mg/kg unless stated)	Screening criteria (mg/kg unless stated)	
Aliphatic C5-C6	8	<0.1	-	42	None
Aliphatic C6-C8	8	<0.1	-	100	None
Aliphatic C8-C10	8	<0.1	80	27	None
Aliphatic C10-C12	8	<0.2	1000	130	None
Aliphatic C12-C16	8	<4	1000	1100	None
Aliphatic C16-C21	8	<7-15	1000	65,000	None
Aliphatic C21-C35	8	<7-122	1000	65,000	None
Aromatic C5-C7	8	<0.1	-	42	None
Aromatic C7-C8	8	<0.1	-	130	None
Aromatic C8-C10	8	<0.1	-	34	None
Aromatic C10-C12	8	<0.2	7	74	None
Aromatic C12-C16	8	<4-16	120	140	None
Aromatic C16-C21	8	<4-96	440	260	None
Aromatic C21-C35	8	<7-368	1000	1100	None
Benzene	8	<0.005	0.08 (Table 3.3*)		None
Toluene	8	<0.005	120 (Table 3.3*)		None
Ethylbenzene	8	<0.005	65 (Table 3.3*)		None
m/p-Xylene	8	<0.005	42 (Table 3.3*)		None
o-xylene	8	<0.005	44 (Table 3.3*)		None

**Shallow garden soils compliance criteria (Remediation Strategy, Table 3.3)*

4.2.3. Hydrocarbon concentrations were below both the assessment criteria for the protection of controlled waters (Table 3.4) and garden cover soils (Table 3.3). The material is therefore considered suitable for reuse on the development either as general fills or use as garden soils, however if the latter use is preferred the soils would require additional testing to confirm compliance with the full suite of determinants for garden soils (i.e., metals, PAH 16 and asbestos).

4.3. POL Pipeline Contamination Hotspot – Excavation Walls and Base Validation

4.3.1. Contaminated soils determined through visual / olfactory assessment or with elevated PID readings were removed by mechanical excavator and were temporary stockpiled within a lined and bunded quarantine area within the wider Phase 9 area (adjacent to former boiler house). Hydrocarbon impacted soils were removed vertically down to bedrock (west) or down to bands of clay which were present above the bedrock in the east which were absent of any contamination indicators / elevated PID readings. The remedial excavation was extended laterally until visual/olfactory indicators were absent from the sidewalls and/or where PID readings were <10ppm.

4.3.2. Excavations north towards Camp Road were limited due to the presence of an existing footpath and the two trees which have Tree Protection Orders applied to them. As such, an appropriate stand-off was adopted so as not to undermine the footpath or damage the tree roots. There were no further limitations to the remediation works.

4.3.3. The extents of the Phase 9 Baseball Pitch area and POL hydrocarbon hotspot are indicated on URL as-built drawing 351-20-001-03.

4.3.4. Samples were collected on an approximate frequency of 1 sample per 15m^2 of exposed sidewall in accordance with the Strategy and a reduced frequency of 1 per 25m^2 collected from the base of the excavation (limited to areas absent of shallow bedrock). Validation sample locations are indicated on Drawing D02.

4.3.5. Forty-eight samples (samples Ph9-HS-SS1 to Ph9-HS-SS48) were submitted to accredited laboratory Element Testing Materials for full TPHCWG banding and BTEX analysis. The results of the validation testing (lab ref. 21-1878 and 21-2315) are compared to assessment criteria set out in Table 3.4 of the Remediation Strategy (adopted from Table B2 of the Watermans Controlled Waters DQRA, ref. EED10658-14.1.7_FA).

Table 4.3 Validation Screening Summary for Excavation Sidewalls and Base (Phase 9 Baseball Pitch)

Contaminant	Samples	Range of Concentrations (mg/kg unless stated)	Table B3	
			Screening criteria* (mg/kg unless stated)	Exceedance Concentration & location
Aliphatic C5-C6	48	<0.1	-	None
Aliphatic C6-C8	48	<0.1-17.2	-	None
Aliphatic C8-C10	48	<0.1-39.7	80	None
Aliphatic C10-C12	48	<0.2-117.1	1000	None
Aliphatic C12-C16	48	<4-260	1000	None
Aliphatic C16-C21	48	<7-27	1000	None
Aliphatic C21-C35	48	<7-30	1000	None
Aromatic C6-C7	48	<0.1	-	None
Aromatic C7-C8	48	<0.1	-	None
Aromatic C8-C10	48	<0.1-2.1	-	None
Aromatic C10-C12	48	<0.2-17.8	7	**(3): SS38, SS39 & S43**
Aromatic C12-C16	48	<4-80	120	None
Aromatic C16-C21	48	<7-52	440	None
Aromatic C21-C35	48	<7-170	1000	None
Benzene	48	<0.005	0.08 (Table 3.3*)	None
Toluene	48	<0.005	120 (Table 3.3*)	None
Ethylbenzene	48	<0.005-0.21	65 (Table 3.3*)	None
m/p-Xylene	48	<0.005-0.6	42 (Table 3.3*)	None
o-xylene	48	<0.005-1.32	44 (Table 3.3*)	None

**Shallow garden soils compliance criteria (Remediation Strategy, Table 3.3)*

4.3.6. Hydrocarbon concentrations were below the assessment criteria within most of the validation samples with exception of SS38 (17.6 mg/kg), SS39 (11.8 mg/kg) and SS43 (9.1 mg/kg) for the aromatic C10-C12 hydrocarbon range (criteria of 7 mg/kg). All three samples were collected from the northern part of the remediation excavation with SS38 and SS43 collected from the northern sidewall where some contamination indicators remained, but the excavation could not continue to the footpath and trees; sample SS39 was collected from the base of the excavation immediately adjacent to SS38.

4.3.7. All of the exceedances are only marginally above the assessment criteria (maximum x2.5 the criteria) and it is recognised that whilst these are minor exceedances of the derived values to be protective to controlled waters, they remain below the respective values for garden cover soils for the aromatic C10-C12 fraction (74 mg/kg). It is therefore considered that the minor exceedances are not indicative of the presence of unacceptable levels of residual contamination with the potential to cause significant pollution.

4.4. <u>POL Pipeline Contamination Hotspot – Contaminated Soils</u>

4.4.1. Following the removal of circa 2,604m^3 of fuel impacted soil and stockpiling within a temporary quarantine area within the wider Phase 9 area, three samples were collected (SP-Cont-1 to SP-Cont-3) from the material to establish the hydrocarbon concentrations present.

Sampling was limited to using hand-tools but soils where staining and strong odours were noted were specifically targeted. As natural degradation of surface stockpiled soils is likely to have commenced when compared to soils within the centre of the stockpile, data obtained from the impacted soils during the SGP POL supplementary site investigation (TP1-S1, TP4-S1 and TP4-S2) have been included.

4.4.2. Given the volume of removed soils and the volatile nature of the hydrocarbon fractions present, it is understood that the stockpiled soil will be extended into a series of windrows to facilitate mechanical agitation / turnover. Following which further sampling will be undertaken and a separate assessment made on the potential reuse of the soils within the wider Phase 9 area.

4.4.3. In total, 6 samples of removed impacted soils have been collected (3 during the initial supplementary investigation and 3 in stockpile following removal). The results of the validation testing (lab ref. 20-17917 and 21-2315) are compared to the assessment criteria set out in Table 3.4 of the Remediation Strategy (adopted from Table B2 of the Watermans Controlled Waters DQRA, ref. EED10658-14.1.7_FA).

Table 4.4 Validation Screening Summary for Removed Impacted Soils

Contaminant	Samples	Range of Concentrations (mg/kg unless stated)	Table B3	
			Screening criteria* (mg/kg unless stated)	Exceedance Concentration & location
Aliphatic C5-C6	6	<0.1	-	None
Aliphatic C6-C8	6	1.3-80.8	-	None
Aliphatic C8-C10	6	4.7-204.4	80	**(2): TP4-S1 & TP4-S2**
Aliphatic C10-C12	6	22.3-456.2	1000	None
Aliphatic C12-C16	6	14-901	1000	None
Aliphatic C16-C21	6	7-46	1000	None
Aliphatic C21-C35	6	<7	1000	None
Aromatic C6-C7	6	<0.1	-	None
Aromatic C7-C8	6	<0.1	-	None
Aromatic C8-C10	6	0.3-9.3	-	None
Aromatic C10-C12	6	<0.2-39.6	7	**(2): TP4-S2 & SP-Cont-2**
Aromatic C12-C16	6	14-280	120	**(1): TP4-S2**
Aromatic C16-C21	6	<7-30	440	None
Aromatic C21-C35	6	<7	1000	None
Benzene	6	<0.005	0.08 (Table 3.3*)	None
Toluene	6	<0.005	120 (Table 3.3*)	None
Ethylbenzene	6	0.02-1.02	65 (Table 3.3*)	None
m/p-Xylene	6	0.07-2.4	42 (Table 3.3*)	None
o-xylene	6	0.22-6.05	44 (Table 3.3*)	None

**Shallow garden soils compliance criteria (Remediation Strategy, Table 3.3)*

4.4.4. Exceedances were generally limited to the samples collected during the initial investigation, compared to the quarantined stockpiled soils, however this may suggest that enhanced volatilisation / degradation following removal from the ground has taken place. Further assessment following re-modelling of the stockpile into windrows and a period of aeration will be required and will be reported separately at a later date.

4.5. Phase 9 Baseball Pitch Topsoil

4.5.1. Prior to the commencement of preparatory earthworks, including the recovery of topsoil, SGP carried out both in-situ topsoil and formation soil testing in 2018. The findings were reported in a letter report (R1742b-L07; August 2018); however, for completeness, the findings are reproduced below with a copy of the original report provided in Appendix B.

4.5.2. SGP collected 9 in-situ samples on the working assumption that circa 4,400m^3 of topsoil was present across the baseball pitch (area (14,650m^2) x assumed thickness of topsoil (0.3m)) to achieve a sampling frequency of 1 per 500m^3. URL having since confirmed following recovery that 3,700m^3 of topsoil was recovered from the baseball pitch. A testing frequency of 1 sample per 410m^3 has therefore been achieved, satisfying the prescribed rate of 1 per 500m^3. The stockpile is currently located in the adjacent Phase 9 area.

4.5.3. The results of the baseball pitch topsoil (lab ref. 18-7823 and 18-14613) are reproduced in the table below and are compared to the garden cover criteria outlined in Table 3.3 of the Remediation Strategy.

Table 4.5 Site-Won Topsoil

Contaminant	Samples	Range of Concentrations (mg/kg unless stated)	Residential Use	
			Screening criteria (mg/kg unless stated)	Exceedances
SOM	9	1.5-3.8	-	None
pH	9	7.74-8.25	-	None
asbestos fibre	9	NAD	<0.001%	None
arsenic	9	15.2-52.1	37 (S4UL)	**(1): Ph9-S9A**
cadmium	9	0.1-0.2	11 (S4UL)	None
chromium	9	36.9-82.2	910 (S4UL)	None
chromium IV	9	<0.3	6 (S4UL)	None
copper	9	10-29	2400 (S4UL)	None
lead	9	17-88	200 (C4SL)	None
mercury	9	<0.1	170 (S4UL)	None
nickel	9	18.3-51.50	180 (S4UL)	None
selenium	9	<1-2	250 (S4UL)	None
vanadium	9	52-119	410 (S4UL)	None
zinc	9	64-174	3700 (S4UL)	None
naphthalene	9	<0.04	2.3 (S4UL)	None
acenaphthylene	9	<0.03	170 (S4UL)	None
acenaphthene	9	<0.05	210 (S4UL)	None

Contaminant	Samples	Range of Concentrations (mg/kg unless stated)	Residential Use	
			Screening criteria (mg/kg unless stated)	Exceedances
fluorene	9	<0.04	170 (S4UL)	None
phenanthrene	9	<0.03-0.26	95(S4UL)	None
anthracene	9	<0.04-0.09	280 (S4UL)	None
fluoranthene	9	0.09-0.95	2400 (S4UL)	None
pyrene	9	0.09-0.87	620 (S4UL)	None
benzo(a)anthracene	9	0.06-0.59	7.2 (S4UL)	None
chrysene	9	0.06-0.46	15 (S4UL)	None
benzo(bk)fluoranthene	9	0.11-1.09	-	-
benzo(a)pyrene	9	0.06-0.59	2.2 (S4UL)	None
indeno(123cd)pyrene	9	0.04-0.44	27 (S4UL)	None
dibenzo(ah)anthracene	9	0.04-0.09	0.24(S4UL)	None
benzo(ghi)perylene	9	0.04-0.4	320 (S4UL)	None
aliphatic C5-C6	9	<0.1	42 (S4UL)	None
aliphatic C6-C8	9	<0.1	100 (S4UL)	None
aliphatic C8-C10	9	<0.1	27 (S4UL)	None
aliphatic C10-C12	9	<0.2	130 (S4UL)	None
aliphatic C12-C16	9	<4	1100 (S4UL)	None
aliphatic C16-C21	9	<7	5000 (S4UL)	None
aliphatic C21-C35	9	<7	5000 (S4UL)	None
aromatic C5-C7	9	<0.1	70 (S4UL)	None
aromatic C7-C8	9	<0.1	130 (S4UL)	None
aromatic C8-C10	9	<0.1	34 (S4UL)	None
aromatic C10-C12	9	<0.2	74 (S4UL)	None
aromatic C12-C16	9	<4	140 (S4UL)	None
aromatic C16-C21	9	<7	260 (S4UL)	None
aromatic C21-C35	9	<7	1100 (S4UL)	None
benzene	9	<0.005	0.08 (S4UL)	None
toluene	9	<0.005	130 (S4UL)	None
ethylbenzene	9	<0.005	47 (S4UL)	None
o-xylene	9	<0.005	60 (S4UL)	None
m-xylene	9	<0.005	56 (S4UL)	None
p-xylene	9	<0.005	56 (S4UL)	None
methyl tert butyl ether	9	<0.005	-	None

Notes to table:

S4UL: Suitable For Use Levels published by Chartered Institute of Environmental Health and Land Quality Management Ltd, residential with plant uptake scenario (1% SOM); copyright Land Quality Management Ltd reproduced with permission publication number S4UL3102. All rights reserved.

GAC: Generic Assessment Criteria published by CL:AIRE for human health risk assessment for a residential scenario with consumption of homegrown produce (1% SOM).

C4SL: Category 4 Screening Levels published by CL:AIRE (C4SLs); 'residential without home grown produce land use' (at 1% SOM)

4.5.4. A single minor exceedance was reported or arsenic within sample Ph-S9A with a concentration of 52.1 mg/kg compared to the criterion of 37 mg/kg.

4.5.5. Statistical analysis was undertaken that confirms the exceedance is an outlier of the dataset and is not representative of the soil concentrations and can therefore be excluded from the

dataset. When this value is removed, the upper confidence limit (0.95) for arsenic is reduced to 23.26, well below the criteria of 37 mg/kg.

Table 4.6 Statistical Analysis of Arsenic

statistic	arsenic (mg/kg)
criterion	37
no. of samples	9
Grubbs outlier test for highest value (P0.05)	Ph9-S9A (max value 52.1 mg/kg) is an outlier
arithmetic mean, including outlier	22.42
upper confidence limit (UCL 0.95) including outlier	39.09 (fail)
arithmetic mean, excluding Ph9-S9A outlier	18.71
upper confidence limit (UCL 0.95) excluding Ph9-S9A outlier	23.26 (pass)

4.5.6. No made ground or ashy deposits were observed within the topsoil and it is anticipated that some vertical mixing of the underlying ironstone where naturally elevated arsenic at similar concentrations have been reported within the wider Heyford Park development area. Typically, the bio accessibility of naturally occurring arsenic associated with ironstones (normally present in the form of arsenopyrite) will be low, and the risk to future residential use is therefore considered to be low.

4.6. Phase 9 Baseball Pitch Formation Soils

4.6.1. Sampling and analysis of formation samples was undertaken concurrently with the in-situ topsoil sampling in 2018 to assess whether formation soils following the recovery of the overlying topsoil could form part of the 600mm garden cover system.

4.6.2. In-situ sampling of subsoils below the topsoil was carried out through the excavation and sampling of the top 400mm of natural subsoil with a total of 12 samples collected. Assuming an approximate area of 14,650m^2, the volume of validated soils is effectively 5,860m^3 and the test rate is equivalent to 1 sample per 488m^3, achieving the specified rate of 1 sample per 500m^3.

4.6.3. Sampled soils generally comprised of a dark brown clay with coarse gravel of limestone, although inclusions of brick fragments (S5, S6, S11 and S12) and tarmac (S7 and S11) were observed. No inclusions of ash, slag or clinker were observed but it is noted Hydrock reported ash within 2 locations. A plan detailing the validation entries is provided in Drawing D01 within Appendix B.

4.6.4. Whilst these works were undertaken prior to the recovery of topsoil, a walkover of formation soils was completed by SGP once the topsoil had been stripped. The purpose of this was to establish whether any made ground was visible, in particular the presence of ash which had

been noted by Hydrock. Ground conditions were typical to those reported by SGP in 2018 with clay soils present at formation level. Angular gravel of limestone was present across the site with rare inclusions of brick fragments. No deposits of ash or tarmac were observed.

4.6.5. The results of the formation soils testing are summarised below (lab ref. 18-7823 and 18-14613) and are compared to the garden cover criteria outlined in Table 3.3 of the Remediation Strategy.

Table 4.7 Analysis of Formation Soils

Contaminant	Samples	Range of Concentrations (mg/kg unless stated)	Residential Use	
			Screening criteria (mg/kg unless stated)	Exceedances
SOM	12	0.6-3.6	-	None
pH	12	7.53-8.47	-	None
asbestos fibre	12	NAD	<0.001%	None
arsenic	12	14.3-25.1	37 (S4UL)	None
cadmium	12	<0.1-0.2	11 (S4UL)	None
chromium	12	32.3-47	910 (S4UL)	None
chromium IV	12	<0.3	6 (S4UL)	None
copper	12	9-57	2400 (S4UL)	None
lead	12	11-59	200 (C4SL)	None
mercury	12	<0.1	170 (S4UL)	None
nickel	12	16.3-31.6	180 (S4UL)	None
vanadium	12	42-69	410 (S4UL)	None
zinc	12	52-204	3700 (S4UL)	None
naphthalene	12	<0.04-0.06	2.3 (S4UL)	None
acenaphthylene	12	<0.03-0.08	170 (S4UL)	None
acenaphthene	12	<0.05-0.23	210 (S4UL)	None
fluorene	12	<0.04-0.15	170 (S4UL)	None
phenanthrene	12	<0.03-2.93	95(S4UL)	None
anthracene	12	<0.04-0.87	280 (S4UL)	None
fluoranthene	12	<0.03-6.08	2400 (S4UL)	None
pyrene	12	<0.03-6.08	620 (S4UL)	None
benzo(a)anthracene	12	<0.06-2.15	7.2 (S4UL)	None
chrysene	12	<0.02-2.15	15 (S4UL)	None
benzo(bk)fluoranthene	12	<0.07-3.83	-	-
benzo(a)pyrene	12	<0.04-2.22	2.2 (S4UL)	**(2) Ph9-S4**
indeno(123cd)pyrene	12	<0.04-1.60	27 (S4UL)	None
dibenzo(ah)anthracene	12	<0.04-0.28	0.24(S4UL)	**(2) Ph9-S4 & Ph9-S11**
benzo(ghi)perylene	12	<0.04-1.51	320 (S4UL)	None
aliphatic C5-C6	12	<0.1	42 (S4UL)	None
aliphatic C6-C8	12	<0.1	100 (S4UL)	None
aliphatic C8-C10	12	<0.1	27 (S4UL)	None
aliphatic C10-C12	12	<0.2	130 (S4UL)	None
aliphatic C12-C16	12	<4	1100 (S4UL)	None
aliphatic C16-C21	12	<7	5000 (S4UL)	None
aliphatic C21-C35	12	<7-11	5000 (S4UL)	None

Contaminant	Samples	Range of Concentrations (mg/kg unless stated)	Residential Use	
			Screening criteria (mg/kg unless stated)	Exceedances
aromatic C5-C7	12	<0.1	70 (S4UL)	None
aromatic C7-C8	12	<0.1	130 (S4UL)	None
aromatic C8-C10	12	<0.1	34 (S4UL)	None
aromatic C10-C12	12	<0.2-0.3	74 (S4UL)	None
aromatic C12-C16	12	<4	140 (S4UL)	None
aromatic C16-C21	12	<7-20	260 (S4UL)	None
aromatic C21-C35	12	<7-97	1100 (S4UL)	None
benzene	12	<0.005	0.08 (S4UL)	None
toluene	12	<0.005	130 (S4UL)	None
ethylbenzene	12	<0.005	47 (S4UL)	None
o-xylene	12	<0.005	60 (S4UL)	None
m-xylene	12	<0.005	56 (S4UL)	None
p-xylene	12	<0.005	56 (S4UL)	None
methyl tert butyl ether	12	<0.005	-	None

Notes to table:

S4UL: Suitable For Use Levels published by Chartered Institute of Environmental Health and Land Quality Management Ltd, residential with plant uptake scenario (1% SOM); copyright Land Quality Management Ltd reproduced with permission publication number S4UL3102. All rights reserved.

GAC: Generic Assessment Criteria published by CL:AIRE for human health risk assessment for a residential scenario with consumption of homegrown produce (1% SOM).

C4SL: Category 4 Screening Levels published by CL:AIRE (C4SLs); 'residential without home grown produce land use' (at 1% SOM)

4.6.6. Exceedances were limited to very minor elevated benzo(a)pyrene within sample S4 with a concentration of 2.22 mg/kg compared to the criteria of 2.2 mg/kg and dibenzo(ah)anthracene with concentrations of 0.28 mg/kg (criteria of 0.24 mg/kg) within both S4 and S11.

4.6.7. PAH ratio analysis was completed on the exceeded samples to determine the source of the very minor elevated PAHs, a copy of the plot is provided in Appendix B. Source identification confirms a coal signature and no anthropogenic materials such as ash or clinker were observed within S4, whilst fragments of tarmac were recorded within S11. Source identification indicates a likely low-bioavailability due to the sequestration of PAHs within a carbon or vitrified matrix and benzo(a)pyrene was well below the DEFRA C4SL of 5 mg/kg for garden soils. The minor PAH exceedances are therefore unlikely to represent an unacceptable risk to human health. Similarly, no such deposits were observed following a walkover of surface formation soils following topsoil removal.

4.7. Validation of Imported Aggregate

4.7.1. Dorchester Living have imported two stockpiles of aggregate for intended use within the proposed development and instructed SGP to verify in accordance with the Strategy. These are referred to as AGG-SP1 (300m^3) and AGG-SP2 (600m^3). The source of these materials is unknown.

4.7.2. SGP were also instructed to sample a third stockpile (AGG-SP3) with a volume of approximately 6,000m^3. This did not consist of imported aggregate but was generated from the processing of recovered hardstanding from within the wider Heyford Park development. This stockpile was used for the backfilling of the hotspot remediation excavation as described in Section 3.2.

4.7.3. Representative samples were collected and submitted for an asbestos screen to Chemtest laboratories (ref. 21-05371) and bulk samples for geotechnical testing were submitted to i2Analytical (ref. 21-57487) at the request of DL.

4.7.4. A summary of these stockpiles, the testing undertaken, and sampling frequencies are presented in the table below:

Table 4.8 Summary of validated imported aggregate

Stockpile Ref	Approximate Volume (m^3)	No. Asbestos Tests	Sampling Frequency	No. Geotech Tests	Sampling Frequency#
AGG-SP1	300	2	1 per 150m^3	1	1 per 300m^3
AGG-SP2	600	1*	1 per 600m^3	1	1 per 600m^3
AGG-SP3	6,000	12	1 per 500m^3	2	1 per 3,000m^3

**One sample lost during transit to laboratory.*
#No frequency for geotechnical testing under approved Strategy. Sampled as instructed by client.

4.7.5. Sampling frequencies were undertaken in accordance with the approved Strategy at a frequency of 1 sample per 500m^3 with exception of AGG-SP2 as one of the samples was lost during transit to the laboratory, however the total volume of material is only marginally above the sampling limit. Composite sampling was also undertaken so it is considered that a representative sample of the material has been completed. The requirement or frequency of geotechnical sampling of aggregates was not specified within the Strategy and so testing was completed as per client's request. A summary of the asbestos screening is provided below:

Table 4.9 Asbestos Screening Summary for Imported Aggregate

Stockpile Ref,	Lab Ref	Asbestos Identification
AGG-SP1	21-05371 (AGG-SP1-S1 to - SP2)	NAD
AGG-SP2	21-05371 (AGG-SP2-S2)	NAD
AGG-SP3	21-05371 (AGG-SP3-S1 to -SP12)	NAD

4.7.6. No asbestos was reported within either of the imported aggregates or within the processed material from the wider Heyford Park.

4.8. Validation of Phase 9 Generated Aggregate

4.8.1. No hardstanding has been recovered from Phase 9 given the undeveloped nature of the site, however aggregates produced from recovered hardstanding within the wider Phase 9 area

have undergone verification testing and the findings are included within this report to allow the developer to reuse within the site if required.

4.8.2. Three stockpiles of aggregate have been generated from recovered hardstanding in the wider Phase 9 area and included 195m^3 recovered from Phase 8. The approximate volume of the stockpiles at the time of sampling and the completed test frequencies are summarised in the table below, however testing is on-going pending completion of the processing of the recovered hardstanding. Finalised volumes and updated test results will be provided within the forthcoming Phase 9 Completion Report.

Table 4.10 Summary of Phase 9 generated aggregate

Stockpile Ref	Approximate Volume (m^3)	No. Asbestos Tests	Sampling Frequency	No. Geotech Tests	Sampling Frequency#
Ph9-AGG-1	1,000	2	1 per 500m^3	1	1 per 1000m^3
Ph9-AGG-2	5,000	10	1 per 500m^3	3	1 per 1,666m^3
Ph9-AGG-3	3,000	6	1 per 500m^3	4	1 per 750m^3

#No frequency for geotechnical testing under approved Strategy. Sampling as instructed by client.

4.8.3. Sampling frequencies for asbestos identification (lab ref. 21-11321, 21-13303, 21-14505 & 21-16265) were undertaken in accordance with the approved Remediation Strategy at a frequency of 1 sample per 500m^3. The requirement or frequency of geotechnical sampling of aggregates was not specified within the Strategy and so testing was completed as per the client's request.

Table 4.11 Asbestos Screening Summary for Phase Generated Aggregate

Stockpile Ref,	Lab Ref	Sample	Asbestos Identification	Asbestos Concentration (%)	ACM Identification
Ph9-AGG-1	21-11321	Agg-060421-S1	NAD		
		Agg-060421-S2	NAD		
Ph9-AGG-2	21-13303 & 21-14505	Ph9-Agg2-S1	Yes	0.009	Chrysotile – fibre / clumps
		Ph9-Agg2-S2	Yes	<0.001	Chrysotile – fibre / clumps
		Ph9-Agg2-S3	NAD		
		Ph9-Agg2-S4	Yes	<0.001	Chrysotile – fibre / clumps
		Ph9-Agg2-S5	NAD		
		Ph9-Agg2-S6	NAD		
		Ph9-Agg2-S7	NAD		
		Ph9-Agg2-S8	NAD		
		Ph9-Agg2-S9	Yes	<0.001	Chrysotile – fibre / clumps
		Ph9-Agg2-S10	NAD		
Ph9-AGG-3	21-1405 & 21-16265	Ph9-Agg3-S1	NAD		
		Ph9-Agg3-S2	NAD		
		Ph9-Agg3-S3	NAD		
		Ph9-Agg3-S4	NAD		
		Ph9-Agg3-S5	Yes	0.008	Chrysotile – fibre / clumps

Stockpile Ref,	Lab Ref	Sample	Asbestos Identification	Asbestos Concentration (%)	ACM Identification
		Ph9-Agg3-S6	Yes	<0.001	Chrysotile – fibre / clumps

4.8.4. No asbestos was detected in Ph9-Agg-1 whilst positive incidences of chrysotile fibre/clumps were reported in 4 out of 10 samples from Ph9-Agg-2 and 2 out of 6 samples from Ph9-Agg-3. Following a positive identification, quantification was scheduled to determine the mass of asbestos present. Concentrations were generally below detection limits (<0.001%), however two samples, one from each stockpile was recorded a mass at 0.008% (Ph9-Agg-3) and 0.009% (Ph9-Agg-2). This signified the requirement for further assessment to assess the suitability for use of the aggregate within the development. Even though feedstock materials were inspected by URL for ACM prior to crushing, it is envisaged that the most likely source of the contamination was discrete deposits of ACM within recovered structures.

