



**LAND TO THE REAR OF HALLSTEADS
DOVE HOLES, BUXTON**

**PHASE 2:
GEO-ENVIRONMENTAL SITE INVESTIGATION & RISK ASSESSMENT**

FOR

MICHAEL GREEN PLANNING SERVICES LIMITED



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1 INTRODUCTION

1.1 *Preamble*

RPS Health, Safety & Environment (RPS) was commissioned by Michael Green Planning Services Limited to undertake a Phase 2 Geo-environmental Site investigation & Risk Assessment of Land to the area of Hallsteads, Dove Holes, Buxton.

The report has been commissioned prior to the proposed redevelopment of the site for residential end use.

The site comprises a triangular area of land consisting of two grass fields with steep slope associated with a former quarry which primarily occupies the adjacent land to the northeast. The triangular field in the southwest of the site is understood to be council owned. A footpath is located in the south of the site running east to west.

The information contained within this report is based upon the available information at the time of reporting.

1.2 *Objectives*

The principal objectives of this assessment were as follows:

- To determine whether there was the potential for contamination to be present beneath the site which could impact future site uses/occupiers and the wider environment, significantly constrain the proposed use of the site or affect the development process.

The scope of this assessment has been designed in general accordance with the Environment Agency Contaminated Land Report 11 (CLR 11): Model Procedures for the Management of Land Contamination.

Geotechnical assessment of soils was beyond the scope of this assessment.

1.3 *Legislation and Guidance*

This report has been produced in general accordance with:

- DEFRA Environmental Protection Act 1990: Part 2A - Contaminated Land Statutory Guidance (2012);
- Contaminated Land (England) Regulations 2006 (as amended);
- Model Procedures for the Management of Land Contamination - Contaminated Land Report (CLR) 11;

- DEFRA Environmental Protection Act 1990: Part 2A - Contaminated Land Statutory Guidance (2012).
- National Planning Policy Framework (2012);
- British Standard requirements for the investigation of potentially contaminated sites - Code of practice (ref. BS10175:2011); and
- British Standard requirements for the Code of practice for site investigations (ref. BS5930:2015).

Details of the limitations of this type of assessment are described in Appendix A.

2 PRELIMINARY RISK ASSESSMENT - SUMMARY

2.1 *Phase 1 Environmental Review*

The scope of the Site Investigation was based on the findings of the following Phase 1 Environmental Review:

- Geo-Historic Ground Investigations Limited (August 2014) Desk Study & Phase I Risk Assessment. Land to Rear to Hallsteads, Doveholes, Buxton, SK17. Report ref. 1415-0008-DS

A brief summary of relevant information presented within the Phase I Review is provided in the following Section.

2.2 *Site Location and Description*

The site is located at Hallsteads, Dove Holes, Buxton. The National Grid Reference for the site is 407878, 378668. A site location plan is presented as Figure 1.

Residential properties are located to the south and west of the site. A disused quarry is located adjacent to the northeast of the site, the boundary of which extends partly on to the site in the northeast. A cutting is located adjacent to the northern site boundary.

2.3 *Site History*

Historical plans dated 1879 to 1994 were reviewed to determine the site history.

Prior to circa 1879 the site was undeveloped. A footpath is depicted in the south of the site running approximately east-west. From 1921 to 1943 allotment gardens are depicted in a rectangular area in the south-western corner of the site. The site is not shown to have changed since 1994.

A steep slope is depicted adjacent to the eastern site boundary running south. Old Lead Mines Old Quarry a tramway and cutting, and two reservoirs are located approximately 100m east of the site. A railway is depicted from 1879 to present, approximately 150m west of the site, running approximately north-south. Residential properties are depicted from 1879 adjacent to the southwest corner of the site. These were demolished and new properties built along the western site between 1921 and 1972. A pump is depicted approximately 50m west of the site in 1879 only. From 1972 these are no longer depicted. A garage is depicted from 1972 approximately 200m southwest of the site; this is labelled as Works since 1994.

2.4 Published Geology & Hydrogeology

Based on British Geological Survey mapping (1:50,000-scale) and the Environment Agency's Groundwater Vulnerability mapping (1:100,000-scale), the stratigraphic sequence and aquifer classifications beneath the site are as follows:

Strata	Description & approximate thickness	Aquifer Classification	Environmental Sensitivity
Monsal Dale Limestone Formation	Pale to medium grey, thickly-bedded and bioturbated, with chert nodules. Rich in coral and shelly faunas. (BGS Lexicon) 143m	Principal	Moderate/High
Bee Low Limestone Formation	Pale grey, brownish grey to grey, fine to medium grained calcarenites, thick bedded. Rich in coral and shelly faunas. (BGS Lexicon) 68-213m	Principal	Moderate/High

No superficial deposits are indicated to be present beneath the site.

There is the potential for Made Ground to be present on site as a result of imported materials including potential backfilling of the quarry. No site investigation reports have been reviewed to verify this.

2.5 Hydrology

The Phase 1 report indicates that there are no watercourses present on site.

The historical plans depict two watercourses within 1km of the site which are classified within a River Basin Management Plan published by the Environment Agency under the European Water Framework Directive (2000). A list of all nearby watercourses and water bodies are as follows:

Watercourse / body	Quality Classification	Location	Environmental Sensitivity
Black Brook	Ecological - Moderate Chemical - Good	600m N	Moderate
Drain	No data	550m SW	Low

The Phase 1 report indicates that the site does not lie within a Groundwater Protection Zone and there are no water abstraction licences situated within 1km of the site.

2.6 Landfills and Waste Sites

The Phase 1 report does not identified the presence of any historical landfill sites within 500m of the site.

The Local Authority provided the following information in the Proposed Site Investigation document by Geo-Historic Ground Investigations Ltd.: A site walkover on the 18/3/15 indicated that the site has been subject to the tipping of materials of unknown provenance. This included evidence of what is believed to be molybdenum ore slag, possibly from the Ferro Alloys site in Glossop.

During the site investigation and subsequent monitoring visits RPS personnel were present on the site there was no obvious evidence of this tipped material.

2.7 Potential Areas of Concern

Based upon the site history and Phase 1 report review, the Proposed Site Investigation document identified a potential source of contamination from the former Builders Yard in the south-eastern corner of the site from potential unregulated construction waste storage. The document also identified potential karst limestone features in the north of the site where infilling may have taken place. This report also highlighted molybdenum ore slag as a potential contaminant of site. These areas were targeted during the site investigation. Exploratory locations were also situated across the general site area to provide good coverage.

The Phase 1 report states that the site is in an area specified by BR211 that requires Full Radon Protection Measures.

2.8 Preliminary Conceptual Model

Using all the available information, a preliminary Conceptual Site Model (CSM) was developed prior to commencing the site investigation. This was used to identify the principal sources, pathways and receptors (i.e. potential Pollutant Linkages) on this site, and is summarised in Table 1 below:

Preliminary Conceptual Model

Potential Sources	Potential Contaminants	Considered Pathways	Potential Receptors
On site historical land uses Former quarry Allotment gardens Anecdotal information suggesting builders yard and imported made ground. Off-site historical land uses Old Lead Mines	Potential for Made Ground to be present across site and in the quarry if partly backfilled. Ashy material may be present in the area of allotment gardens. Potential Contaminants include: Asbestos, metals, petroleum hydrocarbons, polyaromatic hydrocarbons, phenols, SVOCs, VOCs, molybdenum,	Human Health -Dermal contact -Inhalation of soil dust -Ingestion of soil dust -Inhalation soil vapours	Human Health -Current site users -Future site users -Construction/ maintenance personnel -Off-site receptors
		Controlled Waters -Leaching of mobile contaminants from made ground. -Vertical and lateral migration of mobile contaminants in permeable strata. -Migration along - subsurface structures.	Controlled Waters -Shallow groundwater (Made Ground) - Principal Aquifer (Monsal Dale Limestone Formation) -Surface Water (Black Brook) -Surface Water (Drain)
		Infrastructure -Direct contact with fill or contaminated soils -Migration of ground gas	Infrastructure -Future building structures -Underground utility services

Potential Sources	Potential Contaminants	Considered Pathways	Potential Receptors
Old Quarry Tramway	ground gas.		-Off-site structures

The site investigation works were targeted to provide further detailed information on the potential Pollutant Linkages in this preliminary conceptual model.

3 SITE INVESTIGATION

3.1 Objectives

The objectives of the site investigation were to assess:

1. General ground conditions.
2. The potential ground contamination resulting from imported Made Ground, the site's former use as allotment gardens in the south-western corner, and tipping of molybdenum ore slag (based on anecdotal information).
3. The ground gas regime.

Geotechnical assessment of soils was beyond the scope of this assessment.

3.2 Description of Intrusive Works

The site investigation was carried out between the 14th July and 16th July 2016, and comprised:

- 7 no. window sampler boreholes advanced to a maximum depth of 4.55m below ground level (bgl).
- In-situ standard penetration testing (SPT) at regular intervals throughout the depth of the boreholes
- Installation of 5 no. groundwater/gas monitoring wells.
- 30 no. trial pits advanced to a maximum depth of 2.9m bgl.

The exploratory locations were positioned to provide effective site coverage and target to potential key source areas of potential contamination as discussed in Section 2.7. The rationale behind each of the site investigation locations is summarised in Table 2.

The proposed positions of BH04 and TP30 were relocated to the west to due to a rising main runs across the site. TP13 was moved further into the site due to the quarry being inaccessible for any plant. TP17 was not advanced due to this area of the site being inaccessible due to the topography associated with the former quarry. BH02 was moved to target the area of Made Ground encountered in TP25.

It was not possible to locate any exploratory holes on the quarry slopes that occupy part of the site due to the steep inclines. The base of the quarry does not appear to fall within the site boundary. Based on observations made during the site visit it is considered unlikely that the extent of quarry within the site area has been subject to significant filling as the base of the quarry appears to be a similar level to the associated cutting.

Rationale of Exploratory Hole Locations

Exploratory Hole Location	Location	Rationale
TPs 01 to 16, 18 to 31 BHs 01 to 05	General site coverage	Overview of ground conditions, investigation into whether karst limestone features have been infilled with Made Ground in north of site (northern area not defined in Proposed Phase 2 Investigation document)
BHs 02, 02A, 02B	Adjacent to north-western site boundary in area of Made Ground	Targeting deep Made Ground, installation of ground gas and shallow groundwater monitoring wells
TP21, TP27	South-western corner of site	Targeting area of former allotment gardens

Exploratory hole logs are presented as Appendix B. Figure 2 shows the location of all exploratory hole locations.

The soil arisings from each hole were carefully examined for visual and olfactory evidence of contamination. Headspace testing was undertaken on site for ionisable volatile organic compounds (VOCs) using a portable Photo-Ionisation Detector (PID). The results are recorded on the borehole logs (in parts per million in air) and have been used to inform the scheduling of laboratory analysis.

3.3 Chemical Laboratory Testing

During the site investigation a total of 47 representative soil samples were collected from exploratory hole arisings in clean containers and forwarded to a UKAS accredited laboratory for analysis. Selected samples were analysed for the following analytes:

Inorganic Determinands:

pH, arsenic, boron, cadmium, chromium, copper, lead, mercury, nickel, sulphide, total cyanide, thiocyanate, sulphate, sulphur, selenium, zinc, molybdenum and asbestos.

Organic Determinands:

Polyaromatic hydrocarbons (PAHs), benzene, toluene, ethylbenzene and xylenes (BTEX), methyl tert-butyl ether (MTBE), speciated total petroleum hydrocarbons (TPH CWG), and phenols.

A single groundwater sample was collected from BH01 monitoring well on 24th July 2016 to site and submitted to a UKAS accredited laboratory and analysed for the same determinands as the soil samples (with the exception of asbestos).

3.4 Geotechnical Laboratory Testing

No geotechnical testing was required as per the specification.

3.5 Encountered Strata

The strata encountered during the intrusive investigation are summarised in the table below, and described in the following section.

Encountered Strata

Strata	Depth to Top of Strata (m bgl)	Thickness (m)
Topsoil	From surface	Min. proven thickness: 0.2m Max. proven thickness: 0.5m
Made Ground	From surface (topsoil in these areas classified as Made Ground)	Minimum thickness 0.2m (BH02) Maximum thickness 4.55m (BH02B)
Glacial Till	Min. depth to top: 0.2m Max depth to top: 0.5m	Min. proven thickness: 0.2m Max. proven thickness: 1.5m
Limestone	Min. depth to top: 0.5m Max depth to top: 1.8m	Thickness not proven
Suspected weathered mudstone	Min. depth to top: 1.5m Max depth to top: 1.8m	Thickness not proven
Shale	Min. depth to top: 1.1m Max depth to top: 1.3m	Min. proven thickness: 0.4m Max. proven thickness: 0.5m

General descriptions of the strata encountered during the intrusive investigation are summarised below. Reference should be made to the borehole and trial pit exploratory hole logs within Appendix B of this report for full descriptions of ground conditions underlying the site.

Topsoil was encountered in all trial pits and comprised gravelly clayey topsoil to an average depth of 0.3m bgl.

Made Ground was encountered in four locations (TP25, BHs 02, 02A and 02B) within a localised area adjacent to the north-eastern site boundary, in the vicinity of the former quarry. Made Ground varied in thickness from 0.2m to >4.55m and comprised sandy gravelly clay (BH02, 02A and 02B), or sand and gravel (TP25) with anthropogenic material including ash, coal, brick, tile, porcelain, pottery and plastic fragment.

Natural superficial deposits encountered in all locations excluding BH02B where the base of the made ground was not proven. This generally comprised of firm or stiff gravelly clay, with occasional

clayey sand or clayey gravel strata, interpreted as the Glacial Till. According to the BGS, no superficial deposits are indicated beneath the site, as described in Section 2.5.

Beneath the superficial deposits (likely Glacial Till), limestone was encountered in thirteen trial pits at an average depth of 1.1m bgl. Trial pits were not excavated deep into the limestone due to the strength of rock. Limestone was not recovered from boreholes. It is probable that the refusal depth marked the depth to limestone (or large fragments of weathered limestone).

Suspected weathered mudstone was encountered in four trial pits and one borehole at an average depth of 1.9m bgl and comprised clayey gravel of weak mudstone. The thickness of mudstone was not proven.

Shale was encountered in two trial pits at an average depth of 1.2m bgl with an average thickness of 0.45m.

Limestone was indicated by BGS beneath the site with no superficial deposits indicated, or mudstone or shale. The limestone encountered was light grey as expected.

3.6 **Groundwater**

Groundwater was encountered in four boreholes/trial pits (TPs 03 and 05, BHs 01 and 04) during excavation at depths of between 1.0m and 2.8m bgl. Groundwater was noted as slight seepages in TPs 03 and 05 and BH04. Encountered groundwater is illustrated on the borehole/trial pit logs in Appendix B.

Following completion of works, groundwater was encountered in two of the borehole installations. In BH01, groundwater was recorded at levels of between 0.9m and 1.1m bgl on the three monitoring occasions. In BH03, groundwater was recorded at 3.4m bgl on the final monitoring occasion only. These boreholes have response zones within Glacial Till. The depth to groundwater during each monitoring visit is presented in Appendix C.

No clearly defined groundwater bodies have been identified beneath the site. The shallow groundwater encountered in BH01 and BH03 appears to be localised in these areas and are likely to be representative of a localised body of perched water.

