

*Contaminated Land
Air Quality
Environmental Audit*



Partnership No: OC 300776

**New Settlement Area, Heyford Park,
Oxfordshire.**

**Dorchester Phase 5,
Contamination Hotspot: Phase 4 Remediation
Works Verification Report.**

For: Urban Regen Ltd.

July 2020

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Signed for Smith Grant LLP:

	Name	Position	Signature	Date
Author	S D Miller BSc MCIWEM	Consultant		06.07.2020
Reviewer	D Wayland BSc MSc AssocCIWM MCIWEM CWEM	Partner		06.07.2020

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1. Introduction

- 1.1. Planning permission for the redevelopment of the former RAF/USAF Upper Heyford airbase was granted by Cherwell District Council (CDC) on the 2nd November 2012, reference 10/01642/OUT. The site, which is being converted to commercial and residential uses, is known as Heyford Park and is divided between the Flying Field Area (FFA) and New Settlement Area (NSA). Urban Regen Ltd. (URL) was instructed by the consortium of Dorchester Heyford Park Group Ltd and Bovis Homes to carry out demolition, remediation and preparatory earthworks across the NSA to prepare various zones for residential development. Dorchester Group and Bovis have divided the site into a number of development phases and the URL works are referenced to these various phases.
- 1.2. The above planning consent contains the following conditions relating to contamination remediation, particularly pertinent to the works detailed in this report is Condition 26.

24	<p><i>No operational development approved by this planning permission shall take place (or such other date or stage in development as may be agreed in writing with the Local Planning Authority), until the following components of a scheme to deal with the risks associated with contamination of the site shall each be submitted to and approved, in writing, by the local planning authority:</i></p> <p>a. <i>A preliminary risk assessment which has identified:</i></p> <p>(i) <i>- all previous uses.</i></p> <p>(ii) <i>- potential contaminants associated with those uses.</i></p> <p>b. <i>A conceptual model of the site indicating sources, pathways and receptors.</i></p> <p>c. <i>Potentially unacceptable risks arising from contamination at the site.</i></p> <p>d. <i>A site investigation scheme, based on (1) to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off site.</i></p> <p>e. <i>The site investigation results and the detailed risk assessment (2) and, based on these, an options appraisal and remediation strategy giving full details of the remediation measures required and how they are to be undertaken.</i></p> <p>f. <i>A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in (3) are complete and identifying any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action. Any changes to these components require the express consent of the local planning authority. The scheme shall be implemented as approved.</i></p>
25	<p><i>Prior to occupation of any new build dwellings, a verification report demonstrating completion of the works set out in the approved remediation strategy and the effectiveness of the remediation shall be submitted to and approved, in writing, by the local planning authority. The report shall include results of sampling and monitoring carried out in accordance with the approved verification plan to demonstrate that the site remediation criteria have been met. It shall also include any plan (a "long-term monitoring and maintenance plan") for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action, as identified in the verification plan, and for the reporting of this to the local planning authority.</i></p>

26	<i>If during development contamination not previously identified is found to be present at the site then no further development within 20m of the contamination shall be carried out until the developer has submitted to and obtained written approval from the local planning authority for an addendum to the method statement. This addendum to the method statement shall detail how this unsuspected contamination will be remediated (if necessary) and thereafter this will be carried out as approved before any development within 20m recommences. Following completion of any such additional remediation, a verification report shall be submitted within 3 months of the completion of the works for the approval of the Local Planning Authority in writing.</i>
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- 1.3. A Remediation Strategy (ref: EED10658-109_S_12.2.3_FA, September 2012) prepared by Waterman Energy, Environment and Design Ltd. (Waterman) on behalf of Dorchester Group, together with a Demolition and Remediation Method Statement produced by Vertase F.L.I. Ltd. were submitted to the Local Planning Authority (Cherwell District Council). The Council subsequently approved the discharge of Condition 24 on the 02nd November 2012. Whilst the role of Waterman has changed within the remediation scheme, and Vertase FLI is no longer involved with the site, the principles of the Remediation Strategy remain the same and have been adopted by URL in their role as Principal Remediation Contractor to Dorchester Group and Bovis.
- 1.4. For clarity, SGP re-submitted an updated Remediation Strategy (R1742-R01-v3) in April 2014 that reflects the changed contractual circumstances with respect to contamination remediation. Approval of the revised Strategy was received from the CDC EHO in October 2014.
- 1.5. Smith Grant LLP (SGP) has been instructed by URL to advise upon the implementation of the remediation works, carry out all necessary inspections and monitoring of the works, and to produce verification reports as the preparatory earthworks in each phase are completed by URL to assist in the discharge of Condition 25 and, if required, Condition 26.
- 1.6. An area of previously unidentified contamination was discovered in Phase 5 of the development in June 2018. In order to fulfil the requirements of Condition 26 SGP notified CDC in writing of the presence of the unexpected contamination (letter ref: R1742-190618, issued 20th June 2018). Characterisation of the contamination indicated that it could be managed under the provisions of the existing Remediation Strategy, no amendments were therefore required.
- 1.7. SGP oversaw the first three phases of remediation works carried out by URL in relation to the identified contamination hotspot in June-July 2018 (Phase 1) and March-July 2019 (Phases 2 & 3). The necessary validation sampling regime was implemented during these works, the details of which are presented in SGP reports 'Dorchester Phase 5, Contamination Hotspot: Remediation Works Verification Report' [Phase 1] (ref: R1742-R16-v1, issued July 2018) and 'Phases 2 & 3' (ref: R1742-R18-v1, issued August 2019). To date, no response has been provided by the Local Authority regarding these reports.

- 1.8. During the third phase of the remediation works, the presence of a pavement along Camp Road and live utilities constrained excavation of the hotspot area to the north. Following disconnection of the utilities, URL remobilised to progress the final remediation works directly to the north of the Phase 3 excavation area.