4.8.5. The ACM present within the aggregate has been confirmed by the laboratory analysis as chrysotile fibres (fibres / clumps). As the asbestos was detected in a loose form and has therefore already degraded from its former matrix, it is considered to be in the state with the highest amount of respirable fibres (CIRIA C733[1]). The influence on soil type can also affect fibre release with granular soils (sands and gravels) resulting in a higher airborne fibre count following disturbance compared to clay soils[1]. As the material is question is aggregate (i.e., gravel), a high proportion for airborne release of fibres can therefore be assumed.

4.8.6. The main receptors considered are adult workers during the movement and placement of aggregate as either general fills or placement as piling mats below permanent structures (plots) and within road boxes. The aggregate within stockpiles Ph9-Agg-2 and Ph9-Agg-3 is not suitable for placement within service corridors where disturbance during maintenance works could occur. The isolation of aggregate under permanent structures, outside service corridors, and outside the top 600mm of garden soils is unlikely to result in exposure to future site occupants or maintenance workers. During construction phase works, exposure is likely to occur during the disturbance and movement of aggregate.

4.8.7. Even though the sensitivity of the site is considered to be high (residential), due to the isolation of the material beneath future permanent structures, hardstanding or at a depth as general fill, where required, this will greatly limit the pathway for future exposure. For this assessment to remain valid, and in accordance with the requirement to maintain exposure to asbestos to levels which are as low as reasonably practicable, aggregate from stockpiles Ph9-Agg-2 and Ph9-Agg-3 must be excluded from the upper 600mm of private garden areas or upper 300mm within areas of public open space / landscaping.

[1] CIRIA (C733). Asbestos in soil and made ground.

4.8.8. It is therefore considered that the site generated aggregate is suitable for its understood, intended purpose, although appropriate control measures in accordance with CAR2012 should be employed during the initial placement of the material within the development to minimise the level of exposure to site workers. Such measures are anticipated to include dust suppression during disturbance / placement works.

5. Post-Remediation Vapour Monitoring

5.1. POL Pipeline Contamination Hotspot – Post-Remediation Vapour Monitoring

5.1.1. Due to the presence of some residual contamination remaining, either associated with localised areas of impacted bedrock which could not be removed (no requirement under the Strategy to remediate bedrock) or the limitations associated with removal of soils along the northern boundary, post-remediation vapour monitoring was undertaken to assess whether there are any residual risks from vapours.

5.1.2. Installations for the monitoring of VOCs were constructed on 06.04.21 with a modification to British Standard BS8576:2013[2] (Section 10.2.3) and were located on an approximate 18m spacing within the remediated hotspot area as indicated on Drawing D02. Due to the presence of compacted aggregate following the backfilling of the excavation, the installation of shallow monitoring wells through the use of a drilling rig was not considered feasible and so monitoring probes were installed within trial-pits. This involved the excavation of a narrow trial-pit to 1m depth and a 1.5m long steel vapour probe was then placed into the pit along the sidewall within a larger diameter drainage pipe. The pit was carefully backfilled with 10mm single-sized stone gravel placed down the drainage pipe to provide a 0.5m permeable fill packing around the response zone of the probe; the remaining 0.5m to ground level was then backfilled with the remaining trial-pit arisings and compacted. The drainage pipe was then removed, leaving the vapour probe in place with approximately 0.5m remaining above ground level. An annulus of hydrated bentonite pellets was then compacted at the surface to provide a sufficient seal between the probe and surrounding ground.

5.1.3. Two probes (V1 and V4) were installed along the northern extent of the remediation excavation where some residual contamination remains. The remaining entries were spaced out to provide coverage across the central and lateral extents of the remediated area.

5.1.4. Following installation of the probes, passive diffusion tubes (provided by Gradko International Ltd.) with appropriate adsorption media for volatile aliphatic and aromatic hydrocarbons (<C16 and BTEX) were secured to the probe caps and sealed with PTFE tape. The diffusion tubes were then left in-situ for a period specified by the laboratory (3 weeks) to allow sufficient adsorption of determinants and achieve a suitable limit of detection (LOD) for comparison with assessment criteria.

5.1.5. A travel blank (to check for cross-contamination which remained sealed) and an external tube to provide background concentrations located along the eastern site boundary were also used during the monitoring period.

[2] BS 8576:2016 Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs)

5.1.6. Diffusion tubes were left in-situ for a period of 3 weeks before collection on 28.04.21 and were couriered to Gradko International Ltd. for analysis (lab ref. P03089R)

5.2. Derivation of Inhalation Assessment Criteria

5.2.1. To determine whether concentrations of the contaminants of concern were present at levels which may pose a risk to human health, derivation of assessment criteria was carried out.

5.2.2. The methodology for deriving assessment screening criteria for health impacts from VOCs at the receptor is set out in Appendix 9 of the VOC handbook[3]. Tolerable Daily Soil Intake values or Index Doses (for non-carcinogens and carcinogens respectively) are multiplied by the body weight (13.3 kg) and divided by the inhalation rate (8.8 m^3/day) of a child receptor as defined in the most recent published UK guidance (DEFRA C4SL). Most of the substances under consideration have toxicological inhalation data published in the "LQM/CIEH S4ULs for Human Health Risk Assessment" (S4UL) - *Copyright Land Quality Management Limited reproduced with Permission* or CL:AIRE "Soil Generic Assessment Criteria for Human Health Risk Assessment".

5.2.3. TDIs and / or IDs used in the determination of inhalation assessment criteria are summarised in the table below:

Table 5.1. Derived Inhalation Assessment Criteria

Contaminant	Index Dose/Tolerable Daily Intake (µg/kg.bw.day^{-1})	Assessment Criteria (µg.m^3)
Benzene	1.4 (S4UL)	2.12
Toluene	1400 (S4UL)	2,115.91
Ethylbenzene	74.3 (S4UL)	112.29
m/p-xylene	60 (S4UL)	90.68
o-xylene	60 (S4UL)	90.68
Aliphatic Hydrocarbons (C56-C6)	5000 (S4UL)	7,556.82
Aliphatic Hydrocarbons (C6-C8)	5000 (S4UL)	7,556.82
Aliphatic Hydrocarbons (C8-C10)	290 (S4UL)	438.3
Aliphatic Hydrocarbons (C10-C12)	290 (S4UL)	438.3
Aliphatic Hydrocarbons (C12-C16)	290 (S4UL)	438.3
Aromatic Hydrocarbons (C5-C7)*	Benzene	Benzene
Aromatic Hydrocarbons (C7-C8)*	Toluene	Toluene
Aromatic Hydrocarbons (C8-C10)	60 (S4UL)	90.68
Aromatic Hydrocarbons (C10-C12)	60 (S4UL)	90.68
Aromatic Hydrocarbons (C12-C16)	60 (S4UL)	90.68

**Aromatic C5-C7 and C7-C8 correspond to benzene and toluene. As BTEX analysis has been undertaken repetition of these results in the aromatic fraction have not been reported.*

[3] CIRIA C682: The VOCs Handbook: Investigating, assessing and managing risks from inhalation of VOCs at land affected by contamination 2009

5.2.4. The assessment criteria are inherently conservative as they assume long-term, constant exposure of residents over 24hr periods, 365 days a year and a continuous source which does not diminish over time. However, for the most vulnerable receptors, infants and small children, significant amounts of time spent within dwellings may be anticipated.

5.3. Vapour Risk Assessment

5.3.1. Comparison of soil-vapour concentrations determined through diffusion tube monitoring are compared to the derived inhalation assessment criteria in the table below. The Gradko laboratory report is provided in Appendix C.

Table 5.2. Derivation of Assessment Criteria and Comparison to Soil-Vapour Concentrations

Contaminant	Assessment Criteria (µg/m^3)	Soil-Vapour Range of concentrations (µg/m^3)	Exceedances
Benzene	2.12	<0.7-1.6	None
Toluene	2,115.91	<0.6-1.7	None
Ethylbenzene	112.29	<0.5-0.6	None
m/p-xylene	90.68	<0.5-2.2	None
o-xylene	90.68	<0.5-0.9	None
Aliphatic Hydrocarbons (EC6-8)	7,556.82	<0.7-77	None
Aliphatic Hydrocarbons (EC8-10)	438.3	<0.7-85	None
Aliphatic Hydrocarbons (EC10-12)	438.3	<0.7-3.4	None
Aliphatic Hydrocarbons (EC12-16)	438.3	<0.7-3.5	None
Aromatic Hydrocarbons (EC5-7)	As Benzene	As Benzene	None
Aromatic Hydrocarbons (EC7-8)	As Toluene	As Toluene	None
Aromatic Hydrocarbons (EC8-10)	90.68	<0.4-3.9	None
Aromatic Hydrocarbons (EC10-12)	90.68	<0.7-16	None
Aromatic Hydrocarbons (EC12-16)	90.68	<0.7-11	None

5.3.2. No exceedances of the derived assessment criteria were reported for any of the BTEX compounds or the aliphatic / aromatic hydrocarbon fractions.

6. Conclusions and Recommendations

6.1. Conclusions

6.1.1. Formation surfaces, site won topsoil, and both imported and generated aggregated (generated from wider Phase 9 area but for potential reuse on the site) have been inspected and sampled by SGP in accordance with the approved Remediation Strategy. The types of materials encountered during the additional assessment and remediation works carried out on the Phase 9 baseball pitch were consistent with those described in the site characterisation.

Topsoil

6.1.2. URL stripped the site topsoil and recovered approximately 3,700m^3 down to natural and/or reworked natural formation soils. Sampling of the topsoil was carried out in-situ prior to the preparatory works as well as the sampling and recording of the 400mm of underlying formation soils. Sampling of the topsoil achieved the stipulated testing frequency of 1 sample per 500m^3 with 1 minor exceedance reported within the 9 samples associated with arsenic. Statistical analysis confirms this is an outlier and is not representative of the wider soils and concludes that the topsoil is suitable for reuse as garden soils, although this is subject to regulatory approval.

Formation Soils

6.1.3. Minor exceedances of the PAHs benzo(a)pyrene (BaP) and dibenzo(ah)anthracene were reported within two of the in-situ formation soils. Ratio analysis to determine the source of the PAHs confirmed a coal signature and whilst no anthropogenic materials were observed in one of the exceeding samples, fragments of tarmac were observed in the other sample (S11) during sampling; however, inspection of formation soils since the removal of topsoil did not identify any anthropogenic materials other than occasional brick fragments. Residual exceedances for BaP were also significantly below the DEFRA C4SL for garden soils of 5 mg/kg. Both DCLG and NHBC have confirmed that they consider C4SLs as useful in assessing the suitability of soils for planned residential land uses. This report concludes given the minor exceedances and the source confirmation which is of a low bioavailability (due to the sequestration of the PAHs with a carbon or vitrified matrix) then the formation soils are suitable for retention in garden areas. A 600mm soil cover system is therefore not required across the site but is limited to the area of the backfilled remedial excavation (see 6.1.8).

Aggregates

6.1.4. The developer has imported approximately 900m^3 of imported aggregate with circa 6,000m^3 sourced from the wider Heyford development (currently stockpiled within the wider Phase 9 area) which has been partially utilised in the backfilling of the remediation hotspot excavation. Sampling was completed at the prescribed frequency of 1 per 500m^3 for asbestos with no asbestos present in any of the samples tested.

6.1.5. No site-generated aggregate was produced from the baseball pitch given the absence of any structures / hardstanding, however testing of aggregates generated from the wider Phase 9 were undertaken to assess the suitability for reuse on the baseball pitch development. Three stockpiles (SP1, SP2 and SP3) were produced with a total volume of 9,000m^3 at the time of sampling, testing was undertaken for asbestos identification at a frequency of 1 per 500m^3. No asbestos was detected in SP1, however low-level fibres were reported within SP2 (non-detect to 0.009%) and SP3 (non-detect to 0.008%). Aggregate from SP2 and SP3 should not be used as backfill within service corridors but is considered suitable for use below permanent structures (plots, drives, roads etc.) where future disturbance is highly unlikely. Appropriate mitigation measures should be deployed during the movement of the aggregate to reduce the likelihood of residual fibre mobilisation and to maintain exposure to asbestos to levels which are as low as reasonably practicable.

Hydrocarbon Hotspot

6.1.6. A hydrocarbon hotspot was identified as part of supplementary investigation works undertaken by SGP and remediated in accordance with the Remediation Strategy. Approximately 2,604m^3 of fuel impacted soils were removed from the hotspot area and have been temporarily stockpiled pending re-profiling into windrows to allow a period of natural attenuation before further sampling to assess contaminant levels and make appropriate recommendations on the suitability for reuse. At present, these materials are stockpiled within a lined quarantine area within the wider Phase 9 site and will be subject to further assessment and reporting at a later date.

6.1.7. Validation sampling of the base and sidewalls of the remediation excavation were undertaken in accordance with the Strategy with only 3 of 48 samples reported exceedances of the assessment criteria. These were considered minor exceedances and were largely associated within part of the northern sidewall where removal was constrained due to a footpath and retained trees.

6.1.8. Infilling of the remediation excavation as per the URL as-built surveys was completed using aggregate from a validated stockpile of aggregate within Phase 9. Whilst testing was completed for asbestos (none present), no chemical testing was undertaken, as such any garden areas (Plots 513-516 and 549-554) which extend across the backfilled remediated area should consist of 600mm of clean imported soils.

Vapour Assessment

6.1.9. Vapour monitoring was undertaken following removal of the hotspot to assess whether residual contamination associated with either the underlying bedrock or area of retained, impacted soils in the northern sidewall which could not be removed. No exceedances of derived inhalation criteria were reported concluding there is no risk to future occupants from residual vapours.

Water Main Risk Assessment

6.1.10. A risk assessment with regards to water pipelines may be required by the utility provider. This should be undertaken utilising the information provided within this report and supplemented as appropriate by other reporting pertaining to the site.

Sulphates and Concrete

6.1.11. No specific testing has been undertaken for potentially aggressive conditions to concrete. Reference should be made to the preceding site investigation reports.

6.2. Recommendations

6.2.1. To secure completion of remediation in the Phase 9 baseball pitch in accordance with the Remediation Strategy, the developer is required to complete the following actions subject to regulatory approval of this report:

- Placement of clean topsoil to a nominal depth of 150-200mm within all garden areas outside the backfilled remediation excavation.

- Placement of 600mm clean validated soils within the rear gardens of Plots 513-516 and 549-554 and independent depth validation at a frequency of 1 entry per 3 plots.

- Site-won materials to be used as the garden / landscape clean soil cover must be suitable for use and validated to comply with contamination targets set out in Table 3.3 of the Remediation Strategy at the rate of 1 sample per 500m^3.

- Imported soils used for cover purposes are to comply with contamination targets set out in Table 3.3 of the Remediation Strategy at the rate of 1 sample per 250m^3 (minimum 3 samples per single source).

6.2.2. With the adoption of the above normal practices for Brownfield development, and on the information available to it, SGP concludes that the preparatory remedial works have been completed in accordance with the agreed strategy. In the event that any previously undisclosed contamination or suspect materials are identified then this should be assessed by an appropriately qualified and experienced person.

6.3. Limitations

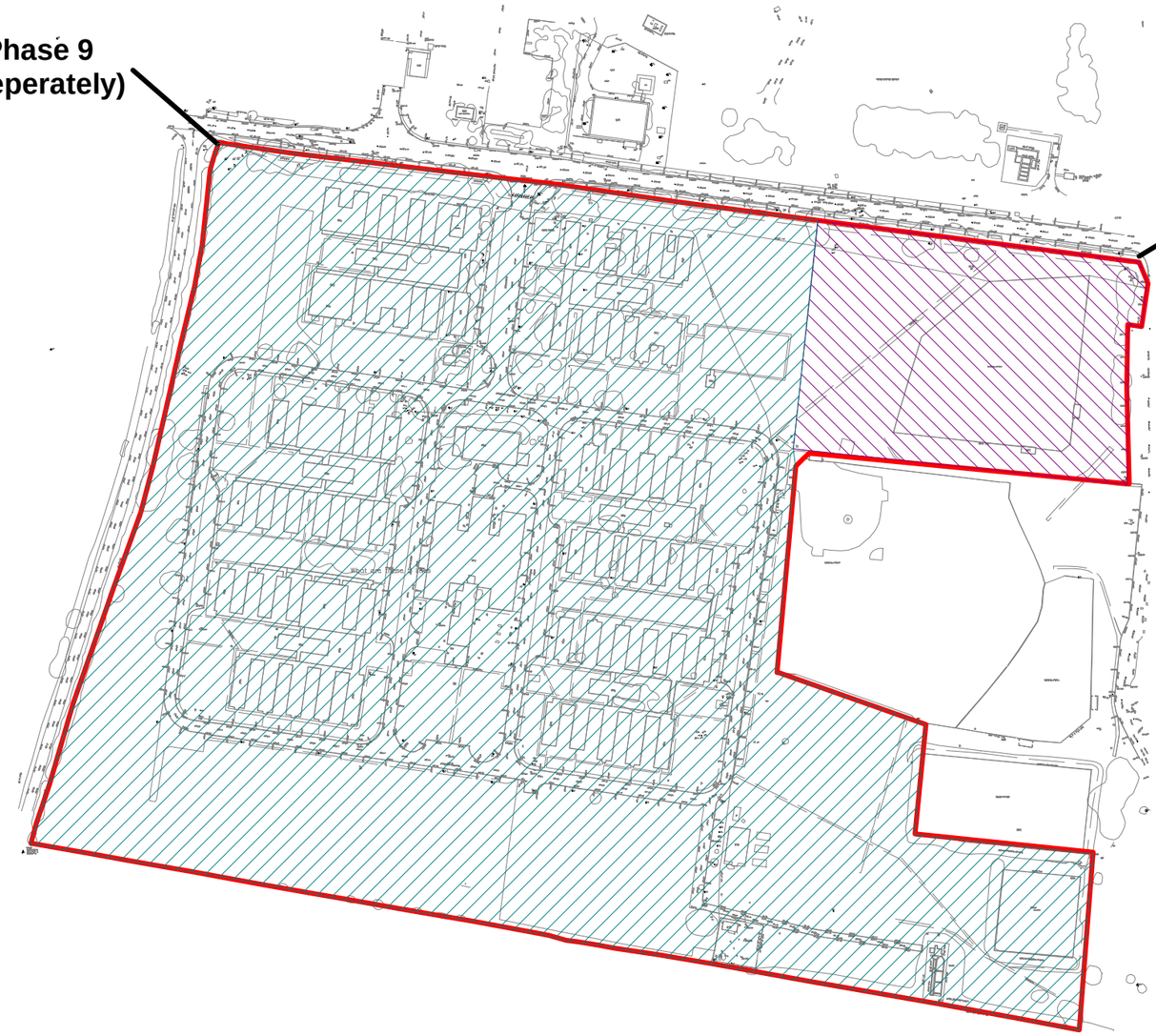
6.3.1. SGP reserves the right to alter any of the foregoing information in the event of new information being disclosed or provided and in the light of changes to legislation, guidelines and responses by the statutory and regulatory authorities.

6.4. This report has been prepared by Smith Grant LLP, for the sole and exclusive use of Urban Regen Ltd. and Dorchester Living, and the benefit of this report may not be assigned to any third party without the prior agreement in writing of Smith Grant LLP.

6.5. 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

Remainder of Phase 9
(to be reported seperately)



Phase 9 Baseball Pitch
R1742b-R22

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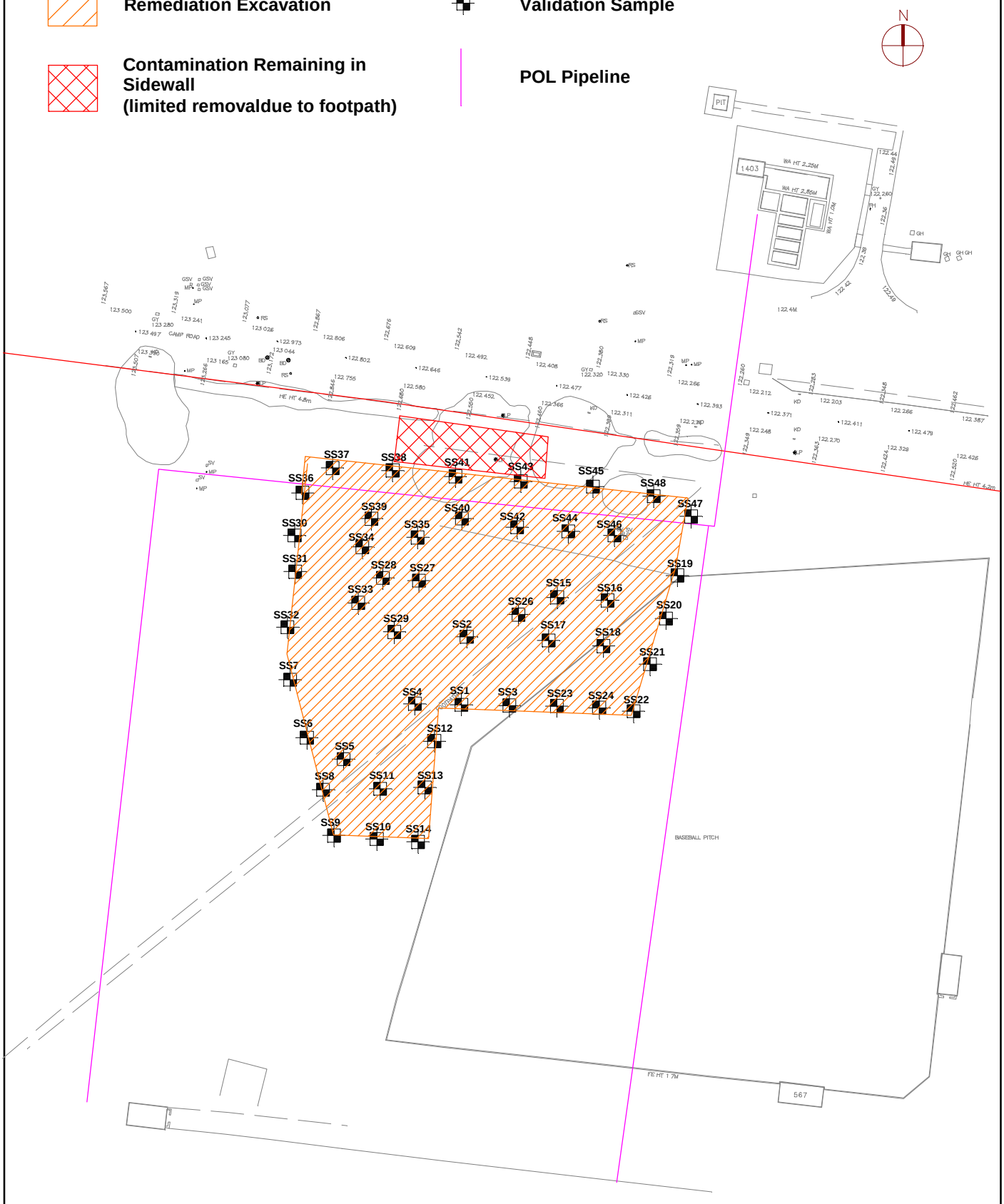
Project: Heyford Park: Phase 9	
Drawing: Site Boundary	
Drawn: DW	Checked: BJT
Date: 04.05.21	Scale: 1:2,500 @ A3
Job No: R1742d	Drg No: R22-D01

Remediation Excavation

Validation Sample

Contamination Remaining in Sidewall (limited removaldue to footpath)

POL Pipeline



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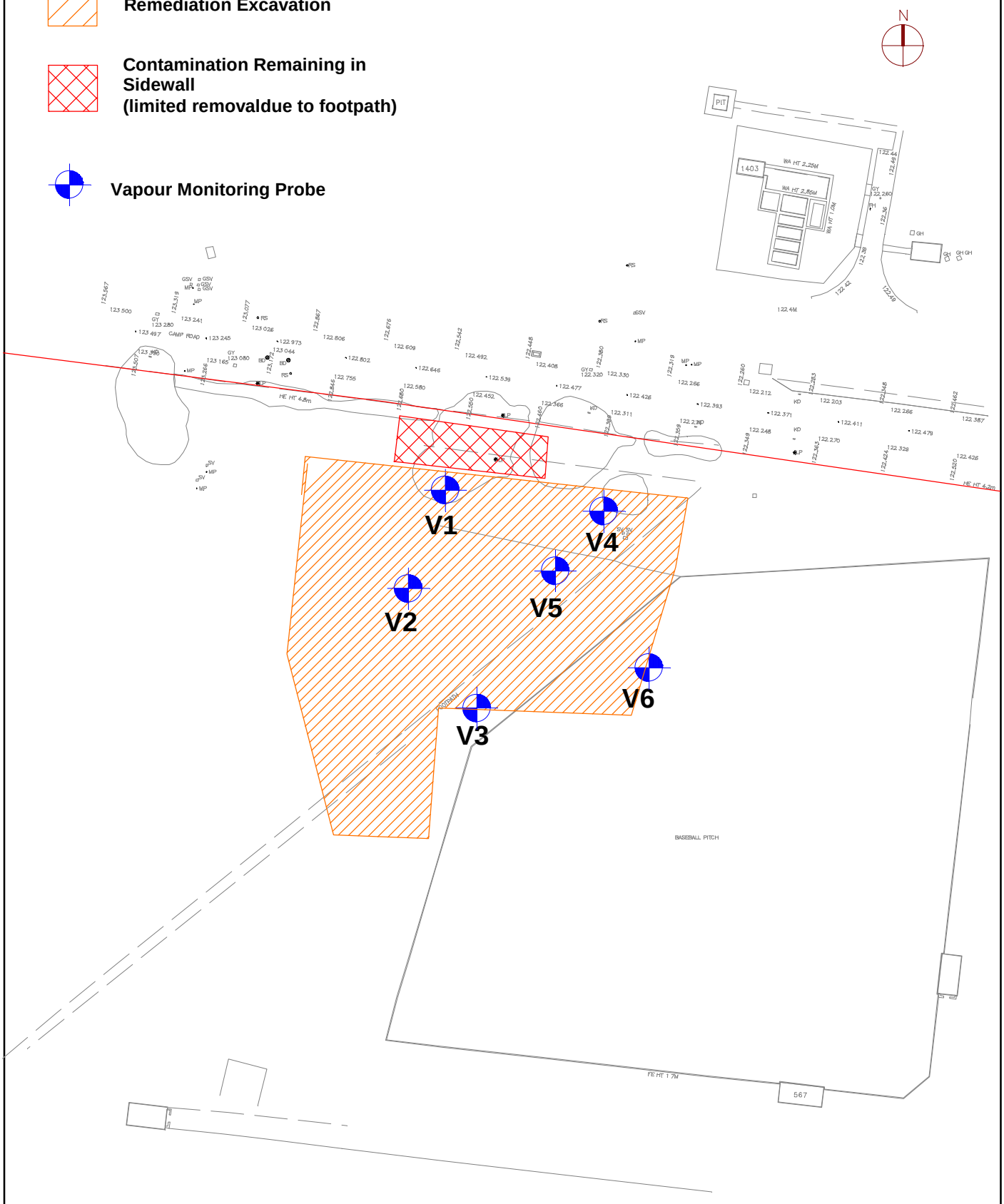
Project: Heyford Park Phase 9		Drawn: DW	Checked: BJT
		Date: 14.06.21	Scale: 1:750
Drawing: POL Hotspot Remediation & Validation Samples		Job No: R1742b	Drg No: R22-D02

Remediation Excavation

Contamination Remaining in Sidewall (limited removaldue to footpath)

Vapour Monitoring Probe



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Project: Heyford Park Phase 9		Drawn: DW	Checked: BJT
		Date: 14.06.21	Scale: 1:750
Drawing: Post-Remediation Vapour Monitoring		Job No: R1742b	Drg No: R22-D03

APPENDIX A

Site Photographs

1.