Encountered Groundwater

Monitoring Well	Elevation (m AOD*)	Well Screen		Depth to Water (m bgl)	Groundwater Elevation (m AOD*)
		Depth (m bgl)	Strata		
a s e d BH01	326.702	1.0-2.0	Glacial Till	0.9 (21/06/16)	325.802
				1.1 (24/06/16)	325.602
				1.0 (30/06/16)	325.722
BH03	331.62	1.0-3.0	Glacial Till	3.39 (30/06/16)	328.230

3.7 Field Evidence of Contamination

No visual or olfactory evidence of contamination was encountered during the intrusive investigation or subsequent monitoring.

Ash was noted in Made Ground encountered in TP25, BH02, 02A and 02B as well as anthropogenic material including coal, brick, tile, porcelain, pottery and plastic fragment.

Photo-Ionisation Detector (PID) Readings

Soil arisings from each exploratory hole were screened for the presence of volatile contaminants using a PID. Elevated concentrations of volatile contaminants (>100 parts per million (ppm)) were not recorded in any of the soil samples.

4 SOIL ANALYTICAL DATA

4.1 *Soil Assessment Criteria*

In order to assess risks to future site users, concentrations of contaminants of concern have been compared to Suitable 4 Use Levels (S4UL) assessment criteria (AC) published by Land Quality Management: Chartered Institute of Environmental Health (LQM:CIEH) in 2015. In accordance with the copyright notice the Publication Number for RPS group is S4UL3394.

The assessment has been based upon the standard residential with plant uptake land use scenario with soil organic matter (SOM) of 1% (most conservative data set).

A notable exclusion from the published S4ULs is lead. In the absence of a S4UL for lead, the Category 4 Screening Level (C4SL) has been selected, published by DEFRA in 2014. It is noted that the C4SLs are based on the acceptance of a low level of toxicological concern, rather than the more conservative standard adopted in the derivation of S4ULs, which are based on a tolerable or minimal level of risk.

A complete copy of the SAC data is presented Appendix D.

4.2 *Soil Analytical Data*

A total of 37 soil samples were analysed for a wide range of inorganic and organic determinands. Of these samples, eight were representative of Made Ground, seventeen were representative of topsoil and twelve were representative of the underlying Superficial Deposits.

Soil Properties

Soil pH in Made Ground was recorded between 7.1 and 7.8. Soil pH in topsoil was recorded between 6.0 and 8.1. Soil pH in Glacial Till was recorded between 5.8 and 8.1.

Soil organic matter in Made Ground was recorded between 7.6% and 11.0%. Soil organic matter in topsoil was recorded between 1.8% and 7.5%. Soil organic matter in Glacial Till was recorded between 0.8% and 4.3%.

Inorganic Determinands

Metals

Arsenic was identified at concentrations exceeding the S4UL of 37mg/kg in all eight samples of Made Ground with the maximum concentration recorded as 130mg/kg (BH02B . 3.5m bgl). Lead was identified at concentrations exceeding the C4SL of 200mg/kg in three samples of Made Ground with the maximum concentration recorded as 800mg/kg (WS02B . 1.5m bgl). Mercury was identified at concentrations exceeding the S4UL of 1.2 mg/kg in three samples of Made Ground with the

maximum concentration recorded as 13mg/kg (BH02B . 13mg/kg). No other exceedances were identified in the Made Ground samples.

Arsenic was identified at a concentration exceeding the S4UL of 37mg/kg in one sample of topsoil (TP01 . 0.2m bgl). Cadmium was identified at a concentration exceeding the S4UL of 11mg/kg in one sample of topsoil (TP01 . 0.2m bgl). Nickel was identified at a concentration of exceeding the S4UL of 130mg/kg in one sample (TP01 . 0.2m bgl).

A single exceedance was recorded above the S4UL for arsenic (37mg/kg) in one Glacial Till sample at 45mg/kg (TP06 . 0.5m bgl) and a single exceedance was recorded at the S4UL for lead of 200 mg/kg (TP13 . 0.3m bgl).

The made ground that was found to be contaminated by arsenic, lead and mercury was limited to a small area in the east of the site adjacent to the quarry slope. The metal contamination identified in the clay samples were immediately to the north and south of the extent of contaminated made ground. The arsenic, nickel and cadmium identified in topsoil were situated in the northern tip of the site adjacent to Hallsteads Road.

No metal exceedances were identified the southern, central and western areas of the site.

Molybdenum

No S4UL was available for molybdenum. Instead it was considered appropriate to calculate a value using CLEA v1.07 based on EIC/AGS/CL:AIRE (December 2009) The Soil Generic Assessment Criteria for Human Health Risk Assessment. ISBN 978-1-905046-20-1.

The value calculated for molybdenum was 665mg/kg.

A total of 16 samples were analysed for molybdenum. The maximum concentration of molybdenum was 210mg/kg identified in the samples collected from TP28 in the southern area of the site close to the access gateway. The next highest concentration of molybdenum was 71 mg/kg identified in a sample collected from nearby (TP24). No exceedances were identified in any of the samples.

Asbestos

A total of 37 samples of were screened for asbestos fibre content under laboratory conditions. No asbestos was detected in any of the samples.

Cyanide

CLEA 1.06 cannot be used to model the acute risk associated with cyanide. In the absence of available guidance from DEFRA and the Environment Agency for the assessment of acute risks from cyanide, it is considered appropriate to use the methods proposed by the Massachusetts Department of Environmental Protection (MADEP) and the first edition of the SNIFFER Framework,

which can be used as a basis for assessing acute risks. Annex 7 of the Sniffer Framework provides the following equation (FA7-1) for deriving a numeric target for a one-time bolus ingestion event.

$$RTC = TF \times BW$$

—————
OTSIR

RTC	=	Reference target concentration (mg/kg)
TF	=	Appropriate toxicological factor (mg/kg body weight)
BW	=	Body weight of an 18 month old child (kg)
OTSIR	=	One time soil ingestion rate (kg soil)

The document indicates the use of the following values for the above parameters:

TF	=	0.01 mg/kg bw
BW	=	10.65 kg
OTSIR	=	0.002 kg

Using this equation, a SAC of 53 mg/kg has been derived for the assessment of acute risk.

Concentrations of cyanide were low and no exceedances were identified in any of the soil samples. Cyanide is therefore not considered likely to represent a risk to site users or controlled waters receptors.

Organic Determinands

Petroleum Hydrocarbons

A total of 37 soil samples were analysed for carbon banded petroleum hydrocarbons with an aliphatic/aromatic split and BTEX. The concentrations of petroleum hydrocarbons generally were not recorded over the limit of detection (LOD) and no S4UL exceedances were identified in any of the samples.

Environment Agency Science Report P5-080 recommends that even where screening values are not exceeded for individual hydrocarbon fractions, potential cumulative effects between the fractions might exist. This is addressed by calculating the Hazard Quotient (HQ) for each fraction by dividing the measured concentration of the fraction by the GAC value. The HQs are added to derive a Hazard Index (HI). An HI greater than 1 can be considered indicative of a potential risk to human health, with further risk assessment or remediation required. None of the calculated HI values were greater than 1 and therefore petroleum hydrocarbon concentrations identified are not considered to represent a significant risk to human health receptors.

Polycyclic Aromatic Hydrocarbons

A total of 37 soil samples were analysed for a range of speciated polycyclic aromatic hydrocarbons. The concentrations generally were not recorded over the LOD and no exceedances were identified in any of the samples

Phenols

A total of 37 soil samples were analysed for total monohydric phenols. The concentrations were low and no exceedances were recorded above the corresponding assessment criteria.

4.3 Summary of Soil Analytical Data

A total of 37 samples were analysed for a wide range of inorganic and organic determinants and were considered in terms of material type: Made Ground, topsoil and Glacial Till. Made Ground was encountered in a localised area in the vicinity of the quarry in the north-eastern corner of the site.

Samples of Made Ground (which were limited to an area adjacent to the north-eastern site boundary) contained concentrations of arsenic, lead and mercury in exceedance of the S4UL.

Two samples of Glacial Till were identified as having a single exceedance of arsenic or lead exceeding S4ULs. These were situated immediately adjacent to the made ground in the eastern area of the site.

A single topsoil sample was recorded as having concentrations of metals including arsenic, cadmium and nickel exceeding S4ULs. This was situated in the northern tip of the site.

A total of 37 samples were screened for asbestos fibre content. No asbestos was detected in any of the samples.

No organic contaminants were identified at concentrations exceeding the assessment criteria.

The following table summarises contaminant concentrations that exceeded the corresponding AC.

Table 5: Summary of Soil Exceedances

Determinand	S4UL (mg/kg)	Location	Depth (m.bgl)	Concentration (mg/kg)
Arsenic	37	TP25	0.60	93
		TP25	1.50	98
		BH02	0.15	45
		BH02A	0.30	83
		BH02B	0.50	89
		BH02B	1.50	100
		BH02B	2.50	130

Determinand	S4UL (mg/kg)	Location	Depth (m.bgl)	Concentration (mg/kg)
		BH02B	3.50	120
		TP01	0.20	37
		TP06	0.50	45
Lead	200 (C4SL)	BH02A	0.30	220
		BH02B	1.50	800
		BH02B	3.50	250
		TP13	0.30	200
Mercury	1.2	TP25	1.50	4.7
		BH02B	1.50	13
		BH02B	2.50	2.1
Nickel	130	TP01	0.20	180

5 GROUNDWATER ANALYTICAL DATA

5.1 *Groundwater Analytical Data*

Groundwater samples were obtained on one occasion (24th June 2016) and groundwater level monitoring was undertaken on three occasions (21st, 24th 30th and June). The borehole locations are illustrated by Figure 2. The results of the groundwater monitoring are enclosed in Appendix C.

Since the site is situated on a Principal Aquifer, relating to the Monsal Dale Limestone Formation, the results of the groundwater analysis have been compared to UK Drinking Water Standard (DWS). Whilst no potable abstraction have been identified in the vicinity of the site these were considered more appropriate than EQS values as there are no significant surface water courses within 500m of the site. Where such values are not available, the Environmental Quality Standard (EQS) freshwater values have been used. The screening levels used for the assessment of groundwater are discussed in greater detail in Appendix F.

Groundwater was found to be limited during the monitoring programme. Only a single well contained sufficient groundwater to enable collection of a sample. The groundwater sample was recovered from BH01, which was located in the immediate vicinity of TP01 where exceedances of arsenic, cadmium and nickel were encountered in topsoil in the northern tip of the site.

Groundwater Properties

Groundwater pH was recorded as 5.1.

Inorganic Determinants

Metals

The groundwater sample was analysed for a broad range of metallic determinants. No exceedances above DWS were identified.

Molybdenum

No screening criteria were available for molybdenum. The recorded concentration of molybdenum was 5.3ug/l and the limit of detection (LOD) is 1.1ug/l. This value is not considered to represent a significantly elevated concentration. The concentrations of molybdenum in soils in the northern area of the site were low (19mg/kg in TP01).

Sulphate

Sulphate was identified at 33mg/l which did not exceed the DWS value of 250mg/l.

Cyanide

Cyanide was not identified at a concentration above the detection limit of 40 g/l.

Organic Determinands

Petroleum Hydrocarbons

The groundwater sample was analysed for carbon banded petroleum hydrocarbons, BTEX and MTBE. DWS values are only specified for benzene (1 g/l) and TPH Aliphatic/Aromatic Total (10 g/l). EQS values are specified for toluene (50ug/l) and xylene (30ug/l).

With the exception of Aromatic Hydrocarbons C8-C10 no detectable concentrations of petroleum hydrocarbons or BTEX were identified. The concentration of Aromatic C8-C10 was 0.8ug/l which is not considered to be significantly elevated.

Polycyclic Aromatic Hydrocarbons

The groundwater sample was analysed for speciated PAHs. No detectable concentrations were identified. The LOD was 0.01ug/l.

5.2 Summary of identified Groundwater Contamination

Limited groundwater was encountered within the monitoring wells. A sufficient volume to enable collection a sample was limited to a single well (BH01). A sample was collected from this installation and analysed for a wide range of determinands. The concentrations were low are not considered to represent a risk to controlled waters receptors.

6 GROUND GAS RISK ASSESSMENT

6.1 *Ground Gas Monitoring Data*

Ground gas monitoring was undertaken on three occasions; 12st, 24th 30th and June 2016. Installations were monitored for concentrations of methane, carbon dioxide and oxygen, in addition to flow rates, relative pressure and barometric pressure. A Photo-Ionisation Detector (PID) was also used to record concentrations of volatile organic compounds (VOCs). The results are presented in Appendix C.

Methane was not detected in any of the boreholes on any of the gas monitoring visits.

The maximum-recorded concentration of carbon dioxide was 4.1% v/v (BH02). This was situated in the vicinity of the localised mad ground. Across wider site the concentrations were typically between 1% and 3%. It is likely that these carbon dioxide concentrations are natural background concentrations associated with the limestone bedrock.

VOCs were monitored on three occasions (21st, 24th and 30th June 2016). The maximum recorded VOC concentration was 1ppm in all of the boreholes.

No detectable flow (l/hr) was recorded in any of the boreholes during the course of the monitoring events undertaken to date.

Atmospheric pressure ranged from 971mb to 981mb over the course of the monitoring. In general the highest recorded land gas concentrations were found in association with low-pressure events.

6.2 *Ground Gas Risk Assessment*

The CIRIA Report C665 *Assessing risks posed by hazardous ground gases to buildings'* outlines indicative guideline concentrations for carbon dioxide and methane in association with gas flow rates for which gas protection measures may be required in new residential or commercial developments.

The methodology is based on the NHBC Traffic Light System that characterises and ranks the gas regime as green, amber 1, amber 2 or red, with corresponding indicative gas protection measures. Using this methodology, the ground gas regime at this site corresponds to green, whereby no specific gas protection measures are required.

Please note that the minimum number of gas monitoring visits recommended by CIRIA C665 is six. The Phase 1 report identified the site to be in an area specified by BR211 that requires Full Radon Protection Measures. RPS does not consider additional gas monitoring visits necessary providing that the Radon Protection Measures would be sufficient protection to cover ground gas assuming a uprated characteristic situation of Amber 1. Amber 1 required basic gas protection measures comprising a sealed gas resistant membrane and ventilated sub floor void.

British Standard 8485:2015 (Code of Practice for Characterisation and Remediation from Ground Gas in Affected Developments) outlines typical gas protection measures and prescribes a point scoring system for specifying an appropriate level of gas protection. This system prescribes a target level of points to be achieved, based on the Characteristic Situation and the sensitivity of the development. Each individual level of gas protection measures (i.e. gas-proof membrane; floor slab; passive venting) is given a range of points depending on the quality / standard of the protection measure (i.e. thickness of membrane; or degree of ventilation), and points are summed for each level of protection to be incorporated into the design. This document should be consulted when outlining / designing appropriate gas protection measures.

BRE 211 Radon, Guidance on protective Measures for New Buildings details the required protection measures for full radon protection

7 ENVIRONMENTAL RISK ASSESSMENT

The UK approach to the management of land contamination through the development process is risk-based, as was formerly implemented by Planning Policy Statement Number 23 (PPS23). PPS23 was formally withdrawn during March 2012 and replaced by the National Planning Policy Framework (NPPF).

The Local Authority is likely to have based their strategy for the implementation of the National Planning Policy Framework on the withdrawn PPS23. Therefore, this risk assessment will be based primarily on the withdrawn PPS23, with broad consideration for the contents of the National Planning Policy Framework.

The risk assessment methods adopted by PPS23 reflected those adopted by Part 2A of the Environmental Protection Act (1990). Part 2A identifies that harm to human health and the environment arises not solely from the presence of contaminating substances or sources but from their migration along a pathway to where they can impact a receptor.

Discussion of the likelihood and significance of environmental risk to potential receptors at the site and the surrounds is detailed below.