- 1.9. SGP has now inspected the fourth phase of the hotspot remediation works carried out by URL and has collected validation samples of the stripped soil surfaces and replaced soils for determination of compliance with the agreed remediation target values (RTVs). This report describes the works carried out in the area (the extents of which are shown on Drawing D01) and the analysis undertaken, drawing conclusions and making recommendations concerning the further works required by Dorchester Homes in order to fully discharge Planning Conditions 25 and 26.

2. Remediation Strategy

2.1. Expected Contamination

2.1.1. The wider development comprises an area of the former Upper Heyford Airbase, latterly developed and used by the United States Airforce, which has been decommissioned and is used in part for civilian purposes, including commercial and residential uses as part of Heyford Park. Identified known or potential contamination sources determined from the historical uses of the site and site investigations were generally found to be minor, consisting of low-level but pervasive contamination by metals / metalloids and PAHs, with localised hydrocarbons associated with bulk fuel storage tanks and the potential for asbestos in pipe laggings and gaskets, insulation board and cement-bound products, or as dispersed fibre in made ground. The key identified potential contamination hotspots in the wider site were fuel hydrocarbons associated with bulk underground fuel storage tanks (USTs).

2.1.2. Natural background contamination may be present in the bedrock and soils. The site lies within or adjacent to the "ironstone domain" as described in DEFRA Technical Guidance Sheet TGS01 "Arsenic", July 2012; the site lies within 1km of mapped outcrops of ironstones within the Jurassic sedimentary rocks. Within the ironstone domain, the normal background concentration (NBC) of arsenic is reported to be 220 mg/kg; the NBC is defined as the upper 95% confidence limit of the 95th percentile of topsoil concentrations. The normal background concentration of vanadium within the ironstone domain is reported by BGS to be >128 mg/kg. Both values substantially exceed the Remediation Strategy 'Table B1' criteria for cover soils.

2.2. Unexpected Contamination – Hydrocarbon Hotspots

2.2.1. Condition 26 of the Planning Permission for the site contains the requirement that when unexpected contamination is encountered an addendum remediation method statement is to be produced for implementation. This is then to be followed by a verification plan which is to be submitted to the Local Planning Authority within 3 months of completion of the works. Provision has therefore been made within the Remediation Strategy for the discovery of unexpected contamination which includes the investigation of any such materials by a suitably qualified Environmental Consultant, with subsequent verification reporting to be issued to CDC as necessary.

2.2.2. The removal of hydrocarbon contamination is already detailed within the approved Strategy and as such it is considered that revision of the Strategy is not required if unexpected hydrocarbon hotspots of a similar size / degree to those anticipated in the overall site characterisation are encountered. Hydrocarbon contaminated soils can therefore be dealt with via the techniques described in the Strategy, comprising of the key following actions:

- excavation of hydrocarbon contaminated soils under supervision of a suitably qualified Environmental Consultant up to either site boundaries, retained buildings, services or intact bedrock;
- removal of contaminated soils offsite to a secure bunded stockpile which is to be placed on an impermeable membrane / paved surface until the material is either suitably disposed of or treated to allow retention within the wider development;
- collection of verification samples from the side walls and bases of excavations where contaminated materials are removed at a frequency of 1 composite sample per 15m² of exposed surface (minimum 3 samples) and testing overburden deemed to be clean at a 1:250m³ frequency for submission to an accredited laboratory for fractionated hydrocarbon analysis, and;
- the assessment and recording of any residual contamination present on intact rock surfaces, for which there is no requirement to excavate.

2.2.3. Verification sampling, as described above, is necessary to demonstrate that any residual hydrocarbon contamination does not pose a significant risk to controlled waters by reference to the soil standards agreed by Waterman with the Environment Agency (Waterman Remediation Strategy: Tables B2 and B3). The criteria are organised in two tiers according to the distance of hotspots from the southern / southeastern (down-gradient) boundary of the site. As the hydrocarbon hotspot detailed in this report is greater than 250m from the southeast boundary the results of the verification sampling are to be compared with the criteria set out in Table B3 of the Waterman Strategy, which is reproduced in table 2.1 below.

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

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

3. Description of Works

3.1. Preliminary Investigation (June 2018)

3.1.1. Following the discovery of underground storage tanks (USTs) within the area of the former petrol station in Phase 5, a trial-pitting exercise was carried out on 7th June 2018 to ensure that no further tanks were present in the immediate vicinity. In the two trial pits excavated to the west/northwest of the USTs, suspected hydrocarbon contamination (described as bitumen impacted soils and diesel impacted gravels) was encountered, as discussed in letter 'R1742-190618' issued to CDC in June 2018. The presence of hydrocarbon contamination within the suspect materials was subsequently confirmed by laboratory analysis.

3.2. Phase 1 Remediation (June-July 2018)

3.2.1. The first phase of remediation works to remove grossly contaminated soils was carried out by URL between 12/06/18 - 02/07/18 and are described in SGP report "Dorchester Phase 5, Contamination Hotspot: Remediation Works Verification Report" (ref: R1742-R16-v1, issued July 2018). The presence of an active bus shelter and an associated road constrained the excavation to the north; however, as contamination was still apparent along the northern excavation wall and development plans included demolition of these constraints, it was determined that further remediation works would be required in this area.

3.3. Phase 2 & 3 Remediation (March-July 2019)

3.3.1. Following removal of the above constraints, URL remobilised to site to progress with the second phase of remediation directly to the north of Phase 1. These works were carried out between 18.03.19 - 02.04.19 and again involved the excavation and offsite removal of soils demonstrating indicators of gross hydrocarbon contamination. The excavation was progressed towards the northern site boundary but could not be extended further due to the presence of live services.

3.3.2. A trial pitting exercise was then carried out to delineate the western extents of the contamination hotspot which indicated that hydrocarbon contaminated soils were still present within the western part of the development area, particularly towards the northern boundary. Several items of suspected unexploded ordnance (UXO) were also identified during this exercise which were later confirmed to be practice bombs. Consequently, a UXO engineer was required to be present during the subsequent excavation and removal of contaminated soils by URL (referred to as the Phase 3 (Visit 3) works) which occurred between 16.04.19 - 22.07.19. The excavation of all remaining soils to bedrock within the development area for inspection was also required as a result of the potential for UXO, whether contamination was present or not.