22.05.18 – Southern view across the western end of the baseball pitch

2.

22.05.18 – Western view. Baseball pitch currently a managed area of public open space

3.

22.05.18 – Western view across the northern boundary (Camp Road to right – off photo)

4.

15.12.20 – Eastern view across southern boundary of site

5.

15.12.20 – Northeast view across path which crosses the western end of the site

6.

14.01.21 – Stripping and recovery of topsoil complete. Trenching to delineate extent of impacted area to allow initial recover of clean overburden soils

7.

14.01.21 – Clean soils temporary stockpiled on surface to allow inspection prior to relocation to temporary holding area

8.

14.01.21 – Exposure of POL pipeline in the north. Shallow ingress of groundwater, no sheen, floating product or globules observed.

9.

14.01.21 – Excavation of a series of shallow trial-pits to delineate extent of impacted soils

10.

14.01.21 – Eastern view across the hotspot area with partial recovery of clean surface soils and a series of trial-pits / trenches to delineate extent

11.

14.01.21 – Clean soils temporary stockpile to allow inspection

12.

02.02.21 – View across baseball pitch following stripping and recovery of topsoil

13.

02.02.21 – Excavation of clean overlying soils and removal from remediation area to allow extension down to impacted soils

14.

02.02.21 – Hydrocarbon impacted soils present as dark grey to black gravel beneath clean light brown soils/gravels.

15.

02.02.21 – Horizon of impacted soils visible approximately 1-1.5m below ground level

16.

03.02.21 – Hydrocarbon impacted gravel evident by black colouration

17.

03.02.21 – POL pipeline exposed in the northwest. Wrapping around pipework suggests possible historical repair work

18.

03.02.21 – Backfill of remediation excavation with aggregates

19.

04.02.21 – Removal of clean overlying soils continued south down to impacted soils

20.

04.02.21 – Western extent of contamination following delineation works

21.

08.02.21 – Recovery of clean overlying soils from hotspot area

22.

08.02.21 – Recovery of clean overlying soils from hotspot area. Ingress of shallow groundwater, no sheen, globules or floating product observed.

23.

08.02.21 – Recovery of clean overlying soils from hotspot area

24.

09.02.21 – Exposure of POL pipeline which ran north to south through the centre of the baseball pitch

25.

09.02.21 – Removal of pipeline from remediation excavation

26.

09.02.21 – Removal of clean surface soils from remediation area

27.

09.02.21 – Northeast extent of remediation excavation

28.

09.02.21 – Northern sidewall of remediation excavation absent of any significant contamination indicators suggesting sufficient removal of impacted soils

29.

09.02.21 – Area of contamination (black soils)

30.

09.02.21 – Removal of impacted soils until visual, olfactory indicators absent and low (<10ppm) readings recorded on PID. Base of excavation in northeast onto clay.

31.

10.02.21 – Relict manhole chamber within northeast where impacted soils thin out.

32.

10.02.21 – Recovery of clean surface soils

33.

10.02.21 - Recovery of clean surface soils to allow removal of underlying impacted soils.

34.

10.02.21 – Light grey soils below light brown visible denote fuel impacted soils.

35.

16.02.21 – Backfilling of remediation excavation with aggregate concurrently with removal of impacted soils

36.

16.02.21 – Removal of impacted soils down to bedrock. Ingress of groundwater at surface of bedrock, no sheens observed.

37.

16.02.21 – Black / dark grey soils above bedrock shown thickness of impacted soil horizon

38.

17.02.21 – Collection ofvalidation samples at the base of the remediation excavaion

39.

17.02.21 -. Completed extent of remediation excavation in the north / northwest. Base and sidewalls ready for validation samples to be collected

40.

17.02.21 - Backfill of remediation excavation immediately following the collection of samples due to the ingress of groundwater

41.

17.02.21 - Residual pocket of impacted soil awaiting removal

42.

18.02.21 – Removal of clean overburden from northern extent of remediation excavation

43.

18.02.21 – Grey impacted soils awaiting removal following removal of clean overburden. Pipework in sidewall drainage pipe and not POL pipeline

44.

18.02.21 – Removal of impacted soils down to layer of clean clay above shallow bedrock

45.

18.02.21 – Northern extent of remediation excavation due to the presence of trees with protection orders

46.

18.02.21 – Impacted soils appear to extend north towards Camp Road beyond the accessible extent of remediation

47.

18.02.21 – Northern extent of hotspot remediation prior to backfill

48.

06.04.21 – Vapour probe installed within footprint of remediation excavation

49.  06.04.21 – Concrete collars placed over monitoring probes to protect during monitoring period	No Photo

APPENDIX B

Topsoil & Formation Validation Report
(ref. R1742b-L07; August 2018)

Contaminated Land
Air Quality
Environmental Audit

SMITH GRANT
Environmental Consultancy
LLP

Partnership No: OC 300776

Our ref: R1742B-L07
Your ref:

07th August 2018

Andy Walker
Urban Regen
23 Springvale
Bolton
BL7 0FS

by e-mail: andy.walker@urbanregen.co.uk

Dear Andy

Upper Heyford – Dorchester Phase 9 – Basketball Pitch
Supplementary Site Investigation

SGP have been instructed to produce a validation report for a parcel of land formerly occupied by a baseball pitch associated with RAF Heyford which is currently utilised as a public open space for recreational use. This parcel of land forms the north-west corner of the wider Phase 9 area (see Drawing D01).

The site is part of a wider area covered by a Hydrock Remediation Strategy (ref. HPW-HYD-PX-REM-RP-GE-3000-P1-S2, April 2017) which states that a site wide engineered cover system is required to comprise of a 200mm hard dig layer, geotextile and 400mm clean soil cover. At present it is unknown whether the Strategy has been approved, however it is proposed that a revised Strategy to cover the Phase 9 area is appropriate given the absence of made ground in some locations and that the made ground consists largely of placed uncontaminated natural soils. These remedial recommendations are consistent with those made with the approved Remediation Strategy (R1742-R01-v3) which covers other phases of the Heyford Park New Settlement Area. This report has therefore been produced to satisfy the proposed remedial recommendations.

No potential contaminative activities such as the storage of fuels (ASTs, USTs, boiler house etc.) was identified within previous reporting with historical mapping confirming the site remained undeveloped until the construction of a baseball pitch sometime between 1979 and 1992.

Given the effective Greenfield history of the site it may be underlain by natural soils or made ground comprising of reworked natural soils, negating the requirement for an engineered cover system.

In-situ sampling was therefore completed to ascertain whether the natural soils were suitable for retention within shallow garden soils and to also determine the extent and chemistry of shallow made ground soils present across the site.

<u>In-situ Topsoil Testing</u>
It is a requirement under the Hydrock Strategy that site won soils are sampled at a minimum test frequency of 1 sample per 250m^3, however proposed recommendations under a revised Strategy and in line with previous remedial works within the Heyford development specify testing of site won soils at a frequency of 1 per 500m^3.

Assuming an approximate site area of 14,650m^2 and a nominal topsoil thickness of 0.3m, this equivalates to an approximate volume of 4,395m^3. Sampling was carried out in-situ with the proposed

sampling frequency of 1 sample per 500m^3 resulting in the collection of 9 samples (achieving a frequency of 1 per 488m^3) to assess the potential for recovery and reuse within the development.

Samples were collected by SGP and were placed in appropriate laboratory-provided containers and stored in cooled boxes. Samples submitted for chemical analysis were delivered to Exova-Jones Environmental Ltd (EJEL) within 24 hours of collection and samples for asbestos screen were sent to Chemtest within 48 hours of collection. SGP retains chain of custody documentation.

The results of the soil analyses are compared to human health critical values (CVs) for initial screening purposes. The CVs adopted are appropriate to the environmental setting and proposed future residential use of the site and are taken primarily from the LQM / CIEH Suitable for Use Levels (S4ULs) which are used to define land that is 'not contaminated'. These a derived for a sandy loam soil; reference is initially made to the S4ULs derived for a soil with 1% organic matter as a conservative assumption for screening purposes.

The Defra Category 4 Screening Level (C4SL) for lead in soils under residential land-use has been utilised to allow an initial screening for risk to human health. This is intended to demonstrate that land is definitely not Contaminated Land as defined under Part IIA of the Environmental Protection Act. The adoption of the C4SL in a planning scenario has not been universally accepted, however in the absence of other generic screening criteria for lead following the withdrawal of the SGV by the EA it is considered appropriate to utilise the screening criterion.

Chemical laboratory certificate (18-7823) and asbestos laboratory certificate (18-14613) are attached. Results are summarised in the table below and are compared to assessment criteria for garden cover soils as per above.

It is noted that published criteria have been utilised to reflect those proposed within a revised Strategy with some values differing slightly from those within the current Hydrock Strategy.

Table 2. Analysis Summary for in-situ Topsoil

Contaminant	Samples	Range of Concentrations (mg/kg unless stated)	Residential Use	
			Screening criteria (mg/kg unless stated)	Exceedances
SOM	9	1.5-3.8	-	None
pH	9	7.74-8.25	-	None
asbestos fibre*	9	NAD	<0.001%	None
antimony	9	2-5	550 (GAC)	None
arsenic	9	15.2-52.1	37 (S4UL)	**(1): Ph9-S9A**
barium	9	59-107	1300 (GAC)	None
beryllium	9	0.9-3.0	1.7 (S4UL)	**(1): Ph9-S9A**
cadmium	9	0.1-0.2	11 (S4UL)	None
chromium	9	36.9-82.2	910 (S4UL)	None
chromium IV	9	<0.3	6 (S4UL)	None
cobalt	9	7.6-13.6	-	None
copper	9	10-29	2400 (S4UL)	None
lead	9	17-88	200 (C4SL)	None
mercury	9	<0.1	170 (S4UL)	None
molybdenum	9	1.5-2.3	670 (GAC)	None
nickel	9	18.3-51.50	180 (S4UL)	None

Contaminant	Samples	Range of Concentrations (mg/kg unless stated)	Residential Use	
			Screening criteria (mg/kg unless stated)	Exceedances
selenium	9	<1-2	250 (S4UL)	None
vanadium	9	52-119	410 (S4UL)	None
water soluble boron	9	0.9-2.9	290 (S4UL)	None
zinc	9	64-174	3700 (S4UL)	None
naphthalene	9	<0.04	2.3 (S4UL)	None
acenaphthylene	9	<0.03	170 (S4UL)	None
acenaphthene	9	<0.05	210 (S4UL)	None
fluorene	9	<0.04	170 (S4UL)	None
phenanthrene	9	<0.03-0.26	95(S4UL)	None
anthracene	9	<0.04-0.09	280 (S4UL)	None
fluoranthene	9	0.09-0.95	2400 (S4UL)	None
pyrene	9	0.09-0.87	620 (S4UL)	None
benzo(a)anthracene	9	0.06-0.59	7.2 (S4UL)	None
chrysene	9	0.06-0.46	15 (S4UL)	None
benzo(bk)fluoranthene	9	0.11-1.09	-	-
benzo(a)pyrene	9	0.06-0.59	2.2 (S4UL)	None
indeno(123cd)pyrene	9	0.04-0.44	27 (S4UL)	None
dibenzo(ah)anthracene	9	0.04-0.09	0.24(S4UL)	None
benzo(ghi)perylene	9	0.04-0.4	320 (S4UL)	None
aliphatic C5-C6	9	<0.1	42 (S4UL)	None
aliphatic C6-C8	9	<0.1	100 (S4UL)	None
aliphatic C8-C10	9	<0.1	27 (S4UL)	None
aliphatic C10-C12	9	<0.2	130 (S4UL)	None
aliphatic C12-C16	9	<4	1100 (S4UL)	None
aliphatic C16-C21	9	<7	5000 (S4UL)	None
aliphatic C21-C35	9	<7	5000 (S4UL)	None
aromatic C5-C7	9	<0.1	70 (S4UL)	None
aromatic C7-C8	9	<0.1	130 (S4UL)	None
aromatic C8-C10	9	<0.1	34 (S4UL)	None
aromatic C10-C12	9	<0.2	74 (S4UL)	None
aromatic C12-C16	9	<4	140 (S4UL)	None
aromatic C16-C21	9	<7	260 (S4UL)	None
aromatic C21-C35	9	<7	1100 (S4UL)	None
benzene	9	<0.005	0.08 (S4UL)	None
toluene	9	<0.005	130 (S4UL)	None
ethylbenzene	9	<0.005	47 (S4UL)	None
o-xylene	9	<0.005	60 (S4UL)	None
m-xylene	9	<0.005	56 (S4UL)	None
p-xylene	9	<0.005	56 (S4UL)	None
methyl tert butyl ether	9	<0.005		None

Notes to table:

S4UL: Suitable For Use Levels published by Chartered Institute of Environmental Health and Land Quality Management Ltd, residential with plant uptake scenario (1% SOM); copyright Land Quality Management Ltd reproduced with permission publication number S4UL3102. All rights reserved.

GAC: Generic Assessment Criteria published by CL:AIRE for human health risk assessment for a residential scenario with consumption of homegrown produce (1% SOM).

C4SL: Category 4 Screening Levels published by CL:AIRE (C4SLs); 'residential without home grown produce land use' (at 1% SOM)

Two minor exceedances were reported and were limited to a single sample (Ph9-S9A). Arsenic was recorded at 52.1 mg/kg (criteria of 37 mg/kg), and beryllium at 3 mg/kg (criteria of 1.7 mg/kg). In the absence of anthropogenic material, statistical analysis has been carried out on the sample mean, the results are tabulated in the table below:

Table 3. Statistical Analysis of Arsenic and

statistic	arsenic (mg/kg)	beryllium (mg/kg)
criterion	37	1.7
no. of samples	9	9
Grubbs outlier test for highest value (P0.05)	Ph9-S9A (max value 52.1 mg/kg) is an outlier	Ph9-S9A (max value 3.0 mg/kg) is an outlier
arithmetic mean, including outlier	22.42	1.36
upper confidence limit (UCL 0.95) including outlier	39.09 (fail)	2.28 (fail)
arithmetic mean, excluding Ph9-S9A outlier	18.71	1.15
upper confidence limit (UCL 0.95) excluding Ph9-S9A outlier	23.26 (pass)	1.25 (pass)

Statistical analysis confirms that both exceedances are outliers of the dataset and are not representative of the soil concentrations and can therefore be excluded from the dataset. When these exceedances are removed, the UCL (0.95) for arsenic is 23.26 mg/kg and 1.25 mg/kg for beryllium resulting in no exceedances.

In-Situ Future Formation Soil Validation

Under a revised Strategy and in accordance with validation works within the wider Heyford Park development, sampling of the underlying 400mm subsoil beneath any topsoil or removed hardstanding would be sampled to determine its retention as part of the 600mm garden cover providing that it is uncontaminated and suitable for such use.

In-situ sampling of subsoils below the topsoil cover was completed through the excavation and sampling of the top 400mm of soil. Sampling was completed at a test frequency of 1 sample per 500m^3, the residual depth of 400mm equating to 1 sample per 1,250m^2 plan area of development.

Twelve in-situ samples were collected from the underlying soil with depth validation photos showing the extent of the 400mm depth range appended to this report with sampling locations reproduced in Drawing D01. Assuming an approximate site area of 14,650m^{2,} the volume of validated soils is effectively 5,860m^3, exceeding the specified sampling rate of 1 sample per 500m^3 (1 per 488m^3 achieved).

Sampled soils generally comprised of a dark brown clay soil with coarse gravel of limestone although inclusions of brick fragments (S5, S6, S11 and S12) and tarmac (S7 and S11) were observed. No inclusions of ash, slag or clinker were observed but it is noted that Hydrock reported ash within 2 locations. A plan detailing the validation entries with Hydrock's trial-pits is provided in Drawing D01.

Table 4. Analysis Summary of Formation Soils

Contaminant	Samples	Range of Concentrations (mg/kg unless stated)	Residential Use	
			Screening criteria (mg/kg unless stated)	Exceedances
SOM	12		-	None
pH	12	7.53-8.47	-	None
asbestos fibre*	12	NAD	<0.001%	None
antimony	12	1-3	550 (GAC)	None
arsenic	12	14.3-25.1	37 (S4UL)	None
barium	12	49.119	1300 (GAC)	None
beryllium	12	0.9-1.4	1.7 (S4UL)	None
cadmium	12	<0.1-0.2	11 (S4UL)	None
chromium	12	32.3-47	910 (S4UL)	None
chromium IV	12	<0.3	6 (S4UL)	None
cobalt	12	6.3-12.5	-	None
copper	12	9-57	2400 (S4UL)	None
lead	12	11-59	200 (C4SL)	None
mercury	12	<0.1	170 (S4UL)	None
molybdenum	12	1.2-2.6	670 (GAC)	None
nickel	12	16.3-31.6	180 (S4UL)	None
selenium	12	<1	250 (S4UL)	None
vanadium	12	42-69	410 (S4UL)	None
water soluble boron	12	0.7-3.4	290 (S4UL)	None
zinc	12	52-204	3700 (S4UL)	None
naphthalene	12	<0.04-0.06	2.3 (S4UL)	None
acenaphthylene	12	<0.03-0.08	170 (S4UL)	None
acenaphthene	12	<0.05-0.23	210 (S4UL)	None
fluorene	12	<0.04-0.15	170 (S4UL)	None
phenanthrene	12	<0.03-2.93	95(S4UL)	None
anthracene	12	<0.04-0.87	280 (S4UL)	None
fluoranthene	12	<0.03-6.08	2400 (S4UL)	None
pyrene	12	<0.03-6.08	620 (S4UL)	None
benzo(a)anthracene	12	<0.06-2.15	7.2 (S4UL)	None
chrysene	12	<0.02-2.15	15 (S4UL)	None
benzo(bk)fluoranthene	12	<0.07-3.83	-	-
benzo(a)pyrene	12	<0.04-2.22	2.2 (S4UL)	**(2) Ph9-S4**
indeno(123cd)pyrene	12	<0.04-1.60	27 (S4UL)	None
dibenzo(ah)anthracene	12	<0.04-0.28	0.24(S4UL)	**(2) Ph9-S4 & Ph9-S11**
benzo(ghi)perylene	12	<0.04-1.51	320 (S4UL)	None
aliphatic C5-C6	12	<0.1	42 (S4UL)	None
aliphatic C6-C8	12	<0.1	100 (S4UL)	None
aliphatic C8-C10	12	<0.1	27 (S4UL)	None

Contaminant	Samples	Range of Concentrations (mg/kg unless stated)	Residential Use	
			Screening criteria (mg/kg unless stated)	Exceedances
aliphatic C10-C12	12	<0.2	130 (S4UL)	None
aliphatic C12-C16	12	<4	1100 (S4UL)	None
aliphatic C16-C21	12	<7	5000 (S4UL)	None
aliphatic C21-C35	12	<7-11	5000 (S4UL)	None
aromatic C5-C7	12	<0.1	70 (S4UL)	None
aromatic C7-C8	12	<0.1	130 (S4UL)	None
aromatic C8-C10	12	<0.1	34 (S4UL)	None
aromatic C10-C12	12	<0.2-0.3	74 (S4UL)	None
aromatic C12-C16	12	<4	140 (S4UL)	None
aromatic C16-C21	12	<7-20	260 (S4UL)	None
aromatic C21-C35	12	<7-97	1100 (S4UL)	None
benzene	12	<0.005	0.08 (S4UL)	None
toluene	12	<0.005	130 (S4UL)	None
ethylbenzene	12	<0.005	47 (S4UL)	None
o-xylene	12	<0.005	60 (S4UL)	None
m-xylene	12	<0.005	56 (S4UL)	None
p-xylene	12	<0.005	56 (S4UL)	None
methyl tert butyl ether	12	<0.005	-	None

Notes to table:

S4UL: Suitable For Use Levels published by Chartered Institute of Environmental Health and Land Quality Management Ltd, residential with plant uptake scenario (1% SOM); copyright Land Quality Management Ltd reproduced with permission publication number S4UL3102. All rights reserved.

GAC: Generic Assessment Criteria published by CL:AIRE for human health risk assessment for a residential scenario with consumption of homegrown produce (1% SOM).

C4SL: Category 4 Screening Levels published by CL:AIRE (C4SLs); 'residential without home grown produce land use' (at 1% SOM)

Exceedances were limited to a very minor elevated concentrations of benzo(a)pyrene within sample Ph9-S4 with a concentration of 2.22 mg/kg compared to the criteria of 2.2 mg/kg, and dibenzo(ah)anthracene with concentrations of 0.28 mg/kg (criteria of 0.24 mg/kg) with both Ph9-S4 and Ph9-S11.

PAH ratio analysis was completed on the exceeded samples to determine the source of the elevated PAHs, a copy of the plot is attached to this report. Source identification confirms a coal signature, no anthropogenic material such as ash or clinker were observed within Ph9-S4 whilst fragments of tarmac were recorded within Ph9-S11. Source identification indicates a likely low bio-availability due to the sequestration of PAHs within a carbon or vitrified matrix, with B(a)P concentrations below the DEFRA C4SL criteria of 5 mg/kg for garden soils. The minor PAH exceedances are unlikely to represent an unacceptable risk to human health.

Conclusions

Topsoil cover was present across the site (with exception of entry S29) extending to depths of 0.2 and 0.3m bgl. Minor exceedances of site topsoil were initially recorded for both arsenic and beryllium within sample Ph9-S9A, however further statistical analysis confirmed the exceedances are not

representative of the dataset and when removed the UCL (0.95) did not result in any exceedances. It is concluded that the topsoil is suitable for recovery and reuse within the development.

The 0.4m of soils present beneath the topsoil layer were a brown clay with frequent limestone gravel (possible weathered bedrock) and rare inclusions of brick and tarmac, tarmac fragments were limited to entries S7 and S11. It is anticipated that the clay layer may have been placed in part during construction of the baseball pitch where soils from the wider Heyford area may have been placed.

Concentrations of determinants were below the assessment criteria except with 3 minor exceedances for the PAHs benzo(a)pyrene (no 1) and dibenzo(ah)anthracene (no 2) in entries S4 and S11. Further assessment has confirmed a coal signature, possibly associated with minor tarmac inclusions and concluded that the identified sources are likely to be below significant in terms of solubility and bioavailability due to the sequestration within coal / tarmac.

SGP considers that the risk associated to future site occupants to concentrations to be negligible and that the site soils (topsoil and subsoil) are suitable for retention in future garden areas. The recommended remedial measures (i.e. engineered cover system) may be revised to be consistent with those applied to other similar areas i.e. no specific requirement for cover soils.

Recommendations

It is recommended that in the absence of a revised Strategy being produced and issued for the Phase 9 area that this report be submitted to CDC for approval, however further justification to the deviation from the submitted Strategy may be required.

Assessment of risks associated with occasional exceedances and conclusions regarding suitability for retention at shallow depths should be provided to CDC for approval.

Yours sincerely
for: Smith Grant LLP

D Wayland BSc MSc MCIWEM

Attached:

Drawing D01
App A: Entry Logs & Photo Record
App B: Lab Certificate: 18-7823 & 18-14613
App C: PAH Ratio Plot & Arsenic and Beryllium CLR7 Statistics

DRAWING

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Project: Heyford Park, Upper Heyford	
Drawing: Phase 9 - Basketball Pitch Insitu Validation Samples	
Drawn: DW	Checked: BJT
Date: 06.08.18	Scale: 1:500 @ A3
Job No: R1742b	Drg No: R1742b-L07-D01

APPENDIX A

SHEET:	LOCATION:	PROJECT:	ENGINEER:	JOB NO.	TRIAL PIT NO.
1 of 1	See Plan	Heyford Dorchester	DW	R1742b	Ph9-S1
		EXCAVATED BY: Tracked 360	CLIENT: Urban Regen Ltd.	DATE: 1st May	

DEPTH (m)	SAMPLES	Lab testing	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND
		Heyford Suite	0	Dark brown CLAY topsoil with rootlets	
0.2	Ph9-S1A		0.2	MADE GROUND: Dark brown CLAY with coarse gravel (relict gas pipe at base)	
		Heyford Suite			
0.6	Ph9-S1B			Base at 0.6m bgl	

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GROUND WATER:

No groundwater encountered

REMARKS:

Sidewalls stable
PID <0.1 ppm

D: small disturbed sample
B: bulk disturbed sample
PP: pocket penetrometer

SCALE:	LOGGED BY:	FIGURE NO.
1:250	DW	1

SHEET:	LOCATION:	PROJECT:	ENGINEER:	JOB NO.	TRIAL PIT NO.
1 of 1	See Plan	Heyford Dorchester	DW	R1742b	Ph9-S2
		EXCAVATED BY: Tracked 360	CLIENT: Urban Regen Ltd.	DATE: 1st May	

DEPTH (m)	SAMPLES	Lab testing	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND
		Heyford Suite	0	Dark brown CLAY topsoil with rootlets	
0.3	Ph9-S2A		0.3	Dark brown to red CLAY with frequent gravel of angular limestone	
		Heyford Suite			
0.7	Ph9-S2B			Base at 0.7m bgl	

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GROUND WATER:

No groundwater encountered

REMARKS:

Sidewalls stable
PID <0.1 ppm

D: small disturbed sample
B: bulk disturbed sample
PP: pocket penetrometer

SCALE:	LOGGED BY:	FIGURE NO.
1:250	DW	1

SHEET:	LOCATION:	PROJECT:	ENGINEER:	JOB NO.	TRIAL PIT NO.
1 of 1	See Plan	Heyford Dorchester	DW	R1742b	Ph9-S3
		EXCAVATED BY: Tracked 360	CLIENT: Urban Regen Ltd.	DATE: 1st May	

DEPTH (m)	SAMPLES	Lab testing	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND
0.2	Ph9-S3A	Heyford Suite	0	Dark brown CLAY topsoil with rootlets	
0.6	Ph9-S3B	Heyford Suite	0.2	Dark brown CLAY with frequent gravel of angular limestone	
				Base at 0.6m bgl	

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GROUND WATER:

No groundwater encountered

REMARKS:

Sidewalls stable
PID <0.1 ppm

D: small disturbed sample
B: bulk disturbed sample
PP: pocket penetrometer

SCALE:	LOGGED BY:	FIGURE NO.
1:250	DW	1

SHEET:	LOCATION:	PROJECT:	ENGINEER:	JOB NO.	TRIAL PIT NO.
1 of 1	See Plan	Heyford Dorchester	DW	R1742b	Ph9-S4
		EXCAVATED BY: Tracked 360	CLIENT: Urban Regen Ltd.	DATE: 1st May	

DEPTH (m)	SAMPLES	Lab testing	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND
0.2	Ph9-S4A	Heyford Suite	0	Dark brown CLAY topsoil with rootlets	
			0.2	Dark brown CLAY with frequent gravel of angular limestone	
0.6	Ph9-S4B	Heyford Suite		Base at 0.6m bgl	

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GROUND WATER:

No groundwater encountered

REMARKS:

Sidewalls stable
PID <0.1 ppm

D: small disturbed sample
B: bulk disturbed sample
PP: pocket penetrometer

SCALE:	LOGGED BY:	FIGURE NO.
1:250	DW	1

SHEET:	LOCATION:	PROJECT:	ENGINEER:	JOB NO.	TRIAL PIT NO.
1 of 1	See Plan	Heyford Dorchester	DW	R1742b	Ph9-S5
		EXCAVATED BY: Tracked 360	CLIENT: Urban Regen Ltd.	DATE: 1st May	

DEPTH (m)	SAMPLES	Lab testing	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND
		Heyford Suite	0	Dark brown CLAY topsoil with rootlets	
0.3	Ph9-S5A		0.3	Dark brown CLAY with frequent gravel of angular limestone and rare brick fragments	
		Heyford Suite			
0.7	Ph9-S5B			Base at 0.7m bgl	

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GROUND WATER:

No groundwater encountered

REMARKS:

Sidewalls stable
PID <0.1 ppm

D: small disturbed sample
B: bulk disturbed sample
PP: pocket penetrometer

SCALE:	LOGGED BY:	FIGURE NO.
1:250	DW	1

SHEET:	LOCATION:	PROJECT:	ENGINEER:	JOB NO.	TRIAL PIT NO.
1 of 1	See Plan	Heyford Dorchester	DW	R1742b	Ph9-S6
		EXCAVATED BY: Tracked 360	CLIENT: Urban Regen Ltd.	DATE: 1st May	

DEPTH (m)	SAMPLES	Lab testing	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND
0.2	Ph9-S6A	Heyford Suite	0	Dark brown CLAY topsoil with rootlets	
0.6	Ph9-S6B	Heyford Suite	0.2	Dark brown CLAY with frequent gravel of angular limestone and rare brick fragments	
				Base at 0.6m bgl	

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GROUND WATER:

No groundwater encountered

REMARKS:

Sidewalls stable
PID <0.1 ppm

D: small disturbed sample
B: bulk disturbed sample
PP: pocket penetrometer

SCALE:	LOGGED BY:	FIGURE NO.
1:250	DW	1

SHEET:	LOCATION:	PROJECT:	ENGINEER:	JOB NO.	TRIAL PIT NO.
1 of 1	See Plan	Heyford Dorchester	DW	R1742b	Ph9-S7
		EXCAVATED BY: Tracked 360	CLIENT: Urban Regen Ltd.	DATE: 1st May	

DEPTH (m)	SAMPLES	Lab testing	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND
0.2	Ph9-S7A	Heyford Suite	0	Dark brown CLAY topsoil with rootlets	
0.6	Ph9-S7B	Heyford Suite	0.2	Dark brown CLAY with frequent gravel of angular limestone and rare brick and tarmac fragments	
				Base at 0.6m bgl	

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GROUND WATER:

No groundwater encountered

REMARKS:

Sidewalls stable
PID <0.1 ppm

D: small disturbed sample
B: bulk disturbed sample
PP: pocket penetrometer

SCALE:	LOGGED BY:	FIGURE NO.
1:250	DW	1

SHEET:	LOCATION:	PROJECT:	ENGINEER:	JOB NO.	TRIAL PIT NO.
1 of 1	See Plan	Heyford Dorchester	DW	R1742b	Ph9-S8
		EXCAVATED BY: Tracked 360	CLIENT: Urban Regen Ltd.	DATE: 1st May	

DEPTH (m)	SAMPLES	Lab testing	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND
		Heyford Suite	0	Dark brown CLAY topsoil with rootlets	
0.2	Ph9-S8A		0.2	Dark brown CLAY with frequent gravel of angular limestone	
		Heyford Suite			
0.6	Ph9-S8B			Base at 0.6m bgl	

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GROUND WATER:

No groundwater encountered

REMARKS:

Sidewalls stable
PID <0.1 ppm

D: small disturbed sample
B: bulk disturbed sample
PP: pocket penetrometer

SCALE:	LOGGED BY:	FIGURE NO.
1:250	DW	1

SHEET:	LOCATION:	PROJECT:	ENGINEER:	JOB NO.	TRIAL PIT NO.
1 of 1	See Plan	Heyford Dorchester	DW	R1742b	Ph9-S9
		EXCAVATED BY: Tracked 360	CLIENT: Urban Regen Ltd.	DATE: 1st May	

DEPTH (m)	SAMPLES	Lab testing	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND
		Heyford Suite	0	Light brown CLAYbecoming darker with frequent gravel of angular limestone	
0.6	Ph9-S9A			Base at 0.6m bgl	

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GROUND WATER:

No groundwater encountered

REMARKS:

Sidewalls stable
PID <0.1 ppm

D: small disturbed sample
B: bulk disturbed sample
PP: pocket penetrometer

SCALE:	LOGGED BY:	FIGURE NO.
1:250	DW	1

SHEET:	LOCATION:	PROJECT:	ENGINEER:	JOB NO.	TRIAL PIT NO.
1 of 1	See Plan	Heyford Dorchester	DW	R1742b	Ph9-S1(
		EXCAVATED BY: Tracked 360	CLIENT: Urban Regen Ltd.	DATE: 1st May	

DEPTH (m)	SAMPLES	Lab testing	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND
			0	Dark brown CLAY topsoil with rootlets	
		Heyford Suite	0.3	Dark brown CLAY with frequent gravel of angular limestone	
0.7	Ph9-S10A			Base at 0.7m bgl	

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GROUND WATER:

No groundwater encountered

REMARKS:

Sidewalls stable
PID <0.1 ppm

D: small disturbed sample
B: bulk disturbed sample
PP: pocket penetrometer

SCALE:	LOGGED BY:	FIGURE NO.
1:250	DW	1

SHEET:	LOCATION:	PROJECT:	ENGINEER:	JOB NO.	TRIAL PIT NO.
1 of 1	See Plan	Heyford Dorchester	DW	R1742b	Ph9-S11
		EXCAVATED BY: Tracked 360	CLIENT: Urban Regen Ltd.	DATE: 1st May	

DEPTH (m)	SAMPLES	Lab testing	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND
			0	Dark brown CLAY topsoil with rootlets	
		Heyford Suite	0.3	Light brown CLAY with coarse gravel of limestone and rare brick and tarmac fragments	
0.7	Ph9-S11A			Base at 0.7m bgl	

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GROUND WATER:

No groundwater encountered

REMARKS:

Sidewalls stable
PID <0.1 ppm

D: small disturbed sample
B: bulk disturbed sample
PP: pocket penetrometer

SCALE:	LOGGED BY:	FIGURE NO.
1:250	DW	1

SHEET:	LOCATION:	PROJECT:	ENGINEER:	JOB NO.	TRIAL PIT NO.
1 of 1	See Plan	Heyford Dorchester	DW	R1742b	Ph9-S12
		EXCAVATED BY: Tracked 360	CLIENT: Urban Regen Ltd.	DATE: 1st May	

DEPTH (m)	SAMPLES	Lab testing	DEPTH (m)	DESCRIPTION OF STRATA	LEGEND
			0	Dark brown CLAY topsoil with rootlets	
		Heyford Suite	0.3	Light brown CLAY with coarse gravel of limestone and rare brick fragments	
0.7	Ph9-S12A			Base at 0.7m bgl	

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GROUND WATER:

No groundwater encountered

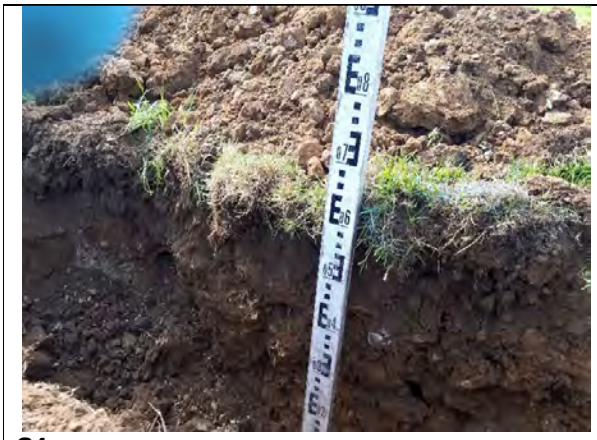
REMARKS:

Sidewalls stable
PID <0.1 ppm

D: small disturbed sample
B: bulk disturbed sample
PP: pocket penetrometer

SCALE:	LOGGED BY:	FIGURE NO.
1:250	DW	1

 S1	 S1
 S2	 S2
 S3	 S3



S4

S4

S5

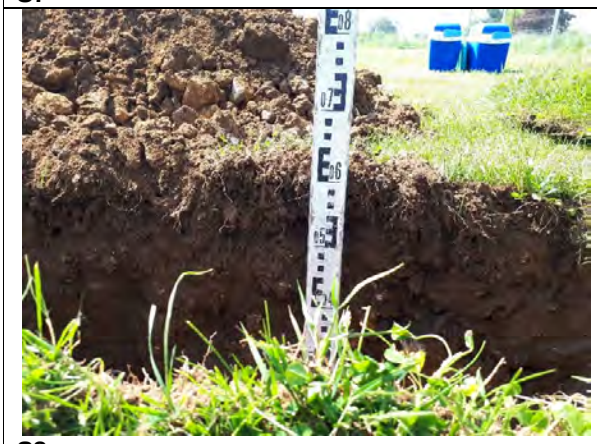
S5

S6

S6

S7

S7



S8

S8

S9

S9

S10

S10

S11

S11

S12

S12

APPENDIX B

Exova Jones Environmental

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

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Smith Grant LLP
Station House
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LL14 6DL

Attention :	Dan Wayland
Date :	7th June, 2018
Your reference :	R1742B
Our reference :	Test Report 18/7823 Batch 1
Location :	Heyford (Dorchester)
Date samples received :	22nd May, 2018
Status :	Final report
Issue :	1

Twenty samples were received for analysis on 22nd May, 2018 of which twenty 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: Smith Grant LLP
Reference: R1742B
Location: Heyford (Dorchester)
Contact: Dan Wayland
JE Job No.: 18/7823

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	LOD/LOR	Units	Method No.
Sample ID	PH9-S1A	PH9-S1B	PH9-S2A	PH9-S2B	PH9-S3A	PH9-S3B	PH9-S4A	PH9-S4B	PH9-S5A	PH9-S5B			
Depth	0.00-0.20	0.20-0.60	0.00-0.30	0.30-0.70	0.00-0.20	0.20-0.60	0.00-0.20	0.20-0.60	0.00-0.30	0.30-0.70			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018			
Antimony	2	2	2	2	2	2	3	3	2	2	<1	mg/kg	TM30/PM15
Arsenic #M	15.9	17.1	16.2	19.1	21.6	16.5	17.4	18.1	19.3	25.1	<0.5	mg/kg	TM30/PM15
Barium #M	68	68	62	49	59	51	61	69	63	95	<1	mg/kg	TM30/PM15
Beryllium	1.1	1.2	1.3	1.3	1.1	1.0	1.1	1.0	1.1	1.0	<0.5	mg/kg	TM30/PM15
Cadmium #M	0.1	0.1	<0.1	<0.1	0.2	0.2	0.1	<0.1	0.1	0.1	<0.1	mg/kg	TM30/PM15
Chromium #M	42.2	43.2	42.5	47.0	38.8	34.9	38.6	39.8	43.5	45.1	<0.5	mg/kg	TM30/PM15
Cobalt #M	8.5	9.3	9.4	9.3	8.2	6.5	8.3	9.4	8.0	6.8	<0.5	mg/kg	TM30/PM15
Copper #M	15	14	10	11	10	9	12	27	11	18	<1	mg/kg	TM30/PM15
Lead #M	21	24	17	11	38	42	36	35	35	32	<5	mg/kg	TM30/PM15
Mercury #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	TM30/PM15
Molybdenum #M	1.9	1.9	1.8	1.9	1.5	1.6	1.9	2.0	1.8	2.1	<0.1	mg/kg	TM30/PM15
Nickel #M	24.2	23.0	26.3	27.2	22.4	16.3	22.5	22.3	22.0	18.3	<0.7	mg/kg	TM30/PM15
Selenium #M	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	mg/kg	TM30/PM15
Vanadium	55	57	54	55	54	50	55	57	54	69	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	1.2	1.2	1.1	0.7	0.9	1.1	1.6	1.4	1.8	1.1	<0.1	mg/kg	TM74/PM32
Zinc #M	64	68	64	52	78	63	71	59	67	122	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #M	<0.04	<0.04	<0.04	<0.04	<0.04	0.06	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	0.03	<0.03	0.05	<0.03	0.07	<0.03	mg/kg	TM4/PM8
Acenaphthene #M	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.23	<0.05	0.23	<0.05	mg/kg	TM4/PM8
Fluorene #M	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.12	<0.04	0.15	<0.04	mg/kg	TM4/PM8
Phenanthrene #M	0.11	<0.03	<0.03	<0.03	0.12	0.70	0.06	2.24	0.07	2.93	<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	0.06	0.22	<0.04	0.87	<0.04	0.69	<0.04	mg/kg	TM4/PM8
Fluoranthene #M	0.42	0.11	0.09	<0.03	0.51	1.56	0.21	6.08	0.22	3.88	<0.03	mg/kg	TM4/PM8
Pyrene #	0.37	0.11	0.09	<0.03	0.50	1.34	0.20	4.91	0.20	3.14	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.21	0.08	0.08	<0.06	0.30	0.63	0.12	2.15	0.13	1.31	<0.06	mg/kg	TM4/PM8
Chrysene #M	0.21	0.07	0.06	<0.02	0.31	0.66	0.12	2.15	0.13	1.48	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #M	0.43	0.14	0.11	<0.07	0.67	1.26	0.25	3.83	0.26	2.88	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.23	0.08	0.06	<0.04	0.39	0.70	0.14	2.22	0.15	1.54	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #M	0.19	0.06	<0.04	<0.04	0.29	0.49	0.10	1.49	0.12	1.19	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	0.06	0.10	<0.04	0.28	<0.04	0.19	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.17	0.06	<0.04	<0.04	0.28	0.47	0.09	1.33	0.10	1.04	<0.04	mg/kg	TM4/PM8
PAH 16 Total	2.3	0.7	<0.6	<0.6	3.5	8.2	1.3	28.0	1.4	20.7	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.31	0.10	0.08	<0.05	0.48	0.91	0.18	2.76	0.19	2.07	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.12	0.04	0.03	<0.02	0.19	0.35	0.07	1.07	0.07	0.81	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	89	91	90	89	89	90	84	90	91	88	<0	%	TM4/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: Smith Grant LLP
Reference: R1742B
Location: Heyford (Dorchester)
Contact: Dan Wayland
JE Job No.: 18/7823

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	LOD/LOR	Units	Method No.
Sample ID	PH9-S1A	PH9-S1B	PH9-S2A	PH9-S2B	PH9-S3A	PH9-S3B	PH9-S4A	PH9-S4B	PH9-S5A	PH9-S5B			
Depth	0.00-0.20	0.20-0.60	0.00-0.30	0.30-0.70	0.00-0.20	0.20-0.60	0.00-0.20	0.20-0.60	0.00-0.30	0.30-0.70			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018			
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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 #M	<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
>C12-C16 #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	<7	<7	<7	<7	<7	<7	<7	<7	<7	11	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>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 #	<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	<7	<7	<7	<7	<7	<7	78	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	<19	<19	<19	<19	<19	<19	<19	<19	<19	78	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	<38	<38	<38	<38	<38	<38	<38	<38	78	<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
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	10.7	12.6	11.2	12.4	10.2	10.8	10.6	12.5	12.1	13.2	<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Organic Matter	1.8	1.9	1.5	0.6	1.5	1.2	2.6	1.4	2.4	1.2	<0.2	%	TM21/PM24
Electrical Conductivity @25C (5:1 ext)	204	192	203	157	203	176	236	175	234	191	<100	uS/cm	TM76/PM58
pH #M	8.18	8.25	8.12	8.31	8.25	8.24	8.10	8.46	8.06	8.38	<0.01	pH units	TM73/PM11
Sample Type	Clayey Loam	Clayey Loam	Loam	Clay	Clayey Loam	Clay	Clayey Loam	Clay	Clayey Loam	Clayey Loam		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, vegetation, carbon	stones, vegetation	vegetation, stones	vegetation, stones	vegetation, stones	stones	stones, vegetation	loam, stones, vegetation	vegetation, stones	sones, vegeation		None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Smith Grant LLP
Reference: R1742B
Location: Heyford (Dorchester)
Contact: Dan Wayland
JE Job No.: 18/7823

Report : Solid

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

J E Sample No.	21-22	23-24	25-26	27-28	29-30	31-32	33-34	35-36	37-38	39-40	LOD/LOR	Units	Method No.
Sample ID	PH9-S6A	PH9-S6B	PH9-S7A	PH9-S7B	PH9-S8A	PH9-S8B	PH9-S9A	PH9-S10A	PH9-S11A	PH9-S12A			
Depth	0.00-0.20	0.20-0.60	0.00-0.20	0.20-0.60	0.00-0.20	0.20-0.60	0.00-0.60	0.30-0.70	0.30-0.70	0.30-0.70			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018			
Antimony	3	3	3	2	2	2	5	2	1	2	<1	mg/kg	TM30/PM15
Arsenic #M	23.0	22.4	21.1	14.3	15.2	15.1	52.1	15.5	17.3	15.1	<0.5	mg/kg	TM30/PM15
Barium #M	68	119	65	81	60	52	107	61	51	67	<1	mg/kg	TM30/PM15
Beryllium	1.2	1.2	1.4	1.4	0.9	1.0	3.0	1.4	0.9	1.0	<0.5	mg/kg	TM30/PM15
Cadmium #M	0.1	0.2	0.1	0.2	0.2	<0.1	<0.1	0.1	0.1	0.2	<0.1	mg/kg	TM30/PM15
Chromium #M	45.3	40.3	43.1	34.8	36.9	34.7	82.2	45.5	32.3	33.7	<0.5	mg/kg	TM30/PM15
Cobalt #M	9.7	12.5	8.8	6.9	7.6	7.4	13.6	10.6	6.3	7.1	<0.5	mg/kg	TM30/PM15
Copper #M	11	12	29	57	12	11	13	18	11	14	<1	mg/kg	TM30/PM15
Lead #M	42	59	88	40	22	17	84	21	23	23	<5	mg/kg	TM30/PM15
Mercury #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	TM30/PM15
Molybdenum #M	2.0	1.9	2.3	2.6	1.8	1.7	1.9	1.2	1.5	1.4	<0.1	mg/kg	TM30/PM15
Nickel #M	26.3	31.6	24.0	21.7	18.3	18.1	51.5	23.1	16.5	16.9	<0.7	mg/kg	TM30/PM15
Selenium #M	<1	<1	<1	<1	<1	<1	2	<1	<1	<1	<1	mg/kg	TM30/PM15
Vanadium	61	57	60	42	52	53	119	62	47	47	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	1.7	1.1	1.7	1.3	1.8	1.2	2.9	3.4	0.9	1.2	<0.1	mg/kg	TM74/PM32
Zinc #M	75	80	128	204	87	61	174	67	64	67	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #M	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	0.08	<0.03	<0.03	<0.03	<0.03	0.08	0.07	<0.03	mg/kg	TM4/PM8
Acenaphthene #M	<0.05	<0.05	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	0.09	0.06	<0.05	mg/kg	TM4/PM8
Fluorene #M	<0.04	<0.04	<0.04	0.06	<0.04	<0.04	<0.04	<0.04	0.06	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #M	0.07	0.22	0.24	1.09	0.07	<0.03	0.26	0.06	0.79	0.66	<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	0.08	0.09	0.43	<0.04	<0.04	0.09	<0.04	0.34	0.22	<0.04	mg/kg	TM4/PM8
Fluoranthene #M	0.24	0.92	0.95	3.47	0.28	<0.03	0.61	0.18	3.11	1.64	<0.03	mg/kg	TM4/PM8
Pyrene #	0.22	0.84	0.87	3.15	0.26	<0.03	0.50	0.18	2.88	1.42	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.15	0.47	0.47	1.61	0.15	<0.06	0.28	0.12	1.42	1.03	<0.06	mg/kg	TM4/PM8
Chrysene #M	0.15	0.46	0.46	1.64	0.17	<0.02	0.28	0.11	1.55	1.01	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #M	0.34	1.12	1.09	3.50	0.39	<0.07	0.55	0.26	3.58	1.90	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.18	0.63	0.59	2.03	0.21	<0.04	0.29	0.13	2.00	0.98	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #M	0.12	0.48	0.44	1.60	0.18	<0.04	0.21	0.11	1.55	0.74	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	0.09	0.09	0.27	<0.04	<0.04	<0.04	<0.04	0.28	0.14	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.11	0.40	0.40	1.36	0.18	<0.04	0.19	0.10	1.51	0.69	<0.04	mg/kg	TM4/PM8
PAH 16 Total	1.6	5.7	5.7	20.4	1.9	<0.6	3.3	1.3	19.2	10.6	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.24	0.81	0.78	2.52	0.28	<0.05	0.40	0.19	2.58	1.37	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.10	0.31	0.31	0.98	0.11	<0.02	0.15	0.07	1.00	0.53	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	88	91	91	96	90	90	84	90	89	101	<0	%	TM4/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: Smith Grant LLP
Reference: R1742B
Location: Heyford (Dorchester)
Contact: Dan Wayland
JE Job No.: 18/7823

Report : Solid

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

J E Sample No.	21-22	23-24	25-26	27-28	29-30	31-32	33-34	35-36	37-38	39-40	LOD/LOR	Units	Method No.
Sample ID	PH9-S6A	PH9-S6B	PH9-S7A	PH9-S7B	PH9-S8A	PH9-S8B	PH9-S9A	PH9-S10A	PH9-S11A	PH9-S12A			
Depth	0.00-0.20	0.20-0.60	0.00-0.20	0.20-0.60	0.00-0.20	0.20-0.60	0.00-0.60	0.30-0.70	0.30-0.70	0.30-0.70			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018			
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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 #M	<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
>C12-C16 #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>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 #	<0.2	0.3	<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	20	<7	<7	<7	<7	9	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	17	<7	91	<7	<7	<7	<7	97	70	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	<19	<19	<19	111	<19	<19	<19	<19	106	70	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	<38	<38	111	<38	<38	<38	<38	106	70	<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	58	<5	<5	<5	<5	ug/kg	TM31/PM12
Ethylbenzene #	<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	12.4	11.9	12.0	10.9	10.1	12.8	21.7	22.1	10.7	10.6	<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Organic Matter	2.5	1.7	3.8	1.8	3.3	1.2	3.6	2.7	1.3	1.7	<0.2	%	TM21/PM24
Electrical Conductivity @25C (5:1 ext)	244	214	238	166	252	191	248	247	123	197	<100	uS/cm	TM76/PM58
pH #M	8.10	8.23	7.98	8.30	7.74	8.29	7.77	7.53	8.26	8.47	<0.01	pH units	TM73/PM11
Sample Type	Clayey Loam	Clayey Loam	Loam	Clayey Loam	Loam	Clayey Loam	Clayey Loam	Clay	Clayey Loam	Clayey Loam		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	vegetation, stones	stones, vegetation	stones, vegetation	stones, vegetation	vegetation, stones, carbon	stones	stones, vegetation	loam, stones	stones, vegetation, brick fragment	stones, vegetation		None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Smith Grant LLP
Reference: R1742B
Location: Heyford (Dorchester)
Contact: Dan Wayland

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 18/7823						

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.: 18/7823

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 HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an 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.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	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
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 18/7823

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	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	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes	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		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	
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes

JE Job No: 18/7823

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes	Yes	AD	Yes
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
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes	Yes	AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes	Yes	AD	Yes
TM76	Modified US EPA method 120.1. Determination of Specific Conductance by Metrohm automated probe analyser.	PM58	Dried and ground solid samples are extracted with water in a 5:1 water to solid ratio, the samples are shaken on an orbital shaker.			AD	Yes

Chemtest
The right chemistry to deliver results
Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.co.uk

UKAS TESTING
2183

Final Report

Report No.:	18-14613-1
Initial Date of Issue:	31-May-2018
Client	Smith Grant LLP
Client Address:	Station House, Station Road Ruabon Wrexham LL14 6DL
Contact(s):	Dan Wayland
Project	R17426 Heyford Park (Dorchester)

Quotation No.:		**Date Received:**	24-May-2018
Order No.:		**Date Instructed:**	24-May-2018
No. of Samples:	20		
Turnaround (Wkdays):	5	**Results Due:**	31-May-2018
Date Approved:	31-May-2018		

Approved By:

Details: Glynn Harvey, Laboratory Manager

Chemtest
The right chemistry to deliver results

Results - Soil

Project: R17426 Heyford Park (Dorchester)

Client: Smith Grant LLP				**Chemtest Job No.:**	18-14613	18-14613	18-14613	18-14613	18-14613	18-14613	18-14613	18-14613	18-14613
Quotation No.:				**Chemtest Sample ID.:**	627756	627757	627758	627759	627760	627761	627762	627763	627764
				Client Sample ID.:	PH9-S1A	PH9-S1B	PH9-S2A	PH9-S2B	PH9-S3A	PH9-S3B	PH9-S4A	PH9-S4B	PH9-S5A
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.0	0.2	0.0	0.3	0.0	0.2	0.0	0.2	0.0
				Bottom Depth (m):	0.2	0.6	0.3	0.7	0.2	0.6	0.2	0.6	0.3
				Asbestos Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected

Chemtest
The right chemistry to deliver results

Results - Soil

Project: R17426 Heyford Park (Dorchester)

Client: Smith Grant LLP				**Chemtest Job No.:**	18-14613	18-14613	18-14613	18-14613	18-14613	18-14613	18-14613	18-14613	18-14613
Quotation No.:				**Chemtest Sample ID.:**	627765	627766	627767	627768	627769	627770	627771	627772	627773
				Client Sample ID.:	PH9-S5B	PH9-S6A	PH9-S6B	PH9-S7A	PH9-S7B	PH9-S8A	PH9-S8B	PH9-S9A	PH9-S10A
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.3	0.0	0.2	0.0	0.2	0.0	0.2	0.0	0.3
				Bottom Depth (m):	0.7	0.2	0.6	0.2	0.6	0.2	0.6	0.6	0.7
				Asbestos Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected

Results - Soil

Project: R17426 Heyford Park (Dorchester)

Client: Smith Grant LLP					**Chemtest Job No.:**	18-14613	18-14613
Quotation No.:					**Chemtest Sample ID.:**	627774	627775
					Client Sample ID.:	PH9-S11A	PH9-S12A
					Sample Type:	SOIL	SOIL
					Top Depth (m):	0.3	0.3
					Bottom Depth (m):	0.7	0.7
					Asbestos Lab:	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
ACM Type	U	2192		N/A		-	-
Asbestos Identification	U	2192	%	0.001		No Asbestos Detected	No Asbestos Detected

Test Methods

SOP	Title	Parameters included	Method summary
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.co.uk

APPENDIX C

Contaminated Land Assessment - Statistical Spreadsheet

Ref:	R1742b	Date:	06.08.18
Site:	Heyford	Author:	DW
Substance:	Beryllium		

data entry (maximum 200 values)

identifier	observed value
Ph9-S1A	15.90
PH9-S2A	16.20
PH9-S3A	21.60
PH9-S4A	17.40
PH9-S5A	19.3
PH9-S6A	23.0
PH9-S7A	21.1
PH9-S8A	15.2

planning or Part IIA scenario: planning

select units: mg/kg

select signficance level (P): 0.05

(P 0.05 should be used by default)

enter critical concentration (Cc): 37 mg/kg

(SGV / GAC)

total number of observations: 8

number of non-detects: 0

0.04 mg/kg

0.02 mg/kg

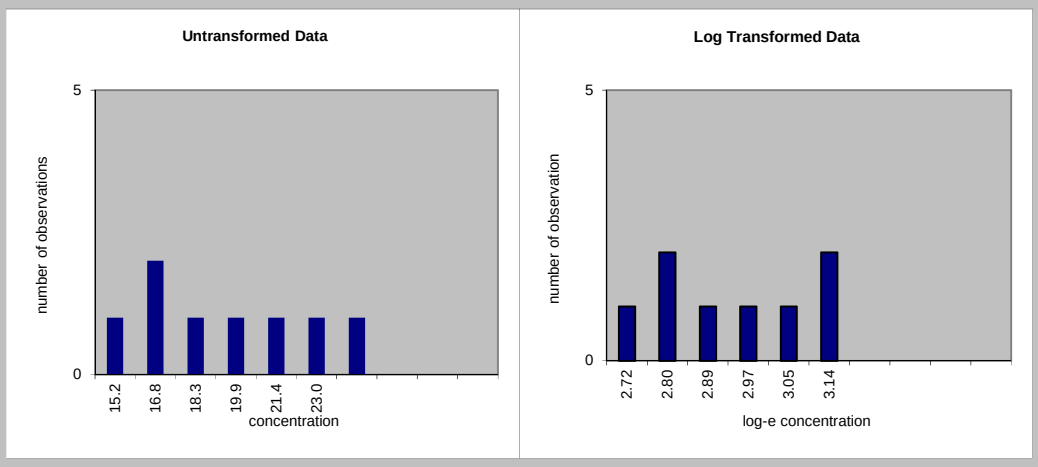
(typically 50% of the m.d.l.)