7.1 *Future Site User/Occupants*

Based on the proposed residential development, the most sensitive human health receptor will be future residents living on site. Soil concentrations were compared to Residential with home grown produce values derived by LQM. We have assumed 1% soil organic matter (SOM) values where applicable for the purpose of the risk assessment. These are the most conservative values.

Soil samples collected from the northeastern area and the northern tip of the site (primarily samples of made ground) contained elevated concentrations of a series of metal contaminants. No elevated concentrations of organic compounds were identified across the site. No asbestos was identified in shallow samples collected from across the site.

The risk associated with the metal contamination to future site users/occupants can be mitigated by ensuring the affected soils are not present at the surface post development. It is likely that much of the affected soils will be stripped during the initial enabling works. Care should be taken not to spread the contamination by relocated excavated soils to other areas of the site.

Large areas of the completed development will be covered by buildings and hardstanding in the form of roads and pavements. This physical surface cover will prevent the exposure of site users to contaminants in these areas of the site. With regard to garden areas and areas of soft landscaping the exposure can be controlled by adopted the use of a cover system in areas of the site where soil contamination has been identified. A suitable cover system could include a growth medium of

topsoil/subsoil to a depth of 600mm. The cover system could be formed of imported materials or site won materials (from other areas of the site) providing that the contaminant concentrations are less than the adopted assessment criteria. It would be necessary to prove this through topsoil validation including laboratory analysis of samples collected from the source materials and photographic evidence of the depth of the system. RPS does not consider that a cover system will be required for the unaffected areas of the site (southern and central western areas). Providing that a cover system is implemented in the eastern area and northern tip of the site the risk to future site users associated with contamination is considered to be low.

7.2 Construction/ Maintenance Workers

CLEA V1.07 cannot be used to assess the acute (short term exposure) risk that personnel in close contact with exposed soils may experience during demolition, redevelopment or site maintenance duties.

No asbestos was detected in any of the 37 sample analysed. No organic contaminants were identified at concentrations likely to represent a risk to such workers.

Potential risks to construction workers associated with metal contaminants can easily be controlled in most site areas by the use of appropriate personnel protective equipment (disposable coveralls, gloves and particulate/vapour masks) and by adopting high levels of personal hygiene.

Providing contractors undertake and implement a site specific risk assessment and such measures are taken, based on the available information, the potential risk to ground workers is considered to be **LOW**.

7.3 Groundwater

Groundwater was encountered during site works at 1.0m bgl in BH01. Slight seepages were encountered in TPs 03 and 05, BHs 01 and 04 between 1.0m and 2.8m bgl.

No exceedances were identified above DWS values (where available) in the sample recovered from BH01.

No clearly defined groundwater bodies have been identified beneath the site and the groundwater encountered in BH01 is considered to be localised to this area as perched groundwater.

The site is directly underlain by a Principal Aquifer relating to the Monsal Dale Limestone Formation. The site does not lie within a Source Protection Zone and there are no water abstraction licences within 1km of the site. The potential risk to the controlled waters receptors from contaminants originating from the site is considered to be **LOW**.

7.4 Surface Water

The closest surface water receptors are 550m southwest of the site and 600m north of the site. During site works and subsequent groundwater monitoring no laterally extensive groundwater was encountered and it is therefore unlikely that shallow groundwater is in hydraulic continuity with surface waters. Deeper groundwater was not encountered in site works or subsequent monitoring visits. There is potential for deeper groundwater to enter surface water receptors, however no contaminated groundwater was encountered at the site. The potential risk to surface water receptors is considered to be **LOW**.

7.5 Structures and Infrastructure

Buildings (on site and off site)

Limited ground gas monitoring undertaken on site as part of the current investigation indicates that based on the NHBC Traffic Light System the gas regime as beneath the site can be categorised as Green. The Phase 1 report identified that the site is located within an area that requires Full Radon Protection Measures. . RPS does not consider additional gas monitoring visits necessary providing that the Radon Protection Measures would be sufficient protection to cover ground gas assuming a uprated characteristic situation of Amber 1. Amber 1 required basic gas protection measures comprising a sealed gas resistant membrane and ventilated sub floor void.

Providing that basic gas protection measures are incorporated into the building design the risk associated with ground gas is **LOW**. *Please note that it is critical that appropriate gas and radon protection is incorporated into the building design.*

Based on using the average of the highest 20% water soluble sulphate value (20.0mg/l) and the average lowest pH (6.0) from soil samples the ACEC class for topsoil is AC-1. Based on using the average of the highest 20% water soluble sulphate value (14.0mg/l) and the average lowest pH (6.0) from soil samples, and the pH (5.1) and the water soluble sulphate value (33ug/l) from the groundwater sample the ACEC class for Glacial Till is AC-1. Based on using the average of the two highest water soluble sulphate values (59.5mg/l) and the average lowest pH (7.2) from soil samples the ACEC class for Made Ground is AC-1.

Assuming appropriate mitigation measures are adopted, the risk to infrastructure is considered to be **LOW**.

Polymeric Utility Pipes

No elevated concentrations of organic contaminants were recorded within samples collected from soils and groundwater on site. The risk posed to buried services is considered to be **LOW**.

7.6 Revised Conceptual Model

The potential source-pathway-receptor linkages at the subject site discussed above are summarised in the following risk matrix.

Receptor:	Pathway:		
	Direct contact, ingestion soils and dust	Inhalation of vapours	Leaching and ground/ groundwater migration
Current Site Users	Low Limited viable exposure scenario from contaminants in shallow soil.	Low No sources identified by PID screening.	N/A
Future Site Users	Moderate (Low) Potential shallow soil exposure in future private gardens. (Risk can be mitigated by adopted surface cover system).	Low No sources identified by PID screening.	N/A
Construction/ Maintenance Workers	Moderate (Low) Potential shallow soil exposure to future ground workers. (Risk can be mitigated by taking precautions).	Low No sources identified by PID screening.	N/A
Ground water	N/A	Low No sources identified by PID screening.	Low No contaminants identified in groundwater sample.
Surface Water	N/A	N/A	Low No contaminants identified in groundwater sample.
Structures and infrastructure - Contaminants	Moderate (Low) Limited exposure from contaminants in shallow soil to structures and infrastructure. Risk mitigated by incorporation of protection measures)	N/A	Low No contaminants identified in groundwater sample.

The risk ratings are defined as follows:

- **Low risk** - *it is considered unlikely that issues within the category will give rise to significant harm..*
- **Moderate risk** - *it is possible, but not certain that issues within the category will give rise to significant harm.*
- **High risk** - *there is a high potential that issues within the category will give rise to significant harm.*

The risk assessment is based upon the available information relating to the site. Should ground conditions inconsistent with those outlined in this report be encountered RPS should be contacted to enable further assessment.

8 CONCLUSIONS & RECOMMENDATIONS

8.1 *Conclusions*

Soil contaminant concentrations were generally low other than the presence of a series of toxic metals at concentrations exceeding the human health assessment criteria in the northern and eastern area of the site. The risk to human health receptors can be controlled by ensuring that the affected soils are not present at the surface post development. It is likely that much of the affected soils will be stripped during the initial enabling works. Care should be taken not to spread the contamination by relocated excavated soils to other areas of the site. Where the contamination is present beneath the stripped soils this can be achieved by providing a cover system of topsoil/subsoil in gardens and landscaped areas in the north and eastern areas of the site where the contamination was identified. The presence of buildings and hardstanding will break the contaminant pathway in non-landscaped/garden areas.

No organic contaminants were identified at concentrations exceeding the assessment criteria. During the site investigation, soils arisings were screened for volatile compounds using a photo ionisation detector. No significant concentrations were identified.

No asbestos was detected in any of the samples analysed. No exceedances of groundwater were detected above the adopted drinking water standards.

The site is located within an area that requires Full Radon Protection Measures. These measures should also be designed to protect buildings from ground gas assuming Amber 1 ground gas conditions.

Site won materials may be suitable for reuse within proposed earthworks at the site subject to suitable sampling and testing and placement in accordance with a suitable earthworks specification.

Geotechnical assessment of soils was beyond the scope of this assessment.

8.2 *Recommendations*

There is a limited potential for previously unidentified underground structures and soil/groundwater contamination to be encountered during redevelopment of the site. If any previously unidentified underground structures or contamination is encountered during redevelopment work in that area should halt until professional advice has been sought.

Care should be taken to prevent contaminated soils situated in the north and eastern areas of the site from being spread across the wider site. During the initial site strip soils from this area of the site should be handled and stockpile separately. If the contaminated material is to be removed from site during the site strip it should be subject to appropriate waste classification and disposed of

appropriately. If the site strip materials from the affected area are to remain on site it should be positioned at a location where it will not become exposed at the surface and ideally in an area where surface water infiltration is low (i.e. beneath roadways subject to geotechnical consideration).

It will be necessary to manage the contaminated soils appropriately in order to prevent the contamination of unaffected soils. This can be achieved by careful materials management. Any waste soils arising from construction activities of the site should be disposed of in accordance with the relevant statutes and Duty of Care regulations.

The redevelopment should be undertaken under a Construction Environmental Management Plan (CEMP). The purpose of this is to limit the environmental impact of redevelopment on the environment.

Full radon protection measures should be incorporated into the design of all buildings. These protection measures should also be specified to protect buildings assuming Amber 1 ground gas conditions. *The ground gas risk rating has been uprated from green to Amber 1 based on the limited gas monitoring.*

Figure 1

Site Location Plan





Unit 12, Watersedge Business Park, Modwen Road, Salford Quays, M5 3EZ
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Client: Michael Green Planning Services Ltd.

Date: Jun 2016 Scale: 1:25,000 Original Paper Size: A4

Project: Hallsteads, Dove Holes, Buxton

Drawn: HT Checked: AC Job Ref: RCEI43989

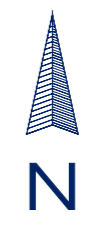
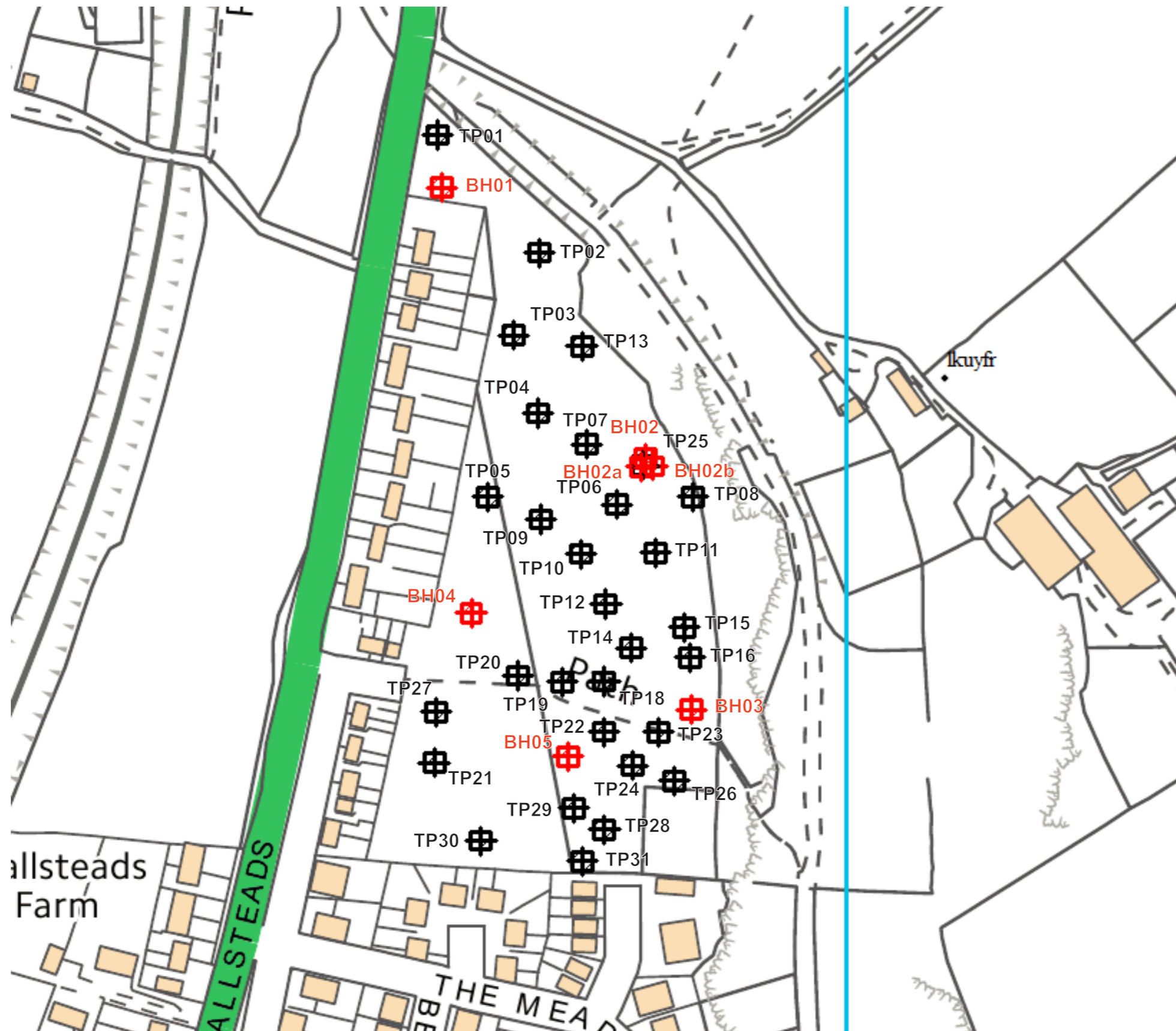
Title: Site Location Plan



Figure Number: 01 Rev: 00

Figure 2

Borehole Location Plan





-  Trial Pit
-  Borehole

RPS Unit 12, Watersedge Business Park
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 W rpsgroup.com

Client: Michael Green Planning Services Ltd.

Title: Borehole Location Plan

Site: Hallsteads, Dove Holes, Buxton

Status: Final Date: June 2016

Scale: NTS Size: A3

Job Number: RCEI43989 Fig: 02 Rev: 00

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Appendix A

Site Investigation General Notes



RPS HEALTH, SAFETY & ENVIRONMENT

Phase 2 – Site Investigations

General Notes

1. The assessments made in this report are based on the ground conditions as revealed by intrusive investigations, together with the results of any field or laboratory testing or chemical analysis undertaken and other relevant data which may have been obtained including previous site investigations. In any event, ground contamination often exists as small discrete areas of contamination ("hot spots") and there can be no certainty that any or all such areas have been located and/or sampled.
2. There may be special conditions appertaining to the site which have not been taken into account in the report. The assessment may be subject to amendment in the light of additional information becoming available.
3. Where any data supplied by the Client or from other sources, including that from previous site investigations, have been used it has been assumed that the information is correct. No responsibility can be accepted by RPS Companies for inaccuracies within the data supplied by other parties.
4. Whilst the report may express an opinion on possible ground conditions between or beyond trial pit or borehole locations, or on the possible presence of features based on either visual, verbal or published evidence this is for guidance only and no liability can be accepted for the accuracy thereof.
5. Comments on groundwater conditions are based on observations made at the time of the investigation unless otherwise stated. Groundwater conditions may vary due to seasonal or other effects.
6. This report is prepared and written in the context of the agreed scope of work and should not be used in a different context. Furthermore, new information, improved practices and changes in legislation may necessitate a re-interpretation of the report in whole or part after its original submission.
7. The copyright in the written materials shall remain the property of the RPS Company but with a royalty-free perpetual licence to the client deemed to be granted on payment in full to the RPS Company by the client of the outstanding amounts.
8. The report is provided for sole use by the Client and is confidential to them and their professional advisors. No responsibility whatsoever for the contents of the report will be accepted to any person other than the Client.
9. These terms apply in addition to the RPS Group "Standard Terms of Business" (or in addition to another written contract which may be in place instead thereof) unless specifically agreed in writing. (In the event of a conflict between these terms and the said Standard Terms of Business the said Standard Terms of Business shall prevail). In the absence of such a written contract the Standard Terms of Business will apply.