3.3.3. Following completion of these excavation works, and in addition to those carried out during the earlier phases of remediation, all of the accessible areas of the site had undergone

investigation and/or remediation with the exception of a narrow strip of land directly to the north of Phase 3. This was due to the presence of a pavement located onsite which adjoined Camp Road and until recently was still used by members of the public. As indicators of hydrocarbon contamination were present within the northern extent of the Phase 3 excavation, it was determined that investigation of this area would be required following removal of the constraints.

3.3.4. The details of the Phase 2 and 3 excavation works are included in SGP report “Dorchester Phase 5, Contamination Hotspot: Remediation Works Verification Report; Phases 2 & 3” (ref: R1742-R18-v1, issued August 2019).

3.4. Phase 4 Remediation (June 2020)

3.4.1. Following the disconnection of live utilities beneath the pavement to the immediate north of the Phase 3 remediation visit (pavement along Camp Road) as mentioned in Section 3.1.5, URL remobilised for a final remediation visit, the Phase 4 consisted of a narrow strip associated with the former pavement. Initially, trial pitting was carried out in this area on the 2nd June 2020 to determine the extent of any impacted soils. Investigation confirmed the presence of hydrocarbon contaminated soils from about 2.5m bgl to the limestone bedrock at approximately 3m bgl. Remediation works then commenced from 04th June 2020 and initially consisted of the excavation of soils not exhibiting significant contamination indicators up to the northern site boundary. Due to the identification of UXO during the previous phase of remediation, a specialist UXO Engineer was present during all intrusive works within Phase 4.

3.4.2. Similarly, to the earlier phases of the remediation works, the soils encountered typically comprised a thin veneer of weathered limestone bedrock fill with underlying strata of light brown clays and black ashy gravels. Consistent with the previous methodology, soils were inspected for visual and olfactory indicators of contamination and were screened using a PID for the presence of VOCs. Materials that did not display significant contamination indicators and demonstrated VOC readings below 10ppm were stockpiled next to the excavation area and were sampled for hydrocarbon analysis to assess their suitability for replacement, as discussed in Section 4.

3.4.3. Following removal and segregation of the clean overburden, excavation of the underlying contaminated soils commenced. Observed contamination indicators included moderate to strong hydrocarbon odours, grey stained soils, and PID readings of soils above 10ppm (the highest reading recorded was 390ppm). The identified hydrocarbon contamination extended to the underlying weathered limestone bedrock (encountered between 3m and 3.2m bgl), where the excavation stopped.

3.4.4. Upon completion of these works indicators of contamination were still present within the northern excavation sidewall; however, as Camp Road is located directly to the north of the site and is to be incorporated within the wider development no further excavation works are

proposed. The hydrocarbon impacted northern sidewall was therefore sampled as part of the validation sampling regime, as discussed in Section 4.

3.4.5. The extents of the Phase 4 excavation works (which had a total area of approximately 285m²) including the areas of previous remediation phases are shown in Drawing D01.

3.5. Post-excavation Works

3.5.1. Following excavation of the contaminated soils, URL removed the materials to a quarantine area within the wider NSA where it will remain stockpiled until a decision is made to either treat the material or dispose of it to a suitable receiving facility.

3.2.1 It was considered that the existing acceptability criteria for hydrocarbons set out in the approved Remediation Strategy remained applicable to confirm the absence of polluting materials provided consideration was also given to human health risks; consequently, it was deemed that no significant modification to the Strategy was required. Subsequent to the removal of the grossly contaminated soils, SGP collected validation samples from the sidewalls (with exception of the southern extent which adjoins the previous validated Phase 3 excavation area) and the base of the excavation to assess the potential for any residual hydrocarbon contamination that could present a risk to either current or future receptors. The locations from where validation samples were collected are indicated on Drawing D01.

3.2.2 Upon receipt of laboratory results confirming that the soils stockpiled adjacent to the hotspot were suitable to be retained, these were replaced into the excavation area and compacted.

4. Inspections and Testing

4.1. SGP attended the site on two occasions during the fourth phase of remediation earthworks carried out in relation to the Phase 5 contamination hotspot. The dates and activities undertaken during SGP attendance are cross referenced to the site inspection photographic record (Appendix A) and Laboratory Analysis Reports (Appendix B), as summarised in Table 4.1 below.

Table 4.1 SGP Inspection Summary

Date	SGP Activities	Record
02/06/2020	Observation of excavation works. Trial-pitting to delineate extent of impacted soils along final remediation area	Appendix A – Photos: 1-4
04/06/2020	Observation of excavation works, directing which soils may potentially be retained and which require removal based on the absence/presence of contamination indicators; collection of validation samples from excavation extents and from potentially recoverable material.	Appendix A - Photos: 5-13 Appendix B - 20/7098 (HSV4-S1-S3 & SS1-SS11)
08/06/2020	Observation of excavation works, directing which soils may potentially be retained and which require removal based on the absence/presence of contamination indicators; collection of validation samples from excavation extents.	Appendix A - Photos: 14-16 Appendix B - 20/7098 (HSV4-SS12)

4.2 Phase 4 Validation Samples Analysis: Retained Soils

4.2.1 URL initially stripped potentially clean soils overlying the hotspot which did not exhibit visual or olfactory indicators of contamination. These soils were then screened with a PID for VOCs and providing the reading was below 10ppm the material was side-cast for potential replacement following receipt of laboratory analysis carried out on samples of the material. Validation samples were collected at an approximate frequency of 1 composite per 250m³.