calculate

The null hypothesis (H_0) is that the true mean is equal to or greater than the critical concentration at a confidence level of 95%

Contaminated Land Assessment - Statistical Spreadsheet

1. Data review bell-shaped histograms indicate a normal-type distribution



Use log-transformed data? no

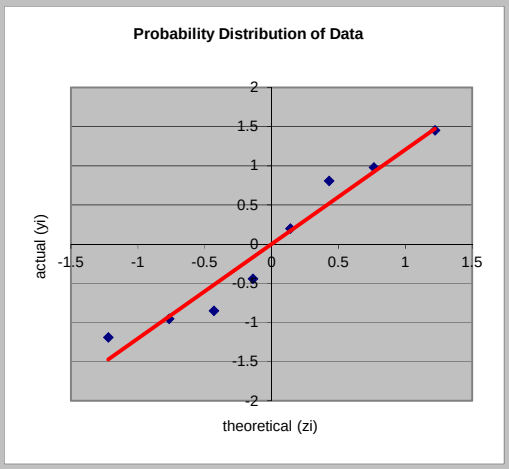
2. Check for statistical outliers Grubbs Test - assumes that data other than outlier(s) are normally distributed

T_{crit} =	2.03	T_n =	1.45	log transformed Tn =	1.38

maximum value 23 mg/kg is not an outlier

note: outliers should only be removed in particular circumstances

3. Assessment of normal distribution



Shapiro-Wilk normality test

W = 0.562

signficance level	0.01	0.05
critical level	0.749	0.818

W is less than the critical value at 5% significance level

Are data points aligned close to red line, indicating a normal distribution? yes

Non-parametric testing (Chebychev Theorem) is appropriate

4. Significance Tests Against Critical Value

Non-parametric Chebychev Test

sample mean = 18.7125 mg/kg sample unbiased standard deviation = 2.95 mg/kg

k statistic = -17.515 critical value = -4.360

k statistic is less than critical value **null hypothesis can be rejected**

upper confidence limit (UCL 0.95) = 23.26 mg/kg

Ref:	R1742b	Date:	06.08.18
Site:	Heyford	Author:	DW
Substance:	Beryllium		

Contaminated Land Assessment - Statistical Spreadsheet

Ref:	R1742b	Date:	06.08.18
Site:	Heyford	Author:	DW
Substance:	Beryllium		

data entry (maximum 200 values)

identifier	observed value
Ph9-S1A	1.10
PH9-S2A	1.30
PH9-S3A	1.10
PH9-S4A	1.10
PH9-S5A	1.1
PH9-S6A	1.2
PH9-S7A	1.4
PH9-S8A	0.9

planning or Part IIA scenario: planning

select units: mg/kg

select signficance level (P): 0.05

(P 0.05 should be used by default)

enter critical concentration (Cc): 1.7 mg/kg

(SGV / GAC)

total number of observations: 8

number of non-detects: 0

0.04 mg/kg

0.02 mg/kg

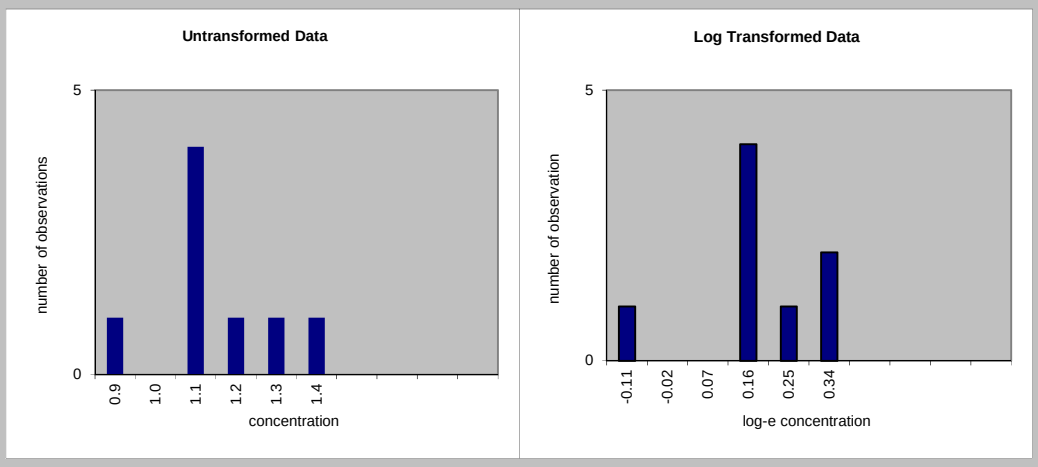
(typically 50% of the m.d.l.)

calculate

The null hypothesis (H_0) is that the true mean is equal to or greater than the critical concentration at a confidence level of 95%

Contaminated Land Assessment - Statistical Spreadsheet

1. Data review bell-shaped histograms indicate a normal-type distribution



Use log-transformed data? no

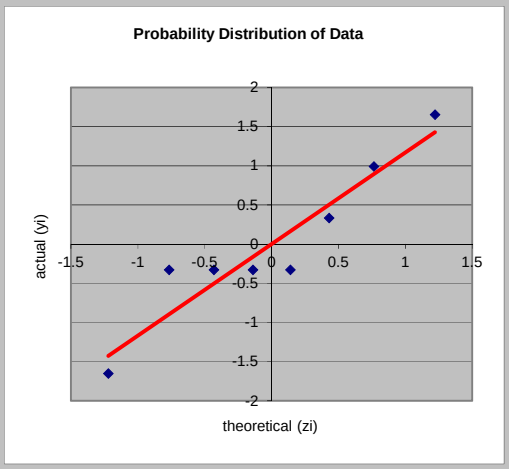
2. Check for statistical outliers Grubbs Test - assumes that data other than outlier(s) are normally distributed

T_{crit} =	2.03	T_n =	1.65	log transformed Tn =	1.54

maximum value 1.4 mg/kg is not an outlier

note: outliers should only be removed in particular circumstances

3. Assessment of normal distribution



Shapiro-Wilk normality test

W = 0.917

signficance level	0.01	0.05
critical level	0.749	0.818

data do not significantly vary from a normal distribution

Are data points aligned close to red line, indicating a normal distribution? yes

One-sample T test is appropriate

4. Significance Tests Against Critical Value

One-sample T Test

sample mean = 1.15 mg/kg sample unbiased standard deviation = 0.15 mg/kg

t statistic = -10.290 critical value = -1.895

t statistic is less than critical value **null hypothesis can be rejected**

upper confidence limit (UCL 0.95) = 1.25 mg/kg

Ref:	R1742b	Date:	06.08.18
Site:	Heyford	Author:	DW
Substance:	Beryllium		

Job name	Upper Heyford (Dorchester)
Job no.	R1742b
Date:	18.07.18
Author:	DW
Laboratory:	Exova Jones
Lab. Reference:	18-7823

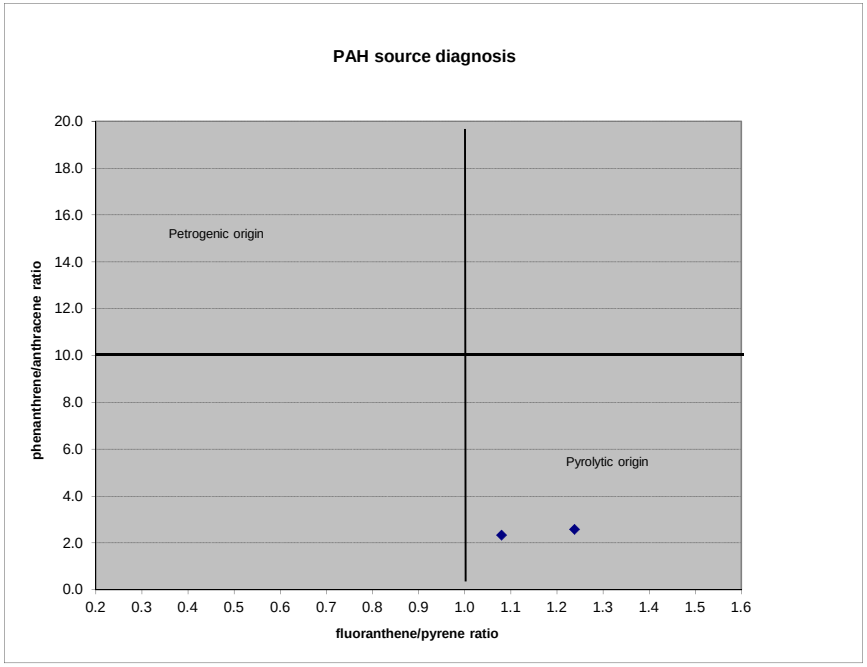
PAH concentrations

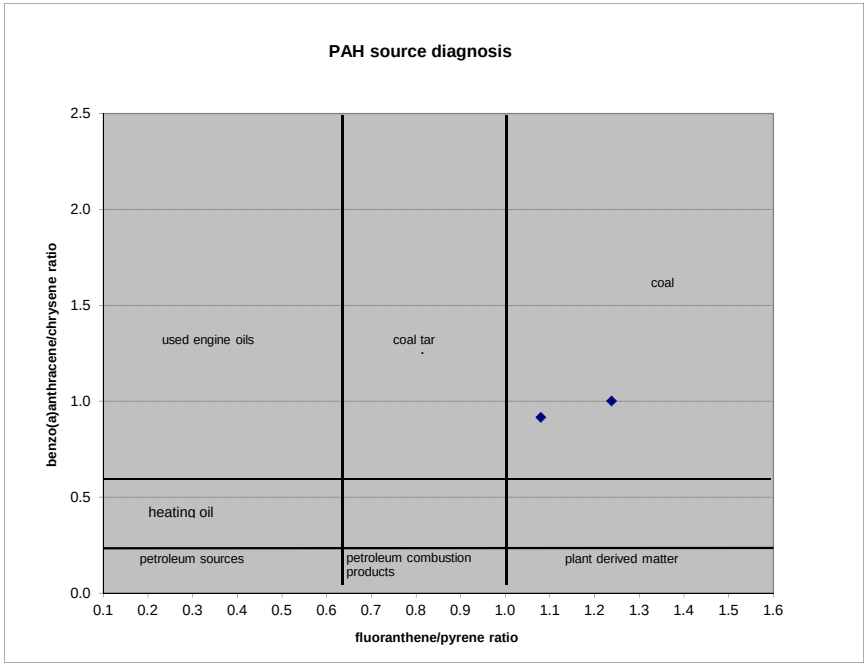
sample identity	Ph9-S4	Ph9-S11																		
phenanthrene	2.24	0.79																		
anthracene	0.87	0.34																		
fluoranthene	6.08	3.11																		
pyrene	4.91	2.88																		
benz(a)anthracene	2.15	1.42																		
chrysene	2.15	1.55																		

PAH units	mg/kg

PAH ratios

phe/ant	2.575	2.324																		
flu/pyr	1.238	1.080																		
baa/chr	1.000	0.916																		





APPENDIX C

Laboratory Test Certificates

Element Materials Technology
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W: www.element.com

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

Attention :	Scott Miller
Date :	19th January, 2021
Your reference :	R1742D
Our reference :	Test Report 21/453 Batch 1
Location :	Heyford (Dorchester)
Date samples received :	15th January, 2021
Status :	Final report
Issue :	1

One sample was received for analysis on 15th January, 2021 of which one was scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Hayley Prowse
Project Manager

Client Name: Smith Grant LLP
Reference: R1742D
Location: Heyford (Dorchester)
Contact: Scott Miller
EMT Job No: 21/453

Report : Liquid

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

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-4												
Sample ID	PH9-HS-WS1												
Depth													
COC No / misc													
Containers	V G												
Sample Date	14/01/2021 10:15												
Sample Type	Ground Water												
Batch Number	1												
Date of Receipt	15/01/2021												
												LOD/LOR	Units	Method No.
MTBE #	<5											<5	ug/l	TM36/PM12
Benzene #	<5											<5	ug/l	TM36/PM12
Toluene #	<5											<5	ug/l	TM36/PM12
Ethylbenzene #	<5											<5	ug/l	TM36/PM12
m/p-Xylene #	<5											<5	ug/l	TM36/PM12
o-Xylene #	<5											<5	ug/l	TM36/PM12
TPH CWG														
Aliphatics														
>C5-C6 #	<10											<10	ug/l	TM36/PM12
>C6-C8 #	<10											<10	ug/l	TM36/PM12
>C8-C10 #	<10											<10	ug/l	TM36/PM12
>C10-C12 #	<5											<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10											<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10											<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10											<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10											<10	ug/l	TM5/TM36/PM12/PM16/PM30
Aromatics														
>C5-EC7 #	<10											<10	ug/l	TM36/PM12
>EC7-EC8 #	<10											<10	ug/l	TM36/PM12
>EC8-EC10 #	<10											<10	ug/l	TM36/PM12
>EC10-EC12 #	<5											<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10											<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10											<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10											<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10											<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10											<10	ug/l	TM5/TM36/PM12/PM16/PM30

Client Name: Smith Grant LLP
Reference: R1742D
Location: Heyford (Dorchester)
Contact: Scott Miller

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 21/453						

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/453

SOILS

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

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

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

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

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

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

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

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

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

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

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

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

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an 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

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

EMT Job No.: 21/453

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

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

ABBREVIATIONS and ACRONYMS USED

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

EMT Job No: 21/453

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			

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Smith Grant LLP
Station House
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Ruabon
Wrexham
LL14 6DL

Attention :	Dan Wayland
Date :	12th February, 2021
Your reference :	R1742B
Our reference :	Test Report 21/1520 Batch 1
Location :	Heyford
Date samples received :	4th February, 2021
Status :	Final report
Issue :	1

Seven samples were received for analysis on 4th February, 2021 of which seven were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Bruce Leslie
Project Manager

Element Materials Technology

Client Name: Smith Grant LLP
Reference: R1742B
Location: Heyford
Contact: Dan Wayland
EMT Job No: 21/1520

Report : Solid

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

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-2	3-4	5-6	7-8	9-10	11-12	13-14				LOD/LOR	Units	Method No.
Sample ID	PH9-HS-SS1	PH9-HS-SS2	PH9-HS-SS3	PH9-HS-SS4	PH9-HS-SS5	PH9-HS-SS6	PH9-HS-SS7						
Depth	0.80-2.50	2.50	0.80-2.50	2.00-3.00	2.50-3.00	2.50-3.00	2.50-3.00						
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J						
Sample Date	03/02/2021	03/02/2021	03/02/2021	04/02/2021	04/02/2021	04/02/2021	04/02/2021						
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	04/02/2021	04/02/2021	04/02/2021	04/02/2021	04/02/2021	04/02/2021	04/02/2021						
TPH CWG													
Aliphatics													
>C5-C6 #M	<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	0.6	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	1.5	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C10-C12 #M	<0.2	<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	<4	<4	<4	<4				<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	<19	<19	<19	<19	<19	<19				<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 #	<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	mg/kg	TM36/PM12
>EC8-EC10 #M	<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	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	<4	<4	<4	<4				<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	<19	<19	<19	<19	<19	<19	<19				<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	<38	<38	<38	<38	<38	<38				<38	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	21	<5	<5	<5	<5				<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	39	<5	<5	<5	<5				<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	34	<5	<5	<5	<5				<5	ug/kg	TM36/PM12
Natural Moisture Content	17.2	32.1	22.7	15.4	23.9	13.4	24.9				<0.1	%	PM4/PM0
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay					None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown					None	PM13/PM0
Other Items	stones	stones, chalk	stones	stones	stones, silt	stones	stones					None	PM13/PM0

Client Name: Smith Grant LLP
Reference: R1742B
Location: Heyford
Contact: Dan Wayland

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 21/1520						

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/1520

SOILS

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

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

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

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

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

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

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

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

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

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

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

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

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an 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

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

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

ABBREVIATIONS and ACRONYMS USED

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

EMT Job No: 21/1520

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	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 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	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 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	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	No
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes

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Smith Grant LLP
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LL14 6DL

Attention :	Dan Wayland
Date :	19th February, 2021
Your reference :	R1742b
Our reference :	Test Report 21/1878 Batch 1
Location :	Heyford - Phase 9
Date samples received :	11th February, 2021
Status :	Final report
Issue :	1

Nineteen samples were received for analysis on 11th February, 2021 of which nineteen were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Bruce Leslie
Project Manager

Element Materials Technology

Client Name: Smith Grant LLP
Reference: R1742b
Location: Heyford - Phase 9
Contact: Dan Wayland
EMT Job No: 21/1878

Report : Solid

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

EMT Sample No.	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	19-20	LOD/LOR	Units	Method No.
Sample ID	PH9-HS-SS8	PH9-HS-SS9	PH9-HS-SS10	PH9-HS-SS11	PH9-HS-SS12	PH9-HS-SS13	PH9-HS-SS14	PH9-HS-SS15	PH9-HS-SS16	PH9-HS-SS17			
Depth	1.50-2.50	1.50-2.50	1.50-2.50	2.50	1.50-2.50	1.50-2.50	1.50-2.50	1.80	1.80	1.80			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	08/02/2021	08/02/2021	08/02/2021	08/02/2021	08/02/2021	08/02/2021	08/02/2021	09/02/2021	09/02/2021	09/02/2021			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	11/02/2021	11/02/2021	11/02/2021	11/02/2021	11/02/2021	11/02/2021	11/02/2021	11/02/2021	11/02/2021	11/02/2021			
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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.5	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 #M	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	10.3	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #M	<4	<4	<4	<4	<4	<4	<4	25	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	<19	<19	<19	<19	<19	<19	35	<19	<19	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>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 #	<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	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	<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	TM36/PM12
Benzene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
Natural Moisture Content	13.0	12.4	15.0	22.4	15.3	18.1	17.9	15.2	17.9	13.5	<0.1	%	PM4/PM0
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay		None	PM13/PM0
Sample Colour	Light Brown	Medium Brown	Medium Brown	Light Brown	Medium Brown	Medium Brown	Medium Brown	Light Brown	Light Brown	Light Brown		None	PM13/PM0
Other Items	Stones, sand	Stones	Stones	Stones	Stones, sand	sand	Stones	Stones, silt	Stones	Stones		None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Smith Grant LLP
Reference: R1742b
Location: Heyford - Phase 9
Contact: Dan Wayland
EMT Job No: 21/1878

Report : Solid

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

EMT Sample No.	21-22	23-24	25-26	27-28	29-30	31-32	33-34	35-36	37-38		LOD/LOR	Units	Method No.
Sample ID	PH9-HS-SS18	PH9-HS-SS19	PH9-HS-SS20	PH9-HS-SS21	PH9-HS-SS22	PH9-HS-SS23	PH9-HS-SS24	PH9-HS-SS26	PH9-HS-SS27				
Depth	1.80	1.20-1.80	1.20-1.80	1.20-1.80	1.80-2.40	1.80-2.40	1.80-2.40	1.80	1.80				
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J				
Sample Date	09/02/2021	09/02/2021	09/02/2021	09/02/2021	09/02/2021	10/02/2021	10/02/2021	10/02/2021	10/02/2021				
Sample Type	Clay	Clay	Sand	Clay	Clay	Clay	Clayey Sand	Clay	Clay				
Batch Number	1	1	1	1	1	1	1	1	1				
Date of Receipt	11/02/2021	11/02/2021	11/02/2021	11/02/2021	11/02/2021	11/02/2021	11/02/2021	11/02/2021	11/02/2021				
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	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	mg/kg	TM36/PM12
>C8-C10	0.4	<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	<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 #M	<4	<4	<4	<4	<4	<4	<4	<4	<4		<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	<7	<7	<7	<7	<7	<7	<7	<7	<7		<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	<7	<7	<7	<7	<7	30	<7	<7	<7		<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	<19	<19	<19	<19	30	<19	<19	<19		<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>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	<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	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	<4	<4	15	<4	<4	<4		<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	<7	<7	<7	52	<7	<7	<7		<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7	<7	<7	<7	170	<7	<7	<7		<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	<19	<19	<19	<19	<19	237	<19	<19	<19		<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	<38	<38	<38	<38	267	<38	<38	<38		<38	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/kg	TM36/PM12
Natural Moisture Content	23.4	18.0	7.7	20.3	13.9	18.6	20.9	27.4	11.3		<0.1	%	PM4/PM0
Sample Type	Clay	Clay	Sand	Clay	Clay	Clay	Clayey Sand	Clay	Clay			None	PM13/PM0
Sample Colour	Light Brown	Light Brown	Light Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown			None	PM13/PM0
Other Items	Stones	Stones, sand	Stones	Stones, chalk, sand	Stones	Sand, stones	Sand, stones	stones	stones			None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Smith Grant LLP
Reference: R1742b
Location: Heyford - Phase 9
Contact: Dan Wayland

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 21/1878						

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/1878

SOILS

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

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

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

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

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

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

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

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

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

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

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

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

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an 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

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

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

ABBREVIATIONS and ACRONYMS USED

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

EMT Job No: 21/1878

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	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 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	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 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	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	No
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes

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Attention :	Dan Wayland
Date :	3rd March, 2021
Your reference :	R1742B
Our reference :	Test Report 21/2315 Batch 1
Location :	Heyford Park-Phase 9
Date samples received :	19th February, 2021
Status :	Final report
Issue :	1

Thirty two samples were received for analysis on 19th February, 2021 of which thirty two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Bruce Leslie
Project Manager

Element Materials Technology

Client Name: Smith Grant LLP
Reference: R1742B
Location: Heyford Park-Phase 9
Contact: Dan Wayland
EMT Job No: 21/2315

Report : Solid

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

EMT Sample No.	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	19-20	LOD/LOR	Units	Method No.
Sample ID	OVER-SP1-S1	OVER-SP1-S2	OVER-SP1-S3	OVER-SP1-S4	OVER-SP2-S1	OVER-SP2-S2	OVER-SP2-S3	OVER-SP2-S4	PH9-HS-SS28	PH9-HS-SS29			
Depth									2.00	2.00			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	16/02/2021	16/02/2021	16/02/2021	16/02/2021	16/02/2021	16/02/2021	16/02/2021	16/02/2021	16/02/2021	16/02/2021			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	19/02/2021	19/02/2021	19/02/2021	19/02/2021	19/02/2021	19/02/2021	19/02/2021	19/02/2021	19/02/2021	19/02/2021			
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	1.5	0.7	<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	2.4	1.4	<0.1	mg/kg	TM36/PM12
>C10-C12 #M	<0.2 SV	<0.2 SV	<0.2	<0.2	<0.2 SV	<0.2	<0.2	<0.2	<0.2	18.6	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #M	<4 SV	<4 SV	<4	<4	<4 SV	<4	<4	<4	9	56	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	<7 SV	<7 SV	<7	<7	<7 SV	<7	13	15	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	<7 SV	<7 SV	<7	<7	<7 SV	<7	122	45	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	<19	<19	<19	<19	<19	135	60	<19	77	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>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 #	<0.2 SV	<0.2 SV	<0.2	<0.2	<0.2 SV	<0.2	<0.2	<0.2	<0.2	1.0	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4 SV	<4 SV	<4	<4	<4 SV	<4	<4	16	<4	22	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7 SV	<7 SV	<7	<7	<7 SV	<7	43	96	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7 SV	<7 SV	<7	<7	<7 SV	<7	368	212	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	<19	<19	<19	<19	<19	<19	411	324	<19	23	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	<38	<38	<38	<38	<38	546	384	<38	100	<38	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5	<5	<5	25	14	<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5	48	31	<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5	45	39	<5	ug/kg	TM36/PM12
Natural Moisture Content	18.7	17.9	20.6	18.3	19.1	17.6	20.5	21.1	25.1	20.8	<0.1	%	PM4/PM0
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	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, vegetation	stones	stones	stones, vegetation	stones	stones	stones, vegetation	stones	stones	stones		None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: Smith Grant LLP
Reference: R1742B
Location: Heyford Park-Phase 9
Contact: Dan Wayland
EMT Job No: 21/2315

Report : Solid

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

EMT Sample No.	21-22	23-24	25-26	27-28	29-30	31-32	33-34	35-36	37-38	39-40	LOD/LOR	Units	Method No.
Sample ID	PH9-HS-SS30	PH9-HS-SS31	PH9-HS-SS32	PH9-HS-SS33	PH9-HS-SS34	PH9-HS-SS35	PH9-HS-SS36	PH9-HS-SS37	PH9-HS-SS38	PH9-HS-SS39			
Depth	1.5-1.8	1.5-1.8	1.5-1.8	1.80	1.80	2.00	1.5-1.8	1.5-1.8	1.7-2.0	1.80			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	17/02/2021	17/02/2021	17/02/2021	17/02/2021	17/02/2021	17/02/2021	17/02/2021	17/02/2021	17/02/2021	17/02/2021			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	19/02/2021	19/02/2021	19/02/2021	19/02/2021	19/02/2021	19/02/2021	19/02/2021	19/02/2021	19/02/2021	19/02/2021			
TPH CWG													
Aliphatics													
>C5-C6 #M	<0.1	<0.1	<0.1	<0.1 SV	<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 SV	<0.1	1.8	<0.1	2.2	17.2	1.4	<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	1.4 SV	<0.1	4.0	<0.1	10.0	39.7	6.6	<0.1	mg/kg	TM36/PM12
>C10-C12 #M	<0.2	<0.2	<0.2	12.5 SV	<0.2	4.9	<0.2	14.8	89.0	94.9	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #M	<4	<4	<4	38 SV	<4	24	<4	62	193	240	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	<7	<7	<7	<7 SV	<7	<7	<7	<7	8	16	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	<7	<7	<7	<7 SV	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	<19	<19	52	<19	35	<19	89	347	359	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1	<0.1 SV	<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 SV	<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 SV	<0.1	0.3	<0.1	0.6	2.1	0.3	<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2 SV	<0.2	<0.2	<0.2	<0.2	17.6	11.8	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	10 SV	<4	<4	<4	13	79	80	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	<7	<7 SV	<7	<7	<7	<7	10	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7	<7	<7 SV	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	<19	<19	<19	<19	<19	<19	<19	<19	109	92	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	<38	<38	52	<38	<38	<38	89	456	451	<38	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	<5	<5	<5	<5 SV	<5	14	<5	14	361	8	<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5	<5 SV	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5	<5 SV	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5	6 SV	<5	30	<5	52	206	40	<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5	16 SV	<5	59	<5	116	597	91	<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5	63 SV	<5	103	<5	364	1323	229	<5	ug/kg	TM36/PM12
Natural Moisture Content	22.7	25.1	23.0	10.8	12.4	25.9	14.6	16.4	19.1	14.1	<0.1	%	PM4/PM0
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	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, silt	stones, silt	stones, silt	stones	stones	stones, water	stones	stones	stones	stones		None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Smith Grant LLP
Reference: R1742B
Location: Heyford Park-Phase 9
Contact: Dan Wayland
EMT Job No: 21/2315