Appendix B


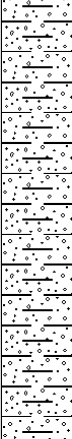

Exploratory Hole Logs






RPS		RPS Health, Safety and Environment Unit 12, Watersedge Business Park Modwen Road, Salford Quays, M5 3EZ Tel: 0161 874 3737 Fax: 0161 877 3959			Site Hallsteads, Dove Holes, Buxton		Trial Pit Number TP01				
Excavation Method Trial Pit		Dimensions		Ground Level (mOD) 324.90		Client Michael Green Planning Services Ltd.		Job Number 43989			
		Location (dGPS) 407818.93 E 378852.1 N		Dates 14/06/2016		Engineer Helen Tribick		Sheet 1/1			
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water			
0.20	E PID - 35ppm			324.60	(0.30) 0.30	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.					
0.80	E PID - 35ppm			323.80	(0.80) 1.10	Firm brown slightly sandy gravelly CLAY with occasional cobbles and boulders. Gravel is subrounded to subangular fine to coarse of limestone. Cobbles and boulders are subangular to angular of limestone maximum dimension 0.4m.					
1.20	E PID - 49ppm			323.60	(0.20) 1.30	Firm dark grey slightly gravelly organic CLAY with occasional wood. Gravel is rounded to subrounded fine of limestone.					
1.80	E PID - 47ppm				(1.50) 2.80	Firm orange mottled dark grey slightly gravelly CLAY. Gravel is subangular fine of mudstone.					
				322.10	2.80	Complete at 2.80m					
Plan						Remarks					
.						Backfilled with arisings.					
.						Pit sides stable.					
.						No groundwater encountered.					
.											
.											
.											
						Scale (approx)		Logged By		Figure No.	
						1:25		HT		43989.TP01	

RPS		RPS Health, Safety and Environment Unit 12, Watersedge Business Park Modwen Road, Salford Quays, M5 3EZ Tel: 0161 874 3737 Fax: 0161 877 3959			Site Hallsteads, Dove Holes, Buxton		Trial Pit Number TP02		
Excavation Method Trial Pit		Dimensions		Ground Level (mOD) 328.17		Client Michael Green Planning Services Ltd.		Job Number 43989	
		Location (dGPS) 407862.997 E 378800.022 N		Dates 14/06/2016		Engineer Helen Tribick		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.10	E PID - 15ppm			327.97	0.20	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.			
1.00	E PID - 13ppm			326.87	1.30	Firm orange brown slightly sandy gravelly CLAY with occasional cobbles and boulders. Sand is fine. Gravel is subangular to angular fine to coarse of limestone. Cobbles and boulders are subangular to angular of limestone maximum dimension 0.3m.			
				326.67	1.50	Firm dark grey slightly gravelly organic CLAY with occasional wood. Gravel is rounded to subrounded fine of limestone.			
				326.17	2.00	Firm orange mottled dark grey slightly gravelly CLAY. Gravel is subangular fine of mudstone.			
						Complete at 2.00m			
Plan						Remarks			
.						Backfilled with arisings.			
.						Pit sides stable.			
.						No groundwater encountered.			
.									
.									
.									
						Scale (approx)		Logged By	
						1:25		HT	
						Figure No. 43989.TP02			

RPS		RPS Health, Safety and Environment Unit 12, Watersedge Business Park Modwen Road, Salford Quays, M5 3EZ Tel: 0161 874 3737 Fax: 0161 877 3959			Site Hallsteads, Dove Holes, Buxton		Trial Pit Number TP03		
Excavation Method Trial Pit		Dimensions		Ground Level (mOD) 328.40		Client Michael Green Planning Services Ltd.		Job Number 43989	
		Location (dGPS) 407851.975 E 378763.018 N		Dates 14/06/2016		Engineer Helen Tribick		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.20	E PID - 11ppm			328.10	(0.30) 0.30	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.			
0.90	E PID - 15ppm			327.00	(1.10) 1.40	Firm brown slightly sandy gravelly CLAY with occasional cobbles and boulders. Sand is fine. Gravel is subrounded to subangular fine to coarse of limestone. Cobbles and boulders are subangular to angular of limestone maximum dimension 0.4m.			
			Water strike(1) at 1.80m.	326.60	(0.40) 1.80	Firm dark grey slightly gravelly organic CLAY with occasional wood. Gravel is rounded to subrounded fine of limestone.		▽1	
				325.50	(1.10) 2.90	Dark grey clayey GRAVEL. Gravel is subangular to angular fine to medium of mudstone. Suspected weathered mudstone.			
						Complete at 2.90m			
Plan						Remarks			
.						Slight seepage from 1.8m.			
.						Backfilled with arisings.			
.						Pit sides stable.			
.						Scale (approx)		Logged By	
.						1:25		HT	
.								Figure No.	
.								43989.TP03	


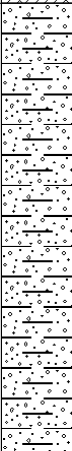

RPS		RPS Health, Safety and Environment Unit 12, Watersedge Business Park Modwen Road, Salford Quays, M5 3EZ Tel: 0161 874 3737 Fax: 0161 877 3959			Site Hallsteads, Dove Holes, Buxton		Trial Pit Number TP04		
Excavation Method Trial Pit		Dimensions		Ground Level (mOD) 328.49		Client Michael Green Planning Services Ltd.		Job Number 43989	
		Location (dGPS) 407862.986 E 378729.002 N		Dates 14/06/2016		Engineer Helen Tribick		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.10	E PID - 36ppm			328.19	(0.30) 0.30	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.			
0.60	E PID - 30ppm				(1.50)	Stiff orange brown slightly sandy slightly gravelly CLAY with occasional cobbles. Sand is fine. Gravel is subrounded fine of limestone and coal. Cobbles are subangular to angular of limestone.			
				326.69	1.80 (0.20)	Dark grey clayey GRAVEL. Gravel is subangular to angular fine to medium of mudstone. Suspected weathered mudstone.			
				326.49	2.00	Complete at 2.00m			
Plan						Remarks Excavating from 1.00m. No groundwater encountered. Pit sides stable. Backfilled with arisings.			
						Scale (approx) 1:25		Logged By HT	
						Figure No. 43989.TP04			

Excavation Method Trial Pit	Dimensions	Ground Level (mOD) 329.14	Client Michael Green Planning Services Ltd.	Job Number 43989
	Location (dGPS) 407840.977 E 378692.032 N	Dates 15/06/2016	Engineer Helen Tribick	Sheet 1/1



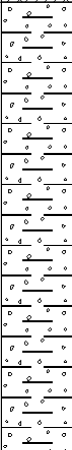
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.60	E PID - 12ppm		Water strike(1) at 1.00m.	328.84	(0.30)	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.		
					0.30	Firm and stiff orange mottled brown slightly sandy slightly gravelly CLAY with occasional cobbles and boulders. Sand is fine. Gravel is subrounded to subangular fine to coarse of limestone. Cobbles and boulders are rounded to subangular to angular of limestone maximum dimension 0.4m. Becoming firm friable orange mottled blue grey.		
					(1.70)	Becoming stiff orange mottled dark grey.		∇1
				327.14	2.00	Complete at 2.00m		




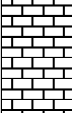
Plan	Remarks		
. .	Backfilled with arisings. Pit sides stable. Slight seepage in gravel at 1.0m.		
	Scale (approx) 1:25	Logged By HT	Figure No. 43989.TP05

Excavation Method Trial Pit	Dimensions	Ground Level (mOD) 330.40	Client Michael Green Planning Services Ltd.	Job Number 43989
	Location (dGPS) 407897.959 E 378687.988 N	Dates 14/06/2016	Engineer Helen Tribick	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	E PID - 10ppm			330.10	(0.30) 0.30	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.		
				328.60	(1.50) 1.80	Firm orange brown slightly sandy slightly gravelly CLAY with occasional cobbles and boulders. Sand is fine. Gravel is subrounded fine of limestone and coal. Cobbles and boulders are subrounded of limestone maximum dimension 0.5m.		
				328.40	(0.20) 2.00	Strong light grey LIMESTONE. Suspected bedrock.		
						Complete at 2.00m		

Plan	Remarks			
. .	Pit terminated due to strength of rock. No groundwater encountered. Pit sides stable. Backfilled with arisings.			
	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">Scale (approx) 1:25</td> <td style="width:33%;">Logged By HT</td> <td style="width:33%;">Figure No. 43989.TP06</td> </tr> </table>	Scale (approx) 1:25	Logged By HT	Figure No. 43989.TP06
Scale (approx) 1:25	Logged By HT	Figure No. 43989.TP06		

		RPS Health, Safety and Environment Unit 12, Watersedge Business Park Modwen Road, Salford Quays, M5 3EZ Tel: 0161 874 3737 Fax: 0161 877 3959				Site Hallsteads, Dove Holes, Buxton		Trial Pit Number TP07	
		Excavation Method Trial Pit		Dimensions		Ground Level (mOD) 328.73		Client Michael Green Planning Services Ltd.	
		Location (dGPS) 407883.99 E 378715.005 N		Dates 15/06/2016		Engineer Helen Tribick		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.70	E PID - 33ppm			328.43	0.30	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.			
					(1.50)	Stiff orange brown mottled grey slightly gravelly CLAY. Gravel is subrounded to subangular fine to medium of limestone and coal.			
				326.93	1.80	Complete at 1.80m			
Plan .						Remarks No groundwater encountered. Pit sides stable. Backfilled with arisings.			
						Scale (approx) 1:25	Logged By HT	Figure No. 43989.TP07	

		RPS Health, Safety and Environment Unit 12, Watersedge Business Park Modwen Road, Salford Quays, M5 3EZ Tel: 0161 874 3737 Fax: 0161 877 3959			Site Hallsteads, Dove Holes, Buxton		Trial Pit Number TP08		
		Excavation Method Trial Pit		Dimensions		Ground Level (mOD) 331.60		Client Michael Green Planning Services Ltd.	
		Location (dGPS) 407930.987 E 378691.973 N		Dates 15/06/2016		Engineer Helen Tribick		Job Number 43989	
						Sheet 1/1			
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.80	E PID - 3ppm				(0.30)	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.			
					0.30 (0.20)	Firm brown slightly gravelly CLAY. Gravel is subrounded fine to medium of limestone and coal.			
					0.50 (0.40)	Strong light grey LIMESTONE. Suspected bedrock.			
					0.90	Complete at 0.90m			
Plan .						Remarks Pit terminated due to strength of rock. No groundwater encountered. Pit sides stable. Backfilled with arisings.			
						Scale (approx) 1:25	Logged By HT	Figure No. 43989.TP08	



RPS Health, Safety and Environment
 Unit 12, Watersedge Business Park
 Modwen Road, Salford Quays, M5 3EZ
 Tel: 0161 874 3737 Fax: 0161 877 3959


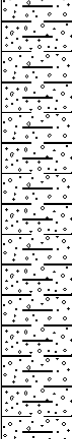
Site
 Hallsteads, Dove Holes, Buxton




Trial Pit Number
TP09

Excavation Method Trial Pit	Dimensions		Ground Level (mOD) 329.76	Client Michael Green Planning Services Ltd.	Job Number 43989
	Location (dGPS) 407863.969 E 378681.991 N		Dates 14/06/2016	Engineer Helen Tribick	Sheet 1/1


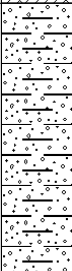


Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	E PID - 13ppm			329.46	(0.30)	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.		
					0.30	Stiff orange brown slightly sandy slightly gravelly CLAY with occasional cobbles. Sand is fine. Gravel is subrounded fine of limestone and coal. Cobbles are subangular to angular of limestone.		
					(1.00)			
					1.30	Strong black with orange staining SHALE.		
				328.46	(0.50)			
				327.96	1.80	Strong light grey LIMESTONE. Suspected bedrock.		
				327.86	(0.10) 1.90			
						Complete at 1.90m		

Plan .	Remarks Backfilled with arisings. Pit sides collapse in shale. No groundwater encountered. Pit terminated due to strength of rock.		
	<table border="1"> <tr> <td>Scale (approx) 1:25</td> <td>Logged By HT</td> <td>Figure No. 43989.TP09</td> </tr> </table>	Scale (approx) 1:25	Logged By HT
Scale (approx) 1:25	Logged By HT	Figure No. 43989.TP09	

RPS		RPS Health, Safety and Environment Unit 12, Watersedge Business Park Modwen Road, Salford Quays, M5 3EZ Tel: 0161 874 3737 Fax: 0161 877 3959			Site Hallsteads, Dove Holes, Buxton		Trial Pit Number TP10		
Excavation Method Trial Pit		Dimensions		Ground Level (mOD) 331.05		Client Michael Green Planning Services Ltd.		Job Number 43989	
		Location (dGPS) 407881.988 E 378666.033 N		Dates 14/06/2016		Engineer Helen Tribick		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.20	E PID - 27ppm			330.75	0.30	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.			
					1.50	Stiff orange brown slightly sandy slightly gravelly CLAY with occasional cobbles. Sand is fine. Gravel is subrounded fine of limestone and coal. Cobbles are subangular to angular of limestone.			
					1.80	Complete at 1.80m			
Plan .						Remarks No groundwater encountered. Pit sides stable. Backfilled with arisings.			
						Scale (approx) 1:25	Logged By HT	Figure No. 43989.TP10	



RPS		RPS Health, Safety and Environment Unit 12, Watersedge Business Park Modwen Road, Salford Quays, M5 3EZ Tel: 0161 874 3737 Fax: 0161 877 3959			Site Hallsteads, Dove Holes, Buxton		Trial Pit Number TP11				
Excavation Method Trial Pit		Dimensions		Ground Level (mOD) 331.86		Client Michael Green Planning Services Ltd.		Job Number 43989			
		Location (dGPS) 407914.975 E 378667.026 N		Dates 15/06/2016		Engineer Helen Tribick		Sheet 1/1			
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water			
0.50	E PID - 8ppm			331.56	(0.30)	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.					
					0.30	Firm brown silty slightly sandy CLAY. Sand is fine.					
					(0.90)						
					1.20 (0.10)	Strong light grey LIMESTONE. Suspected bedrock.					
				330.66	1.30	Complete at 1.30m					
				330.56							
Plan						Remarks					
.						Backfilled with arisings.					
.						Pit sides stable.					
.						No groundwater encountered.					
.						Pit terminated due to strength of rock.					
.						Scale (approx)		Logged By		Figure No.	
.						1:25		HT		43989.TP11	

Excavation Method Trial Pit	Dimensions	Ground Level (mOD) 332.86	Client Michael Green Planning Services Ltd.	Job Number 43989
	Location (dGPS) 407892.988 E 378643.981 N	Dates 14/06/2016	Engineer Helen Tribick	Sheet 1/1




Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	E PID - 24ppm			332.56	(0.30)	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.		
					0.30	Stiff brown slightly sandy slightly gravelly CLAY with occasional cobbles and boulders. Sand is fine. Gravel is subrounded fine to medium of limestone. Cobbles and boulders are angular of limestone maximum dimension 0.7m.		
					(0.90)			
					1.20 (0.10)	Strong light grey LIMESTONE. Suspected bedrock.		
				331.66 331.56	1.30	Complete at 1.30m		