4.2.2 Three samples were submitted to accredited laboratory, Element (formerly Exova Jones), Flintshire, for full TPHCWG banding and BTEX analysis. The results of the validation testing (Element report ref: 20/7098 (samples HSV4-S1-S3) are compared to the assessment criteria set out table B3 of the approved Remediation Strategy, as summarised in Table 4.2 below.

Table 4.2 Validation Screening Summary for Replacement Soils (Phase 4)

Contaminant	Samples	Range of Concentrations (mg/kg unless stated)	Table B3	
			Screening criteria* (mg/kg unless stated)	Exceedance Concentration & location
Aliphatic C5-C6	3	<0.1	-	-
Aliphatic C6-C8	3	<0.1	-	-
Aliphatic C8-C10	3	<0.1	240	None
Aliphatic C10-C12	3	<0.2	1000	None
Aliphatic C12-C16	3	<4-12	1000	None

Contaminant	Samples	Range of Concentrations (mg/kg unless stated)	Table B3	
			Screening criteria* (mg/kg unless stated)	Exceedance Concentration & location
Aliphatic C16-C21	3	19-32	1000	None
Aliphatic C21-C35	3	81-126	1000	None
Aromatic C6-C7	3	<0.1	-	-
Aromatic C7-C8	3	<0.1	-	-
Aromatic C8-C10	3	<0.1	-	-
Aromatic C10-C12	3	10-13	23	None
Aromatic C12-C16	3	40-73	1000	None
Aromatic C16-C21	3	40-73	1000	None
Aromatic C21-C35	3	160-221	1000	None
Benzene	3	<0.005	0.08 (Table B1)	None
Toluene	3	<0.005	120 (Table B1)	None
Ethylbenzene	3	<0.005	65 (Table B1)	None
m/p-Xylene	3	<0.005	42 (Table B1)	None
o-xylene	3	<0.005	44 (Table B1)	None

4.2.3 Hydrocarbon concentrations were below the assessment criteria within all three validation samples collected from the soils stockpiled for potential replacement. No criteria are derived within Table B3 for BTEX compounds and so screening thresholds were utilised from Table B1 of the Waterman Strategy (chemical criteria for material in the capping layer), none of which were exceeded. These soils were therefore deemed suitable for replacement within the excavation.

4.3 Phase 4 Validation Samples Analysis: Excavation Walls and Base

4.3.1 Contaminated soils determined through visual/olfactory assessment or with elevated PID readings were removed by mechanical excavator and were temporarily stockpiled within the wider NSA area pending further assessment. Hydrocarbon impacted soils were present above bedrock and were therefore removed down to the bedrock in accordance with the Strategy. A photographic record of the remedial works is presented in Appendix A.

4.3.2 SGP collected validation samples from the northern, western and eastern excavation sidewalls in order to confirm that residual contamination was not present at unacceptable concentrations. No samples were required from the southern sidewall as this adjoined the previously remediated Phase 3 area. Samples were also collected from the bedrock at the base of the excavation to assess whether it has been significantly impacted by the observed hydrocarbon contamination.

4.3.3 The extents of the Phase 4 excavation area and the hydrocarbon hotspot are indicated in Drawings D01 and D02.

4.3.4 Samples were collected at an approximate frequency of 1 sample per 15m² of exposed sidewall in accordance with the strategy, with a reduced frequency of 1 sample per 70m²

collected from the base of the excavation. Validation sample locations are indicated on Drawing D01.

4.3.5 Twelve samples were submitted to accredited laboratory, Element, Flintshire, for full TPHCWG banding and BTEX analysis. The results of the validation testing (Element report ref: 20/7098 (samples SS1-SS12)) are compared to assessment criteria set out table B3 of the approved Remediation Strategy, as summarised in Table 4.3 below:

Table 4.3 Validation Screening Summary for Excavation Side Walls and Base (Phase 4)

Contaminant	Samples	Range of Concentrations (mg/kg unless stated)	Table B3	
			Screening criteria* (mg/kg unless stated)	Exceedance Concentration & location
Aliphatic C5-C6	26	<0.1	-	-
Aliphatic C6-C8	26	<0.1-0.2	-	-
Aliphatic C8-C10	26	<0.1-23.8	240	None
Aliphatic C10-C12	26	<0.2-856.4	1000	None
Aliphatic C12-C16	26	<4-1,215	1000	1 (HSV4-SS4)
Aliphatic C16-C21	26	<7-38	1000	None
Aliphatic C21-C35	26	<7-96	1000	None
Aromatic C6-C7	26	<0.1	-	-
Aromatic C7-C8	26	<0.1	-	-
Aromatic C8-C10	26	<0.1-1.1	-	-
Aromatic C10-C12	26	<0.2-24.1	23	1 (HSV4-SS11)
Aromatic C12-C16	26	<4-118	1000	None
Aromatic C16-C21	26	<7-20	1000	None
Aromatic C21-C35	26	<7	1000	None
Benzene	26	<0.005	0.08 (Table B1)	None
Toluene	26	<0.005	120 (Table B1)	None
Ethylbenzene	26	<0.005-0.01	65 (Table B1)	None
m/p-Xylene	26	<0.005-0.395	42 (Table B1)	None
o-xylene	26	<0.005-0.734	44 (Table B1)	None

4.3.6 Hydrocarbon concentrations were below the assessment criteria within the majority of the validation samples collected with the exceptions of 'SS4' and 'SS11' for the C12-16 aliphatic hydrocarbon range and the C10-12 aromatic hydrocarbon range, respectively. Sample 'SS4' was collected from the central area of the northern sidewall (where visually impacted material was observed but was unable to be excavated due to the presence Camp Road), and sample 'S11' was from the impacted bedrock for which there is no requirement for removal under the approved Strategy.

4.3.7 Both exceedances were minor with the C12-16 aliphatic hydrocarbon concentration of sample 'S4' reported at 1,215mg/kg (screening criteria 1,000mg/kg) and the C10-12 aromatic hydrocarbon of sample 'S11' at 24.1mg/kg (screening criteria 23mg/kg). This is therefore not

considered to be indicative of the presence of unacceptable levels of residual contamination with the potential to cause significant pollution.