Report : Solid

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

EMT Sample No.	41-42	43-44	45-46	47-48	49-50	51-52	53-54	55-56	57-58	59-60	LOD/LOR	Units	Method No.
Sample ID	PH9-HS-SS40	PH9-HS-SS41	PH9-HS-SS42	PH9-HS-SS43	PH9-HS-SS44	PH9-HS-SS45	PH9-HS-SS46	PH9-HS-SS47	PH9-HS-SS48	SP-CONT-1			
Depth	2.00	1.5-2.0	2.20	1.5-2.0	2.00	1.5-2.0	2.00	1.0-1.6	1.0-1.6				
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	18/02/2021	18/02/2021	18/02/2021	18/02/2021	18/02/2021	18/02/2021	18/02/2021	18/02/2021	18/02/2021	18/02/2021			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	19/02/2021	19/02/2021	19/02/2021	19/02/2021	19/02/2021	19/02/2021	19/02/2021	19/02/2021	19/02/2021	19/02/2021			
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	0.7	7.5	1.7	10.8	<0.1	<0.1	<0.1	<0.1	0.1	1.3	<0.1	mg/kg	TM36/PM12
>C8-C10	0.6	21.0	2.4	16.6	<0.1	<0.1	<0.1	<0.1	0.3	4.7	<0.1	mg/kg	TM36/PM12
>C10-C12 #M	<0.2	117.1	8.4	9.9	<0.2	<0.2	13.1	<0.2	<0.2	96.6 SV	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #M	<4	260	23	34	<4	<4	53	<4	<4	14 SV	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	<7	27	<7	<7	<7	<7	<7	<7	<7	14 SV	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7 SV	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	433	36	71	<19	<19	66	<19	<19	131	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>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	1.4	0.1	1.0	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	4.8	<0.2	9.1	<0.2	<0.2	<0.2	<0.2	<0.2	4.8 SV	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	72	12	19	<4	<4	13	<4	<4	24 SV	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	13	<7	<7	<7	<7	<7	<7	<7	<7 SV	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7 SV	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	<19	91	<19	29	<19	<19	<19	<19	<19	29	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	524	<38	100	<38	<38	66	<38	<38	160	<38	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	<5	<5	72	497	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
Ethylbenzene #	11	89	29	117	<5	<5	<5	<5	<5	24	<5	ug/kg	TM36/PM12
m/p-Xylene #	23	310	59	277	<5	<5	<5	<5	<5	72	<5	ug/kg	TM36/PM12
o-Xylene #	<5	1072	40	573	<5	<5	<5	<5	<5	215	<5	ug/kg	TM36/PM12
Natural Moisture Content	23.4	20.5	20.4	25.9	17.9	18.2	28.1	23.4	30.4	13.7	<0.1	%	PM4/PM0
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	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	stones	stones	stones, water	stones	stones	stones	stones	stones, vegetation	stones		None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Smith Grant LLP
Reference: R1742B
Location: Heyford Park-Phase 9
Contact: Dan Wayland
EMT Job No: 21/2315

Report : Solid

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

EMT Sample No.	61-62	63-64									LOD/LOR	Units	Method No.
Sample ID	SP-CONT-2	SP-CONT-3											
Depth													
COC No / misc													
Containers	V J	V J											
Sample Date	18/02/2021	18/02/2021											
Sample Type	Clay	Clay											
Batch Number	1	1											
Date of Receipt	19/02/2021	19/02/2021											
TPH CWG													
Aliphatics													
>C5-C6 #M	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C6-C8 #M	7.8	8.5									<0.1	mg/kg	TM36/PM12
>C8-C10	19.5	14.7									<0.1	mg/kg	TM36/PM12
>C10-C12 #M	80.9	22.3									<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #M	219	84									<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	17	11									<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	<7	<7									<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	344	141									<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC8-EC10 #M	1.3	0.9									<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	8.8	3.7									<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	78	35									<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	19	<7									<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7									<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	107	40									<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	451	181									<38	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	24	310									<5	ug/kg	TM36/PM12
Benzene #	<5	<5									<5	ug/kg	TM36/PM12
Toluene #	<5	<5									<5	ug/kg	TM36/PM12
Ethylbenzene #	167	103									<5	ug/kg	TM36/PM12
m/p-Xylene #	328	260									<5	ug/kg	TM36/PM12
o-Xylene #	817	511									<5	ug/kg	TM36/PM12
Natural Moisture Content	20.2	12.0									<0.1	%	PM4/PM0
Sample Type	Clay	Clay										None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown										None	PM13/PM0
Other Items	stones	stones										None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Smith Grant LLP
Reference: R1742B
Location: Heyford Park-Phase 9
Contact: Dan Wayland

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 21/2315						

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/2315

SOILS

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

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

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

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

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

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

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

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

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

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

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

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

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an 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

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

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

ABBREVIATIONS and ACRONYMS USED

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

EMT Job No: 21/2315

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	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 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	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 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	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	No
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes

TEST CERTIFICATE

PSD Assessment of material for use in Earthworks

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

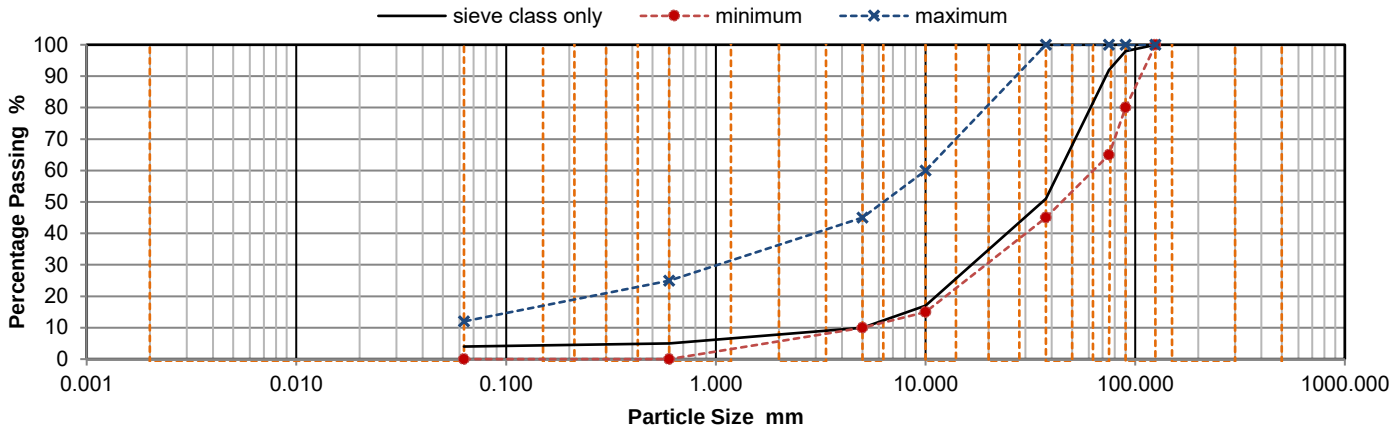
Tested in Accordance with: BS 1377-2:1990: Clause 9.2

Client:	Smith Grant LLP	Client Reference:	R1742B
Client Address:	Station House, Station Road, Ruabon, Wrexham, LL146DL	Job Number:	21-57487
		Date Sampled:	16/02/2021
		Date Received:	17/02/2021
Contact:	Daniel Wayland	Date Tested:	26/02/2021
Site Address:	Heyford PH9	Sampled By:	Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1774079	Depth Top [m]:	Not Given
Hole No.:	AGG SP1 S1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	CRUSHED CONCRETE		
Sample Preparation:	Sample was whole tested, oven dried at 106.1 °C and broken down by hand.		



Sieving		Material Type 6F2 Selected granular material			
Particle Size mm	Passing %	Material Specification			Pass or Fail
500	100				
300	100				
150	100				
125	100	100	-	100	PASS
90	98	80	-	100	PASS
75	92	65	-	100	PASS
63	78				
50	65				
37.5	51	45	-	100	PASS
28	41				
20	32				
14	23				
10	17	15	-	60	PASS
6.3	11				
5	10	10	-	45	PASS
3.35	7				
2	6				
1.18	6				
0.6	5	0	-	25	PASS
0.425	5				
0.3	5				
0.212	5				
0.15	5				
0.063	4	0	-	12	PASS

Uniformity Coefficient [Cu]		8.7
D60	mm	45.4
D10	mm	5.24

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Earthworks
Specification for Highway Works, Volume 1, Series 600, TABLE 6/2

Remarks: Re-issue 1: Grading recalculated to BS1377-2 as per client request

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 19/03/2021

GF 471.1

TEST CERTIFICATE

PSD Assessment of material for use in Earthworks

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

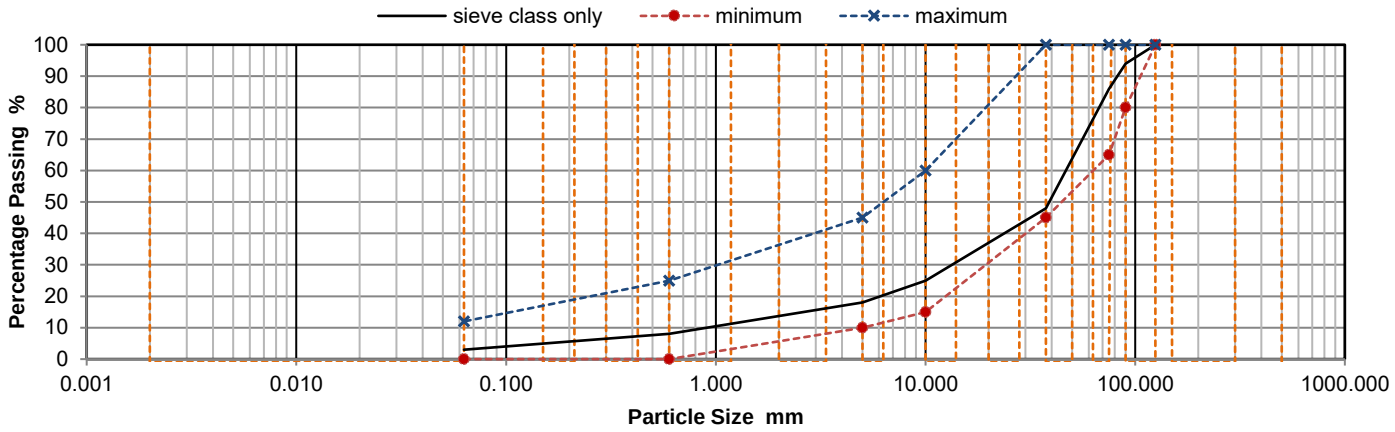
Tested in Accordance with: BS 1377-2:1990: Clause 9.2

Client:	Smith Grant LLP	Client Reference:	R1742B
Client Address:	Station House, Station Road, Ruabon, Wrexham, LL146DL	Job Number:	21-57487
		Date Sampled:	16/02/2021
		Date Received:	17/02/2021
Contact:	Daniel Wayland	Date Tested:	26/02/2021
Site Address:	Heyford PH9	Sampled By:	Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1774080	Depth Top [m]:	Not Given
Hole No.:	AGG SP2 S1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	CRUSHED CONCRETE		
Sample Preparation:	Sample was whole tested, oven dried at 106.0 °C and broken down by hand.		



Sieving		Material Type 6F2 Selected granular material			
Particle Size mm	Passing %	Material Specification			Pass or Fail
500	100				
300	100				
150	100				
125	100	100	-	100	PASS
90	94	80	-	100	PASS
75	86	65	-	100	PASS
63	71				
50	59				
37.5	48	45	-	100	PASS
28	41				
20	36				
14	30				
10	25	15	-	60	PASS
6.3	19				
5	18	10	-	45	PASS
3.35	15				
2	12				
1.18	10				
0.6	8	0	-	25	PASS
0.425	7				
0.3	6				
0.212	5				
0.15	4				
0.063	3	0	-	12	PASS

Uniformity Coefficient [Cu]		48
D60	mm	51
D10	mm	1.05

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Earthworks
Specification for Highway Works, Volume 1, Series 600, TABLE 6/2

Remarks: Re-issue 1: Grading recalculated to BS1377-2 as per client request

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 19/03/2021

GF 471.1

TEST CERTIFICATE

PSD Assessment of material for use in Earthworks

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Tested in Accordance with: BS 1377-2:1990: Clause 9.2

Client: Smith Grant LLP
Client Address: Station House, Station Road, Ruabon, Wrexham, LL146DL
Contact: Daniel Wayland
Site Address: Heyford PH9

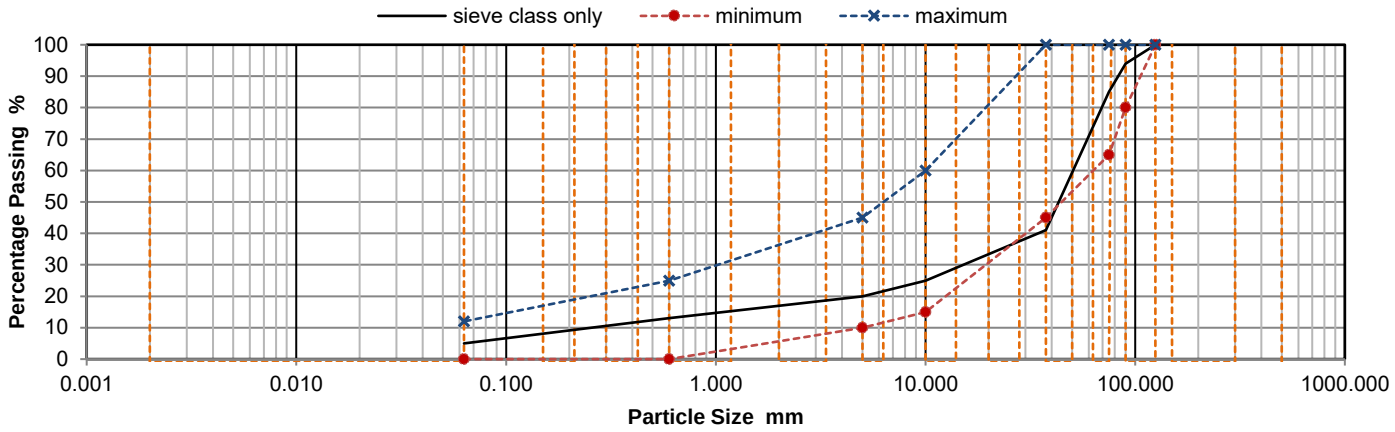
Client Reference: R1742B
Job Number: 21-57487
Date Sampled: 16/02/2021
Date Received: 17/02/2021
Date Tested: 26/02/2021
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1774081
Hole No.: AGG SP3 S1
Sample Reference: Not Given
Sample Description: CRUSHED CONCRETE
Sample Preparation: Sample was whole tested, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: Not Given
Depth Base [m]: Not Given
Sample Type: B



Sieving		Material Type 6F2 Selected granular material			
Particle Size mm	Passing %	Material Specification			Pass or Fail
500	100				
300	100				
150	100				
125	100	100	-	100	PASS
90	94	80	-	100	PASS
75	85	65	-	100	PASS
63	66				
50	53				
37.5	41	45	-	100	FAIL
28	37				
20	32				
14	28				
10	25	15	-	60	PASS
6.3	21				
5	20	10	-	45	PASS
3.35	18				
2	17				
1.18	15				
0.6	13	0	-	25	PASS
0.425	12				
0.3	11				
0.212	9				
0.15	8				
0.063	5	0	-	12	PASS

Uniformity Coefficient [Cu]		210
D60	mm	56.6
D10	mm	0.268

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Earthworks
Specification for Highway Works, Volume 1, Series 600, TABLE 6/2

Remarks: Re-issue 1: Grading recalculated to BS1377-2 as per client request

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 19/03/2021

GF 471.1

TEST CERTIFICATE

PSD Assessment of material for use in Earthworks

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

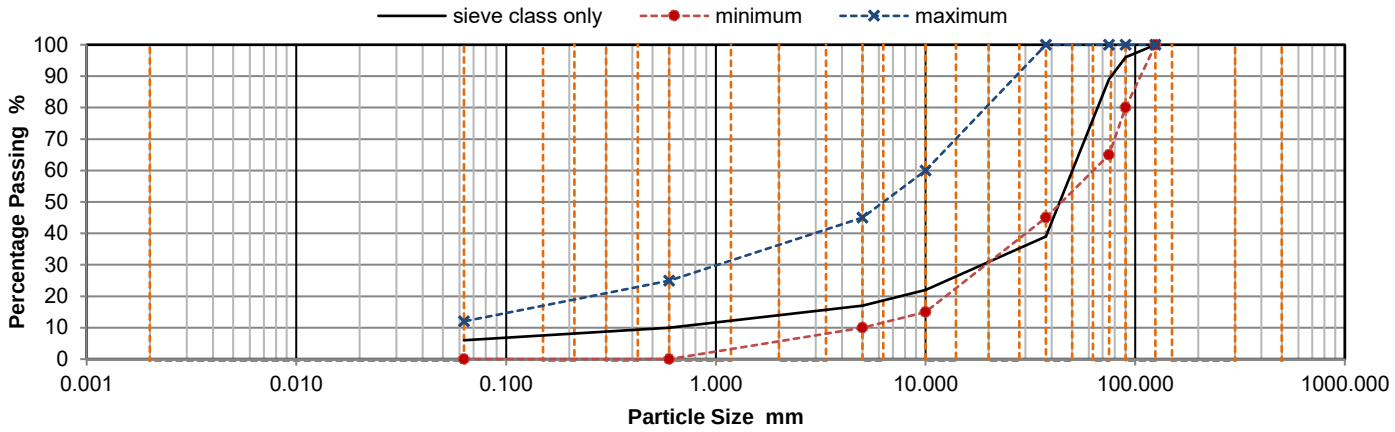
Tested in Accordance with: BS 1377-2:1990: Clause 9.2

Client:	Smith Grant LLP	Client Reference:	R1742B
Client Address:	Station House, Station Road, Ruabon, Wrexham, LL146DL	Job Number:	21-57487
		Date Sampled:	16/02/2021
		Date Received:	17/02/2021
Contact:	Daniel Wayland	Date Tested:	26/02/2021
Site Address:	Heyford PH9	Sampled By:	Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1774082	Depth Top [m]:	Not Given
Hole No.:	AGG SP3 S2	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	CRUSHED CONCRETE		
Sample Preparation:	Sample was whole tested, oven dried at 106.1 °C and broken down by hand.		



Sieving		Material Type 6F2 Selected granular material			
Particle Size mm	Passing %	Material Specification			Pass or Fail
500	100				
300	100				
150	100				
125	100	100	-	100	PASS
90	96	80	-	100	PASS
75	89	65	-	100	PASS
63	74				
50	55				
37.5	39	45	-	100	FAIL
28	33				
20	29				
14	25				
10	22	15	-	60	PASS
6.3	18				
5	17	10	-	45	PASS
3.35	14				
2	12				
1.18	11				
0.6	10	0	-	25	PASS
0.425	9				
0.3	8				
0.212	8				
0.15	7				
0.063	6	0	-	12	PASS

Uniformity Coefficient [Cu]		76
D60	mm	53.1
D10	mm	0.701

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Earthworks
Specification for Highway Works, Volume 1, Series 600, TABLE 6/2

Remarks: Re-issue 1: Grading recalculated to BS1377-2 as per client request

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 19/03/2021

GF 471.1

TEST CERTIFICATE

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Testing for Constituents of Coarse Recycled Aggregate

Tested in Accordance with: BS EN 933-11:2009

Client:	Smith Grant LLP	Client Reference:	R1742B
Client Address:	Station House, Station Road, Ruabon, Wrexham, LL146DL	Job Number:	21-57487
		Date Sampled:	16/02/2021
		Date Received:	17/02/2021
Contact:	Daniel Wayland	Date Tested:	26/02/2021
Site Address:	Heyford PH9	Sampled By:	Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1774079	Depth Top [m]:	Not Given
Hole No.:	AGG SP1 S1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	CRUSHED CONCRETE		

Sample preparation: Sample was dried at 106.1°C

Constituents	Proportion (cm3/kg)
Floating (FL)	0

Constituents	Proportion (%)
Concrete/ Concrete units and Mortar (Rc)	95
Unbound Aggregate (Ru)	3.4
Masonry (Rb)	0
Bituminous materials (Ra)	0.5
Glass (Rg)	0
Other (X)	0

Remarks: Re-issue 1: Grading recalculated to BS1377-2 as per client request

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 19/03/2021

GF 147.16

TEST CERTIFICATE

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Testing for Constituents of Coarse Recycled Aggregate

Tested in Accordance with: BS EN 933-11:2009

Client:	Smith Grant LLP	Client Reference:	R1742B
Client Address:	Station House, Station Road, Ruabon, Wrexham, LL146DL	Job Number:	21-57487
		Date Sampled:	16/02/2021
		Date Received:	17/02/2021
Contact:	Daniel Wayland	Date Tested:	26/02/2021
Site Address:	Heyford PH9	Sampled By:	Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1774080	Depth Top [m]:	Not Given
Hole No.:	AGG SP2 S1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	CRUSHED CONCRETE		

Sample preparation: Sample was dried at 106°C

Constituents	Proportion (cm3/kg)
Floating (FL)	0

Constituents	Proportion (%)
Concrete/ Concrete units and Mortar (Rc)	12
Unbound Aggregate (Ru)	84
Masonry (Rb)	1.4
Bituminous materials (Ra)	0.7
Glass (Rg)	0
Other (X)	0

Remarks: Re-issue 1: Grading recalculated to BS1377-2 as per client request

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 19/03/2021

TEST CERTIFICATE

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Testing for Constituents of Coarse Recycled Aggregate

Tested in Accordance with: BS EN 933-11:2009

Client:	Smith Grant LLP	Client Reference:	R1742B
Client Address:	Station House, Station Road, Ruabon, Wrexham, LL146DL	Job Number:	21-57487
		Date Sampled:	16/02/2021
		Date Received:	17/02/2021
Contact:	Daniel Wayland	Date Tested:	26/02/2021
Site Address:	Heyford PH9	Sampled By:	Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1774081	Depth Top [m]:	Not Given
Hole No.:	AGG SP3 S1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	CRUSHED CONCRETE		

Sample preparation: Sample was dried at 106°C

Constituents	Proportion (cm3/kg)
Floating (FL)	0

Constituents	Proportion (%)
Concrete/ Concrete units and Mortar (Rc)	13
Unbound Aggregate (Ru)	83
Masonry (Rb)	2.5
Bituminous materials (Ra)	0
Glass (Rg)	0
Other (X)	0

Remarks: Re-issue 1: Grading recalculated to BS1377-2 as per client request

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 19/03/2021

GF 147.16

TEST CERTIFICATE

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Testing for Constituents of Coarse Recycled Aggregate

Tested in Accordance with: BS EN 933-11:2009

Client:	Smith Grant LLP	Client Reference:	R1742B
Client Address:	Station House, Station Road, Ruabon, Wrexham, LL146DL	Job Number:	21-57487
		Date Sampled:	16/02/2021
		Date Received:	17/02/2021
Contact:	Daniel Wayland	Date Tested:	26/02/2021
Site Address:	Heyford PH9	Sampled By:	Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1774082	Depth Top [m]:	Not Given
Hole No.:	AGG SP3 S2	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	CRUSHED CONCRETE		

Sample preparation: Sample was dried at 106.1°C

Constituents	Proportion (cm3/kg)
Floating (FL)	0.1

Constituents	Proportion (%)
Concrete/ Concrete units and Mortar (Rc)	2.4
Unbound Aggregate (Ru)	95
Masonry (Rb)	1.5
Bituminous materials (Ra)	1
Glass (Rg)	0
Other (X)	0.2

Remarks: Re-issue 1: Grading recalculated to BS1377-2 as per client request

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 19/03/2021

TEST CERTIFICATE

PSD Assessment of material for use in Earthworks

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

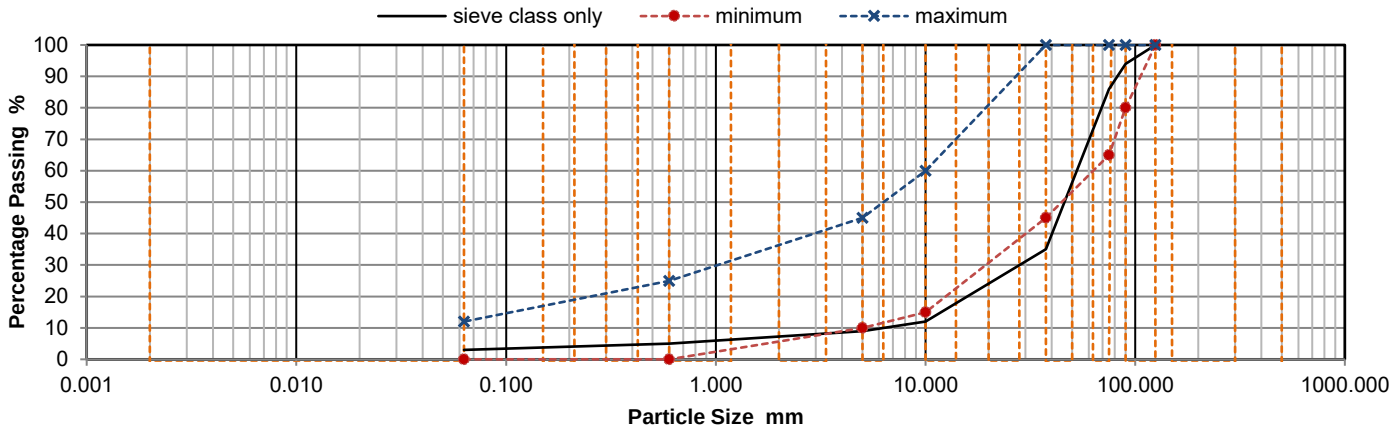
Tested in Accordance with: BS 1377-2:1990: Clause 9.2

Client:	Smith Grant LLP	Client Reference:	R1742B
Client Address:	Station House, Station Road, Ruabon, Wrexham, LL146DL	Job Number:	21-68265
		Date Sampled:	06/04/2021
		Date Received:	09/04/2021
Contact:	Daniel Wayland	Date Tested:	27/04/2021
Site Address:	Hayford Phase 9	Sampled By:	Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1834720	Depth Top [m]:	Not Given
Hole No.:	AGG 060421 S1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	CRUSHED CONCRETE		
Sample Preparation:	Sample was whole tested, oven dried at 106.0 °C and broken down by hand.		



Sieving		Material Type 6F2 Selected granular material			
Particle Size mm	Passing %	Material Specification			Pass or Fail
500	100				
300	100				
150	100				
125	100	100	-	100	PASS
90	94	80	-	100	PASS
75	86	65	-	100	PASS
63	61				
50	49				
37.5	35	45	-	100	FAIL
28	27				
20	20				
14	15				
10	12	15	-	60	FAIL
6.3	10				
5	9	10	-	45	FAIL
3.35	8				
2	7				
1.18	6				
0.6	5	0	-	25	PASS
0.425	5				
0.3	4				
0.212	4				
0.15	3				
0.063	3	0	-	12	PASS

Uniformity Coefficient [Cu]		9.5
D60	mm	62.3
D10	mm	6.55

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Earthworks

Specification for Highway Works, Volume 1, Series 600, TABLE 6/2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 30/04/2021

GF 471.1

TEST CERTIFICATE

Testing for Constituents of Coarse Recycled Aggregate

Tested in Accordance with: BS EN 933-11:2009

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Client:	Smith Grant LLP	Client Reference:	R1742B
Client Address:	Station House, Station Road, Ruabon, Wrexham, LL146DL	Job Number:	21-68265
		Date Sampled:	06/04/2021
		Date Received:	09/04/2021
Contact:	Daniel Wayland	Date Tested:	27/04/2021
Site Address:	Hayford Phase 9	Sampled By:	Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1834720	Depth Top [m]:	Not Given
Hole No.:	AGG 060421 S1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	CRUSHED CONCRETE		

Sample preparation: Sample was dried at 106°C

Constituents	Proportion (cm3/kg)
Floating (FL)	1.4

Constituents	Proportion (%)
Concrete/ Concrete units and Mortar (Rc)	92
Unbound Aggregate (Ru)	1
Masonry (Rb)	8.2
Bituminous materials (Ra)	0
Glass (Rg)	0
Other (X)	0.1

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 30/04/2021

GF 147.16

TEST CERTIFICATE

PSD Assessment of material for use in Earthworks

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

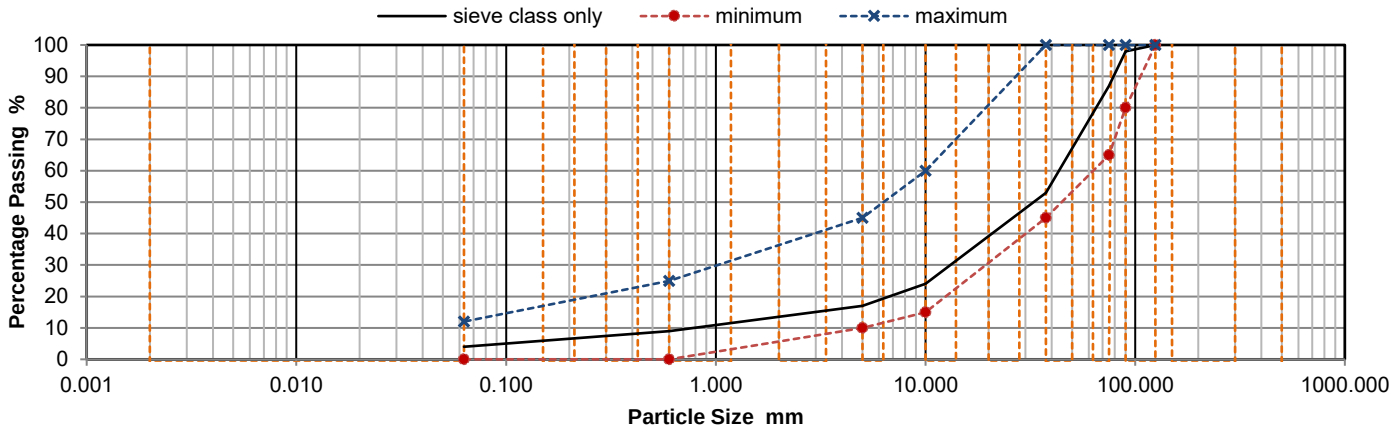
Tested in Accordance with: BS 1377-2:1990: Clause 9.2

Client:	Smith Grant LLP	Client Reference:	R1742B
Client Address:	Station House, Station Road, Ruabon, Wrexham, LL146DL	Job Number:	21-75647
		Date Sampled:	12/05/2021
		Date Received:	13/05/2021
Contact:	Scott Miller	Date Tested:	03/06/2021
Site Address:	Heyford Phase 9	Sampled By:	Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1874622	Depth Top [m]:	Not Given
Hole No.:	Agg SP3 - GS1 to GS3	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	CRUSHED CONCRETE		
Sample Preparation:	Sample was whole tested, oven dried at 40.0 °C and broken down by hand.		