Plan .	Remarks Pit terminated due to strength of rock. No groundwater encountered. Pit sides stable. Backfilled with arisings.			
	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">Scale (approx) 1:25</td> <td style="width:33%;">Logged By HT</td> <td style="width:33%;">Figure No. 43989.TP12</td> </tr> </table>	Scale (approx) 1:25	Logged By HT	Figure No. 43989.TP12
Scale (approx) 1:25	Logged By HT	Figure No. 43989.TP12		

RPS		RPS Health, Safety and Environment Unit 12, Watersedge Business Park Modwen Road, Salford Quays, M5 3EZ Tel: 0161 874 3737 Fax: 0161 877 3959			Site Hallsteads, Dove Holes, Buxton		Trial Pit Number TP13				
Excavation Method Trial Pit		Dimensions		Ground Level (mOD) 328.85		Client Michael Green Planning Services Ltd.		Job Number 43989			
		Location (dGPS) 407870.196 E 378754.5 N		Dates 15/06/2016		Engineer Helen Tribick		Sheet 1/1			
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water			
0.30	E PID - 7ppm			328.65	0.20	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.					
					0.50	Brown very clayey SAND with occasional pockets of clay and occasional cobbles and boulders. Sand is fine to medium.. Cobbles and boulders are subrounded of limestone maximum dimension 0.3m.					
					0.70	Firm brown slightly gravelly CLAY. Gravel is subrounded fine to medium of limestone and coal.					
					1.00	Becoming brown grey. Becoming stiff orange brown mottled grey.					
				327.15	1.70	Complete at 1.70m					
Plan						Remarks					
.						No groundwater encountered.					
.						Pit sides stable.					
.						Backfilled with arisings.					
.											
.											
.											
						Scale (approx)		Logged By		Figure No.	
						1:25		HT		43989.TP13	


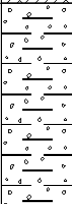

RPS		RPS Health, Safety and Environment Unit 12, Watersedge Business Park Modwen Road, Salford Quays, M5 3EZ Tel: 0161 874 3737 Fax: 0161 877 3959			Site Hallsteads, Dove Holes, Buxton		Trial Pit Number TP14				
Excavation Method Trial Pit		Dimensions		Ground Level (mOD) 334.30		Client Michael Green Planning Services Ltd.		Job Number 43989			
		Location (dGPS) 407903.955 E 378624.958 N		Dates 16/06/2016		Engineer Helen Tribick		Sheet 1/1			
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water			
0.40	E PID - 10ppm			334.10	0.20	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.					
					1.40	Grey brown very clayey cobbly GRAVEL with occasional boulders. Gravel is angular fine to coarse of limestone. Cobbles and boulders are angular of limestone maximum dimension 0.8m.					
				332.70	1.60	Complete at 1.60m					
Plan						Remarks					
.						No groundwater encountered.					
.						Pit sides stable.					
.						Backfilled with arisings.					
.											
.											
.											
						Scale (approx)		Logged By		Figure No.	
						1:25		HT		43989.TP14	

Excavation Method Trial Pit	Dimensions	Ground Level (mOD) 333.69	Client Michael Green Planning Services Ltd.	Job Number 43989
	Location (dGPS) 407928.004 E 378633.988 N	Dates 15/06/2016	Engineer Helen Tribick	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.70	E PID - 3ppm			333.39	(0.30) 0.30	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.		
				332.69	(0.70) 1.00	Brown clayey gravelly SAND with occasional cobbles and boulders. Sand is fine to coarse. Gravel is subrounded to angular fine to coarse of limestone. Cobbles and boulders are angular of limestone maximum dimension 0.4m.		
				332.39	(0.30) 1.30	Strong light grey LIMESTONE. Suspected bedrock.		
						Complete at 1.30m		




Plan .	Remarks Backfilled with arisings. Pit sides stable. No groundwater encountered. Pit terminated due to strength of rock.			
	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">Scale (approx) 1:25</td> <td style="width:33%;">Logged By HT</td> <td style="width:33%;">Figure No. 43989.TP15</td> </tr> </table>	Scale (approx) 1:25	Logged By HT	Figure No. 43989.TP15
Scale (approx) 1:25	Logged By HT	Figure No. 43989.TP15		

Excavation Method Trial Pit	Dimensions	Ground Level (mOD) 333.49	Client Michael Green Planning Services Ltd.	Job Number 43989
	Location (dGPS) 407931.015 E 378596.986 N	Dates 15/06/2016	Engineer Helen Tribick	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	E PID - 3ppm			333.19	(0.30)	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.		
					0.30	Stiff orange brown slightly gravelly CLAY. Gravel is subrounded fine to medium of limestone and coal.		
					(0.70)			
				332.49	1.00	Strong light grey LIMESTONE. Suspected bedrock.		
				332.29	(0.20)			
					1.20	Complete at 1.20m		




Plan .	Remarks Backfilled with arisings. Pit sides stable. No groundwater encountered. Pit terminated due to strength of rock.			
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Scale (approx) 1:25	Logged By HT	Figure No. 43989.TP16		

Excavation Method Trial Pit	Dimensions	Ground Level (mOD) 334.04	Client Michael Green Planning Services Ltd.	Job Number 43989
	Location (dGPS) 407891.983 E 378610.012 N	Dates 16/06/2016	Engineer Helen Tribick	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	E PID - 12ppm			333.84	(0.20) 0.20	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.		
				333.54	(0.30) 0.30	Brown clayey gravelly cobbly SAND. Sand is fine to coarse. Gravel is subangular to angular fine to coarse of limestone. Cobbles are subangular to angular of limestone.		
				333.34	(0.20) 0.20	Strong light grey LIMESTONE. Suspected bedrock.		
						Complete at 0.70m		




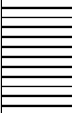

Plan .	Remarks Pit terminated due to strength of rock. No groundwater encountered. Pit sides stable. Backfilled with arisings.			
	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">Scale (approx) 1:25</td> <td style="width:33%;">Logged By HT</td> <td style="width:33%;">Figure No. 43989.TP18</td> </tr> </table>	Scale (approx) 1:25	Logged By HT	Figure No. 43989.TP18
Scale (approx) 1:25	Logged By HT	Figure No. 43989.TP18		

Excavation Method Trial Pit	Dimensions	Ground Level (mOD) 333.30	Client Michael Green Planning Services Ltd.	Job Number 43989
	Location (dGPS) 407874.022 E 378609.991 N	Dates 16/06/2016	Engineer Helen Tribick	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	E PID - 1ppm			333.00 332.70 332.60	(0.30) 0.30	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.		
					(0.30) 0.30	Brown clayey gravelly cobbly bouldery SAND. Sand is fine. Gravel is subangular to angular coarse of limestone. Cobbles and boulders are angular of limestone maximum dimension 0.7m.		
					(0.10) 0.70	Strong light grey LIMESTONE. Suspected bedrock.		
						Complete at 0.70m		



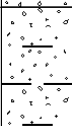

Plan .	Remarks Backfilled with arisings. Pit sides stable. No groundwater encountered. Pit terminated due to strength of rock.			
	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">Scale (approx) 1:25</td> <td style="width:33%;">Logged By HT</td> <td style="width:33%;">Figure No. 43989.TP19</td> </tr> </table>	Scale (approx) 1:25	Logged By HT	Figure No. 43989.TP19
Scale (approx) 1:25	Logged By HT	Figure No. 43989.TP19		

Excavation Method Trial Pit	Dimensions	Ground Level (mOD) 332.87	Client Michael Green Planning Services Ltd.	Job Number 43989
	Location (dGPS) 407854.007 E 378611.987 N	Dates 15/06/2016	Engineer Helen Tribick	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	E PID - 44ppm			332.57	(0.30) 0.30	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.		
				331.97	(0.60) 0.90	Stiff orange brown slightly gravelly CLAY. Gravel is subrounded fine of limestone.		
				331.77	(0.20) 1.10	Orange slightly sandy SILT. Sand is fine.		
				331.37	(0.40) 1.50	Strong black with orange staining SHALE.		
				331.27	(0.10) 1.60	Strong light grey LIMESTONE. Suspected bedrock.		
						Complete at 1.60m		


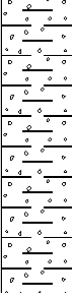
Plan .	Remarks Pit terminated due to strength of rock. No groundwater encountered. Pit sides stable. Backfilled with arisings.						
	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">Scale (approx)</td> <td style="width:33%;">Logged By</td> <td style="width:33%;">Figure No.</td> </tr> <tr> <td style="text-align: center;">1:25</td> <td style="text-align: center;">HT</td> <td style="text-align: center;">43989.TP20</td> </tr> </table>	Scale (approx)	Logged By	Figure No.	1:25	HT	43989.TP20
Scale (approx)	Logged By	Figure No.					
1:25	HT	43989.TP20					

Excavation Method Trial Pit	Dimensions	Ground Level (mOD) 333.14	Client Michael Green Planning Services Ltd.	Job Number 43989
	Location (dGPS) 407815.985 E 378574.022 N	Dates 15/06/2016	Engineer Helen Tribick	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.40	E PID - 14ppm			332.84	(0.30) 0.30	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.		
					(1.20)	Stiff orange brown slightly gravelly CLAY. Gravel is subrounded fine to medium of limestone.		
				331.64	1.50 (0.40)	Becoming friable and orange mottled brown.		
				331.24	1.90	Dark grey clayey GRAVEL. Gravel is subangular to angular fine to medium of mudstone. Suspected weathered mudstone.		
						Complete at 1.90m		

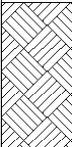


Plan	Remarks		
. .	Backfilled with arisings. Pit sides stable. No groundwater encountered.		
	Scale (approx) 1:25	Logged By HT	Figure No. 43989.TP21

Excavation Method Trial Pit	Dimensions	Ground Level (mOD) 334.36	Client Michael Green Planning Services Ltd.	Job Number 43989
	Location (dGPS) 407891.992 E 378587.994 N	Dates 16/06/2016	Engineer Helen Tribick	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	E PID - 13ppm			334.16	(0.20) 0.20	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.		
				333.16	(1.00) 1.20	Stiff gravelly CLAY with occasional cobbles and boulders. Gravel is subrounded fine to medium of limestone and coal. Cobbles and boulders are angular of limestone maximum dimension 0.8m.		
						Complete at 1.20m		

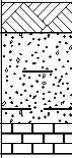
Plan .	Remarks Pit terminated due to boulder in base of pit preventing progress.			
	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">Scale (approx) 1:25</td> <td style="width:33%;">Logged By HT</td> <td style="width:33%;">Figure No. 43989.TP22</td> </tr> </table>	Scale (approx) 1:25	Logged By HT	Figure No. 43989.TP22
Scale (approx) 1:25	Logged By HT	Figure No. 43989.TP22		

Excavation Method Trial Pit	Dimensions	Ground Level (mOD) 334.01	Client Michael Green Planning Services Ltd.	Job Number 43989
	Location (dGPS) 407916.027 E 378587.011 N	Dates 16/06/2016	Engineer Helen Tribick	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.90	E PID - 4ppm				(0.50)	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.		
				333.51	0.50 (0.60)	Brown clayey gravelly cobbly bouldery SAND. Sand is fine to coarse. Gravel is subangular to angular fine to coarse of limestone. Cobbles and boulders are subangular to angular of limestone maximum dimension 1.0m.		
				332.91 332.81	1.10 (0.10) 1.20	Strong light grey LIMESTONE. Suspected bedrock.		
						Complete at 1.20m		

Plan .	Remarks Pit terminated due to strength of rock. No groundwater encountered. Pit sides stable. Backfilled with arisings.			
	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">Scale (approx) 1:25</td> <td style="width:33%;">Logged By HT</td> <td style="width:33%;">Figure No. 43989.TP23</td> </tr> </table>	Scale (approx) 1:25	Logged By HT	Figure No. 43989.TP23
Scale (approx) 1:25	Logged By HT	Figure No. 43989.TP23		


Excavation Method Trial Pit	Dimensions	Ground Level (mOD) 334.20	Client Michael Green Planning Services Ltd.	Job Number 43989
	Location (dGPS) 407904.99 E 378573.024 N	Dates 16/06/2016	Engineer Helen Tribick	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.40	E PID - 11ppm			334.00 333.40 333.20	(0.20) 0.20 (0.60) (0.80) (0.20) 1.00	<p>TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.</p> <p>Brown clayey gravelly SAND with occasional pockets of clay and occasional cobbles and boulders. Gravel is angular fine to coarse of limestone. Cobbles and boulders are angular of limestone maximum dimension 0.7m. Cobble of slag at 0.4m. No other evidence of Made Ground.</p> <p>Strong light grey LIMESTONE. Suspected bedrock.</p> <p>Complete at 1.00m</p>		


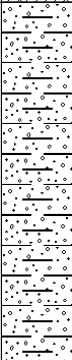
Plan .	Remarks Pit terminated due to strength of rock. No groundwater encountered. Pit sides stable. Backfilled with arisings.		
	Scale (approx) 1:50	Logged By HT	Figure No. 43989.TP24

RPS		RPS Health, Safety and Environment Unit 12, Watersedge Business Park Modwen Road, Salford Quays, M5 3EZ Tel: 0161 874 3737 Fax: 0161 877 3959			Site Hallsteads, Dove Holes, Buxton		Trial Pit Number TP25				
Excavation Method Trial Pit		Dimensions		Ground Level (mOD) 329.62		Client Michael Green Planning Services Ltd.		Job Number 43989			
		Location (dGPS) 407908.967 E 378704.896 N		Dates 15/06/2016		Engineer Helen Tribick		Sheet 1/1			
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water			
0.60	E PID - 89ppm			329.52	(0.10) 0.10	MADE GROUND: Brown clayey topsoil.					
					(1.50)	MADE GROUND: Red brown sand and gravel including ash, coal, brick, tile, porcelain and plastic fragment.					
1.50	E PID - 87ppm			328.02	1.60 (0.40)	Firm orange brown mottled grey gravelly CLAY. Gravel is subrounded fine to medium of limestone.					
				327.62	2.00	Complete at 2.60m					
Plan						Remarks					
.						Backfilled with arisings. Pit sides stable. No groundwater encountered.					
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						Scale (approx) 1:25		Logged By HT		Figure No. 43989.TP25	





Excavation Method Trial Pit	Dimensions	Ground Level (mOD) 333.89	Client Michael Green Planning Services Ltd.	Job Number 43989
	Location (dGPS) 407922.972 E 378565.974 N	Dates 16/06/2016	Engineer Helen Tribick	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	E PID - 2ppm			333.69	(0.20) 0.20	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal. Orange brown very clayey GRAVEL with occasional cobbles and boulders. Gravel is subangular to angular fine to coarse of limestone. Cobbles and boulders are angular of limestone maximum dimension 0.4m.		
				332.09	1.80	Complete at 1.80m		

Plan .	Remarks Backfilled with arisings. Pit sides stable. No groundwater encountered.			
	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:30%;">Scale (approx) 1:50</td> <td style="width:30%;">Logged By HT</td> <td style="width:40%;">Figure No. 43989.TP26</td> </tr> </table>	Scale (approx) 1:50	Logged By HT	Figure No. 43989.TP26
Scale (approx) 1:50	Logged By HT	Figure No. 43989.TP26		