4.3.8 No criteria are derived within Table B3 for BTEX compounds and so screening thresholds were utilised from Table B1 of the Waterman Strategy (chemical criteria for material in the capping layer), none of which were exceeded.

4.3.9 Drawing D02 indicates the locations of the samples with the concentrations of hydrocarbons relative to the RTVs.

5. Conclusions and Recommendations

5.1. Verification of Remediation

- 5.1.1. The Phase 4 remediation works pertaining to the Dorchester Phase 5 contamination hotspot confirmed an additional 285m² area of soils potentially impacted by hydrocarbons above bedrock. URL has remediated the contamination identified within this area via the removal of grossly impacted soils for ex-situ treatment or disposal to the extents feasible; however, due to the presence of Camp Road to the north some residual, albeit limited contamination remains.
- 5.1.2. Validation samples collected from the western and eastern sidewalls of the Phase 4 excavation area confirmed residual concentrations were below the assessment criteria. A single sample collected from the northern sidewall (up to Camp Road) and one from the bedrock at the base of the excavation did, however, demonstrate very minor exceedances, but this is not considered to be indicative of the presence of unacceptable levels of pollutants requiring further removal.
- 5.1.3. Soils overlying the hydrocarbon hotspot that did not display contamination indicators or PID readings over 10ppm have been stripped, sampled at a frequency approximating 1 sample per 250m³ and tested for fractionated hydrocarbon analysis. All of the samples recorded hydrocarbon concentrations below the accepted screening criteria and the soils have therefore been replaced into the excavation.

5.2. Ground Gas / Vapour Hazards

- 5.2.1. URL have completed remediation of the hydrocarbon impacted soils within the wider Phase 5 area to the extents feasible. Residual hydrocarbon vapours may remain within either the impacted bedrock and/or potentially impacted soils underlying the roads to the north, south and east.
- 5.2.2. The risks of vapour intrusion into the planned built development within the remediated area (Build Phase 5C) has previously been addressed by SGP in report R1742d-R01-v1 Final; March 2020 (New Settlement Area, Heyford Park, Oxfordshire: Dorchester Phase 5C - Post Remediation Vapour Risk Assessment'). This assessment was completed following the third phase of remediation works and concluded that specific VOC resistant membranes are not required within the Phase 5C development providing a ventilated sub-floor void is constructed in all future dwellings.
- 5.2.3. The vapour assessment was completed prior to this final remediation visit, this is not considered to impact the vapour assessment or its conclusions as it was carried out when residual contamination remained. This has since been removed under this most recent and final remediation visit.

5.2.4. SGP concludes that the remedial works carried out to date with respect to the Phase 5 contamination hotspot have been completed in accordance with the agreed strategy.

5.2.5. United Utilities guidelines require production of a water pipeline risk assessment (WRAS) to evaluate whether there is a requirement for protected water supply pipes on the development. This should utilise the investigation findings detailed in this report as well as the earlier Remediation Works Verification Reports pertaining to the Phase 5 contamination hotspot referenced within this report.

5.3. Limitations

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

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

5.5. Reasonable skill, care and diligence have been exercised within the timescale and budget available, and in accordance with the technical requirements of the brief. Notwithstanding the efforts made by the professional team in undertaking the assessment and preparing this report, it is possible that other ground conditions and contamination as yet undetected may exist. Reliance on the findings of this report must therefore be limited accordingly. Such reliance must be based on the whole report and not on extracts which may lead to incomplete or incorrect conclusions when taken out of context. This report reviews and relies upon site investigations largely conducted by others. If errors or omissions in previous work have been noted then these have been duly noted, however SGP accepts no responsibility for advice given on the basis of incorrect factual information provided to it.

DRAWINGS

PHASE 5C, HEYFORD PARK, UPPER HEYFORD, BICESTER

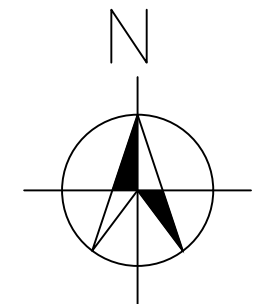
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- REVISIONS:
- A. 2019-06-27. Plot 26 adjusted to ensure AD.M4(3) compliancy. DJE
 - B. 2019-10-03. Red line, plot numbers and schedule updated. MED

LEGEND			
SITE BOUNDARIES			
	APPLICATION BOUNDARY		
EXISTING VEGETATION			
	EXISTING TREE TO BE RETAINED		EXISTING RPA
	EXISTING VEGETATION TO BE REMOVED		
EXTERNAL BOUNDARY TREATMENTS			
	1800mm HIGH SCREEN WALL (REFER TO MATERIALS LAYOUT 0521-PHS-SD-SR-108 FOR MATERIALS)		1800mm HIGH CLOSE BOARD TIMBER FENCE
	1800mm HIGH PLOT DIVISION PANEL FENCE		1800mm HIGH TIMBER MATCHBOARD ACCESS GATE
NUMBERING			
12	PLOT NUMBERS	G12	GARAGE NUMBERS
V	VISITOR PARKING	(h)	PLOT HANDING
P12	PARKING NUMBERS	BM	BIN MUSTER AREA
SSP	SUBSTATION PARKING		
MISCELLANEOUS			
	CHIMNEY		PERSONNEL ACCESS
	AFFORDABLE HOUSING - RENTED		GARAGE ACCESS
	BIN HARDSTANDING WITH 1.5m TURNING CIRCLE		EXISTING BUILDING
	LOCATION OF WHEELCHAIR UNIT'S PARKING SPACE		WHEELCHAIR UNIT
	ROTARY DRYER		COMPOST BIN
	BIN HARDSTANDING		WATER BUTT
GROUND SURFACING			
	MARSHALLS KEYBLOK BLOCK PAVING COLOUR: BRINDLE		RAMP / RUMBLE STRIP TO ENGINEERS DESIGN
	MARSHALLS PIORA CONCRETE BLOCK PERMEABLE PAVING COLOUR: BRINDLE		PAVING SLABS
	TARMAC		450mm x 450mm MARSHALLS SAXON BUFF PATIO SLABS
LANDSCAPING			
	PROPOSED NEW TREE (REFER TO SEPARATE LANDSCAPING DRAWINGS FOR EXACT DETAILS)		PROPOSED HEDGEROW (REFER TO SEPARATE LANDSCAPING DRAWINGS FOR EXACT DETAILS)
	PROPOSED GRASS PLANTING (REFER TO SEPARATE LANDSCAPING DRAWINGS FOR EXACT DETAILS)		PROPOSED PLANTING BEDS (REFER TO SEPARATE LANDSCAPING DRAWINGS FOR EXACT DETAILS)