Sieving		Material Type 6F2 Selected granular material			
Particle Size mm	Passing %	Material Specification			Pass or Fail
500	100				
300	100				
150	100				
125	100	100	-	100	PASS
90	98	80	-	100	PASS
75	87	65	-	100	PASS
63	75				
50	64				
37.5	53	45	-	100	PASS
28	48				
20	39				
14	30				
10	24	15	-	60	PASS
6.3	19				
5	17	10	-	45	PASS
3.35	15				
2	13				
1.18	11				
0.6	9	0	-	25	PASS
0.425	8				
0.3	7				
0.212	6				
0.15	5				
0.063	4	0	-	12	PASS

Uniformity Coefficient [Cu]		55
D60	mm	45.1
D10	mm	0.824

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Earthworks

Specification for Highway Works, Volume 1, Series 600, TABLE 6/2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Signed:

Szczepan Bielatowicz
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 11/06/2021

GF 471.1

TEST CERTIFICATE

Testing for Constituents of
Coarse Recycled Aggregate
Tested in Accordance with: BS EN 933-11:2009

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Client:	Smith Grant LLP	Client Reference:	R1742B
Client Address:	Station House, Station Road, Ruabon, Wrexham, LL146DL	Job Number:	21-75647
		Date Sampled:	12/05/2021
		Date Received:	13/05/2021
Contact:	Scott Miller	Date Tested:	03/06/2021
Site Address:	Heyford Phase 9	Sampled By:	Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1874622	Depth Top [m]:	Not Given
Hole No.:	Agg SP3 - GS1 to GS3	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	CRUSHED CONCRETE		

Sample preparation: Sample was dried at 40°C

Constituents	Proportion (cm3/kg)
Floating (FL)	1

Constituents	Proportion (%)
Concrete/ Concrete units and Mortar (Rc)	88
Unbound Aggregate (Ru)	0.9
Masonry (Rb)	9.9
Bituminous materials (Ra)	0.4
Glass (Rg)	0.1
Other (X)	0.1

Remarks:

Signed:

Szczepan Bielatowicz
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 11/06/2021

GF 147.16

TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

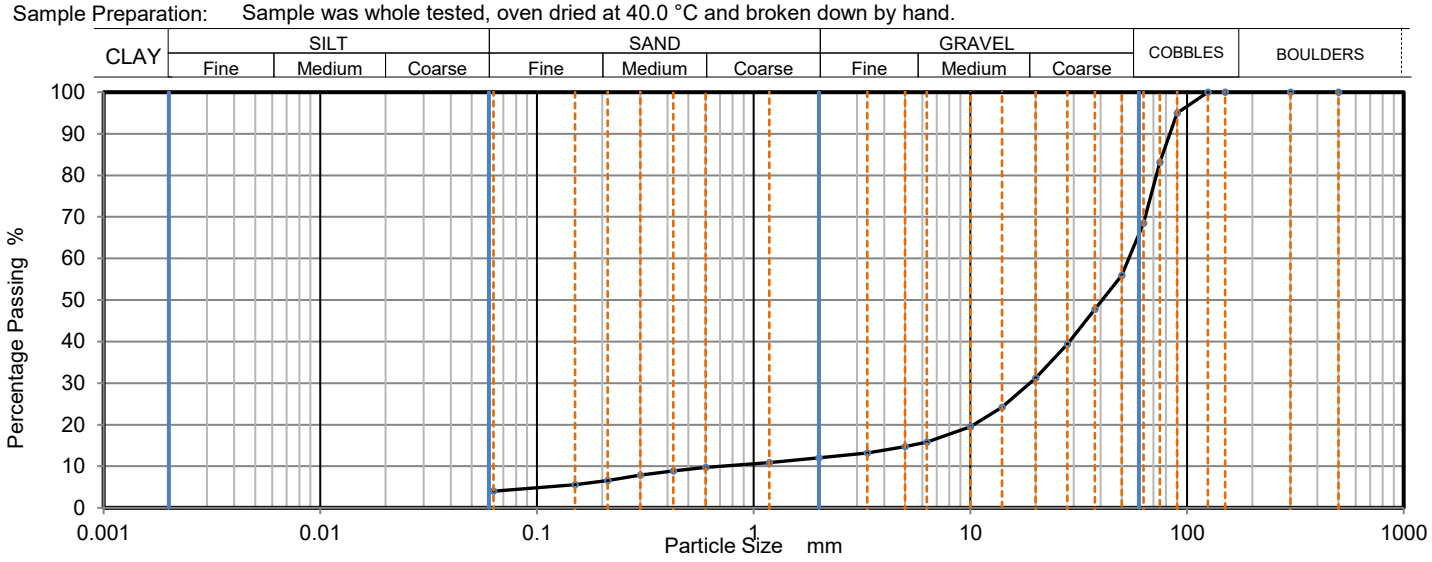
UKAS TESTING 4041

Client:	Smith Grant LLP	Client Reference:	R1742B
Client Address:	Station House, Station Road, Ruabon, Wrexham, LL146DL	Job Number:	21-75652
		Date Sampled:	12/05/2021
		Date Received:	13/05/2021
Contact:	megan.jones@smithgrant.co.uk	Date Tested:	03/06/2021
Site Address:	Heyford Phase 9	Sampled By:	Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1874642	Depth Top [m]:	Not Given
Hole No.:	Agg SP2 - GS1 to GS3	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Multicolor slightly clayey sandy GRAVEL with cobbles		
Sample Preparation:	Sample was whole tested, oven dried at 40.0 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	95		
75	83		
63	69		
50	56		
37.5	48		
28	39		
20	31		
14	24		
10	20		
6.3	16		
5	15		
3.35	13		
2	12		
1.18	11		
0.6	10		
0.425	9		
0.3	8		
0.212	7		
0.15	6		
0.063	5		

Sample Proportions	% dry mass
Very coarse	32
Gravel	57
Sand	7
Fines <0.063mm	5

Grading Analysis		
D100	mm	125
D60	mm	53.9
D30	mm	18.8
D10	mm	0.709
Uniformity Coefficient		76
Curvature Coefficient		9.3

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

Aleksandra Jurochnik
PL Technical Reviewer
for and on behalf of i2 Analytical Ltd

Date Reported: 11/06/2021

GF 100.20

TEST CERTIFICATE

Testing for Constituents of Coarse Recycled Aggregate

Tested in Accordance with: BS EN 933-11:2009

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Client:	Smith Grant LLP	Client Reference:	R1742B
Client Address:	Station House, Station Road, Ruabon, Wrexham, LL146DL	Job Number:	21-75652
		Date Sampled:	12/05/2021
		Date Received:	13/05/2021
Contact:	megan.jones@smithgrant.co.uk	Date Tested:	03/06/2021
Site Address:	Heyford Phase 9	Sampled By:	Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1874642	Depth Top [m]:	Not Given
Hole No.:	Agg SP2 - GS1 to GS3	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Multicolor slightly clayey sandy GRAVEL with cobbles		

Sample preparation: Sample was dried at 40°C

Constituents	Proportion (cm3/kg)
Floating (FL)	1

Constituents	Proportion (%)
Concrete/ Concrete units and Mortar (Rc)	88
Unbound Aggregate (Ru)	1.4
Masonry (Rb)	7
Bituminous materials (Ra)	2.9
Glass (Rg)	0
Other (X)	0.1

Remarks:

Signed:

Aleksandra Jurochnik
PL Technical Reviewer
for and on behalf of i2 Analytical Ltd

Date Reported: 11/06/2021

(A division of Gradko International Ltd.)
St. Martins House, 77 Wales Street Winchester, Hampshire SO23 0RH
tel.: 01962 860331 fax: 01962 841339 e-mail:diffusion@gradko.co.uk

2187

LABORATORY ANALYSIS REPORT

Report Number	**P03089R**
Customer	**Smith Grant LLP** **Station House** **Station Road** **Ruabon, Wrexham** **LL14 6DL**
Booking In Reference	**R0544**
Despatch Note Number	**84741**
Date Samples Received	**05/05/2021**
Diffusion Tube Type	**Tenax**
Job Reference	**R1742b**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Tube Number	**GRA08325**
Gradko Lab Reference	**08P0741**
Exposure Time (mins)*	**31640**
Sample ID	**V1**

BTEX	**ng on tube**	**ppb in air***	**µgm^{-3}***
Benzene	6.6	0.3	0.9
Toluene	14.7	0.5	1.7
Ethylbenzene	6.4	0.1	0.6
m/p-Xylene	24.2	0.5	2.2
o-Xylene	9.2	0.2	0.8

	NIST Library Quality Match	**Estimated ng on tube**	**ppb in air***
EC5-EC6 Aliphatic Hydrocarbons**		<5	<0.1

EC>6-EC8 Aliphatic Hydrocarbons**	NIST Library Quality Match	**Estimated ng on tube**	**ppb in air***	**µgm^{-3}***
Pentane, 3,3-dimethyl-	83	19	0.3	1.2
Hexane, 3,3-dimethyl-	78	18	0.3	1.3
Pentane, 2,3,3-trimethyl-	90	14	0.2	1.0
Cyclopentane, 1,1,3-trimethyl-	74	7	0.1	0.5
Pentane, 3-ethyl-2-methyl-	92	7	0.1	0.5
Pentane, 2,3,4-trimethyl-	64	7	0.1	0.5
Butane, 2,2,3-trimethyl-	72	7	0.1	0.4
Pentane, 2,2-dimethyl-	78	6	0.1	0.4
Hexane, 2,4-dimethyl-	81	5	0.1	0.4
Cyclopentane, 1,1-dimethyl-	46	<5	<0.1	<0.3

REPORT OFFICIALLY CHECKED

Gradko International Ltd
This signature confirms the authenticity of these results
Signed.....
L. Gates, Laboratory Manager

gradko environmental
(A division of Gradko International Ltd.)
St. Martins House, 77 Wales Street Winchester, Hampshire SO23 0RH
tel.: 01962 860331 fax: 01962 841339 e-mail:diffusion@gradko.co.uk

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LABORATORY ANALYSIS REPORT

	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Hexane, 3-ethyl-	59	<5	<0.1	<0.4
Hexane, 2,2,5-trimethyl-	53	<5	<0.1	<0.4
Pentane, 2,3-dimethyl-	59	<5	<0.1	<0.3
Total**		**109**	**1.7**	**7.5**

EC>8-EC10 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Cyclohexane, 1,1,3-trimethyl-	91	26	0.4	2.1
Cyclohexane, 1,3,5-trimethyl-	91	8	0.1	0.6
Hexane, 3-ethyl-2-methyl-	72	8	0.1	0.6
Total**		**42**	**0.7**	**3.4**

	NIST Library Quality Match	Estimated ng on tube	ppb in air*
EC>10-EC12 Aliphatic Hydrocarbons**		<5	<0.1

EC>12-EC16 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Hexadecane	35	<5	<0.1	<0.7

EC5-EC7 Aromatic Hydrocarbons** (Benzenze)

EC>7-EC8 Aromatic Hydrocarbons** (Toluene)

EC>8-EC10 Aromatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Benzene, 1,2,4-trimethyl-	95	25	0.4	1.9

	NIST Library Quality Match	Estimated ng on tube	ppb in air*
EC>10-EC12 Aromatic Hydrocarbons**		<5	<0.1

	NIST Library Quality Match	Estimated ng on tube	ppb in air*
EC>12-EC16 Aromatic Hydrocarbons**		<5	<0.1

REPORT OFFICIALLY CHECKED

Gradko International Ltd
This signature confirms the authenticity of these results
Signed.....
L. Gates, Laboratory Manager

gradko environmental
(A division of Gradko International Ltd.)
St. Martins House, 77 Wales Street Winchester, Hampshire SO23 0RH
tel.: 01962 860331 fax: 01962 841339 e-mail:diffusion@gradko.co.uk

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LABORATORY ANALYSIS REPORT

Tube Number	**004520**
Gradko Lab Reference	**08P0742**
Exposure Time (mins)*	**31640**
Sample ID	**V2**

BTEX	ng on tube	ppb in air*	µgm^{-3}*
Benzene	6.0	0.3	0.8
Toluene	5.0	0.2	0.6
Ethylbenzene	<5	<0.1	<0.5
m/p-Xylene	6.8	0.1	0.6
o-Xylene	<5	<0.1	<0.5

	NIST Library Quality Match	Estimated ng on tube	ppb in air*
EC5-EC6 Aliphatic Hydrocarbons**		<5	<0.1

EC>6-EC8 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Hexane, 3-ethyl-	87	6	0.1	0.4
Hexane, 2,4-dimethyl-	81	5	0.1	0.4
Cyclopentane, methyl-	37	<5	<0.1	<0.3
Hexane, 2,5-dimethyl-	70	<5	<0.1	<0.4
Total**		**21**	**0.3**	**1.4**

EC>8-EC10 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Heptane, 2,5-dimethyl-	91	15	0.2	1.2
Heptane, 4-ethyl-	53	7	0.1	0.5
Cyclohexane, propyl-	58	6	0.1	0.5
Heptane, 2,3-dimethyl-	74	<5	<0.1	<0.4
Heptane, 2,4-dimethyl-	90	<5	<0.1	<0.4
Heptane, 3-ethyl-	76	<5	<0.1	<0.4
Total**		**42**	**0.7**	**3.4**

	NIST Library Quality Match	Estimated ng on tube	ppb in air*
EC>10-EC12 Aliphatic Hydrocarbons**		<5	<0.1

EC>12-EC16 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Pentadecane	64	7	0.1	0.9
Tetradecane	51	<5	<0.1	<0.6
Hexadecane	60	<5	<0.1	<0.7
Total**		**<17**	**<0.3**	**<2.3**

REPORT OFFICIALLY CHECKED

Gradko International Ltd
This signature confirms the authenticity of these results
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L. Gates, Laboratory Manager

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St. Martins House, 77 Wales Street Winchester, Hampshire SO23 0RH
tel.: 01962 860331 fax: 01962 841339 e-mail:diffusion@gradko.co.uk

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LABORATORY ANALYSIS REPORT

EC5-EC7 Aromatic Hydrocarbons**

(Benzenze)

EC>7-EC8 Aromatic Hydrocarbons**

(Toluene)

EC>8-EC10 Aromatic Hydrocarbons**	NIST Library Quality Match	**Estimated ng on tube**	**ppb in air***	**µgm^{-3}***
Benzene, 1,2,4-trimethyl-	95	8	0.1	0.6
Benzene, 1,3,5-trimethyl-	64	<5	<0.1	<0.4
Total**		**13**	**0.2**	**1.0**

EC>10-EC12 Aromatic Hydrocarbons**	NIST Library Quality Match	**Estimated ng on tube**	**ppb in air***	**µgm^{-3}***
Naphthalene	94	30	0.5	2.5
Benzene, 1,2,4,5-tetramethyl-	55	5	0.1	0.5
Benzene, 2-ethyl-1,4-dimethyl-	86	<5	<0.1	<0.4
Benzene, 1-ethyl-3,5-dimethyl-	95	<5	<0.1	<0.4
Benzene, 1-methyl-3-(1-methylethyl)-	72	<5	<0.1	<0.4
Benzene, 1,2,3-trimethyl-	50	<5	<0.1	<0.4
Total**		**56**	**0.9**	**4.6**

EC>12-EC16 Aromatic Hydrocarbons**	NIST Library Quality Match	**Estimated ng on tube**	**ppb in air***	**µgm^{-3}***
Naphthalene, 1-methyl-	91	16	0.3	1.5
Naphthalene, 2-methyl-	95	9	0.1	0.8
Naphthalene, 2,6-dimethyl-	95	6	0.1	0.6
Naphthalene, 2,3-dimethyl-	98	6	0.1	0.6
Naphthalene, 1,5-dimethyl-	96	<5	<0.1	<0.5
Total**		**43**	**0.7**	**4.0**

Tube Number	**GRA02522**
Gradko Lab Reference	**08P0743**
Exposure Time (mins)*	**31645**
Sample ID	**V3**

BTEX	**ng on tube**	**ppb in air***	**µgm^{-3}***
Benzene	5.0	0.2	0.7
Toluene	<5	<0.2	<0.6
Ethylbenzene	<5	<0.1	<0.5
m/p-Xylene	<5	<0.1	<0.5
o-Xylene	<5	<0.1	<0.5

REPORT OFFICIALLY CHECKED

Gradko International Ltd
This signature confirms the authenticity of these results
Signed.....
L. Gates, Laboratory Manager

(A division of Gradko International Ltd.)
St. Martins House, 77 Wales Street Winchester, Hampshire SO23 0RH
tel.: 01962 860331 fax: 01962 841339 e-mail:diffusion@gradko.co.uk

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LABORATORY ANALYSIS REPORT

	NIST Library Quality Match	Estimated ng on tube	ppb in air*
EC5-EC6 Aliphatic Hydrocarbons**		<5	<0.1
EC>6-EC8 Aliphatic Hydrocarbons**		<5	<0.1
EC>8-EC10 Aliphatic Hydrocarbons**		<5	<0.1
EC>10-EC12 Aliphatic Hydrocarbons**		<5	<0.1
EC>12-EC16 Aliphatic Hydrocarbons**		<5	<0.1
EC5-EC7 Aromatic Hydrocarbons**		(Benzenze)	
EC>7-EC8 Aromatic Hydrocarbons**		(Toluene)	
EC>8-EC10 Aromatic Hydrocarbons**		<5	<0.1
EC>10-EC12 Aromatic Hydrocarbons**		<5	<0.1
EC>12-EC16 Aromatic Hydrocarbons**		<5	<0.1

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Gradko International Ltd
This signature confirms the authenticity of these results
Signed.....
L. Gates, Laboratory Manager

gradko environmental
(A division of Gradko International Ltd.)
St. Martins House, 77 Wales Street Winchester, Hampshire SO23 0RH
tel.: 01962 860331 fax: 01962 841339 e-mail:diffusion@gradko.co.uk

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LABORATORY ANALYSIS REPORT

Tube Number	**GRA05953**
Gradko Lab Reference	**08P0744**
Exposure Time (mins)*	**31650**
Sample ID	**V4**

BTEX	ng on tube	ppb in air*	µgm^{-3}*
Benzene	9.1	0.4	1.3
Toluene	12.1	0.4	1.4
Ethylbenzene	<5	<0.1	<0.5
m/p-Xylene	13.7	0.3	1.3
o-Xylene	9.8	0.2	0.9

	NIST Library Quality Match	Estimated ng on tube	ppb in air*
EC5-EC6 Aliphatic Hydrocarbons**		<5	<0.1

	NIST Library Quality Match	Estimated ng on tube	ppb in air*
EC>6-EC8 Aliphatic Hydrocarbons**		<5	<0.1

	NIST Library Quality Match	Estimated ng on tube	ppb in air*
EC>8-EC10 Aliphatic Hydrocarbons**		<5	<0.1

EC>10-EC12 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Dodecane	93	18	0.3	1.9
Undecane	92	15	0.2	1.5
Total**		**33**	**0.5**	**3.4**

EC>12-EC16 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Pentadecane	89	8	0.1	1.1
Tridecane	95	7	0.1	0.8
Tetradecane	97	6	0.1	0.8
Hexadecane	95	5	0.1	0.8
Total**		**27**	**0.4**	**3.5**

EC5-EC7 Aromatic Hydrocarbons**	(Benzenze)
EC>7-EC8 Aromatic Hydrocarbons**	(Toluene)

EC>8-EC10 Aromatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Benzene, 1,2,4-trimethyl-	70	<5	<0.1	<0.4

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EC>10-EC12 Aromatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Naphthalene	94	67	1.1	5.5
Benzene, 2-ethyl-1,4-dimethyl-	34	<5	<0.1	<0.4
Total**		**72**	**1.1**	**5.9**

EC>12-EC16 Aromatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Naphthalene, 1-methyl-	93	<5	<0.1	<0.4
Naphthalene, 2-methyl-	94	<5	<0.1	<0.4
Total**		**<10**	**<0.2**	**<0.9**

Tube Number	**GRA03786**
Gradko Lab Reference	**08P0745**
Exposure Time (mins)*	**31655**
Sample ID	**V5**

BTEX	ng on tube	ppb in air*	µgm^{-3}*
Benzene	<5	<0.2	<0.7
Toluene	<5	<0.2	<0.6
Ethylbenzene	<5	<0.1	<0.5
m/p-Xylene	6.2	0.1	0.6
o-Xylene	<5	<0.1	<0.5

EC5-EC6 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*
		<5	<0.1

EC>6-EC8 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Hexane, 3,4-dimethyl-	50	15	0.2	1.1
Hexane, 3-ethyl-	87	13	0.2	0.9
Hexane, 2,4-dimethyl-	93	11	0.2	0.8
Cyclohexane, 1,3-dimethyl-, cis-	94	9	0.1	0.7
Pentane, 3-ethyl-2-methyl-	59	9	0.1	0.6
Hexane, 2,3-dimethyl-	91	8	0.1	0.6
Pentane, 2,3,3-trimethyl-	78	7	0.1	0.5
Hexane, 2,5-dimethyl-	94	6	0.1	0.5
Cyclohexane, methyl-	87	6	0.1	0.4
Cyclohexane, 1,2-dimethyl-, trans-	91	6	0.1	0.4
Pentane, 2,3-dimethyl-	72	<5	<0.1	<0.3
Cyclohexane, 1,4-dimethyl-, trans-	87	<5	<0.1	<0.4
Cyclohexane, 1,2-dimethyl-, cis-	55	<5	<0.1	<0.4
Total**		**105**	**1.7**	**7.5**

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LABORATORY ANALYSIS REPORT

EC>8-EC10 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Heptane, 2,5-dimethyl-	90	32	0.5	2.6
Heptane, 4-ethyl-	81	18	0.3	1.5
Heptane, 2,3-dimethyl-	87	13	0.2	1.0
Heptane, 3-ethyl-	83	12	0.2	0.9
Cyclohexane, 1,1,3-trimethyl-	93	11	0.2	0.9
Heptane, 2,4-dimethyl-	94	10	0.2	0.8
Cyclohexane, 1-ethyl-2-methyl-, trans-	64	10	0.2	0.8
Hexane, 3-ethyl-2-methyl-	78	6	0.1	0.5
1-Ethyl-3-methylcyclohexane (c,t)	94	6	0.1	0.4
Hexane, 2,4,4-trimethyl-	83	<5	<0.1	<0.4
Hexane, 2,3,5-trimethyl-	86	<5	<0.1	<0.4
Cyclohexane, 1,2,4-trimethyl-	94	<5	<0.1	<0.4
Total**		**132**	**2.1**	**11**

EC>10-EC12 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*
		<5	<0.1

EC>12-EC16 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Pentadecane	47	13	0.2	1.7
Tetradecane	60	7	0.1	0.8
Hexadecane	83	<5	<0.1	<0.7
Total**		**24**	**0.4**	**3.2**

EC5-EC7 Aromatic Hydrocarbons** (Benzenze)

EC>7-EC8 Aromatic Hydrocarbons** (Toluene)

EC>8-EC10 Aromatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Benzene, 1,2,4-trimethyl-	95	15	0.2	1.1
Benzene, 1,3,5-trimethyl-	90	<5	<0.1	<0.4
Total**		**20**	**0.3**	**1.5**

EC>10-EC12 Aromatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Naphthalene	93	44	0.7	3.6
Indan, 1-methyl-	60	29	0.5	2.4
Benzene, 2-ethyl-1,4-dimethyl-	83	15	0.2	1.3
Benzene, 1,2,4,5-tetramethyl-	90	10	0.2	0.9
Benzene, 4-ethyl-1,2-dimethyl-	89	7	0.1	0.6
Total**		**106**	**1.7**	**8.8**

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EC>12-EC16 Aromatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Naphthalene, 1-methyl-	96	15	0.2	1.4
Naphthalene,2-methyl-	95	10	0.2	0.9
Naphthalene, 2,6-dimethyl-	96	9	0.1	0.9
Naphthalene, 1,5-dimethyl-	95	8	0.1	0.8
Total**		**42**	**0.7**	**3.9**

Tube Number	**GRA06950**
Gradko Lab Reference	**08P0746**
Exposure Time (mins)*	**31660**
Sample ID	**V6**

BTEX	ng on tube	ppb in air*	µgm^{-3}*
Benzene	11.2	0.5	1.6
Toluene	6.9	0.2	0.8
Ethylbenzene	<5	<0.1	<0.5
m/p-Xylene	6.4	0.1	0.6
o-Xylene	<5	<0.1	<0.5

EC5-EC6 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Pentane, 3-methyl-	68	<5	<0.1	<0.3

EC>6-EC8 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Hexane, 3-ethyl-	94	144	2.3	9.1
Cyclohexane, 1,3-dimethyl-, cis-	95	127	2.0	9.0
Hexane, 2,4-dimethyl-	95	93	1.5	6.7
Cyclohexane, 1,2-dimethyl-, trans-	91	89	1.4	6.3
Hexane, 3,4-dimethyl-	90	82	1.3	5.9
Pentane, 3-ethyl-2-methyl-	72	73	1.2	5.3
Hexane, 2,3-dimethyl-	86	71	1.1	5.1
	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Cyclohexane, methyl-	87	57	0.9	3.5
Cyclopentane, 1,2,3-trimethyl-, (1.alpha.,2.alpha.,3.beta.)-	91	54	0.9	3.8
Cyclohexane, 1,4-dimethyl-	90	47	0.7	3.3
Pentane, 2,3-dimethyl-	91	45	0.7	2.9
Cyclohexane, 1,4-dimethyl-, trans-	87	44	0.7	3.1
Hexane, 2,5-dimethyl-	95	43	0.7	3.1
Cyclopentane, 1-ethyl-2-methyl-	91	37	0.6	2.6

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	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Pentane, 3-ethyl-	74	34	0.5	2.2
Cyclohexane, 1,2-dimethyl-, cis-	94	26	0.4	1.8
Pentane, 2,2,4-trimethyl-	78	13	0.2	0.9
Cyclopentane, 1,3-dimethyl-, trans-	58	10	0.2	0.6
Cyclopentane, 1,2-dimethyl-	95	9	0.1	0.5
Hexane, 3-methyl-	86	8	0.1	0.5
Pentane, 2,4-dimethyl-	87	7	0.1	0.4
Heptane	64	<5	<0.1	<0.3
Total**		**1118**	**18**	**77**

EC>8-EC10 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Heptane, 2,5-dimethyl-	91	163	2.6	13.2
Heptane, 4-ethyl-	87	154	2.4	12.5
Cyclohexane, 1,1,3-trimethyl-	94	113	1.8	9.0
Heptane, 3-ethyl-	87	100	1.6	8.1
Cyclohexane, ethyl-	70	96	1.5	6.8
Cyclohexane, 1,2,4-trimethyl-	89	88	1.4	7.0
Heptane, 2,4-dimethyl-	94	67	1.1	5.4
1-Ethyl-4-methylcyclohexane	91	56	0.9	4.5
Hexane, 3-ethyl-2-methyl-	91	52	0.8	4.2
Cyclohexane, 1-ethyl-4-methyl-, trans-	83	42	0.7	3.3
Hexane, 2,3,5-trimethyl-	91	36	0.6	2.9
Hexane, 2,4,4-trimethyl-	80	32	0.5	2.6
Hexane, 2,3,3-trimethyl-	72	22	0.4	1.8
Nonane, 4-methyl-	60	22	0.4	2.0
Octane, 4-methyl-	93	22	0.3	1.8
Total**		**1067**	**17**	**85**

	NIST Library Quality Match	Estimated ng on tube	ppb in air*
EC>10-EC12 Aliphatic Hydrocarbons**		<5	<0.1

EC>12-EC16 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Tetradecane	47	14	0.2	1.8

EC5-EC7 Aromatic Hydrocarbons** (Benzenze)

EC>7-EC8 Aromatic Hydrocarbons** (Toluene)

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EC>8-EC10 Aromatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Benzene, 1,2,4-trimethyl-	70	35	0.6	2.7
Benzene, 1,3,5-trimethyl-	83	16	0.3	1.2
Total**		**52**	**0.8**	**3.9**

EC>10-EC12 Aromatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Naphthalene	64	60	0.9	4.8
Benzene, 2-ethyl-1,4-dimethyl-	91	44	0.7	3.7
Benzene, 1,2,4,5-tetramethyl-	93	36	0.6	3.1
Benzene, 2-ethyl-1,3-dimethyl-	56	27	0.4	2.3
Benzene, 1-ethyl-3,5-dimethyl-	74	23	0.4	2.0
Total**		**191**	**3.0**	**16**

EC>12-EC16 Aromatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Naphthalene, 2-methyl-	92	28	0.4	2.5
Naphthalene, 1,5-dimethyl-	96	24	0.4	2.3
Naphthalene, 2,6-dimethyl-	97	23	0.4	2.3
Naphthalene, 1,3-dimethyl-	91	18	0.3	1.8
Naphthalene, 1,4-dimethyl-	94	17	0.3	1.7
Total**		**110**	**1.7**	**11**

Tube Number	**003962**
Gradko Lab Reference	**08P0747**
Exposure Time (mins)*	**31665**
Sample ID	**Background**

BTEX	ng on tube	ppb in air*	µgm^{-3}*
Benzene	10.4	0.5	1.5
Toluene	6.4	0.2	0.7
Ethylbenzene	<5	<0.1	<0.5
m/p-Xylene	5.1	0.1	0.5
o-Xylene	<5	<0.1	<0.5

	NIST Library Quality Match	Estimated ng on tube	ppb in air*
EC5-EC6 Aliphatic Hydrocarbons**		<5	<0.1

	NIST Library Quality Match	Estimated ng on tube	ppb in air*
EC>6-EC8 Aliphatic Hydrocarbons**		<5	<0.1

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	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
EC>8-EC10 Aliphatic Hydrocarbons**		<5	<0.1	
EC>10-EC12 Aliphatic Hydrocarbons**		<5	<0.1	
EC>12-EC16 Aliphatic Hydrocarbons**		<5	<0.1	
EC5-EC7 Aromatic Hydrocarbons**		(Benzenze)		
EC>7-EC8 Aromatic Hydrocarbons**		(Toluene)		
EC>8-EC10 Aromatic Hydrocarbons**				
Benzene, 1,2,4-trimethyl-	87	<5	<0.1	<0.4
EC>10-EC12 Aromatic Hydrocarbons**		<5	<0.1	
EC>12-EC16 Aromatic Hydrocarbons**		<5	<0.1	

Tube Number	**004369**
Gradko Lab Reference	**08P0748**
Sample ID	**Blank**

BTEX	**ng on tube**
Benzene	<5
Toluene	<5
Ethylbenzene	<5
m/p-Xylene	<5
o-Xylene	<5

	NIST Library Quality Match	Estimated ng on tube
EC5-EC6 Aliphatic Hydrocarbons**		<5

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	NIST Library Quality Match	Estimated ng on tube
EC>6-EC8 Aliphatic Hydrocarbons**		<5
EC>10-EC12 Aliphatic Hydrocarbons**		<5
EC>12-EC16 Aliphatic Hydrocarbons**		<5
EC5-EC7 Aromatic Hydrocarbons**		(Benzenze)
EC>7-EC8 Aromatic Hydrocarbons**		(Toluene)
EC>8-EC10 Aromatic Hydrocarbons**		<5
EC>10-EC12 Aromatic Hydrocarbons**		<5
EC>12-EC16 Aromatic Hydrocarbons**		<5

Tube Number	**003326**
Gradko Lab Reference	**210512_TXTABLANK_2**
Sample ID	**Laboratory Blank**

BTEX	**ng on tube**
Benzene	<5
Toluene	<5
Ethylbenzene	<5
m/p-Xylene	<5
o-Xylene	<5

	NIST Library Quality Match	Estimated ng on tube
EC5-EC6 Aliphatic Hydrocarbons**		<5

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	NIST Library Quality Match	Estimated ng on tube
EC>6-EC8 Aliphatic Hydrocarbons**		<5
EC>10-EC12 Aliphatic Hydrocarbons**		<5
EC>12-EC16 Aliphatic Hydrocarbons**		<5
EC5-EC7 Aromatic Hydrocarbons**		(Benzenze)
EC>7-EC8 Aromatic Hydrocarbons**		(Toluene)
EC>8-EC10 Aromatic Hydrocarbons**		<5
EC>10-EC12 Aromatic Hydrocarbons**		<5
EC>12-EC16 Aromatic Hydrocarbons**		<5

Uptake Rates:

Benzene 0.70 ng.ppm^{-1}.min^{-1}.
Toluene 1.03 ng.ppm^{-1}.min^{-1}.
Ethylbenzene 1.46 ng.ppm^{-1}.min^{-1}.
m/p Xylene 1.46 ng.ppm^{-1}.min^{-1}.
o-Xylene 1.46 ng.ppm^{-1}.min^{-1}.
All other compounds: 2.00 ng.ppm^{-1}.min^{-1}.

Results are not Blank corrected.
The laboratory blank is a system check and will not be from the same batch of tubes analysed.

Reporting Limit 5ng on tube
Results reported as <5ng on tube are below the reporting limit.
Estimated results reported as <5ng on tube are below the reporting limit for the non-specific standard toluene.

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Uncertainty of Measurement	
Benzene	±15.2%
Toluene	±10.8%
Ethylbenzene	±15.9%
m/p-Xylene	±12.8%
o-Xylene	±12.5%

The reported expanded uncertainty is based on a standard uncertainty multiplied by a factor of *k*=2, providing a level of confidence of approximately 95%. Uncertainty of measurement has not been applied to the reported results.

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Compounds reported may not be the most abundant detected in these samples.
**The classification and grouping of TPH compounds to CWG guidelines is not covered by our UKAS accreditation.

Identification of compounds is carried out by comparison of the mass spectra to the NIST 17 mass spectral library. Compounds with a quality match below 85% are noted as a tentative identity and shown in italics. These compounds are outside of the scope of our UKAS accreditation.

Where a result is shown as less than the reporting limit the reporting limit concentration is included in the total TPH result.

If the sum of results below the reporting limit is greater than the sum of results above the reporting limit total TPH will be reported as less than the value reported.

Analysts Name	Katya Paldamova	**Date of Analysis**	12/05/2021
Report Checked By	Mariella Angelova	**Date of Report**	18/05/2021

Analysis has been carried out in accordance with in-house method GLM 13

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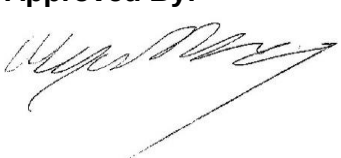
Final Report

Report No.:	21-05371-1		
Initial Date of Issue:	25-Feb-2021		
Client	Smith Grant LLP		
Client Address:	Station House, Station Road Ruabon Wrexham LL14 6DL		
Contact(s):	Dan Wayland		
Project	R1742b Heyford - Phase 9		
Quotation No.:		**Date Received:**	22-Feb-2021
Order No.:		**Date Instructed:**	22-Feb-2021
No. of Samples:	14		
Turnaround (Wkdays):	5	**Results Due:**	26-Feb-2021
Date Approved:	25-Feb-2021		

Approved By:



Details: Glynn Harvey, Technical Manager

Results - Soil

Project: R1742b Heyford - Phase 9

Client: Smith Grant LLP				**Chemtest Job No.:**	21-05371	21-05371	21-05371	21-05371	21-05371	21-05371	21-05371	21-05371	21-05371
Quotation No.:				**Chemtest Sample ID.:**	1146124	1146125	1146126	1146127	1146128	1146129	1146130	1146131	1146132
				Sample Location:	AGG-SP1-S1	AGG-SP1-S2	AGG-SP2-S2	AGG-SP3-S1	AGG-SP3-S2	AGG-SP3-S4	AGG-SP3-S5	AGG-SP3-S6	AGG-SP3-S7
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Date Sampled:	16-Feb-2021	16-Feb-2021	16-Feb-2021	16-Feb-2021	16-Feb-2021	16-Feb-2021	16-Feb-2021	16-Feb-2021	16-Feb-2021
				Asbestos Lab:	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	-	-	-	-	-	-	-

Results - Soil

Project: R1742b Heyford - Phase 9

Client: Smith Grant LLP		**Chemtest Job No.:**			21-05371	21-05371	21-05371	21-05371	21-05371
Quotation No.:		**Chemtest Sample ID.:**			1146133	1146134	1146135	1146136	1146137
		Sample Location:			AGG-SP3-S8	AGG-SP3-S9	AGG-SP3-S10	AGG-SP3-S11	AGG-SP3-S12
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL
		Date Sampled:			16-Feb-2021	16-Feb-2021	16-Feb-2021	16-Feb-2021	16-Feb-2021
		Asbestos Lab:			DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
ACM Type	U	2192		N/A	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	-	-	-

Test Methods

SOP	Title	Parameters included	Method summary
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

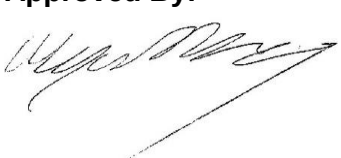
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

2183

Final Report

Report No.:	21-13303-1		
Initial Date of Issue:	27-Apr-2021		
Client	Smith Grant LLP		
Client Address:	Station House, Station Road Ruabon Wrexham LL14 6DL		
Contact(s):	Dan Wayland		
Project	R1742b Hayford - Phase 9		
Quotation No.:		**Date Received:**	23-Apr-2021
Order No.:		**Date Instructed:**	23-Apr-2021
No. of Samples:	6		
Turnaround (Wkdays):	5	**Results Due:**	29-Apr-2021
Date Approved:	27-Apr-2021		

Approved By:



Details: Glynn Harvey, Technical Manager

Results - Soil

Project: R1742b Hayford - Phase 9

Client: Smith Grant LLP		**Chemtest Job No.:**			21-13303	21-13303	21-13303	21-13303	21-13303	21-13303
Quotation No.:		**Chemtest Sample ID.:**			1185894	1185895	1185896	1185897	1185898	1185899
		Sample Location:			Ph9-AGG2-S1	Ph9-AGG2-S2	Ph9-AGG2-S3	Ph9-AGG2-S4	Ph9-AGG2-S5	Ph9-AGG2-S6
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Date Sampled:			20-Apr-2021	20-Apr-2021	20-Apr-2021	20-Apr-2021	20-Apr-2021	20-Apr-2021
		Asbestos Lab:			COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
ACM Type	U	2192		N/A	Fibres/Clumps	Fibres/Clumps	-	Fibres/Clumps	-	-
Asbestos Identification	U	2192		N/A	Chrysotile	Chrysotile	No Asbestos Detected	Chrysotile	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	Stereo Microscopy	Stereo Microscopy	-	Stereo Microscopy	-	-

Test Methods

SOP	Title	Parameters included	Method summary
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry

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All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

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C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

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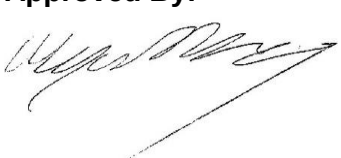
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	21-13303-2		
Initial Date of Issue:	27-Apr-2021	**Date of Re-Issue:**	05-May-2021
Client	Smith Grant LLP		
Client Address:	Station House, Station Road Ruabon Wrexham LL14 6DL		
Contact(s):	Dan Wayland		
Project	R1742b Hayford - Phase 9		
Quotation No.:		**Date Received:**	23-Apr-2021
Order No.:		**Date Instructed:**	23-Apr-2021
No. of Samples:	6		
Turnaround (Wkdays):	8	**Results Due:**	05-May-2021
Date Approved:	05-May-2021		

Approved By:



Details: Glynn Harvey, Technical Manager

Results - Soil

Project: R1742b Hayford - Phase 9

Client: Smith Grant LLP		**Chemtest Job No.:**			21-13303	21-13303	21-13303	21-13303	21-13303	21-13303
Quotation No.:		**Chemtest Sample ID.:**			1185894	1185895	1185896	1185897	1185898	1185899
		Sample Location:			Ph9-AGG2-S1	Ph9-AGG2-S2	Ph9-AGG2-S3	Ph9-AGG2-S4	Ph9-AGG2-S5	Ph9-AGG2-S6
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Date Sampled:			20-Apr-2021	20-Apr-2021	20-Apr-2021	20-Apr-2021	20-Apr-2021	20-Apr-2021
		Asbestos Lab:			COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
ACM Type	U	2192		N/A	Fibres/Clumps	Fibres/Clumps	-	Fibres/Clumps	-	-
Asbestos Identification	U	2192		N/A	Chrysotile	Chrysotile	No Asbestos Detected	Chrysotile	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	Stereo Microscopy	Stereo Microscopy	-	Stereo Microscopy	-	-
Asbestos by Gravimetry	U	2192	%	0.001	0.009	<0.001		<0.001		
Total Asbestos	U	2192	%	0.001	0.009	<0.001		<0.001		

Test Methods

SOP	Title	Parameters included	Method summary
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry

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customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

2183

Final Report

Report No.:	21-14505-1
Initial Date of Issue:	12-May-2021
Client	Smith Grant LLP
Client Address:	Station House, Station Road Ruabon Wrexham LL14 6DL
Contact(s):	Dan Wayland
Project	R1742B Heyford - Phase 9

Quotation No.:		**Date Received:**	04-May-2021
Order No.:		**Date Instructed:**	04-May-2021
No. of Samples:	23		
Turnaround (Wkdays):	7	**Results Due:**	12-May-2021
Date Approved:	12-May-2021	**Subcon Results Due:**	25-May-2021

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Soil

Project: R1742B Heyford - Phase 9

Client: Smith Grant LLP		**Chemtest Job No.:**			21-14505	21-14505	21-14505	21-14505	21-14505	21-14505	21-14505	21-14505	21-14505
Quotation No.:		**Chemtest Sample ID.:**			1192608	1192609	1192610	1192611	1192612	1192613	1192614	1192615	1192616
		Sample Location:			PH9-AGG2-S7	PH9-AGG2-S8	PH9-AGG2-S9	PH9-AGG2-S10	PH9-AGG3-S1	PH9-AGG3-S2	PH9-AGG3-S3	PH9-AGG3-S4	PH9-ACMHS-S1
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):											0
		Bottom Depth (m):											0.5
		Date Sampled:			28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021
		Asbestos Lab:			DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-	-	Fibres/Clumps	-	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	Amosite	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	Stereo Microscopy	-	-	-	-	-	-
Moisture	N	2030	%	0.020									
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0									
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0									
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0									
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0									
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0									
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0									
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0									
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0									
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0									
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0									
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0									
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0									
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0									
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0									
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0									
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0									
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0									
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0									
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0									
Benzene	U	2760	µg/kg	1.0									
Toluene	U	2760	µg/kg	1.0									
Ethylbenzene	U	2760	µg/kg	1.0									
m & p-Xylene	U	2760	µg/kg	1.0									
o-Xylene	U	2760	µg/kg	1.0									
PAH-MS	SN			N/A									

Results - Soil

Project: R1742B Heyford - Phase 9

Client: Smith Grant LLP		**Chemtest Job No.:**			21-14505	21-14505	21-14505	21-14505	21-14505	21-14505	21-14505	21-14505	21-14505	21-14505
Quotation No.:		**Chemtest Sample ID.:**			1192617	1192618	1192619	1192620	1192621	1192622	1192623	1192624	1192625	1192626
		Sample Location:			PH9-ACMHS-S2	PH9-ACMHS-S3	PH9-ACMHS-S4	PH9-ACMHS-S5	PH9-ACMHS-S6	PH9-ACMHS-S7	PH9-ACMHS-S8	TP102-HS-S1	TP102-HS-SS1	TP102-HS-SS2
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0	0	0	0	0	0	0	0.2		
		Bottom Depth (m):			0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.3		
		Date Sampled:			28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021
		Asbestos Lab:			DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM			
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
ACM Type	U	2192		N/A	Fibres/Clumps	-	-	-	-	-	-			
Asbestos Identification	U	2192		N/A	Amosite	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected			
ACM Detection Stage	U	2192		N/A	Stereo Microscopy	-	-	-	-	-	-			
Moisture	N	2030	%	0.020								9.2	8.9	11
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0								< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0								< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0								4.2	< 1.0	< 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0								42	< 1.0	< 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0								99	< 1.0	< 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0								78	< 1.0	< 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0								320	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0								130	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0								680	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0								< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0								< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0								2.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0								11	< 1.0	< 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0								660	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0								2400	< 1.0	5.4
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0								6700	< 1.0	17
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0								460	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0								10000	< 5.0	23
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0								11000	< 10	23
Benzene	U	2760	µg/kg	1.0								< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0								< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0								< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0								< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0								< 1.0	< 1.0	< 1.0
PAH-MS	SN			N/A								See Attached	See Attached	See Attached

Results - Soil

Project: R1742B Heyford - Phase 9

Client: Smith Grant LLP		**Chemtest Job No.:**			21-14505	21-14505	21-14505	21-14505
Quotation No.:		**Chemtest Sample ID.:**			1192627	1192628	1192629	1192630
		Sample Location:			TP102-HS-SS3	TP102-HS-SS4	TP102-HS-SS5	TP102-HS-SS6
		Sample Type:			SOIL	SOIL	SOIL	SOIL
		Top Depth (m):						
		Bottom Depth (m):						
		Date Sampled:			28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021
		Asbestos Lab:						
Determinand	**Accred.**	**SOP**	**Units**	**LOD**				
ACM Type	U	2192		N/A				
Asbestos Identification	U	2192		N/A				
ACM Detection Stage	U	2192		N/A				
Moisture	N	2030	%	0.020	11	24	23	22
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	2.2
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	4.6
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	6.8
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	46
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	46
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10	53
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
PAH-MS	SN			N/A	See Attached	See Attached	See Attached	See Attached

Test Methods

SOP	Title	Parameters included	Method summary
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
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Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

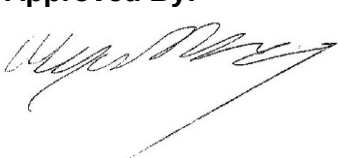
If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	21-14505-3		
Initial Date of Issue:	12-May-2021	**Date of Re-Issue:**	17-May-2021
Client	Smith Grant LLP		
Client Address:	Station House, Station Road Ruabon Wrexham LL14 6DL		
Contact(s):	Dan Wayland		
Project	R1742B Heyford - Phase 9		
Quotation No.:		**Date Received:**	04-May-2021
Order No.:		**Date Instructed:**	04-May-2021
No. of Samples:	23		
Turnaround (Wkdays):	12	**Results Due:**	19-May-2021
Date Approved:	15-May-2021		

Approved By:



Details: Glynn Harvey, Technical Manager

Results - Soil

Project: R1742B Heyford - Phase 9

Client: Smith Grant LLP		**Chemtest Job No.:**			21-14505	21-14505	21-14505	21-14505	21-14505	21-14505	21-14505	21-14505	21-14505
Quotation No.:		**Chemtest Sample ID.:**			1192608	1192609	1192610	1192611	1192612	1192613	1192614	1192615	1192616
		Sample Location:			PH9-AGG2-S7	PH9-AGG2-S8	PH9-AGG2-S9	PH9-AGG2-S10	PH9-AGG3-S1	PH9-AGG3-S2	PH9-AGG3-S3	PH9-AGG3-S4	PH9-ACMHS-S1
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):											0
		Bottom Depth (m):											0.5
		Date Sampled:			28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021
		Asbestos Lab:			DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-	-	Fibres/Clumps	-	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	Amosite	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	Stereo Microscopy	-	-	-	-	-	-
Asbestos by Gravimetry	U	2192	%	0.001			<0.001						
Total Asbestos	U	2192	%	0.001			<0.001						
Moisture	N	2030	%	0.020									
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0									
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0									
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0									
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0									
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0									
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0									
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0									
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0									
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0									
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0									
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0									
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0									
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0									
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0									
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0									
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0									
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0									
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0									
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0									
Benzene	U	2760	µg/kg	1.0									
Toluene	U	2760	µg/kg	1.0									
Ethylbenzene	U	2760	µg/kg	1.0									
m & p-Xylene	U	2760	µg/kg	1.0									
o-Xylene	U	2760	µg/kg	1.0									
PAH-MS	SN			N/A									

Results - Soil

Project: R1742B Heyford - Phase 9

Client: Smith Grant LLP		**Chemtest Job No.:**			21-14505	21-14505	21-14505	21-14505	21-14505	21-14505	21-14505	21-14505	21-14505
Quotation No.:		**Chemtest Sample ID.:**			1192617	1192618	1192619	1192620	1192621	1192622	1192623	1192624	1192625
		Sample Location:			PH9-ACMHS-S2	PH9-ACMHS-S3	PH9-ACMHS-S4	PH9-ACMHS-S5	PH9-ACMHS-S6	PH9-ACMHS-S7	PH9-ACMHS-S8	TP102-HS-S1	TP102-HS-SS1
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0	0	0	0	0	0	0	0.2	
		Bottom Depth (m):			0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.3	
		Date Sampled:			28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021
		Asbestos Lab:			DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM		
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	Fibres/Clumps	-	-	-	-	-	-		
Asbestos Identification	U	2192		N/A	Amosite	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected		
ACM Detection Stage	U	2192		N/A	Stereo Microscopy	-	-	-	-	-	-		
Asbestos by Gravimetry	U	2192	%	0.001	<0.001								
Total Asbestos	U	2192	%	0.001	<0.001								
Moisture	N	2030	%	0.020								9.2	8.9
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0								< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0								< 1.0	< 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0								4.2	< 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0								42	< 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0								99	< 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0								78	< 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0								320	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0								130	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0								680	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0								< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0								< 1.0	< 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0								2.0	< 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0								11	< 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0								660	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0								2400	< 1.0
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0								6700	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0								460	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0								10000	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0								11000	< 10
Benzene	U	2760	µg/kg	1.0								< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0								< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0								< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0								< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0								< 1.0	< 1.0
PAH-MS	SN			N/A								See Attached	See Attached

Results - Soil

Project: R1742B Heyford - Phase 9

Client: Smith Grant LLP		**Chemtest Job No.:**			21-14505	21-14505	21-14505	21-14505	21-14505
Quotation No.:		**Chemtest Sample ID.:**			1192626	1192627	1192628	1192629	1192630
		Sample Location:			TP102-HS-SS2	TP102-HS-SS3	TP102-HS-SS4	TP102-HS-SS5	TP102-HS-SS6
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):							
		Bottom Depth (m):							
		Date Sampled:			28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021
		Asbestos Lab:							
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
ACM Type	U	2192		N/A					
Asbestos Identification	U	2192		N/A					
ACM Detection Stage	U	2192		N/A					
Asbestos by Gravimetry	U	2192	%	0.001					
Total Asbestos	U	2192	%	0.001					
Moisture	N	2030	%	0.020	11	11	24	23	22
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	2.2
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	4.6
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	6.8
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	5.4	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	17	< 1.0	< 1.0	< 1.0	46
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	23	< 5.0	< 5.0	< 5.0	46
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	23	< 10	< 10	< 10	53
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
PAH-MS	SN			N/A	See Attached	See Attached	See Attached	See Attached	See Attached

Test Methods

SOP	Title	Parameters included	Method summary
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.

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I/S	Insufficient Sample
U/S	Unsuitable Sample
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<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

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Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

2183

Final Report

Report No.:	21-16265-1		
Initial Date of Issue:	20-May-2021		
Client	Smith Grant LLP		
Client Address:	Station House, Station Road Ruabon Wrexham LL14 6DL		
Contact(s):	Scott Miller		
Project	R1742b Heyford (Phase 9)		
Quotation No.:	Q15-02887	**Date Received:**	17-May-2021
Order No.:		**Date Instructed:**	17-May-2021
No. of Samples:	2		
Turnaround (Wkdays):	5	**Results Due:**	21-May-2021
Date Approved:	20-May-2021		

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Soil

Project: R1742b Heyford (Phase 9)

Client: Smith Grant LLP	**Chemtest Job No.:**				21-16265	21-16265
Quotation No.: Q15-02887	**Chemtest Sample ID.:**				1201418	1201419
	Sample Location:				Agg-SP3-S5	Agg-SP3-S6
	Sample Type:				SOIL	SOIL
	Date Sampled:				13-May-2021	13-May-2021
	Asbestos Lab:				COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
ACM Type	U	2192		N/A	Fibres/Clumps	Fibres/Clumps
Asbestos Identification	U	2192		N/A	Chrysotile	Chrysotile
ACM Detection Stage	U	2192		N/A	Stereo Microscopy	Stereo Microscopy

Test Methods

SOP	Title	Parameters included	Method summary
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry

Report Information

Key

U	UKAS accredited
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N	Unaccredited
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I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
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SOP	Standard operating procedure
LOD	Limit of detection

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All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

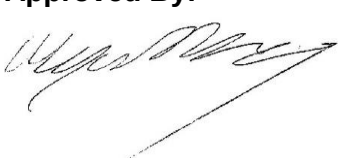
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

2183

Amended Report

Report No.:	21-16265-2		
Initial Date of Issue:	20-May-2021	**Date of Re-Issue:**	27-May-2021
Client	Smith Grant LLP		
Client Address:	Station House, Station Road Ruabon Wrexham LL14 6DL		
Contact(s):	Scott Miller		
Project	R1742b Heyford (Phase 9)		
Quotation No.:	Q15-02887	**Date Received:**	17-May-2021
Order No.:		**Date Instructed:**	17-May-2021
No. of Samples:	2		
Turnaround (Wkdays):	9	**Results Due:**	27-May-2021
Date Approved:	27-May-2021		

Approved By:



Details: Glynn Harvey, Technical Manager

Results - Soil

Project: R1742b Heyford (Phase 9)

Client: Smith Grant LLP		**Chemtest Job No.:**			21-16265	21-16265
Quotation No.: Q15-02887		**Chemtest Sample ID.:**			1201418	1201419
			Sample Location:		Agg-SP3-S5	Agg-SP3-S6
			Sample Type:		SOIL	SOIL
			Date Sampled:		13-May-2021	13-May-2021
			Asbestos Lab:		COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
ACM Type	U	2192		N/A	Fibres/Clumps	Fibres/Clumps
Asbestos Identification	U	2192		N/A	Chrysotile	Chrysotile
ACM Detection Stage	U	2192		N/A	Stereo Microscopy	Stereo Microscopy
Asbestos by Gravimetry	U	2192	%	0.001	0.008	<0.001
Total Asbestos	U	2192	%	0.001	0.008	<0.001

Test Methods

SOP	Title	Parameters included	Method summary
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry

Report Information

Key

U	UKAS accredited
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<	"less than"
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Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com