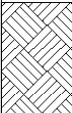

RPS		RPS Health, Safety and Environment Unit 12, Watersedge Business Park Modwen Road, Salford Quays, M5 3EZ Tel: 0161 874 3737 Fax: 0161 877 3959			Site Hallsteads, Dove Holes, Buxton		Trial Pit Number TP27		
Excavation Method Trial Pit		Dimensions		Ground Level (mOD) 332.02		Client Michael Green Planning Services Ltd.		Job Number 43989	
		Location (dGPS) 407817.983 E 378595.979 N		Dates 15/06/2016		Engineer Helen Tribick		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.20	E PID - 8ppm			331.72	0.30	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.			
					1.20	Firm and stiff orange mottled brown slightly sandy slightly gravelly CLAY with occasional cobbles and boulders. Sand is fine. Gravel is subrounded to subangular fine to coarse of limestone. Cobbles and boulders are rounded to subangular to angular of limestone maximum dimension 0.4m.			
				330.52	1.50	Complete at 1.50m			
Plan .						Remarks Chiselling from 0.20m. Pit terminated due to abundance of boulders preventing progress. No groundwater encountered. Pit sides stable. Backfilled with arisings.			
						Scale (approx)	Logged By	Figure No.	
						1:25	HT	43989.TP27	

Excavation Method Trial Pit	Dimensions	Ground Level (mOD) 334.03	Client Michael Green Planning Services Ltd.	Job Number 43989
	Location (dGPS) 407891.999 E 378544.053 N	Dates 16/06/2016	Engineer Helen Tribick	Sheet 1/1


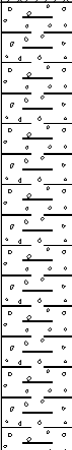
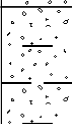
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	E PID - 3ppm			333.63	(0.40) 0.40	TOPSOIL: Dark brown and grey clayey sandy gravelly topsoil. Gravel is subangular fine to medium of limestone. Some red staining throughout topsoil.		
				333.23	(0.40) 0.80	Firm orange brown slightly gravelly CLAY. Gravel is subrounded fine to medium of limestone and coal.		
				333.03	(0.20) 1.00	Firm dark grey slightly organic CLAY.		
				332.53	(0.50) 1.50	Firm red mottled grey CLAY.		
						Complete at 1.50m		


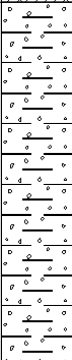


Plan .	Remarks Backfilled with arisings. Pit sides stable. No groundwater encountered.			
	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">Scale (approx) 1:50</td> <td style="width:33%;">Logged By HT</td> <td style="width:33%;">Figure No. 43989.TP28</td> </tr> </table>	Scale (approx) 1:50	Logged By HT	Figure No. 43989.TP28
Scale (approx) 1:50	Logged By HT	Figure No. 43989.TP28		

Excavation Method Trial Pit	Dimensions	Ground Level (mOD) 334.18	Client Michael Green Planning Services Ltd.	Job Number 43989
	Location (dGPS) 407878.997 E 378553.989 N	Dates 15/06/2016	Engineer Helen Tribick	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	E PID - 9ppm			333.78	0.40	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.		
				332.38	1.80	Stiff orange mottled grey slightly gravelly CLAY with occasional boulders. Gravel is subrounded fine to coarse of limestone. Boulders are rounded of limestone maximum dimension 0.4m.		
						Complete at 1.80m		

Plan	Remarks		
. .	Backfilled with arisings. Pit sides stable. No groundwater encountered.		
	Scale (approx) 1:25	Logged By HT	Figure No. 43989.TP29

RPS		RPS Health, Safety and Environment Unit 12, Watersedge Business Park Modwen Road, Salford Quays, M5 3EZ Tel: 0161 874 3737 Fax: 0161 877 3959			Site Hallsteads, Dove Holes, Buxton		Trial Pit Number TP30		
Excavation Method Trial Pit		Dimensions		Ground Level (mOD) 334.36		Client Michael Green Planning Services Ltd.		Job Number 43989	
		Location (dGPS) 407837.967 E 378540.041 N		Dates 15/06/2016		Engineer Helen Tribick		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.10	E PID - 40ppm			334.06	0.30	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.			
					0.30	Firm orange brown slightly gravelly CLAY. Gravel is subrounded fine to medium of limestone. Becoming stiff and friable.			
					1.50				
					1.80	Dark grey clayey GRAVEL. Gravel is subangular to angular fine to medium of mudstone. Suspected weathered mudstone.			
				332.56	2.20	Complete at 2.20m			
Plan				Remarks					
.				Backfilled with arisings.					
.				Pit sides stable.					
.				No groundwater encountered.					
.									
.									
.				Scale (approx)		Logged By		Figure No.	
				1:25		HT		43989.TP30	

RPS		RPS Health, Safety and Environment Unit 12, Watersedge Business Park Modwen Road, Salford Quays, M5 3EZ Tel: 0161 874 3737 Fax: 0161 877 3959			Site Hallsteads, Dove Holes, Buxton		Trial Pit Number TP31		
Excavation Method Trial Pit		Dimensions		Ground Level (mOD) 334.00		Client Michael Green Planning Services Ltd.		Job Number 43989	
		Location (dGPS) 407882.981 E 378530.978 N		Dates 15/06/2016		Engineer Helen Tribick		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.20	E PID - 8ppm			333.70	0.30	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.			
					1.20	Stiff grey brown slightly gravelly CLAY with occasional cobbles. Gravel is subrounded fine of limestone. Cobbles are subrounded of limestone.			
					1.50 (0.10)	Strong light grey LIMESTONE. Suspected bedrock.			
					1.60	Complete at 1.60m			
Plan .						Remarks Backfilled with arisings. Pit sides stable. No groundwater encountered. Pit terminated due to strength of rock.			
						Scale (approx) 1:25	Logged By HT	Figure No. 43989.TP31	

RPS		RPS Health, Safety and Environment Unit 12, Watersedge Business Park Modwen Road, Salford Quays, M5 3EZ Tel: 0161 874 3737 Fax: 0161 877 3959			Site Hallsteads, Dove Holes, Buxton		Number BH01		
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 326.70		Client Michael Green Planning Services Ltd.		Job Number 43989	
		Location (dGPS) 407821.111 E 378829.052 N		Dates 16/06/2016		Engineer Helen Tribick		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.10	E PID - 1ppm			326.40	(0.30) 0.30	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.			
1.00-1.45	SPT N=8		Water strike(1) at 1.00m. 1,1/1,2,2,3		(1.85)	Stiff brown slightly gravelly CLAY. Gravel is subrounded fine to medium of limestone.		▽1	
2.00-2.20	SPT 50/50		5,7/9,14,18,9	324.55	2.15	Complete at 2.15m			
Remarks Refused at 2.15m.							Scale (approx) 1:25	Logged By HT	Figure No. 43989.BH01





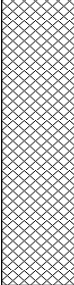
RPS		RPS Health, Safety and Environment Unit 12, Watersedge Business Park Modwen Road, Salford Quays, M5 3EZ Tel: 0161 874 3737 Fax: 0161 877 3959			Site Hallsteads, Dove Holes, Buxton		Number BH02		
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD)		Client Michael Green Planning Services Ltd.		Job Number 43989	
		Location (Handheld GPS) 407913 E 378705 N		Dates 16/06/2016		Engineer Helen Tribick		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.15	E PID - 9ppm				(0.10)	MADE GROUND: Dark brown clayey topsoil.			
					0.10	MADE GROUND: Dark brown sandy gravelly clay including ash, coal and pottery.			
					(0.10)				
0.50	E PID - 5ppm				0.20	Stiff brown gravelly CLAY. Gravel is subrounded fine to medium of limestone.			
					(0.80)				
1.00-1.45	SPT N=12		3,4/4,4,2,2		1.00	No recovery.			
					(0.40)				
					1.40	Orange brown clayey gravelly SAND. Sand is medium to coarse. Gravel is angular to angular fine to medium of shale.			
					(0.80)				
2.00-2.20	SPT 50/50		1,1/28,22		2.20	Complete at 2.20m			
Remarks Refused at 2.2m.							Scale (approx) 1:25	Logged By HT	Figure No. 43989.BH02

RPS		RPS Health, Safety and Environment Unit 12, Watersedge Business Park Modwen Road, Salford Quays, M5 3EZ Tel: 0161 874 3737 Fax: 0161 877 3959			Site Hallsteads, Dove Holes, Buxton		Number BH02A		
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD)		Client Michael Green Planning Services Ltd.		Job Number 43989	
		Location (dGPS) 407909 E 378705 N		Dates 16/06/2016		Engineer Helen Tribick		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.30	E PID - 10ppm				(0.20) 0.20 (0.20) 0.40	MADE GROUND: Dark brown clayey topsoil. MADE GROUND: Dark brown sandy gravelly CLAY including ash, coal and pottery. Stiff orange brown slightly gravelly CLAY. Gravel is subrounded fine to medium of limestone.			
1.00-1.45	SPT N=12		2,2/3,3,3,3		(2.00)				
2.00-2.45	SPT N=1		1,1/1,0,0,0						
2.50-2.55	SPT 25*/10 50/40		25/50		2.40 (0.15) 2.55	Dark grey clayey GRAVEL. Gravel is subangular to angular fine to medium of mudstone. Suspected weathered mudstone. Complete at 2.55m			
Remarks No installation. Refused at 2.55m.							Scale (approx) 1:25	Logged By HT	Figure No. 43989.BH02A

RPS		RPS Health, Safety and Environment Unit 12, Watersedge Business Park Modwen Road, Salford Quays, M5 3EZ Tel: 0161 874 3737 Fax: 0161 877 3959			Site Hallsteads, Dove Holes, Buxton		Number BH02B		
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD)		Client Michael Green Planning Services Ltd.		Job Number 43989	
		Location (Handheld GPS) 407909 E 378705 N		Dates 16/06/2016		Engineer Helen Tribick		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
					(0.20) 0.20	MADE GROUND: Dark brown clayey topsoil.			
0.50	E PID - 9ppm					MADE GROUND: Dark brown sandy gravelly clay including ash, coal and pottery.			
1.00-1.45	SPT N=0		1,0/0,0,0,0						
1.50	E PID - 9ppm								
2.00-2.45	SPT N=0		0,0/0,0,0,0						
2.50	E PID - 10ppm				(4.35)				
3.00-3.45	SPT N=0		0,0/0,0,0,0						
3.50	E PID - 8ppm								
4.00-4.45	SPT N=0		0,0/0,0,0,0						
4.50-4.55	SPT 10*/10 50/40		10/50		4.55				
						Complete at 4.55m			
Remarks Refused at 4.55m.							Scale (approx) 1:25	Logged By HT	
							Figure No. 43989.BH02B		

RPS		RPS Health, Safety and Environment Unit 12, Watersedge Business Park Modwen Road, Salford Quays, M5 3EZ Tel: 0161 874 3737 Fax: 0161 877 3959			Site Hallsteads, Dove Holes, Buxton		Number BH03		
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 331.62		Client Michael Green Planning Services Ltd.		Job Number 43989	
		Location (dGPS) 407833.017 E 378640.018 N		Dates 16/06/2016		Engineer Helen Tribick		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.20	E PID - 1ppm			331.37	0.25	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.			
1.00-1.45	SPT N=15		3,4/3,4,4,4		(2.75)	Stiff brown slightly gravelly CLAY. Gravel is subrounded fine to medium of limestone and coal.			
2.00-2.45	SPT N=13		2,4/3,4,3,3						
3.00-3.20	SPT 50/50		4,5/6,7,17,20	328.62	3.00				
						Complete at 3.20m			
Remarks Refused at 3.2m							Scale (approx) 1:25	Logged By HT	Figure No. 43989.BH03

RPS		RPS Health, Safety and Environment Unit 12, Watersedge Business Park Modwen Road, Salford Quays, M5 3EZ Tel: 0161 874 3737 Fax: 0161 877 3959			Site Hallsteads, Dove Holes, Buxton		Number BH04		
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 333.49		Client Michael Green Planning Services Ltd.		Job Number 43989	
		Location (dGPS) 407931.015 E 378596.986 N		Dates 16/06/2016		Engineer Helen Tribick		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
1.00-1.45	SPT 8*/0 19/450		4,4/4,5,5,5	333.19	(0.30) 0.30	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.			
1.30	E PID - 3ppm				(1.50)	Stiff brown gravelly CLAY. Gravel is subrounded fine to medium of limestone and coal.			
2.00-2.45	SPT N=12		3,4/3,3,3,3	331.69 331.54 331.49	1.80 (0.15) 1.95 (0.05) 2.00	Yellow brown SANDSTONE. Probable cobble.			
					(0.40)	No recovery.			
				331.09	2.40	Yellow brown fine to coarse SAND.			
				330.79	2.70	Stiff orange brown gravelly CLAY. Gravel is subangular fine to medium of mudstone.			
3.00-3.45	SPT N=13		2,3/3,4,3,3	329.99	(0.80) 3.50	Complete at 3.50m			
Remarks Service pit to 1.3m. Refused at 3m. Slight seepage at 2.8m.								Scale (approx) 1:25	Logged By HT
								Figure No. 43989.BH04	

		RPS Health, Safety and Environment Unit 12, Watersedge Business Park Modwen Road, Salford Quays, M5 3EZ Tel: 0161 874 3737 Fax: 0161 877 3959				Site Hallsteads, Dove Holes, Buxton		Number BH05	
		Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 334.13		Client Michael Green Planning Services Ltd.	
		Location (dGPS) 407875.994 E 378576.997 N		Dates 16/06/2016		Engineer Helen Tribick		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.30	E PID - 3ppm			333.88	0.25	TOPSOIL: Dark brown gravelly clayey topsoil. Gravel is subrounded to subangular fine to coarse of limestone and coal.			
1.00-1.20	SPT 12/50		2,2/3,3,3,3	332.93	1.20	Firm brown gravelly CLAY. Gravel is subrounded fine to medium of limestone and coal.			
						Complete at 1.20m			
Remarks No installation. Refused at 1.2m.							Scale (approx) 1:25	Logged By HT	Figure No. 43989.BH05

Appendix C

Field Monitoring Data



Appendix D

Soil Assessment Criteria



Appendix E

Soil Analytical Data





Certificate of Analysis

Certificate Number 16-70109

27-Jun-16

Client RPS Group
Unit 12
Watersedge Business Park
Modwen Road
Salford
M5 3EZ

Our Reference 16-70109

Client Reference RCEI43989

Order No (not supplied)

Contract Title Dove Holes

Description 36 Soil samples.

Date Received 18-Jun-16

Date Started 18-Jun-16

Date Completed 27-Jun-16

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the scope of UKAS accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. Observations and interpretations are outside the scope of ISO 17025. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read "Rob Brown".

Rob Brown
Business Manager



Summary of Chemical Analysis

Soil Samples

Our Ref 16-70109
 Client Ref RCEI43989
 Contract Title Dove Holes

Lab No	1008567	1008568	1008569	1008570	1008571	1008572
Sample ID	TP01	TP02	TP03	TP04	TP09	TP06
Depth	0.20	0.10	0.20	0.10	0.10	0.50
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	14/06/16	14/06/16	14/06/16	14/06/16	15/06/16	14/06/16
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units	1008567	1008568	1008569	1008570	1008571	1008572
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	37	26	23	22	6.2	45
Cadmium	DETSC 2301#	0.1	mg/kg	11	3.8	2.4	0.9	0.3	0.6
Chromium	DETSC 2301#	0.15	mg/kg	31	23	21	20	23	21
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	140	70	45	27	16	100
Lead	DETSC 2301#	0.3	mg/kg	100	130	180	100	27	46
Mercury	DETSC 2325#	0.05	mg/kg	0.32	0.08	0.18	0.06	< 0.05	0.07
Molybdenum	DETSC 2301#	0.4	mg/kg	19			5.1	< 0.4	
Nickel	DETSC 2301#	1	mg/kg	180	57	24	21	33	66
Selenium	DETSC 2301#	0.5	mg/kg	0.9	1.8	0.8	1.3	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	950	250	210	86	75	200
Inorganics									
pH	DETSC 2008#			7.3	7.6	6.8	6.9	6.1	6.5
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.2	0.2	0.3	0.6	0.7	0.1
Organic matter	DETSC 2002#	0.1	%	4.4	2.3	4.1	7.1	6.6	0.9
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	12	16	16	18	17	< 10
Sulphide	DETSC 2024#	10	mg/kg	16	12	12	< 10	< 10	< 10
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	0.08	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 16-70109
 Client Ref RCEI43989
 Contract Title Dove Holes

Lab No	1008567	1008568	1008569	1008570	1008571	1008572
Sample ID	TP01	TP02	TP03	TP04	TP09	TP06
Depth	0.20	0.10	0.20	0.10	0.10	0.50
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	14/06/16	14/06/16	14/06/16	14/06/16	15/06/16	14/06/16
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	1.2	0.6	0.6	1.3	0.9	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 16-70109
 Client Ref RCEI43989
 Contract Title Dove Holes

Lab No	1008573	1008574	1008575	1008576	1008577	1008578
Sample ID	TP10	TP12	TP30	TP21	TP20	TP29
Depth	0.20	0.20	0.10	0.40	0.10	0.50
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	15/06/16	14/06/16	15/06/16	15/06/16	15/06/16	15/06/16
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	15	12	32	33	31	27
Cadmium	DETSC 2301#	0.1	mg/kg	0.8	1.3	0.8	0.1	1.0	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	17	19	22	20	21	27
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	19	25	39	27	40	53
Lead	DETSC 2301#	0.3	mg/kg	68	68	120	61	130	72
Mercury	DETSC 2325#	0.05	mg/kg	0.07	0.06	0.11	0.06	0.14	0.06
Molybdenum	DETSC 2301#	0.4	mg/kg	3.7				9.6	
Nickel	DETSC 2301#	1	mg/kg	20	29	14	5.8	25	32
Selenium	DETSC 2301#	0.5	mg/kg	0.5	< 0.5	0.8	0.8	1.1	1.1
Zinc	DETSC 2301#	1	mg/kg	84	120	120	320	160	130
Inorganics									
pH	DETSC 2008#			6.3	6.5	5.8	6.5	6.0	6.1
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.5	0.4	0.7	0.3	0.6	0.2
Organic matter	DETSC 2002#	0.1	%	3.2	4.8	7.5	2.2	4.0	1.7
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	< 10	11	19	< 10	< 10	12
Sulphide	DETSC 2024#	10	mg/kg	< 10	< 10	12	12	20	12
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 16-70109
 Client Ref RCEI43989
 Contract Title Dove Holes

Lab No	1008573	1008574	1008575	1008576	1008577	1008578
Sample ID	TP10	TP12	TP30	TP21	TP20	TP29
Depth	0.20	0.20	0.10	0.40	0.10	0.50
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	15/06/16	14/06/16	15/06/16	15/06/16	15/06/16	15/06/16
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.5	0.6	1.3	< 0.3	1.1	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 16-70109
 Client Ref RCEI43989
 Contract Title Dove Holes

Lab No	1008579	1008580	1008581	1008582	1008583	1008584
Sample ID	TP31	TP13	TP25	TP25	TP11	TP16
Depth	0.20	0.30	0.60	1.50	0.50	0.20
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	15/06/16	15/06/16	15/06/16	15/06/16	15/06/16	15/06/16
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	14	27	93	98	17	19
Cadmium	DETSC 2301#	0.1	mg/kg	0.9	5.2	0.3	1.0	1.1	6.0
Chromium	DETSC 2301#	0.15	mg/kg	18	22	27	27	20	23
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	28	81	130	160	30	43
Lead	DETSC 2301#	0.3	mg/kg	80	200	130	150	72	48
Mercury	DETSC 2325#	0.05	mg/kg	0.09	0.10	0.64	4.7	0.15	0.20
Molybdenum	DETSC 2301#	0.4	mg/kg	29		13			
Nickel	DETSC 2301#	1	mg/kg	20	81	48	53	28	84
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	1.8	< 0.5	< 0.5	< 0.5	1.4
Zinc	DETSC 2301#	1	mg/kg	94	270	130	190	110	260
Inorganics									
pH	DETSC 2008#			7.4	6.8	7.4	7.7	6.9	7.2
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.4	0.2	0.2	0.6	0.5	0.3
Organic matter	DETSC 2002#	0.1	%	4.2	1.8	7.9	7.6	3.3	1.8
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	13	< 10	19	26	< 10	12
Sulphide	DETSC 2024#	10	mg/kg	< 10	< 10	< 10	16	12	20
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 16-70109
 Client Ref RCEI43989
 Contract Title Dove Holes

Lab No	1008579	1008580	1008581	1008582	1008583	1008584
Sample ID	TP31	TP13	TP25	TP25	TP11	TP16
Depth	0.20	0.30	0.60	1.50	0.50	0.20
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	15/06/16	15/06/16	15/06/16	15/06/16	15/06/16	15/06/16
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.4	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.7	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.7	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	1.8	< 1.6	< 1.6
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	1.1	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 16-70109
 Client Ref RCEI43989
 Contract Title Dove Holes

Lab No	1008585	1008586	1008587	1008588	1008589	1008590
Sample ID	TP18	TP14	BH05	TP22	BH04	TP19
Depth	0.10	0.40	0.30	0.10	1.30	0.50
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	16/06/16	16/06/16	16/06/16	16/06/16	16/06/16	16/06/16
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units	1008585	1008586	1008587	1008588	1008589	1008590
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	13	18	18	17	23	23
Cadmium	DETSC 2301#	0.1	mg/kg	2.5	3.0	6.3	1.9	1.2	2.5
Chromium	DETSC 2301#	0.15	mg/kg	22	12	25	21	9.8	31
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	29	38	49	43	45	34
Lead	DETSC 2301#	0.3	mg/kg	43	160	52	90	83	140
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.10	0.05	0.06	< 0.05	0.07
Molybdenum	DETSC 2301#	0.4	mg/kg	3.7					
Nickel	DETSC 2301#	1	mg/kg	44	55	74	63	18	44
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	1.4	0.8	2.7	< 0.5	0.7
Zinc	DETSC 2301#	1	mg/kg	140	160	210	200	74	170
Inorganics									
pH	DETSC 2008#			6.5	8.1	7.2	7.1	5.8	7.2
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.4	< 0.1	0.2	0.4	< 0.1	0.4
Organic matter	DETSC 2002#	0.1	%	5.3	1.1	1.4	2.8	0.9	4.3
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	15	< 10	< 10	< 10	< 10	< 10
Sulphide	DETSC 2024#	10	mg/kg	< 10	20	24	28	12	12
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.25
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 16-70109
 Client Ref RCEI43989
 Contract Title Dove Holes

Lab No	1008585	1008586	1008587	1008588	1008589	1008590
Sample ID	TP18	TP14	BH05	TP22	BH04	TP19
Depth	0.10	0.40	0.30	0.10	1.30	0.50
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	16/06/16	16/06/16	16/06/16	16/06/16	16/06/16	16/06/16
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	1.6	< 0.3	< 0.3	0.3	< 0.3	0.6

Summary of Chemical Analysis

Soil Samples

Our Ref 16-70109
 Client Ref RCEI43989
 Contract Title Dove Holes

Lab No	1008591	1008592	1008593	1008594	1008595	1008596
Sample ID	BH02	BH02	BH01	BH02A	BH02B	BH02B
Depth	0.15	0.50	0.10	0.30	0.50	1.50
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	16/06/16	16/06/16	16/06/16	16/06/16	16/06/16	16/06/16
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units	1008591	1008592	1008593	1008594	1008595	1008596
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	45	26	29	83	89	100
Cadmium	DETSC 2301#	0.1	mg/kg	2.2	5.4	1.7	1.4	0.5	0.5
Chromium	DETSC 2301#	0.15	mg/kg	20	19	22	25	25	28
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	180	79	56	170	150	130
Lead	DETSC 2301#	0.3	mg/kg	170	46	130	220	170	800
Mercury	DETSC 2325#	0.05	mg/kg	0.15	< 0.05	0.16	0.34	0.27	13
Molybdenum	DETSC 2301#	0.4	mg/kg	8.6		9.4	20	11	14
Nickel	DETSC 2301#	1	mg/kg	48	120	24	57	42	49
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	1.1	0.8	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	210	350	140	200	180	170
Inorganics									
pH	DETSC 2008#			7.1	7.5	6.2	7.2	7.6	7.8
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.3	< 0.1	0.5	0.3	0.6	0.2
Organic matter	DETSC 2002#	0.1	%	7.7	0.8	6.3	9.9	8.0	8.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	11	< 10	19	17	31	32
Sulphide	DETSC 2024#	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.03
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	0.25	< 0.01	0.01	0.03
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis Soil Samples

Our Ref 16-70109
Client Ref RCEI43989
Contract Title Dove Holes

Lab No	1008591	1008592	1008593	1008594	1008595	1008596
Sample ID	BH02	BH02	BH01	BH02A	BH02B	BH02B
Depth	0.15	0.50	0.10	0.30	0.50	1.50
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	16/06/16	16/06/16	16/06/16	16/06/16	16/06/16	16/06/16
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.8	< 0.3	1.9	0.9	0.4	0.5

Summary of Chemical Analysis

Soil Samples

Our Ref 16-70109
 Client Ref RCEI43989
 Contract Title Dove Holes

Lab No	1008597	1008598	1008599	1008600	1008601	1008602
Sample ID	BH02B	BH02B	BH04	TP24	TP26	TP28
Depth	2.50	3.50	0.20	0.40	0.10	0.20
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	16/06/16	16/06/16	16/06/16	16/06/16	16/06/16	16/06/16
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	130	120	24	20	18	7.7
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.4	6.2	2.2	2.9	1.7
Chromium	DETSC 2301#	0.15	mg/kg	26	28	27	17	20	14
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	320	230	66	48	45	52
Lead	DETSC 2301#	0.3	mg/kg	180	250	61	91	64	170
Mercury	DETSC 2325#	0.05	mg/kg	2.1	1.1	0.18	0.11	0.09	0.43
Molybdenum	DETSC 2301#	0.4	mg/kg				71		210
Nickel	DETSC 2301#	1	mg/kg	53	58	100	43	65	13
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	1.9	< 0.5	1.6	< 0.5
Zinc	DETSC 2301#	1	mg/kg	170	180	300	150	190	690
Inorganics									
pH	DETSC 2008#			7.8	7.5	7.3	7.7	6.9	8.1
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.2	0.3	0.4	0.3	0.3	0.2
Organic matter	DETSC 2002#	0.1	%	7.3	11	3.2	4.1	2.4	2.1
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	29	87	12	< 10	< 10	22
Sulphide	DETSC 2024#	10	mg/kg	16	< 10	< 10	< 10	< 10	< 10
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	0.02	< 0.01	0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	1.1
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis Soil Samples

Our Ref 16-70109
Client Ref RCEI43989
Contract Title Dove Holes

Lab No	1008597	1008598	1008599	1008600	1008601	1008602
Sample ID	BH02B	BH02B	BH04	TP24	TP26	TP28
Depth	2.50	3.50	0.20	0.40	0.10	0.20
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	16/06/16	16/06/16	16/06/16	16/06/16	16/06/16	16/06/16
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	1.0
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.9
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.8
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.5
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.3
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	3.7
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.4	0.5	1.3	0.7	0.4	0.5

Summary of Asbestos Analysis

Soil Samples

Our Ref 16-70109
 Client Ref RCEI43989
 Contract Title Dove Holes

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1008567	TP01 0.20	SOIL	NAD	none	Keith Wilson
1008568	TP02 0.10	SOIL	NAD	none	Keith Wilson
1008569	TP03 0.20	SOIL	NAD	none	Keith Wilson
1008570	TP04 0.10	SOIL	NAD	none	Keith Wilson
1008571	TP09 0.10	SOIL	NAD	none	Jeff Cruddas
1008572	TP06 0.50	SOIL	NAD	none	Jeff Cruddas
1008573	TP10 0.20	SOIL	NAD	none	Jeff Cruddas
1008574	TP12 0.20	SOIL	NAD	none	Jeff Cruddas
1008575	TP30 0.10	SOIL	NAD	none	Jeff Cruddas
1008576	TP21 0.40	SOIL	NAD	none	Jeff Cruddas
1008577	TP20 0.10	SOIL	NAD	none	Jeff Cruddas
1008578	TP29 0.50	SOIL	NAD	none	Jeff Cruddas
1008579	TP31 0.20	SOIL	NAD	none	Jeff Cruddas
1008580	TP13 0.30	SOIL	NAD	none	Jeff Cruddas
1008581	TP25 0.60	SOIL	NAD	none	Jeff Cruddas
1008582	TP25 1.50	SOIL	NAD	none	Jeff Cruddas
1008583	TP11 0.50	SOIL	NAD	none	Jeff Cruddas
1008584	TP16 0.20	SOIL	NAD	none	Jeff Cruddas
1008585	TP18 0.10	SOIL	NAD	none	Jeff Cruddas
1008586	TP14 0.40	SOIL	NAD	none	Jeff Cruddas
1008587	BH05 0.30	SOIL	NAD	none	Jeff Cruddas
1008588	TP22 0.10	SOIL	NAD	none	Jeff Cruddas
1008589	BH04 1.30	SOIL	NAD	none	Jeff Cruddas
1008590	TP19 0.50	SOIL	NAD	none	Jeff Cruddas
1008591	BH02 0.15	SOIL	NAD	none	Jeff Cruddas
1008592	BH02 0.50	SOIL	NAD	none	Jeff Cruddas
1008593	BH01 0.10	SOIL	NAD	none	Jeff Cruddas
1008594	BH02A 0.30	SOIL	NAD	none	Jeff Cruddas
1008595	BH02B 0.50	SOIL	NAD	none	Jeff Cruddas
1008596	BH02B 1.50	SOIL	NAD	none	Jeff Cruddas
1008597	BH02B 2.50	SOIL	NAD	none	Jeff Cruddas
1008598	BH02B 3.50	SOIL	NAD	none	Jeff Cruddas
1008599	BH04 0.20	SOIL	NAD	none	Jeff Cruddas
1008600	TP24 0.40	SOIL	NAD	none	Jeff Cruddas
1008601	TP26 0.10	SOIL	NAD	none	Jeff Cruddas
1008602	TP28 0.20	SOIL	NAD	none	Jeff Cruddas

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 16-70109
Client Ref RCEI43989
Contract Dove Holes

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1008567	TP01 0.20 SOIL	14/06/16	PT 1L		Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1008568	TP02 0.10 SOIL	14/06/16	PT 1L		Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1008569	TP03 0.20 SOIL	14/06/16	PT 1L		Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1008570	TP04 0.10 SOIL	14/06/16	PT 1L		Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1008571	TP09 0.10 SOIL	15/06/16	PT 1L		Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1008572	TP06 0.50 SOIL	14/06/16	PT 1L		Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1008573	TP10 0.20 SOIL	15/06/16	PT 1L		Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1008574	TP12 0.20 SOIL	14/06/16	PT 1L		Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1008575	TP30 0.10 SOIL	15/06/16	PT 1L		Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1008576	TP21 0.40 SOIL	15/06/16	PT 1L		Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1008577	TP20 0.10 SOIL	15/06/16	PT 1L		Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1008578	TP29 0.50 SOIL	15/06/16	PT 1L		Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1008579	TP31 0.20 SOIL	15/06/16	PT 1L		Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1008580	TP13 0.30 SOIL	15/06/16	PT 1L		Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1008581	TP25 0.60 SOIL	15/06/16	PT 1L		Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1008582	TP25 1.50 SOIL	15/06/16	PT 1L		Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1008583	TP11 0.50 SOIL	15/06/16	PT 1L		Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1008584	TP16 0.20 SOIL	15/06/16	PT 1L		Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1008585	TP18 0.10 SOIL	16/06/16	GJ 250ml, GJ 60ml, PT 1L		
1008586	TP14 0.40 SOIL	16/06/16	GJ 250ml, GJ 60ml, PT 1L		
1008587	BH05 0.30 SOIL	16/06/16	GJ 250ml, GJ 60ml, PT 1L		
1008588	TP22 0.10 SOIL	16/06/16	GJ 250ml, GJ 60ml, PT 1L		
1008589	BH04 1.30 SOIL	16/06/16	GJ 250ml, GJ 60ml, PT 1L		
1008590	TP19 0.50 SOIL	16/06/16	GJ 250ml, GJ 60ml, PT 1L		
1008591	BH02 0.15 SOIL	16/06/16	GJ 250ml, GJ 60ml, PT 1L		
1008592	BH02 0.50 SOIL	16/06/16	GJ 250ml, GJ 60ml, PT 1L		
1008593	BH01 0.10 SOIL	16/06/16	GJ 250ml, GJ 60ml, PT 1L		
1008594	BH02A 0.30 SOIL	16/06/16	GJ 250ml, GJ 60ml, PT 1L		
1008595	BH02B 0.50 SOIL	16/06/16	GJ 250ml, GJ 60ml, PT 1L		
1008596	BH02B 1.50 SOIL	16/06/16	GJ 250ml, GJ 60ml, PT 1L		
1008597	BH02B 2.50 SOIL	16/06/16	GJ 250ml, GJ 60ml, PT 1L		
1008598	BH02B 3.50 SOIL	16/06/16	GJ 250ml, GJ 60ml, PT 1L		

Information in Support of the Analytical Results

Our Ref 16-70109
Client Ref RCEI43989
Contract Dove Holes

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1008599	BH04 0.20 SOIL	16/06/16	GJ 250ml, GJ 60ml, PT 1L		
1008600	TP24 0.40 SOIL	16/06/16	GJ 250ml, GJ 60ml, PT 1L		
1008601	TP26 0.10 SOIL	16/06/16	GJ 250ml, GJ 60ml, PT 1L		
1008602	TP28 0.20 SOIL	16/06/16	GJ 250ml, GJ 60ml, PT 1L		

Key: P-Plastic T-Tub G-Glass J-Jar

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months



Certificate of Analysis

Certificate Number 16-70295

27-Jun-16

Client RPS Group
Unit 12
Watersedge Business Park
Modwen Road
Salford
M5 3EZ

Our Reference 16-70295

Client Reference (not supplied)

Order No (not supplied)

Contract Title Dove

Description 2 Soil samples.

Date Received 21-Jun-16

Date Started 21-Jun-16

Date Completed 27-Jun-16

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the scope of UKAS accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. Observations and interpretations are outside the scope of ISO 17025. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read 'Rob Brown'.

Rob Brown
Business Manager



Summary of Chemical Analysis

Soil Samples

Our Ref 16-70295

Client Ref

Contract Title Dove

Lab No	1009631	1009632
Sample ID	TP02	TP04
Depth	0.10	0.60
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	14/06/16	14/06/16
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Metals					
Arsenic	DETSC 2301#	0.2	mg/kg		21
Cadmium	DETSC 2301#	0.1	mg/kg		2.1
Chromium	DETSC 2301#	0.15	mg/kg		22
Chromium, Hexavalent	DETSC 2204*	1	mg/kg		< 1.0
Copper	DETSC 2301#	0.2	mg/kg		37
Lead	DETSC 2301#	0.3	mg/kg		160
Mercury	DETSC 2325#	0.05	mg/kg		0.16
Molybdenum	DETSC 2301#	0.4	mg/kg	16	
Nickel	DETSC 2301#	1	mg/kg		21
Selenium	DETSC 2301#	0.5	mg/kg		1.2
Zinc	DETSC 2301#	1	mg/kg		190
Inorganics					
pH	DETSC 2008#				7.0
Cyanide, Total	DETSC 2130#	0.1	mg/kg		0.6
Organic matter	DETSC 2002#	0.1	%		7.4
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l		16
Sulphide	DETSC 2024#	10	mg/kg		16
Petroleum Hydrocarbons					
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg		< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg		< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg		< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg		< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg		< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg		< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg		< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg		< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg		< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg		< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg		< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg		< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg		< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg		< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg		< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg		< 10
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg		< 10
Benzene	DETSC 3321#	0.01	mg/kg		< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg		< 0.01
Toluene	DETSC 3321#	0.01	mg/kg		< 0.01
Xylene	DETSC 3321#	0.01	mg/kg		< 0.01
MTBE	DETSC 3321	0.01	mg/kg		< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 16-70295

Client Ref

Contract Title Dove

Lab No	1009631	1009632
Sample ID	TP02	TP04
Depth	0.10	0.60
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	14/06/16	14/06/16
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
PAHs					
Naphthalene	DETSC 3301	0.1	mg/kg		< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg		< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg		< 0.1
Fluorene	DETSC 3301	0.1	mg/kg		< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg		< 0.1
Anthracene	DETSC 3301	0.1	mg/kg		< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg		< 0.1
Pyrene	DETSC 3301	0.1	mg/kg		< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg		< 0.1
Chrysene	DETSC 3301	0.1	mg/kg		< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg		< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg		< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg		< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg		< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg		< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg		< 0.1
PAH Total	DETSC 3301	1.6	mg/kg		< 1.6
Phenols					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg		< 0.3

Summary of Asbestos Analysis

Soil Samples

Our Ref 16-70295

Client Ref

Contract Title Dove

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1009632	TP04 0.60	SOIL	NAD	none	Keith Wilson
<p>Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.</p>					

Information in Support of the Analytical Results

Our Ref 16-70295

Client Ref

Contract Dove

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1009631	TP02 0.10 SOIL	14/06/16	GJ 250ml, GV		
1009632	TP04 0.60 SOIL	14/06/16	GJ 250ml, GV		

Key: G-Glass J-Jar V-Vial

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix F

Water Assessment Criteria



Summary of Chemical Analysis

Water Samples

Our Ref 16-70998
 Client Ref RCEI43989
 Contract Title Dove Holes

Lab No	1013469
Sample ID	BH1
Depth	
Other ID	
Sample Type	WATER
Sampling Date	24/06/16
Sampling Time	n/s

Test	Method	LOD	DWS	Units	
Metals					
Arsenic, Dissolved	DETS 2306	0.16	10	ug/l	0.89
Cadmium, Dissolved	DETS 2306	0.03	5	ug/l	0.25
Chromium, Dissolved	DETS 2306	0.25	-	ug/l	0.25
Chromium, Hexavalent	DETS 2203	7	3.4	ug/l	7
Copper, Dissolved	DETS 2306	0.4	2000	ug/l	4
Lead, Dissolved	DETS 2306	0.09	1.2	ug/l	0.18
Mercury, Dissolved	DETS 2306	0.01	1	ug/l	0.02
Molybdenum, Dissolved	DETS 2306	1.1	-	ug/l	5.3
Nickel, Dissolved	DETS 2306	0.5	20	ug/l	13
Selenium, Dissolved	DETS 2306	0.25	10	ug/l	5.7
Zinc, Dissolved	DETS 2306	1.3	10.9	ug/l	2.5
Inorganics					
pH	DETS 2008		-		5.1
Cyanide, Total	DETS 2130	40	50	ug/l	40
Hardness	DETS 2303	0.1	-	mg/l	97.9
Sulphate as SO4	DETS 2055	0.1	250	mg/l	33
Sulphide	DETS 2208	10	-	ug/l	10
Total Organic Carbon	DETS 2033	2	-	mg/l	6
Petroleum Hydrocarbons					
Aliphatic C5-C6	DETS 3322	0.1	-	ug/l	0.1
Aliphatic C6-C8	DETS 3322	0.1	-	ug/l	0.1
Aliphatic C8-C10	DETS 3322	0.1	-	ug/l	0.1
Aliphatic C10-C12	DETS 3072*	1	-	ug/l	1
Aliphatic C12-C16	DETS 3072*	1	-	ug/l	1
Aliphatic C16-C21	DETS 3072*	1	-	ug/l	1
Aliphatic C21-C35	DETS 3072*	1	-	ug/l	1
Aliphatic C5-C35	DETS 3072*	10	-	ug/l	10
Aromatic C5-C7	DETS 3322	0.1	-	ug/l	0.1
Aromatic C7-C8	DETS 3322	0.1	-	ug/l	0.1
Aromatic C8-C10	DETS 3322	0.1	-	ug/l	0.8
Aromatic C10-C12	DETS 3072*	1	-	ug/l	1
Aromatic C12-C16	DETS 3072*	1	-	ug/l	1
Aromatic C16-C21	DETS 3072*	1	-	ug/l	1
Aromatic C21-C35	DETS 3072*	1	-	ug/l	1
Aromatic C5-C35	DETS 3072*	10	-	ug/l	10
TPH Ali/Aro Total	DETS 3072*	10	10	ug/l	10
Benzene	DETS 3322	1	1	ug/l	1
Toluene	DETS 3322	1	50	ug/l	1
Ethylbenzene	DETS 3322	1	-	ug/l	1
Xylene	DETS 3322	1	30	ug/l	1
MTBE	DETS 3322	1	-	ug/l	1
PAHs					
Naphthalene	DETS 074*	0.01	2	ug/l	0.01
Acenaphthylene	DETS 074*	0.01	-	ug/l	0.01
Acenaphthene	DETS 074*	0.01	-	ug/l	0.01
Fluorene	DETS 074*	0.01	-	ug/l	0.01
Phenanthrene	DETS 074*	0.01	-	ug/l	0.01
Anthracene	DETS 074*	0.01	0.1	ug/l	0.01
Fluoranthene	DETS 074*	0.01	0.0063	ug/l	0.01
Pyrene	DETS 074*	0.01	-	ug/l	0.01
Benzo(a)anthracene	DETS 074*	0.01	-	ug/l	0.01
Chrysene	DETS 074*	0.01	-	ug/l	0.01
Benzo(b)fluoranthene	DETS 074*	0.01	0.03	ug/l	0.01
Benzo(k)fluoranthene	DETS 074*	0.01	0.03	ug/l	0.01
Benzo(a)pyrene	DETS 074*	0.01	0.01	ug/l	0.01
Indeno(1,2,3-c,d)pyrene	DETS 074*	0.01	-	ug/l	0.01
Dibenzo(a,h)anthracene	DETS 074*	0.01	-	ug/l	0.01
Benzo(g,h,i)perylene	DETS 074*	0.01	-	ug/l	0.01
PAH Total	DETS 074*	0.2	0.1	ug/l	0.2
Phenols					
Phenol - Monohydric	DETS 2130	100	7.7	ug/l	100

- Value = LOD
- Value > DWS
- DWS > LOD
- EQS where no DWS value available

Appendix G

Water Analytical Data





Certificate of Analysis

Certificate Number 16-70998

04-Jul-16

Client RPS Group
Unit 12
Watersedge Business Park
Modwen Road
Salford
M5 3EZ

Our Reference 16-70998

Client Reference RCEI43989

Order No (not supplied)

Contract Title Dove Holes

Description One Water sample.

Date Received 28-Jun-16

Date Started 28-Jun-16

Date Completed 04-Jul-16

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the scope of UKAS accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. Observations and interpretations are outside the scope of ISO 17025. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read 'Rob Brown', with a period at the end.

Rob Brown
Business Manager



Summary of Chemical Analysis

Water Samples

Our Ref 16-70998
 Client Ref RCEI43989
 Contract Title Dove Holes

Lab No	1013469
Sample ID	BH1
Depth	
Other ID	
Sample Type	WATER
Sampling Date	24/06/16
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	0.89
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	0.25
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25
Chromium, Hexavalent	DETSC 2203	7	ug/l	< 7.0
Copper, Dissolved	DETSC 2306	0.4	ug/l	4.0
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.18
Mercury, Dissolved	DETSC 2306	0.01	ug/l	0.02
Molybdenum, Dissolved	DETSC 2306	1.1	ug/l	5.3
Nickel, Dissolved	DETSC 2306	0.5	ug/l	13
Selenium, Dissolved	DETSC 2306	0.25	ug/l	5.7
Zinc, Dissolved	DETSC 2306	1.3	ug/l	2.5
Inorganics				
pH	DETSC 2008			5.1
Cyanide, Total	DETSC 2130	40	ug/l	< 40
Hardness	DETSC 2303	0.1	mg/l	97.9
Sulphate as SO4	DETSC 2055	0.1	mg/l	33
Sulphide	DETSC 2208	10	ug/l	< 10
Total Organic Carbon	DETSC 2033	2	mg/l	6.0
Petroleum Hydrocarbons				
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0
Aliphatic C5-C35	DETSC 3072*	10	ug/l	< 10
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	0.8
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10
TPH Ali/Aro Total	DETSC 3072*	10	ug/l	< 10
Benzene	DETSC 3322	1	ug/l	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0
MTBE	DETSC 3322	1	ug/l	< 1.0

Summary of Chemical Analysis

Water Samples

Our Ref 16-70998

Client Ref RCEI43989

Contract Title Dove Holes

Lab No	1013469
Sample ID	BH1
Depth	
Other ID	
Sample Type	WATER
Sampling Date	24/06/16
Sampling Time	n/s

Test	Method	LOD	Units	
PAHs				
Naphthalene	DETS 074*	0.01	ug/l	< 0.01
Acenaphthylene	DETS 074*	0.01	ug/l	< 0.01
Acenaphthene	DETS 074*	0.01	ug/l	< 0.01
Fluorene	DETS 074*	0.01	ug/l	< 0.01
Phenanthrene	DETS 074*	0.01	ug/l	< 0.01
Anthracene	DETS 074*	0.01	ug/l	< 0.01
Fluoranthene	DETS 074*	0.01	ug/l	< 0.01
Pyrene	DETS 074*	0.01	ug/l	< 0.01
Benzo(a)anthracene	DETS 074*	0.01	ug/l	< 0.01
Chrysene	DETS 074*	0.01	ug/l	< 0.01
Benzo(b)fluoranthene	DETS 074*	0.01	ug/l	< 0.01
Benzo(k)fluoranthene	DETS 074*	0.01	ug/l	< 0.01
Benzo(a)pyrene	DETS 074*	0.01	ug/l	< 0.01
Indeno(1,2,3-c,d)pyrene	DETS 074*	0.01	ug/l	< 0.01
Dibenzo(a,h)anthracene	DETS 074*	0.01	ug/l	< 0.01
Benzo(g,h,i)perylene	DETS 074*	0.01	ug/l	< 0.01
PAH Total	DETS 074*	0.2	ug/l	< 0.20
Phenols				
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100

Information in Support of the Analytical Results

Our Ref 16-70998
Client Ref RCEI43989
Contract Dove Holes

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1013469	BH1 WATER	24/06/16	GB 1L, GV x2, PB 1L		
<p>Key: G-Glass P-Plastic B-Bottle V-Vial</p> <p>DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.</p>					

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months