ACCOMMODATION SCHEDULE					
OPEN MARKET					
Name	Stories	Bedrooms	Gross sqft	No. Of Units	
DL2	2 Storey	3 Bed house	888ft ²	3	
DL6	2 Storey	3 Bed house	858ft ²	6	
Type 1	2 Storey	3 Bed house	1023ft ²	3	
TYPE 1A-SA (side access)	2 Storey	3 Bed house	1038ft ²	2	
SP7C	2.5 Storey	4 Bed house	1400ft ²	1	
SP7B	2.5 Storey	4 Bed house	1400ft ²	1	
SP2-V3	3 Storey	4 Bed house	1523ft ²	7	
TOTAL				23	
AFFORDABLE HOUSING UNITS - RENTED					
Name	Stories	Bedrooms	sqft		
SPF9 1BF3	3 Storey	1 Bed flat	490ft ²	1	
SPF9 1BF2	3 Storey	1 Bed flat	506ft ²	2	
SPF9 1BF1	3 Storey	1 Bed flat	597ft ²	1	
SPF9 2BM2	3 Storey	2 Bed maisonette	813ft ²	1	
SPF9 2BM (DIS)	3 Storey	2 Bed maisonette	829ft ²	1	
SPF9 2BF1	3 Storey	2 Bed flat	829ft ²	1	
SPF9 2BM3	3 Storey	2 Bed maisonette	831ft ²	1	
TOTAL				8	
TOTAL AFFORDABLE UNITS				8	
GRAND TOTAL				31	

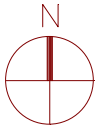


PLANNING LAYOUT

SCALE: 1:500 @ A3
 DATE: DECEMBER 2018
 DRAWN: DGK
 DRAWING TITLE: PLANNING LAYOUT
 DRAWING NO: 0521-PH5C-102

THE OLD BREWERY, LODWAY, PILL, BRISTOL BS20 0DH
 t:01275 813380 f:01275 813381 e:admin@focusdp.com





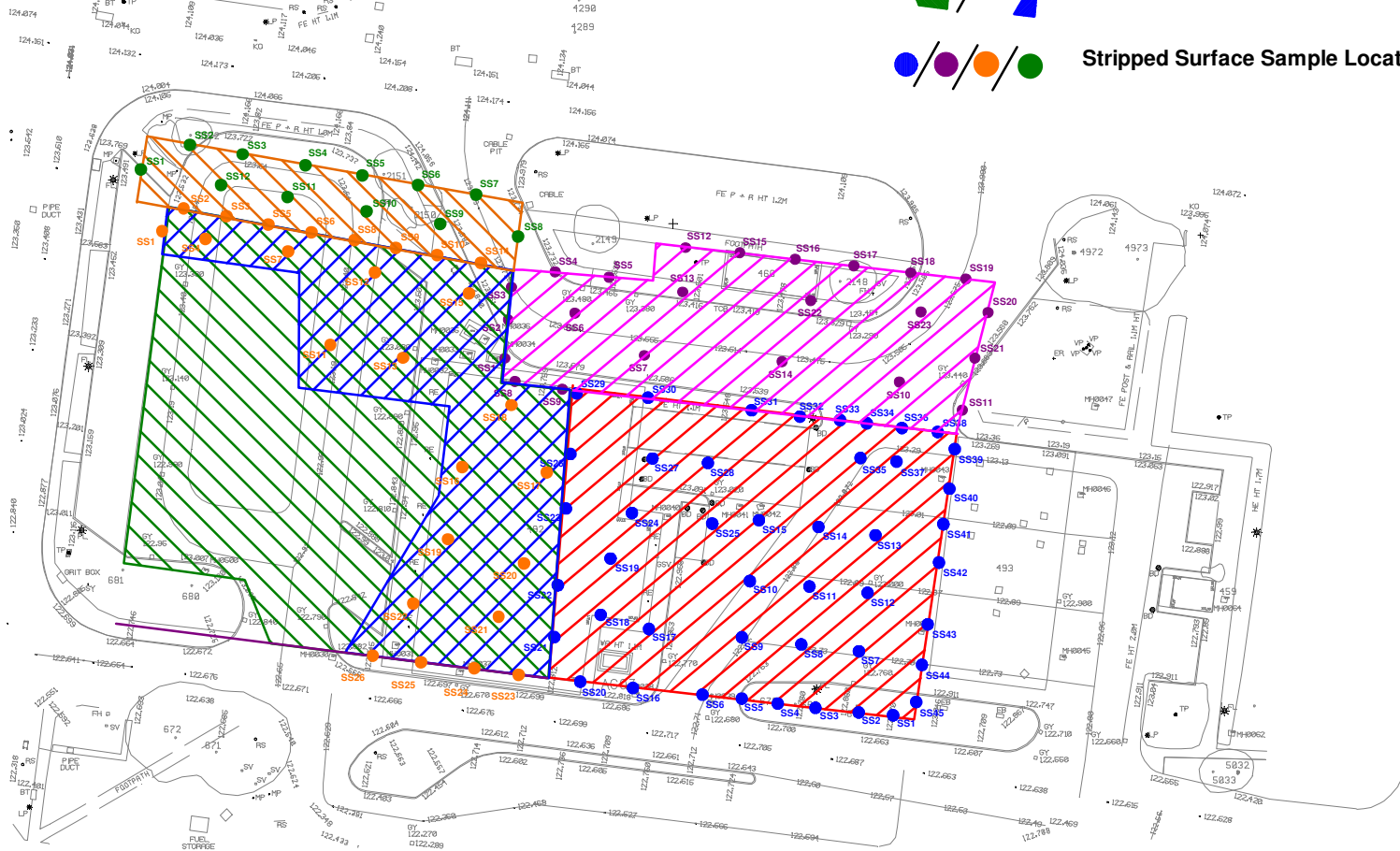
Hotspot Excavation Extents (Ph1 / Ph2 / Ph4)



Ph3 Excavation Area / Hotspot Extents



Stripped Surface Sample Locations (Ph1 / Ph2 / Ph3 / Ph4)



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Smith Grant LLP
Station House, Station Road
Ruxton, Wrexham LL14 6DL
Tel: 01978 822367
Fax: 01978 8247182
www.smithgrant.co.uk
email: consult@smithgrant.co.uk

Project:	
Heyford Park, Upper Heyford	
Drawing:	
Dorchester Phase 5: Contamination Hotspot Excavation Extents and Sample Location Plan	
Drawn:	Checked:
SM	BJT
Date:	Scale:
09.06.19	1:750 @ A4
Job No:	Dwg No:
R1742b	R1742b-R20-D01



   Hotspot Excavation Extents (Ph1 / Ph2 / Ph4)

  Ph3 Excavation Area / Hotspot Extents

-  Hydrocarbon Concentrations < RTVs
-  Hydrocarbon Concentrations 1-5x RTVs
-  Hydrocarbon Concentrations 5-10x RTVs



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SMITH GRANT
Environmental
Consultancy
L I P

Smith Grant LLP
Station House, Station Road
Ruilton, Wrexham LL14 6DL

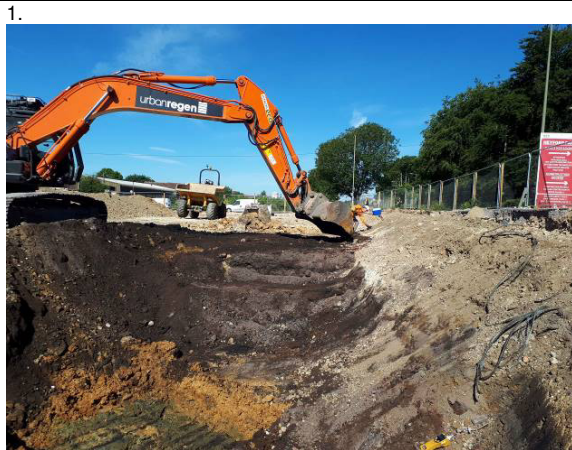
Tel: 01978 822367
Fax: 01978 8247182

www.smithgrant.co.uk
email: consult@smithgrant.co.uk

Project: Hayford Park, Upper Hayford	
Drawing: Dorchester Phase 5: Contamination Hotspot Hydrocarbon Concentrations of Samples Relative to RTVs	
Drawn: SM	Checked: BJT
Date: 09.06.20	Scale: 1:750 @ A4
Job No: R1742b	Dwg No: R1742b-R20-D02

APPENDIX A

Remediation Earthworks Photolog



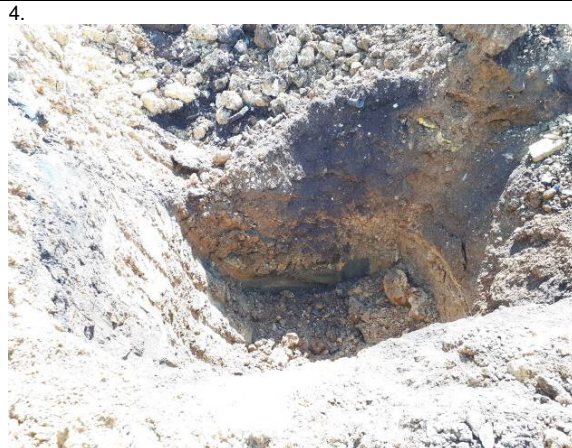
02.06.20 – Recovery of clean stone



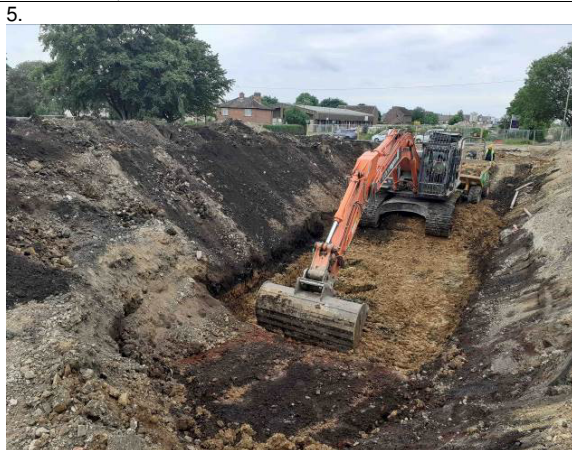
02.06.20 – Clean stone removed from surface exposing impacted clay soil at base



02.06.20 – Eastern view down remediation area (Camp Road visible to left)



02.06.20 – Exploratory trial-pit to determine extent of impacted soils



04.06.20 – Strip of soils not demonstrating significant contamination indicators to direct north of previous Phase 3 hotspot excavation area.



04.06.20 – Soils not demonstrating significant contamination indicators stockpiled to south of excavation area (1/2).

7.



04.06.20 – Soils not demonstrating significant contamination indicators stockpiled to south of excavation area (2/2).

8.



04.06.20 – Excavation of hydrocarbon contaminated soils down to weathered bedrock.

9.



04.06.20 – Removal of contaminated soils to quarantine area within wider development.

10.



04.06.20 – Continuation of excavation of hydrocarbon contaminated soils down to weathered bedrock.

11.



04.06.20 – Soils demonstrating residual indicators of contamination present within northern sidewall of excavation; unable to progress excavation northwards.

12.



04.06.20 – View west across excavation area.

13.



04.06.20 – View east across excavation area.

14.



08.06.20 – Retained soils replaced and compacted into Phase 4 excavation.

15.



08.06.20 – Continuation of excavation to west

16.



08.06.20 – No significant indicators of contamination noted in west of Phase 4 excavation area.

APPENDIX B

Laboratory Analysis Reports

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



Attention : Scott Miller
Date : 12th June, 2020
Your reference : R1742B
Our reference : Test Report 20/7098 Batch 1
Location : Heyford PH 5 (Dorchester)
Date samples received : 5th June, 2020
Status : Final report
Issue : 1

Fifteen samples were received for analysis on 5th June, 2020 of which fifteen were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Authorised By:

Phil Sommerton BSc
Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Smith Grant LLP
Reference: R1742B
Location: Heyford PH 5 (Dorchester)
Contact: Scott Miller
EMT Job No: 20/7098

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	Please see attached notes for all abbreviations and acronyms		
Sample ID	HSV4-S1	HSV4-S2	HSV4-S3	HSV4-SS2	HSV4-SS3	HSV4-SS4	HSV4-SS5	HSV4-SS6	HSV4-SS7	HSV4-SS8			
Depth				2.20-3.20	2.20-3.00	2.20-3.00	2.20-3.00	2.20-3.00	2.20-3.00	2.20-3.00			
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	04/06/2020	04/06/2020	04/06/2020	04/06/2020	04/06/2020	04/06/2020	04/06/2020	04/06/2020	04/06/2020	04/06/2020			
Sample Type	Clay	Loam	Clay	Clay	Clay	Clay	Clayey Sand	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	05/06/2020	05/06/2020	05/06/2020	05/06/2020	05/06/2020	05/06/2020	05/06/2020	05/06/2020	05/06/2020	05/06/2020	LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 ^{#M}	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	<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 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	<0.1	<0.1	<0.1	>>0.2	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	3.5	1.6	1.3	>>23.8	2.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 ^{#M}	<0.2	<0.2	<0.2	236.9	146.9	67.9	856.4	40.4	<0.2	<0.2	<0.2	mg/kg	TMS/PM8/PM16
>C12-C16 ^{#M}	<4	7	12	452	231	254	1215	88	<4	<4	<4	mg/kg	TMS/PM8/PM16
>C16-C21 ^{#M}	19	21	32	13	<7	10	38	<7	<7	<7	<7	mg/kg	TMS/PM8/PM16
>C21-C35 ^{#M}	81	112	126	<7	96	<7	36	<7	<7	<7	<7	mg/kg	TMS/PM8/PM16
Total aliphatics C5-35	100	140	170	705	476	333	2169	131	<19	<19	<19	mg/kg	TMS/PM8/PM16/PM12/PM10
Aromatics													
>C5-EC7 [#]	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8 [#]	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	<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 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	<0.1	<0.1	<0.1	1.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 [#]	<0.2	<0.2	4.3	9.6	5.5	6.3	6.7	<0.2	<0.2	<0.2	<0.2	mg/kg	TMS/PM8/PM16
>EC12-EC16 [#]	10	13	13	68	37	49	118	19	<4	<4	<4	mg/kg	TMS/PM8/PM16
>EC16-EC21 [#]	43	73	40	18	11	14	18	<7	<7	<7	<7	mg/kg	TMS/PM8/PM16
>EC21-EC35 [#]	160	221	194	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TMS/PM8/PM16
Total aromatics C5-35 [#]	213	307	251	96	54	69	144	19	<19	<19	<19	mg/kg	TMS/PM8/PM16/PM12/PM10
Total aliphatics and aromatics(C5-35)	313	447	421	801	530	402	2313	150	<38	<38	<38	mg/kg	TMS/PM8/PM16/PM12/PM10
MTBE [#]													
MTBE [#]	<5 ^{SV}	<5 ^{SV}	<5 ^{SV}	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
Benzene [#]													
Benzene [#]	<5 ^{SV}	<5 ^{SV}	<5 ^{SV}	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
Toluene [#]													
Toluene [#]	<5 ^{SV}	<5 ^{SV}	<5 ^{SV}	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
Ethylbenzene [#]													
Ethylbenzene [#]	<5 ^{SV}	<5 ^{SV}	<5 ^{SV}	10	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
m/p-Xylene [#]													
m/p-Xylene [#]	<5 ^{SV}	<5 ^{SV}	<5 ^{SV}	51	38	21	395	33	<5	<5	<5	ug/kg	TM36/PM12
o-Xylene [#]													
o-Xylene [#]	<5 ^{SV}	<5 ^{SV}	<5 ^{SV}	<5	24	<5	734	<5	<5	<5	<5	ug/kg	TM36/PM12
Natural Moisture Content													
Natural Moisture Content	20.3	32.1	29.9	25.1	21.7	16.3	21.3	25.0	24.0	23.1	<0.1	%	PM4/PM0
Sample Type													
Sample Type	Clay	Loam	Clay	Clay	Clay	Clay	Clayey Sand	Clay	Clay	Clay		None	PM13/PM0
Sample Colour													
Sample Colour	Dark Brown	Dark Brown	Medium Brown	Light Brown	Light Brown	Light Brown	Light Grey	Light Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items													
Other Items	loam and carbon	stones and carbon	stones and loam	stones and sand	stones and sand	stones and sand	stones	stones and sand	none	stones, chalk and sand		None	PM13/PM0

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 20/7098

SOILS

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

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

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

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

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

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

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

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

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

Please include all sections of this report if it is reproduced

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

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

ABBREVIATIONS and ACRONYMS USED

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

EMT Job No: 20/7098

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(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 re	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 re	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 re	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes